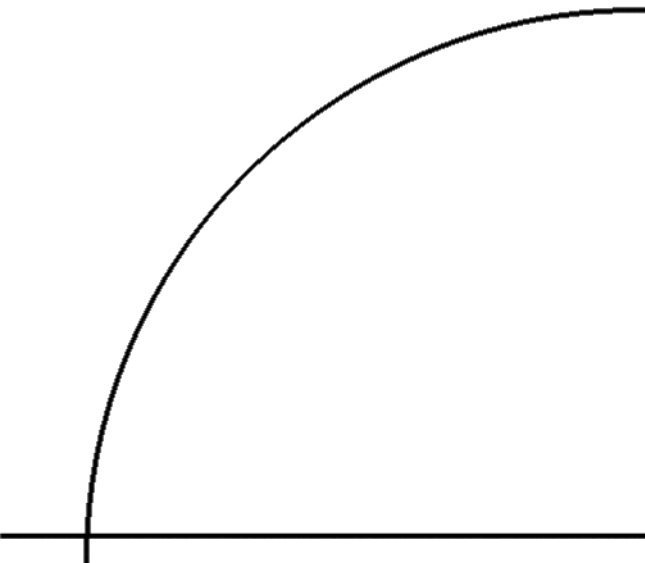


P C D r a f t [®]

User Guide



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The PC Draft manual was based on the MacDraft manual written by Angus MacDonald.

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PCDVR052000

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Chapter 1

Getting Started with PC Draft

Welcome to PC Draft

The purpose of the *PC Draft User Guide* is to provide you with detailed information about the features and capabilities of PC Draft. The manual is structured so that you can refer directly to a particular feature and obtain detailed instructions about its use. Topics in the manual include instructions on creating, editing, moving, and arranging objects on a drawing.

Introduction

Before you proceed, you should be comfortable with terms such as **click**, **drag**, **select**, and **choose**. You should also be familiar with the general methods used in most Windows® applications to move, resize, and scroll a window.

Hardware and Software Requirements

PC Draft is designed to run under Windows® 95 or later and Windows® NT.

Your PC Draft program will run on any PC computer with Pentium® processor. PC Draft requires a minimum of 6 MB application memory (free RAM) to operate, ten megabytes (10 MB) is recommended. The program takes up about 10 MB of hard disk space.

You must run PC Draft from a hard disk. The following instructions describe how to install PC Draft on the hard disk.

Installing PC Draft

To install PC Draft onto your hard disk, follow these steps:

1. **Insert the PC Draft Install CD into a CD drive.**
2. **Find the file icon for the Installer software and double click on it. Once the installation program starts, follow its instructions.**

The PC Draft program and its supplemental files will be installed where you specify on your hard disk.

The installer will create a shortcut folder that you can open by selecting the Start Menu and Programs option.

Enabling Microspot PC Draft

The first time you launch PC Draft you must enter a name and valid serial number to enable the software.

To enable Microspot PC Draft:

1. **Double-click on the PC Draft application icon to launch the software.**
2. **Enter a name and valid serial number (the organization name is optional) into the dialog that appears.**



A screenshot of a Windows-style dialog box titled "Please enter your Serial Number". The dialog has a blue header bar with the title and a close button. Below the header is the Microspot logo, which consists of the word "MICROSPOT" in white on a blue background, with a white pulse line graphic underneath. The main area of the dialog is light gray and contains three text input fields. The first field is labeled "Name:" and is empty. The second field is labeled "Organization (optional):" and is also empty. The third field is labeled "Serial number (XXXX-V000-0000-0000-0000):" and is empty. Below the input fields, there is a block of text: "When you have entered your serial number, click 'OK'. If you do not have a serial number, or do not have it available, click 'Demo'. If you click 'Demo', this software may not run, or may run in a demonstration mode. Check with the software manual for more information." At the bottom right of the dialog are two buttons: "Demo" and "OK".

3. **The serial number must be valid for the version you are using. This will be supplied with the program or upgrade when purchased.**
4. **Only when you have typed in your serial number the OK button will be available.**

Click on this button to open the application.

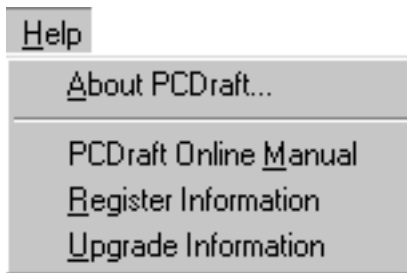
If you click on the Demo button, the application will run in demo mode and some of the features and menu options will be disabled.

The Help Menu

The Help menu is used to open the PC Draft manual, product registration and upgrade information.

The PC Draft Manual in pdf format will be included on disk with the application. The manual will be installed on your hard drive during the installation process.

Choose PC Draft Manual from the Help menu and Acrobat Reader will launch and open the manual. You can then navigate through and read the manual on screen or print sections for your reference.



Getting Started with a Drawing

PC Draft's greatest strength as a drafting and design tool is the way it enables you to define your drawing environment. Using simple menu commands and palette choices, you can specify the default scale, drawing units, and page setup you need for the drawing.

The scaled environment automatically keeps track of the size and area of the objects you draw. You can display their dimensions using the Show Size feature (see Chapter 6), the various dimension tools (see Chapter 4), or the onscreen rulers (see Chapter 6).

NOTE: If you expect to use the same settings over and over in most of your drawings, you can make those the defaults for all new drawings using the File menu's Set Defaults command; see page 1-24. If you expect to use several different sets of defaults, you can make save each setup as a Stationery document; see page 1-17.

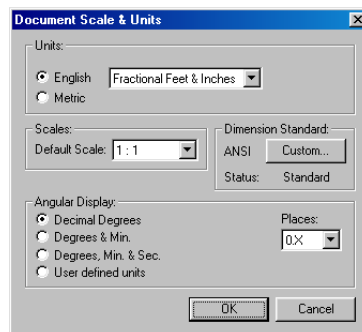
With PC Draft you can draw using either English units (feet and inches) or metric units. PC Draft offers the most commonly used English-unit metric scales. Once you choose a unit system for your drawing, you can define the scale you want to use.

Setting the Size Units

To set the units for a drawing:

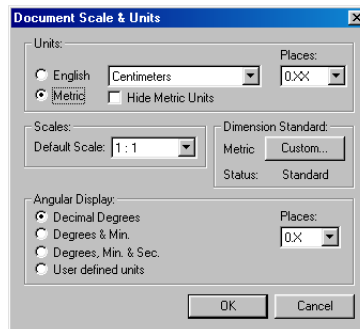
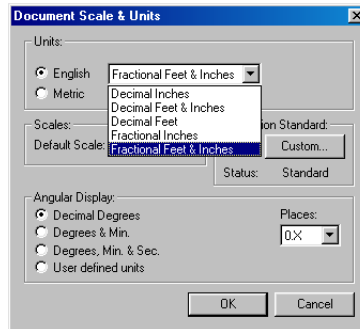
1. Open the Layout menu and choose Set Scale/Units.

The Document Scale & Units dialog box will appear.



2. Click on the English or Metric radio button, depending on the type of units you want to use in the document.

Whether you use the English or Metric system, you can choose the basic units for the drawing: Decimal Inches, Decimal Feet & Inches, Decimal Feet, Fractional Inches, or Fractional Feet & Inches in English drawings; and Millimeters, Centimeters, Decimeters, or Meters in Metric drawings



3. If necessary, change the units in the Units pop-out menu.

NOTE: In metric drawings, you can choose “Hide Metric Units,” which will prevent the unit abbreviations (“mm,” “cm,” and so on) from appearing when dimensions are displayed on the drawing. You can also control the number of places displayed behind the decimal point in both metric and English decimal drawings; see Chapter 4 for more information.

Setting the Scale

Before starting a drawing, you need to determine the sizes of the objects and the paper you are going to use. For large drawings it is impractical to draw objects at their actual sizes; it is necessary to reduce them, yet still maintain their proper proportions.

A scale, the ratio of the object’s size on the drawing to its size in the real world, accomplishes this. For example, if you choose a scale ratio of one-quarter inch equals a foot ($1/4" = 1'$), a line drawn ten inches long on a drawing would represent a 40-foot line in the real world.

NOTE: When you paste an existing object into a drawing with a different scale, the object will automatically adjust in size to conform to the scale of the new drawing.

To specify the default scale:

- 1. Make sure the Document Scale & Units dialog box is open.**
- 2. Point on the combo box beside the label, Default Scale.**
- 3. Press the left mouse button.**

The Scale pop-up menu will appear, displaying the scales available for the chosen unit system.

- 4. Click the wanted scale to choose it.**

The new scale will be displayed in the Default Scale combo box.

- 5. Click on the OK button to close the dialog box and apply the changes.**

NOTE: In drawings that include more than one layer, you can set different scales for different layers, if necessary (see chapter 7 for information about using layers). However, all the layers in a drawing must use the same unit system (English or metric).

Setting the Drawing Size and Layout

Depending on your needs, you can set a drawing's page size, page orientation, and total size. Page size is simply the size of the paper you will be printing, and orientation is whether each page is printed vertically or horizontally.

If necessary, you can create a drawing that will print over several sheets of paper. The maximum drawing size is approximately 56.88 x 56.88 inches (144.46 x 144.46 cms), depending on which page size and orientation you choose.

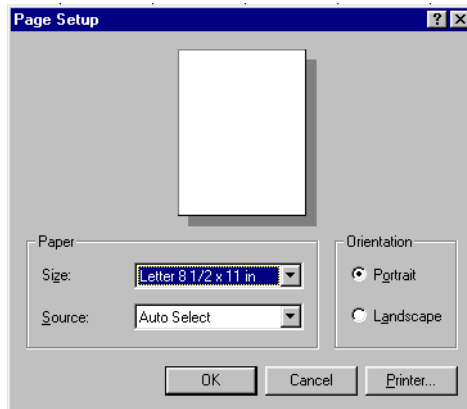
The choice of page size is subject to the page sizes available with the currently active printer or printing device; for example, if the printer you've selected only supports letter-size and legal-size paper, you cannot print to larger or smaller sheets. (See Chapter 8 for more information.)

To set your drawing's page size and orientation:

- 1. Choose the File menu's Page Setup command.**

The Page Setup dialog box will appear.

2. Select the paper size you want for printing your drawing.



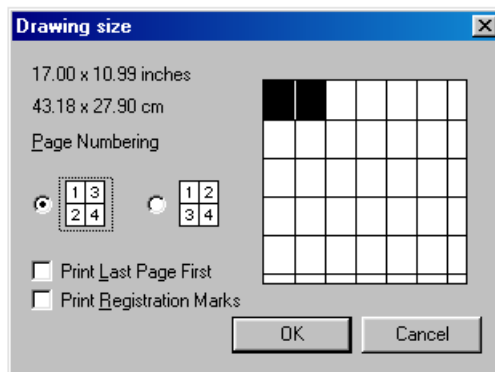
3. Select the page orientation (horizontal or vertical) you want for printing your drawing.
4. Click the OK button.

The Page Setup dialog box will disappear. Your drawing will now have the desired page size and orientation assigned.

To set the size of your drawing:

1. Open the Layout menu and choose Drawing Size.

A dialog box will appear, displaying the current total drawing size in the form of a block diagram.



This diagram represents the maximum drawing size available; each block represents a single page. The blocks that are darkened indicate the current drawing size. You can control the overall size and shape of the drawing by clicking in the diagram.

To change the drawing size:

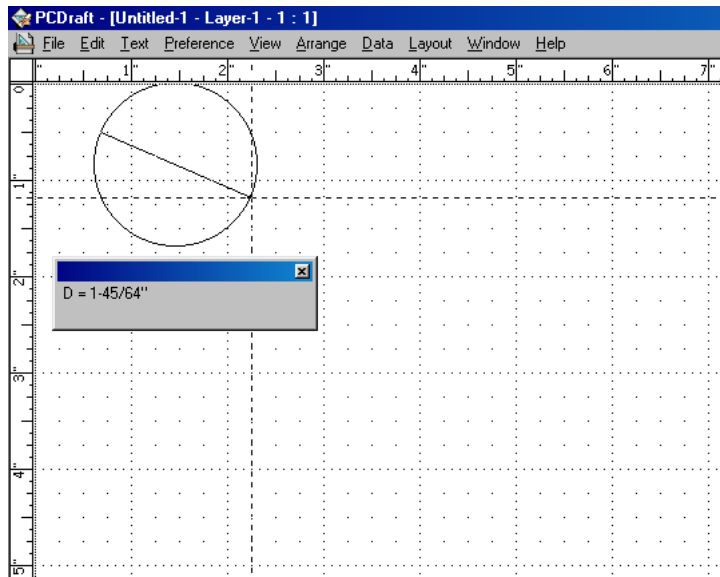
2. **Position the tip of the pointer on one of the activated page blocks and press the left mouse button.**
3. **Holding down the left mouse button, drag until you have activated the number of page blocks required for the drawing size you want.**
4. **Release the left mouse button.**
5. **Click the OK button.**

The PC Draft drawing window generally shows only a portion of the overall drawing. Therefore, when you change the drawing size it might not be noticeable in the window until you zoom out or scroll to another area of the drawing (see Chapter 2 for information about scrolling and zooming).

Rulers and the “Crosshair”

PC Draft’s onscreen rulers can help you draw and position objects in precise locations on your drawing. They appear along the top and left sides of the drawing window, and reflect the current position of the window during scrolling. At magnified views (zoomed in or out), they change size accordingly.

The rulers are especially useful in conjunction with PC Draft’s “crosshair” drawing cursor. This looks like a large pair of crosshairs that extend horizontally and vertically across the window, into the rulers, when a drawing tool is active.



The rulers can show either on-screen sizes (Standard Rulers) or values that match the current scale and units. For example, on a $1/8" = 1'$ scale, the major scale ruler divisions will be in increments of eight (8 ft., 16 ft., and so on).

To display PC Draft's rulers:

- **Open the Layout menu and choose Show Rulers.**

The rulers will be displayed, and a check mark will appear by the Show Rulers command in the Layout menu.

To display scale rulers (if Show Rulers is checked):

- **Open the Layout menu and choose Scale Rulers.**

To display standard rulers:

- **Open the Layout menu and choose Standard Rulers.**

To activate the crosshair cursor:

- **Choose Cross Cursor from the Preference menu.**

The cursor will now appear, when a drawing tool is selected, as a large pair of crosshairs. A checkmark will appear by the Cross Cursor command in the View menu.

Starting a Drawing

With these settings in place, you're ready to start drawing in earnest. The settings you defined—units, scale, page setup, drawing size, rulers, and drawing cursor—will remain active until you change them.

For details on using PC Draft's drawing tools, see Chapter 2 (basic drawing), Chapter 3 (changing the appearance of objects), and Chapter 4 (annotation, including text objects and dimension objects).

Document Handling

- **Open PC Draft from the Start Menu.**

In a few seconds a new untitled document will open on the desktop. You will be able to name this document the first time you save it.

To Create a New Document

1. **Open the File menu and drag until New is highlighted.**

The New submenu will appear.

2. **Holding down the left mouse button, drag until Drawing is highlighted.**
3. **Release the left mouse button.**

To Create Multiple New Documents

Once you have made your choice, a new untitled document will appear in front of any opened documents. Each time you choose "Drawing," a new untitled document will be opened. Change the window sizes and positions as you need to. To activate any opened document, just click on it.

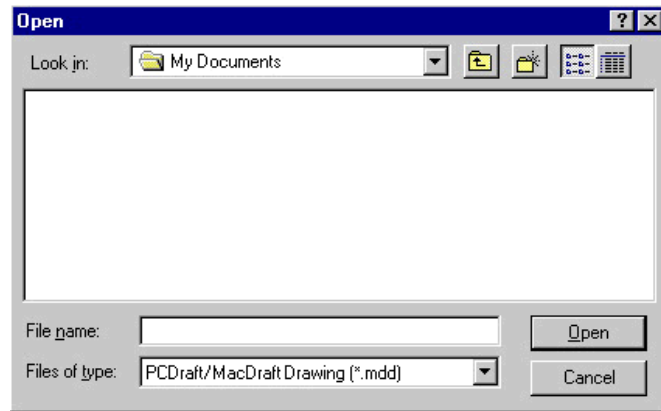
To Find an Existing Document

Using Open From the File Menu

You can find it from the Explorer. Right click on Start Menu and left click Explorer Option. As soon as you find the document on the right side, double click it.

1. Choose Open from the File menu.

A dialog box will appear listing all PC Draft-compatible documents in the current directory.



2. Select the title of the document you want to open by clicking on it.
3. Click the Open button in the dialog box.

In a few seconds the document will be open and ready for you to use.

The available types of documents that may be opened by current version of PC Draft are listed below:

- PC Draft/MacDraft Drawings (*.mdd)
- PC Draft v.4.x Drawings (*.drf)
- PC Draft Symbol Libraries (*.dsy)
- PC Draft Stationeries (*.drs)
- PC Draft 1.0 (WinDraft) Drawings (*.dft)
- DXF and DWG files created by AutoCAD
- Windows Bitmaps (*.bmp)

Loading Layers Into a Drawing

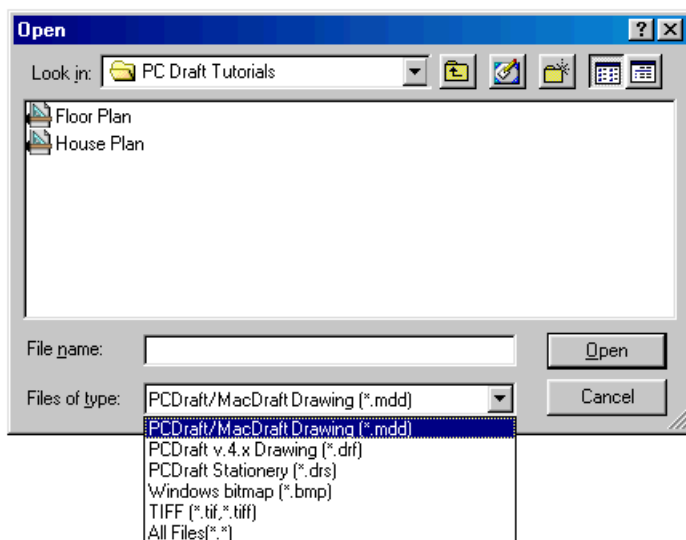
PC Draft lets you load a layer from a different PC Draft document into the active PC Draft document. When you load a layer, the layer's contents and scale information are imported to the active PC Draft document.

To load a layer into the active PC Draft document:

1. **Open the File menu and choose Load Layer.**

A standard open dialog appears.

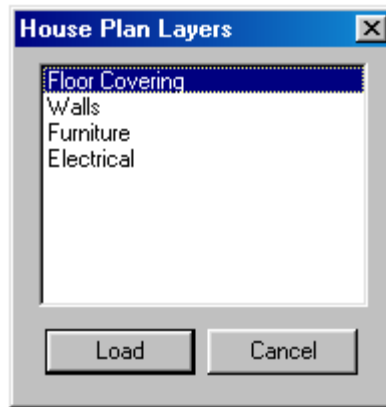
2. **Select the appropriate file format from the Files of type dropdown menu.**



3. **Locate and select the document you want to load.**
4. **Click the Open button.**

A dialog box listing the layers in the selected PC Draft document will appear.

5. **Click on the name of the layer you want.**
6. **Click the Load button.**



The selected layer will be loaded into the active document as the active layer. See Chapter 7 for information about using layers.

NOTE: The Load Layer command can also be used to import images from graphics files saved in the TIFF format. See Appendix C for more information about working with TIFF files.

Saving a Document

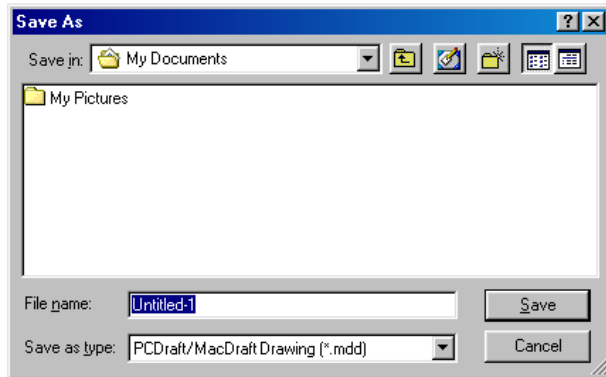
The **Save** function allows you to save a new document or any changes you have made to an existing document. You can save a copy of the whole document onto the disk you are using, or onto any other disk you might want to use for storage.

Saving and Naming an Untitled Document

When you first create a new document, it will have the name “**Untitled-#**,” where “**#**” is the number of new documents you’ve opened since starting PC Draft.

To name and save the document:

1. **Open the File menu and choose Save or Save As.**



The Save dialog box will appear.

2. Type a name for the new document.

You may use any character or symbol on the keyboard. You can also use uppercase or lowercase characters, with spaces between words.

3. Click the Save button.

If there is not enough room on the disk to save your document, a message will appear informing you that the disk is full. To save the document onto a floppy disk if that happens, eject the current floppy disk (if any), insert a new one, then click the Save button. To save the document onto another disk, select the location next to Save in until the name of the volume you want is displayed, then click the Save button.

Saving Changes Made to a Previously Saved Document

After making changes to a previously saved document, you should save it so that the document on your disk will contain those changes.

To save changes made to a previously saved document:

- **Open the File menu and choose Save.**

Once you have done so, the document on the disk will be updated to incorporate the changes.

Saving a Document Onto a Different Disk

If you want to save a document onto a different disk, or if you want to make a document available for someone else, you may want to save it onto another disk.

To save a document onto a different disk:

- 1. Open the File menu and choose Save As.**

A dialog box will appear. The dialog box will display the

PC Draft document titles and the name of the current directory.

- 2. Insert the disk on which you want to save the document into the floppy disk drive. (If you want to save your document on a file server or another hard disk, go on to the next step.)**
- 3. Use the directory list to open the disk and folder in which you want to save the document.**
- 4. Type a new name for the document if you want it to be saved under a different name; otherwise it will be saved under the old name.**
- 5. Click the Save button in the dialog box.**

By using the **Save As** command you can modify an existing document and save it as a new document with a different name, thereby preserving the original version of that document.

Saving a Copy of the Document

To save a copy of the document:

- 1. Open the File menu and choose Save As.**

A dialog box will appear.

- 2. Type a name for the new version so that you can distinguish it from the old version.**
- 3. Click the Save button.**

The document will then be saved with the new name, along with any changes that you have made.

Saving a Document as Stationery

PC Draft lets you save **stationery** files, which act as templates for new documents. For example, you can create a file containing certain images, text and settings, then save it as a stationery file. When you open that stationery file, PC Draft will give you a new untitled drawing containing the images, text and settings, which you can then embellish as required for a specific situation.

It's as if you create a pad of stationery, perhaps featuring a company logo at a particular scale, then "tear off" sheets of paper to use as the basis for new drawings.

Settings that are saved in a stationery document include the scale, units, grid snap, fill patterns and colors in the document.

To save a document as stationery:

- 1. Open the File menu and choose Save As.**

A dialog box will appear.

- 2. Click the Save As type combo box.**

The Save As type pop-up menu will appear.

- 3. Choose Stationery.**

- 4. Type a name for the file.**

- 5. Click the Save button.**

To "tear off" a piece of stationery to use the defined settings in a new document:



- Double-click on the stationery icon.

A new untitled document will appear. The new document will contain the settings and objects defined for the stationery.

Saving a Document in the BMP Format

Windows® provides for integration between various software packages. Information can be transferred between programs using the Copy and Paste method. For example, you can insert charts into a word-processing program, or bitmap images into PC Draft. However, the Copy and Paste method is not always convenient.

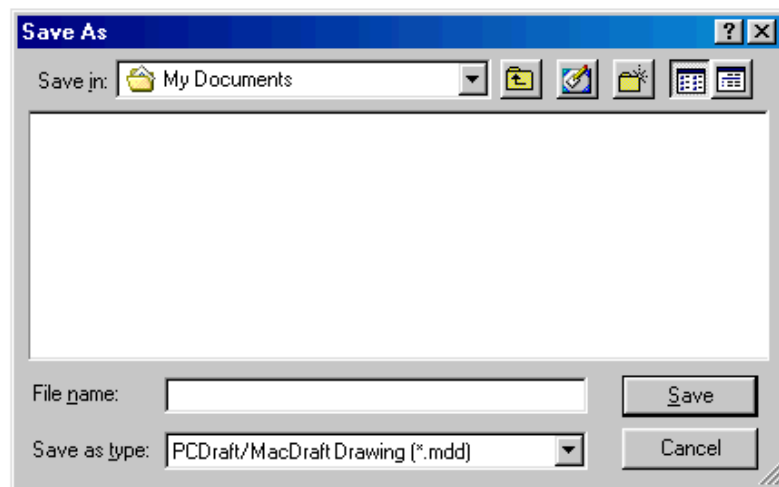
To help solve this problem Microsoft® developed a standard file format called the **BMP** format. Saving a document in the Windows Bitmap format allows you more flexibility in transferring images to other software programs that support the BMP format.

The major benefits of using the BMP format are that it makes it easier to use graphics with certain page layout programs.

To save a document in the BMP format:

1. Open the File menu and choose Save As.

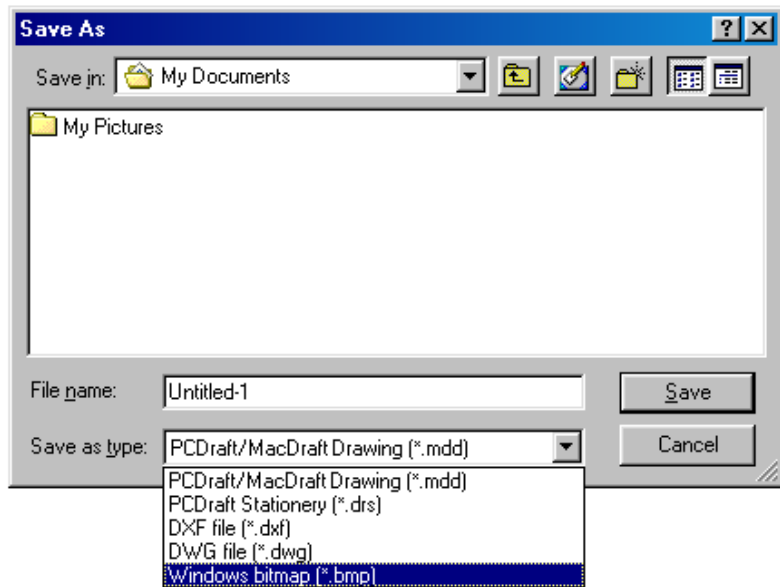
After you have made your choice, the following dialog box will be displayed:



The default format for a document to be saved in is the PC Draft/MacDraft format.

2. Point on the Save as type button.

The Save as type pop-up menu will appear.



3. Choose Windows Bitmap (BMP) format.

4. Click the Save button.

The BMP format icon has a different appearance than a PC Draft drawing icon. The different icons are to help you distinguish between standard PC Draft drawings and BMP documents.



Opening a Document That Has Been Saved in the Windows Bitmap Format

You can open a PC Draft file saved in the Windows Bitmap format using Open or Load Layer option from File Menu.

- 1. Choose Open from the File menu.**

The Open dialog appears.

- 2. Point on the File Format combo box, then press and hold the mouse button.**

The Format pop-up menu will appear.

If you want to view only the Windows Bitmap documents in the current directory:

- 3a. Choose Windows Bitmap, then release the mouse button.**

If you want to view all the documents in the current directory:

- 3b. Choose All, then release the mouse button.**

- 4. Choose the needed file from the list.**

- 5. Click the Open button.**

PC Draft opens the BMP files as regular raster images.

NOTE: Some other applications, such as many word processors and page layout products, can open Windows Bitmap files directly.

Setting Defaults

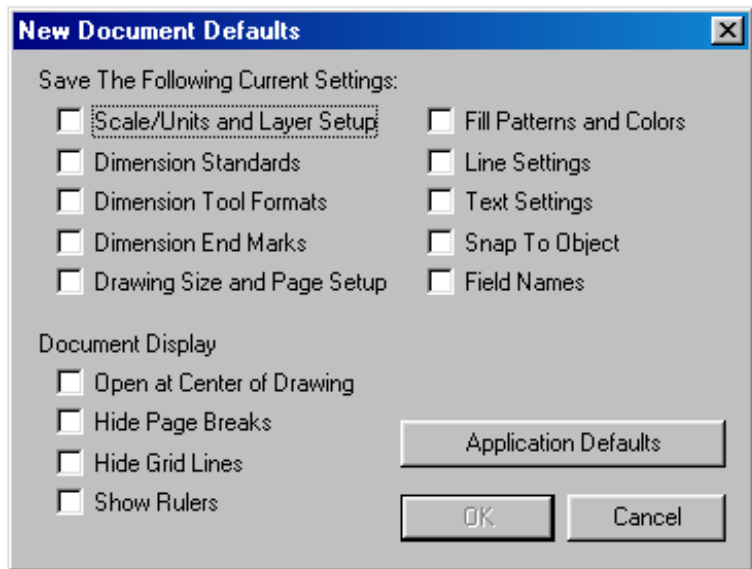
You may configure a document exactly the way you want it, then decide that you want all new documents to have that configuration. PC Draft lets you set certain default settings, including scale, grid snap, colors, and patterns. Once you have established these settings in a document, you can store them as defaults so that the same settings are present in each new drawing you create. Setting defaults is different from saving PC Draft

stationery files. You can save many different stationery documents, each with its own different settings. However, you can only keep one set of defaults. Also, to use the settings saved in a stationery document, you have to open the Stationery document. To use defaults, you simply create a new document.

To set defaults:

1. **Open a document.**
2. **Define the settings you want to save as defaults for all new documents.**
3. **Open the File menu and choose Set Defaults.**

The Defaults for a new document dialog box will appear.



PC Draft lets you specify which settings you want to keep as defaults. You can choose to set all the available defaults, or just a few. (Sometimes, unchecked defaults will be saved.)

To choose the defaults you want to set:

4. Click on the check boxes beside the desired settings.

Following is a list of the default options in the dialog box and the settings that are saved when you choose them.

“Scale/Units and Layer Setup”

- Units
- Default Scale
- Places behind the decimal
- Grid snap
- Rotation and Angular Units

“Dimension Standards”

- Current dimensioning standard (ANSI or metric)
- All options defined in the Dimension Standards dialog box (see Chapter 4 for details on associative dimension objects)

“Dimension Tool Formats”

- Current dimensioning tool setting
- All options defined in the Dimension Format dialog box (see Chapter 4 for details on associative dimension objects)

“Dimension End Marks”

- Current dimension end mark setting

“Drawing Size and Page Setup”

- Drawing size
- All options defined in the Page Setup dialog box

“Fill Patterns and Colors”

- Fill patterns
- Colors in the document’s color table

“Line Settings”

- Line weight
- Line style
- End marks
- Pen color

“Text Settings”

- Font
- Size
- Style
- Spacing
- Justification

“Snap To Object”

- Current Snap To Object setting

“Field Names”

- Current Object Information Field Name definitions

For the Document Display options, if the box beside the option is checked, the option you choose will be applied to all new documents.

If you choose "Open at Center of Drawing," new documents will open with the scroll boxes centered on the scroll bars.

NOTE: When you click the “OK” button, PC Draft saves the defaults automatically. It makes no difference if you later save the current drawing file.

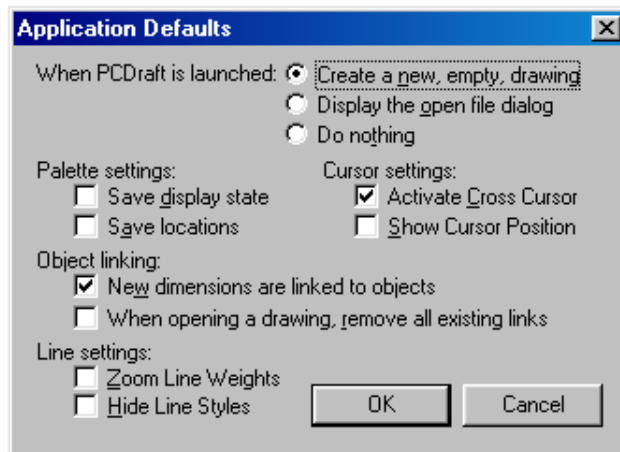
Setting Application Defaults

PC Draft lets you define defaults that affect all new PC Draft documents you create later. The settings you save as Application Defaults affect all documents, even existing documents. The document-level defaults you save affect only new documents you open.

To define the settings for the opening of new documents:

- **Click on the Application Defaults button.**

The Application Defaults dialog box will appear.



When PC Draft is launched

Click the "Create a new empty,drawing" radio button if you want a new drawing document to appear when you open the PC Draft application.

Click the "Display the open file dialog" radio button if you want the Open dialog to appear when you open the PC Draft application.

Click the "Do nothing" radio button if you want the application to open without opening a new document or the Open dialog.

Palette settings

Click the "Save display state" checkbox to make all documents open with the currently displayed palettes shown.

Click the "Save locations" checkbox to make all documents open with the palettes displaying at their current locations.

Cursor settings

Click the "Activate Cross Cursor" checkbox to turn this option off.

Documents will open with the small cursor active rather than the cross cursor.

Click the Show Cursor Position checkbox if you want all documents to open with the cursor position displayed.

Object linking

Click the "New dimensions are linked to object" checkbox to turn this option off. New dimensions drawn will not be linked to objects.

Click the "When opening a drawing, remove all existing object links" checkbox if you wish all links between objects (including dimension objects) to be removed when a drawing is opened.

Line settings

Click the "Zoom Line Weights" checkbox to make all documents open with the Zoom Line Weights function on.

Click the "Hide Line Styles" checkbox to turn this option off and make all documents open with the line styles displayed on the screen.

Closing One Document and Opening Another

Many times you may want to close a document you've been working on, and open another document without quitting the application and returning to the desktop.

To close the current document:

1. **Choose Close from the File menu.**

If the document contains unsaved changes, a dialog box will appear, asking if you want to save changes made to your document before closing it.

2a. Click the Yes button to close the document and save the changes.

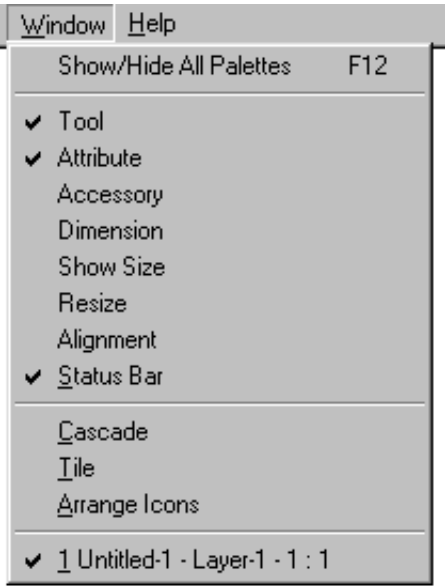
Or,

2b. Click the No button to close the document without saving the changes.

The PC Draft menu bar will appear above an otherwise blank screen.

The Window Menu

The Window menu gives you a quick method for moving to any open drawing or symbol library.



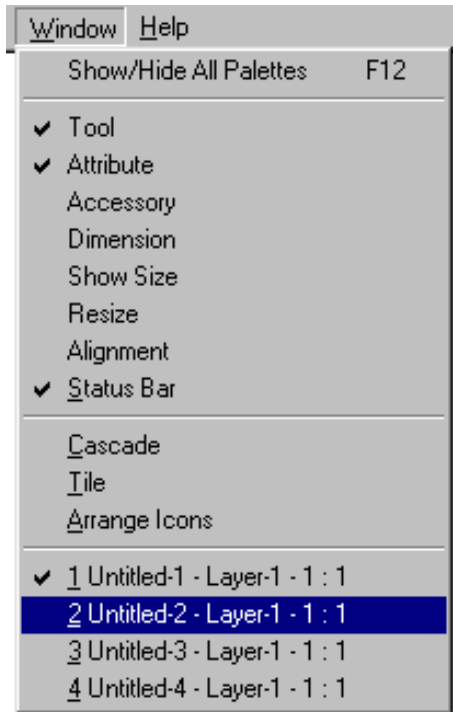
The currently active drawing or library appears in the Window menu with a checkmark. You can switch to a different drawing or library just by opening the Window menu and choosing a document name.

NOTE: The Window menu will display more Windows Options if you have more than 9 documents opened.

To switch to a different drawing or symbol library:

1. Open the Window menu.

The Window menu will display all currently open PC Draft documents, with the active (topmost) drawing or library indicated by a checkmark.



2. Choose the name of the drawing or library you want to work on

The drawing or library you choose will become active and will be displayed in front of the other document windows.

To Exit PC Draft • Choose Exit from the File menu.

If the document contains unsaved changes, a dialog box will appear, giving you the chance to save changes made to your document before exit.

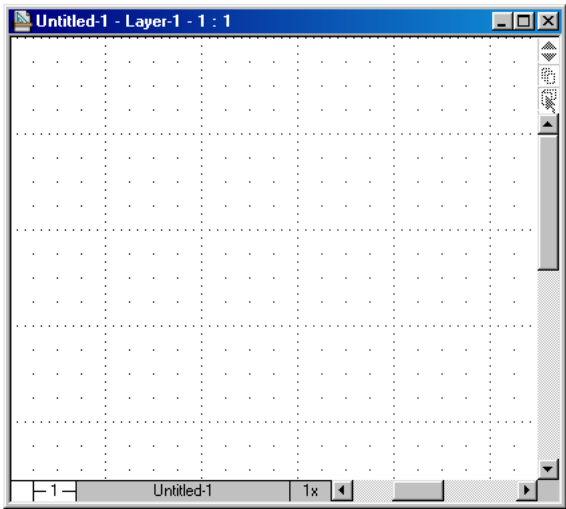
Your options and their results are as follows:

- | | |
|---------------|---|
| Yes | Click on this button to save the changes before exit. |
| No | Click on this button to exit PC Draft without saving changes. |
| Cancel | Click on this button to void the Exit command and return to the current document. |

The PC Draft Document Window

The PC Draft document window allows you to access your document for viewing, creating, and editing the drawing area. It is designed to offer you a drawing area with all of the essential features of PC Draft within easy grasp of your mouse.

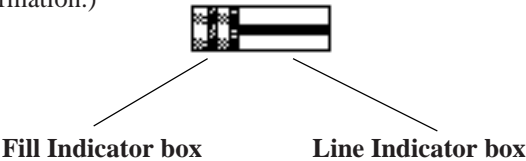
When you open the PC Draft application, a screen like the following will be displayed:



As you can see, the window has several parts to it, and as you read on, each part will be described in detail. The various elements of the screen, as well as illustrations and descriptions of the tools within the palette, will also appear in the pages that follow.

Fill and Line Indicators

The two small boxes in the lower left-hand corner of the window are the Fill and Line Indicators. The Fill Indicator, the box on the left, shows you the current fill. The current fill is the color, shade of gray, or pattern that will be used to fill the objects you draw. The Line Indicator, the box on the right, shows you the current line attributes. The attributes associated with lines and borders are collectively referred to as the “pen model” or simply, the “pen.” The pen includes such attributes as line style, line weight, end marks, and pen color, pattern, or shade of gray. The Line Indicator shows you how these attributes will be used to draw lines and object borders. (See Chapter 3 for more information.)



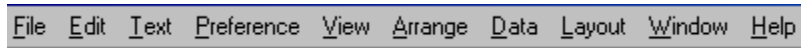
The Drawing Area

The drawing area is the part of the PC Draft window that displays dotted line divisions. These divisions are called **grid lines**. In English units, the distance between the grid lines represents one inch; in decimal feet, one tenth of a foot; and in metric units, one centimeter. You can use the grid lines as visual aids to assist you in your drawing.

When you create a new document, PC Draft automatically establishes a document size based on a single sheet of paper for the current output device. However, you can change the size of your document at any time to accommodate multiple pages, allowing you to create very large drawings. For information on how to change the size of your document, refer to the section titled, “Defining the Drawing Size” in Chapter 8.

When you first open your document, the initial view will be that of the upper-left corner of the total drawing area (unless you have adjusted the Document Defaults to display a different region).

The menu bar appears across the top of the screen, and contains the titles of the PC Draft pull-down menus available for your use.



The Menu Bar

The menus hold menu items. Most menu items are commands that you can choose in order to perform various functions on your drawing.

You choose items from menus by clicking and dragging, as in other Windows applications.

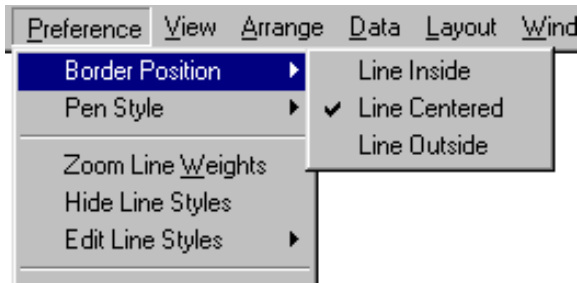
Using Hierarchical Menus

PC Draft uses hierarchical menus: pull-down menus that contain submenus. The submenus list options associated with particular menu items. For example, the Border Position submenu in the Preference menu contains border positions list (see Chapter 3).

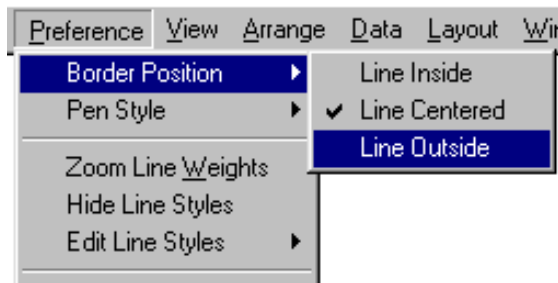
A rightward-pointing triangle beside a menu item indicates that more options related to that menu item are available.

To choose an option from a submenu:

- 1. Open the pull-down menu that contains the submenu you want to access.**
- 2. Move to the menu item used to access the submenu.**



A submenu will appear.



3. **Move horizontally across the menu item to the submenu.**
4. **Move down the submenu until the item you want is highlighted.**
5. **Release the left mouse button.**

Using Keyboard Control Equivalents

Certain menu items can be chosen directly from the keyboard without using the mouse. You can choose these menu items by holding down the Control key, then pressing the key for the character beside the Control key. For example, to choose Duplicate (from the Edit menu), you hold down the Control key and press “D” (uppercase or lowercase) while continuing to hold down the Control key.

For more information on the various menus and the functions accessed from them, refer to Appendix A, “Menus and Dialog Boxes.”

The Palettes

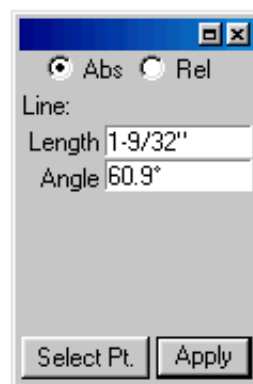
PC Draft's most important tools appear in four floating palettes: the Tool Palette, the Accessory Palette, the Dimension Palette and the Alignment palette. The Attribute, Resize and Alignment palettes control various attributes of the objects created using the other palettes. They are called "floating" palettes because they can move freely around the screen. They float above the drawing area, allowing you to draw "beneath" them.



Tool Palette



Dimension Palette



Resize Palette



Attribute Palette



Alignment palette



Accessory Palette

Moving a Palette You can move a palette around the screen to place it in convenient locations. To move a palette:

1. **Position the pointer on the top or left part of the palette, or any other part that doesn't hold an icon.**
2. **Press down the left mouse button.**
3. **Holding the left mouse button down, drag the palette to the desired location.**
4. **Release the left mouse button.**

Hiding a Palette You can hide a palette when you no longer need it.

To hide a palette:

- **Click on the palette's close box in the top right corner the palette window, or**
- **Select the palette's name from the Palettes submenu in the View menu, or**
- **Select the palette's name from the Window menu, or**
- **Select the palette's name from the popup menu at the bottom left of the document window.**

Displaying Palettes

The palette will disappear, and the check mark beside the palette's name in the list will be removed.

To display a palette:

- **Select the palette's name from the Palettes submenu in the View menu, or**
- **Select the palette's name from the Window menu, or**
- **Select the palette's name from the popup menu at the bottom left of the document window.**

The palette will appear, and a check mark will appear against its name in the list. Check marks appear beside the names of palettes that are currently displayed.

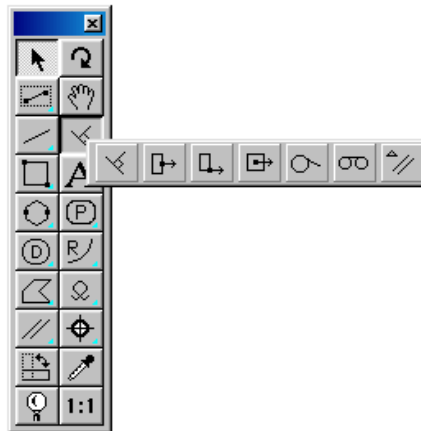
Pop-Up Menus

Each palette holds icons that represent certain tools or functions. Some tools and functions have more than one option associated with them. The options for each function and tool are accessed by means of a pop-up menu.

Icons used to access pop-up menus have clipped corners (which appear blue on color monitors). Unlike pull-down menus, which are opened by pressing on a word in the menu bar, pop-up menus are opened by pressing on an icon in the palette.

To select an option from a pop-up menu:

1. **Position the cursor on the appropriate icon in the palette.**
2. **Press down the left mouse button.**



A pop-up menu will appear on the screen.

3. **Holding down the mouse button, drag to the menu item that represents the desired option.**

As you drag, the menu items will be highlighted.

4. **When the desired menu item is highlighted, release the left mouse button.**

The pop-up menu will disappear, and the tool icon will change to show you the current option.

Using the Palette Tools

The palettes function like boxes of tools that you can use to enter text, draw different objects and lines, and change objects. To draw any of the objects associated with the tools, you must first **activate** (select) the appropriate tool icon. The tools are represented by icons on the palettes. Many of the tools have options associated with them. The options are related to either how the objects are created or to some fundamental differences in the nature of the objects. For example, the square-corner rectangle options are related to how you create a rectangle—either from a corner or from its center. On the other hand, the rounded-corner rectangle options are related to the characteristics of the rectangles' corners. That is, you can draw proportional, constant, or elliptical rounded-corner rectangles.

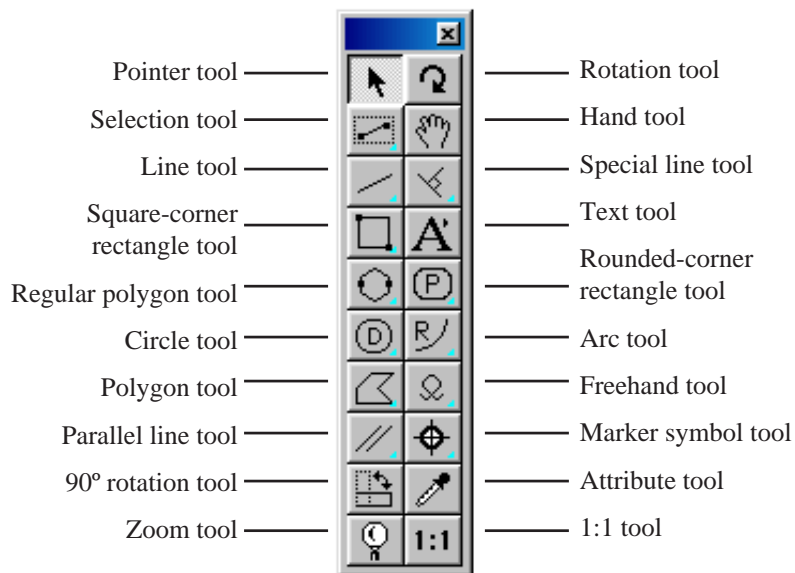
The drawing icons on the palettes show you the current drawing option, or “**current option**,” for each object. When you start out using PC Draft, each object has a default current option listed on the palette. If you want to change the current option for an object, you have to make a choice from a pop-up menu that lists the options associated with the object. (See the above section on pop-up menus for information about choosing options.)

The icon will become highlighted immediately after you choose it. This highlighting shows that it is activated and you can proceed to draw the object associated with the icon.

You can activate other tools on a palette by positioning the pointer on the icon and clicking the left mouse button. As long as the icon is highlighted, you will be able to draw the object or perform the action associated with the tool.

Following are brief descriptions of the tools available on the Tool, Accessory and Dimension palettes.

Tool palette



Pointer tool

Use to move and change the shape of objects, make menu choices and activate palette functions.

Rotation tool

Use to rotate a selected object.

Selection tool

Use to select objects by drawing a selection rectangle around them.

Hand tool

Use to change the position of a drawing as an alternative to using the scroll bars.

Line tool

Use to draw straight lines at any angle (unconstrained lines) or lines that are restricted to a certain angle (constrained lines).

Special line tool

Use to draw lines that are perpendicular to, tangent to or offset from some other object, or lines that start at the mid, end or center point of an existing object.

Square-corner rectangle tool

Use to draw squares and rectangles with square corners.

Text tool

Use to add text to a drawing or edit existing text.

Regular polygon tool

Use to draw symmetrical objects with from 3 to 16 equal sides, such as triangles, hexagons, and octagons.

Rounded-corner rectangle tool

Use to draw rounded-corner rectangles or squares.

Circle tool

Use to draw circles by diameter (D), by radius (R) or by three (3) points; and concentric circles.

Arc tool

Use to draw arcs by radius (R) or three points (3); elliptical arcs (E); and offset arcs.

Polygon tool

Use to draw objects with two or more sides.

Freehand tool

Use to draw freehand lines and shapes, including Bezier and spline curves.

Parallel line tool

Use to draw parallel line figures (both single segments and open or closed parallel polygon figures) and extrudes pairs of lines from straight edges.

Marker symbol tool

Use to draw a standard marker symbol.

90° rotation tool

Use to rotate selected objects by 90°.

Attribute tool

Use to copy and assign object attributes.

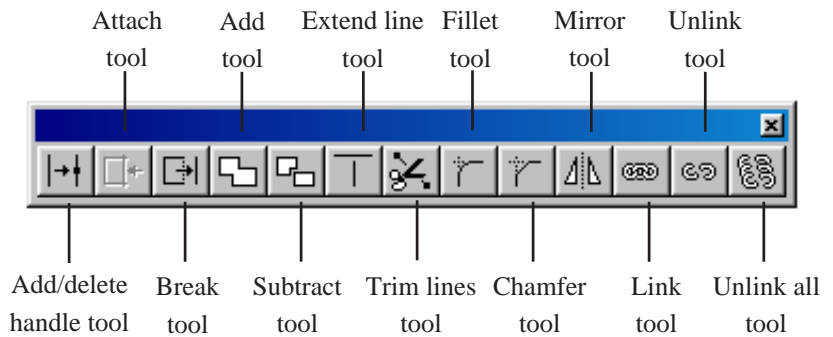
Zoom tool

Use to zoom in or out on areas of a drawing.

1:1 tool

Select to return to a single magnification view of the current drawing area.

Accessory palette



Add/delete handle tool

Use to add or delete (if the Alt key is pressed) edit handles on objects.

Attach tool

Use to attach open shapes and edges to form single objects.

Break tool

Use to break shapes into their component edges.

Add tool

Use to add two closed shapes together to form a single object.

Subtract tool

Allows use of a line or closed shape as a "cutter" to subtract part of another closed shape.

Extend line tool

Use to extend lines to their intersection or to a reference line.

Trim lines tool

Use to trim ends from intersecting lines.

Fillet tool

Use to connect lines with an arc.

Chamfer tool

Use to create a beveled corner at the intersection of two lines.

Mirror tool

Use to mirror objects across a user-defined axis.

Link tool

Use to link two or more vertices together so that when one is moved the others move with it.

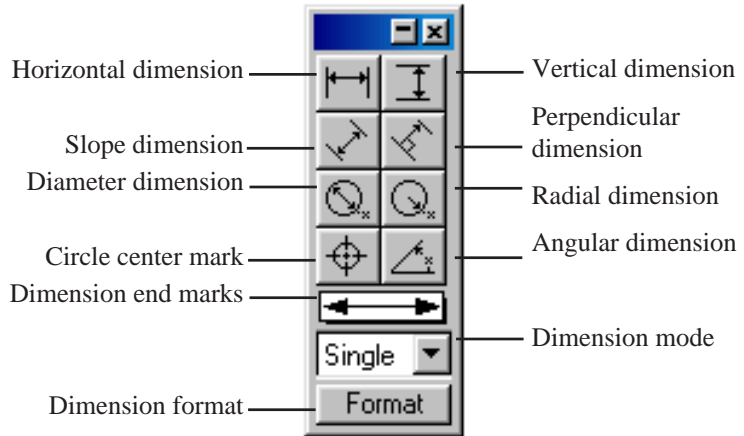
Unlink tool

Use to unlink two or more vertices so that they can be moved individually.

Unlink all tool

Use to unlink all vertices of a selected object.

Dimension palette



Horizontal dimension tool

Use to draw horizontal dimension lines.

Vertical dimension tool

Use to draw vertical dimension lines.

Slope dimension tool

Use to draw sloped dimension lines.

Perpendicular dimension tool

Use to draw dimension lines perpendicular to straight lines and edges.

Diameter dimension tool

Use to draw diameter dimension objects.

Radial dimension tool

Use to draw radial dimension objects.

Circle center mark tool

Use to draw center mark for circles, arcs and ellipses.

Angular dimension tool

Use to draw angular dimension objects.

Dimension end marks popup menu

Use this popup menu to select the end marks for dimension objects.

Dimension modes popup menu

Use this pop out menu to select the mode (Single, Chained or Baseline) of linear dimension tools.

Dimension format

Use to open the Dimension Format dialog and select the format of dimension objects such as text, dimension arrows, leader lines and so on.

Selecting

Remember, you must always select an object before you can make any changes to it. Two fundamental principles of using PC Draft are as follows:

First, you **select** an item.

Second, you **choose** what to do to the item you have selected.

For example, if you want to change the pattern of an object, you first select it, then choose a command to change it.

You can select a single object which you want to change, or (for some operations) you can select multiple objects in order to make the same change to each selected object simultaneously.

Once you have selected an object, small black squares will appear on its borders or at each end. These squares are called **edit handles**. For example, a selected rectangle will have eight edit handles, and a selected line will have one handle at each endpoint. The following procedures will show you various ways of selecting objects on your drawing.

Activating the Pointer Mode

Before you can select an object on your drawing, you must first activate the pointer. The pointer is used to resize, edit, and move objects on a drawing.

To activate the pointer:

1. Position the cursor on the Pointer icon on the palette.

When you move the cursor onto the palette, the cursor will temporarily turn into the arrow pointer to allow you to select a tool.

2. Click the left mouse button.

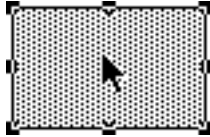
You can also return to the pointer mode by clicking on a unused area of the drawing (except when the Text tool is active).

Selecting Objects

An object is anything that you have created, including rectangles, circles, lines, arc, freehand shapes, and text.

To Select a Filled (Solid) Object

1. Return to the pointer mode by clicking on the Pointer icon, or by clicking on a blank area of your drawing.
2. Position the tip of the pointer on the object.
3. Click the left mouse button. (Handles should appear on the object.)



To Select a Non-Filled Object

1. Return to the pointer mode.
2. Position the tip of the pointer exactly on the edge of the object.



3. Click the left mouse button.

NOTE: If the pointer tip is not exactly on the edge of the object, you might miss the intended object and accidentally select an object behind the non-filled object.

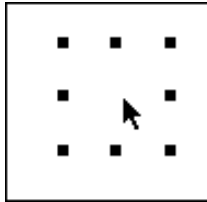
To Select a Line

1. Return to the pointer mode.
2. Position the tip of the pointer on the line.
3. Click the left mouse button. (An edit handle should now appear at each end of the line.)

To Select Objects Hidden Behind Other Objects

1. Position the pointer on the hidden object's estimated location.
2. Click the left mouse button twice (once to select the front object, and then once again to select the object hidden behind it).

You should now see the handles of the hidden object showing through the object in front of it, as shown in the following figure.



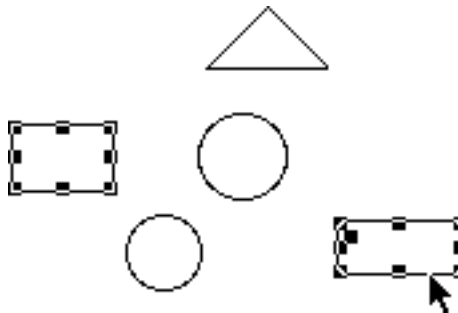
Once the handles appear, you can move the hidden object, or you can choose “Bring To Front” from the Arrange menu to make it appear in front of other objects.

Selecting Multiple Objects

There are two ways to select multiple objects. If you want to select objects that are far apart (or that are separated by other objects you don’t want to select), you can use the Shift-click selection method. If you wanted to select objects that are close together, you can use the selection rectangle to select them.

To Select Objects That Are Far Apart—Selection Using the Shift-Click Method

1. Return to the pointer mode.
2. Select the first object by clicking on it.
3. Press and hold the Shift key down.
4. Select the other objects you want by clicking on them.



5. Release the Shift key.

Deselecting Objects with the Shift-Click Method

You can also use the Shift-click method to deselect selected objects. This capability allows you to exclude a specific object from a selection without deselecting all the selected objects.

To deselect an object:

1. **Return to the pointer mode.**
2. **Press and hold down the Shift key.**
3. **Click on the object you want to deselect.**
4. **Release the Shift key.**

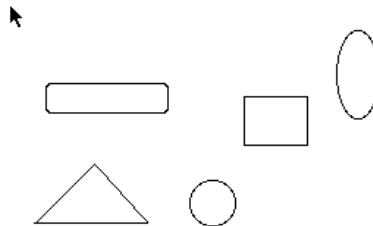
The edit handles will no longer appear on the object you Shift-clicked on. This shows that the object is no longer selected.

To Select Multiple Objects Close Together— Selection Using the Selection Box

The selection box is used to select multiple items on a drawing. The selection box appears when you press down the left mouse button (while in the pointer mode) and drag.

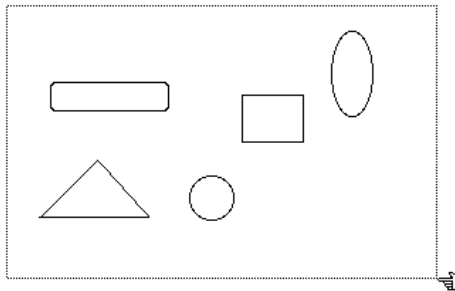
To select objects using the selection box:

1. **Return to the pointer mode.**
2. **Position the pointer above and to the left (for example) of the objects to be selected.**

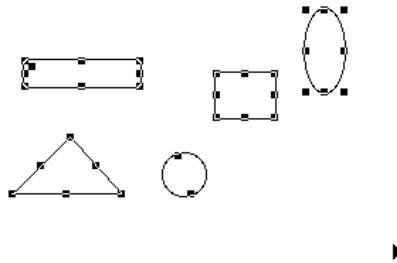


3. **Press and hold down the left mouse button.**
4. **Drag diagonally across until you have enclosed all the objects you want to select in the selection box.**

Notice that the cursor is now a little hand, indicating that the selection box is active.



5. Release the left mouse button.



NOTE: To select multiple objects that lie within the boundary of a larger, filled object that is already selected, you must begin the selection box outside the boundary of the already-selected object.

Using the Select-Touching Method

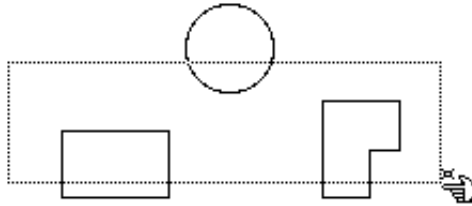
The select-touching method allows you to select objects by simply bringing the selection box in contact with each object.

To select objects using the select-touching method:

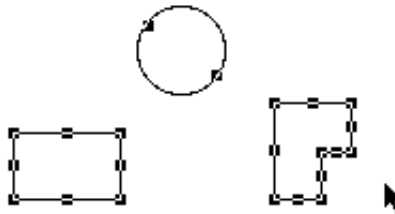
- 1. Return to the pointer mode.**
- 2. Position the pointer above and to the left (for example) of all the objects that you want to select.**

3. Press and hold down the Alt key.
4. Press and hold down the left mouse button.
5. Drag diagonally across until you have created a box that touches all the objects to be selected.

Notice that the hand now has a little symbol above it, indicating that Select/Touching is active.



6. Release the left mouse button and the Alt key.



NOTE: To select multiple objects that lie within the boundary of a larger, filled object that is already selected, you must begin the selection box outside the boundary of the already-selected object.

Selecting All Objects on the Active Layer

To select all objects on the active layer:

- Open the Edit menu and choose Select All.

Notice that all objects and text on the active layer are selected. If you choose Select All while you are in the text mode and have an insertion point selected in a text block, the entire text block will be selected.

Selecting Text on Your Drawing

The two techniques for selecting text are using the I-beam pointer (the text cursor) to select all or part of a piece of text, and using the arrow pointer to select a whole text object. The steps for each are outlined below:

Using the I-beam Pointer to Select Text

1. **Activate the Text icon in the palette by clicking on it.**
2. **Position the I-beam pointer on either side of the text you want to select.**
3. **Press and hold down the left mouse button.**



4. **Drag the cursor through the character(s) until all the text you want to select is highlighted.**

See Chapter 4 for more information on selecting text using the I-beam pointer.



Using the Arrow Pointer to Select Text

1. **Position the tip of the pointer on a text object.**
2. **Click the left mouse button.**

Notice that edit handles appear around the text.



Select Special

The PC Draft Select Special command lets you select objects according to their type, graphical attributes or object information. For example, you could select all the circles that have a green fill and an object information name of Class A.

Select Special is accessed via the Edit menu. The Select Special dialog enables you to define the parameters of the objects you want to select. Any combination of attributes can be used to define a selection: object type, object fill color or fill pattern, object pen color or pen pattern, line weight, line style or object information. All the items in the current (active) layer that match your specifications will be selected.

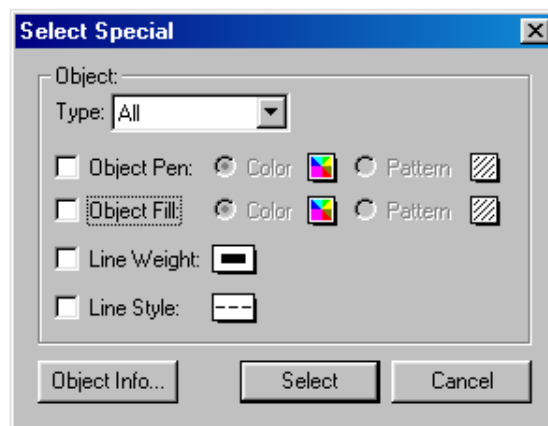
The Select Special dialog

Displaying the Select Special dialog

To display the Select Special dialog:

- **Choose Select Special from the Edit menu.**

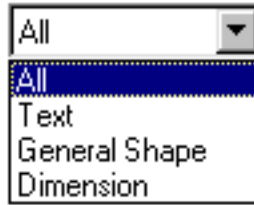
The Select Special dialog appears.



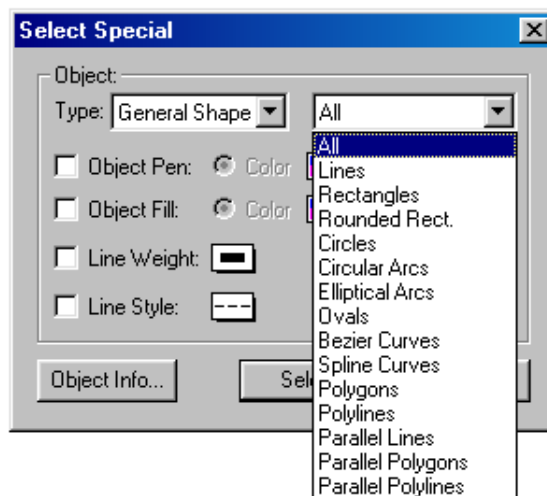
The Select Special options:

Type

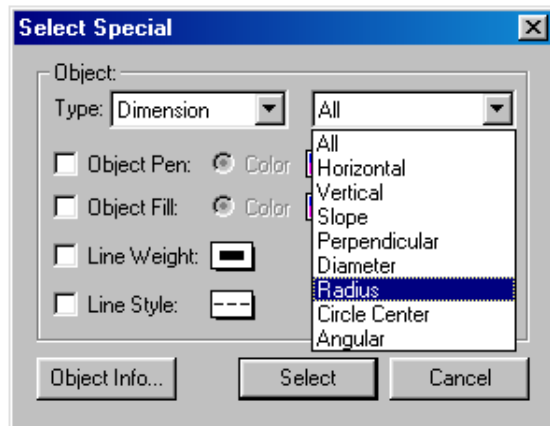
Click on the Type popup menu and select the type of object to be selected.



- **Select All to select all types of objects.**
- **Select Text to select only text objects.**
- **Select General Shape, and a further menu becomes available. Select a particular kind of shape from this popup menu.**



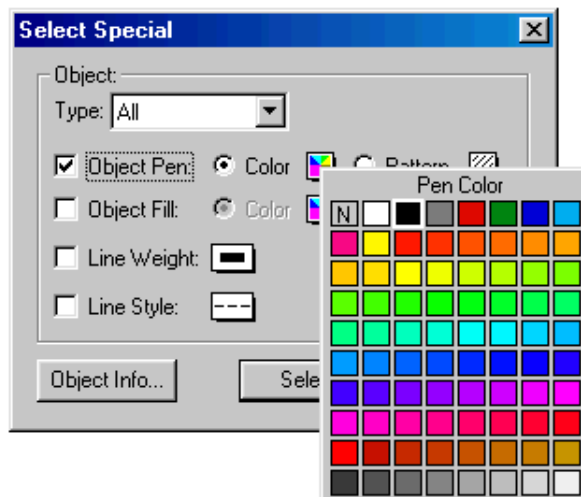
- **Select Dimension, and a further menu becomes available. Select a particular kind of dimension from this popup menu.**



Object pen and object fill

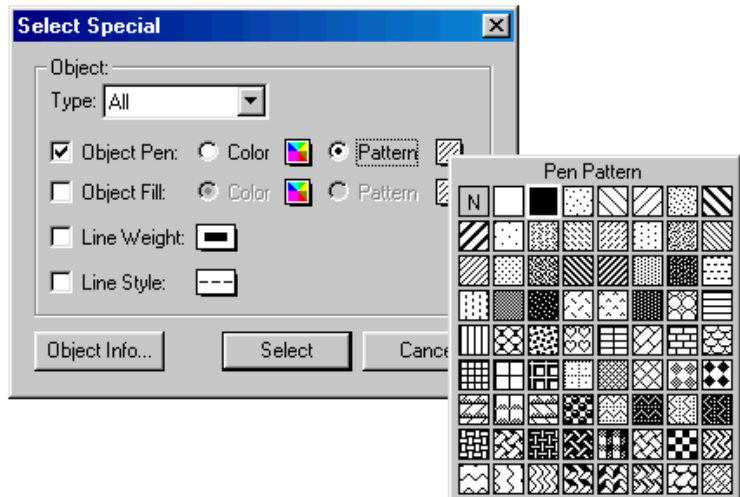
If you click on the **Object Pen** or **Object Fill** checkbox, the relevant Color and Pattern radio buttons become available.

- Click on a Color radio button and then on the related Color button, the Pen Color or Fill Color popup menu will display. Select a particular color to be used as part of your selection criteria.



NOTE: Object pen colors also refer to text pen colors.

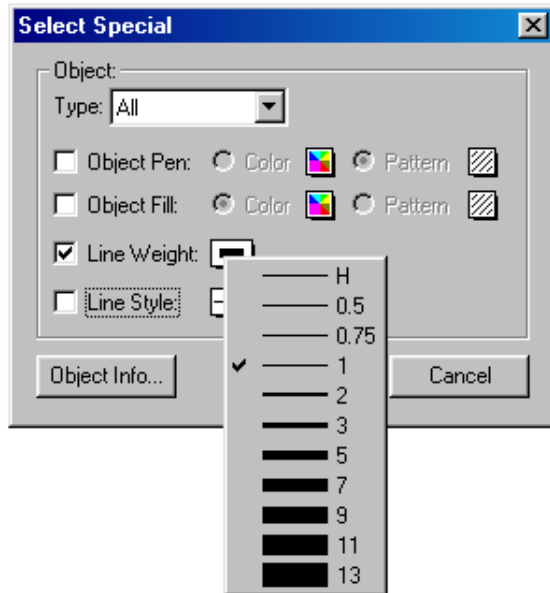
- **Click on a Pattern radio button and then on the related Pattern button, the Pen Pattern or Fill Pattern popup menu will display. Select a particular pattern to be used as part of your selection criteria.**



Line weight

If you click on the Line Weight checkbox, the Line Weight popup menu becomes available.

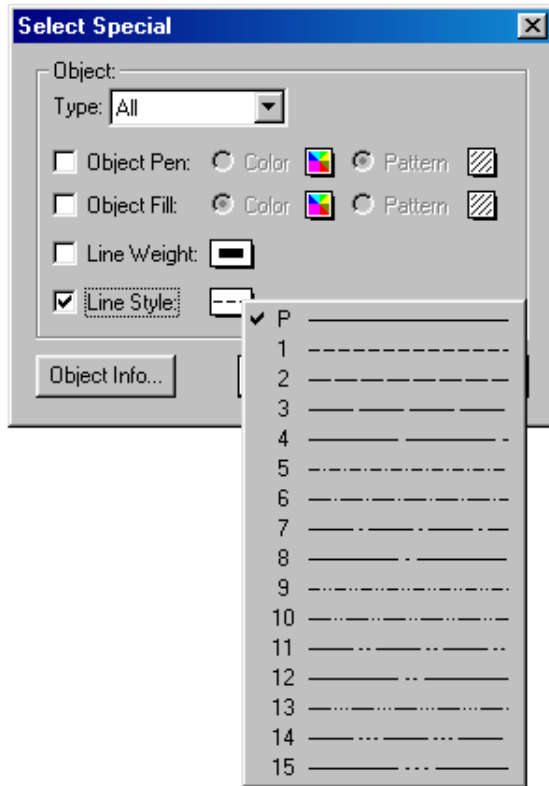
Select a particular line weight to be used as part of your selection criteria.



Line style

If you click on the **Line Style** checkbox, the **Line Style** popup menu becomes available.

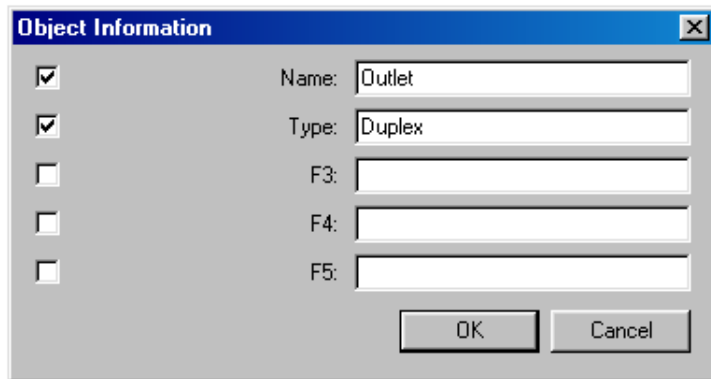
Select a particular line style to be used as part of your selection criteria.



Object info...

In addition to the visible attributes of objects, object information data can be used to determine selections. Access these options by clicking on the **Object Info...** button in the Select Special dialog.

When you click on the **Object Info...** button, an object information dialog box appears, enabling you to specify either all or some of a drawing's object fields as part of your selection criteria. Click on the checkboxes to specify which object information fields should be used to make the selection, then type the information into the relevant fields.

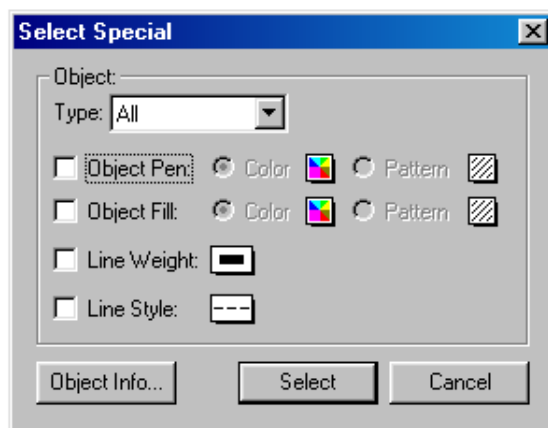


Selecting objects using Select Special

To select objects using Select Special:

- 1. Open the Edit menu and choose Select Special.**

The Select Special dialog appears.



- 2. Set the select criteria as referring to the information above.**

- 3. Click on the Select button.**

All objects on the current layer that meet the criteria you defined will be selected.

Exporting a document

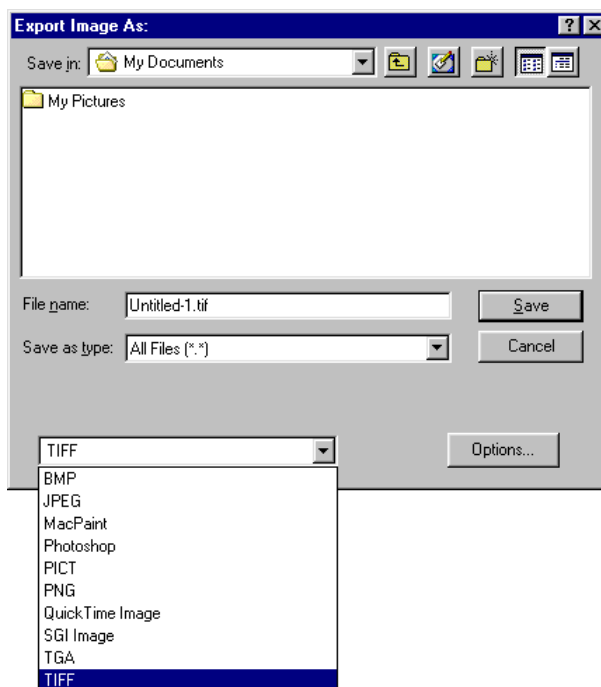
The Export File command in the File menu can be used to export files in any format supported by QuickTime Graphic Exporters, for example JPEG and BMP formats.

To export files:

1. **Select Export File from the File menu.**

A standard dialog appears.

2. **Select the appropriate file format from the Format popup menu at the bottom of the dialog.**



The relevant extension will be added to the file name and the file will be exported in that format. See your QuickTime documentation for further details.

Chapter 2

Creating and Editing Objects

Creating and Editing Objects

When you open a new document in PC Draft, the following characteristics are preset (unless you use stationery or defaults):

- All rectangles, circles, arcs, polygons, and freehand objects will be shaded with a white fill (for closed objects) or no fill (for open objects).
- The document size will be a single sheet of paper.
- All lines and borders of objects will be drawn with a one-pixel, solid-black line weight.
- Scale will be set at 1:1 (one inch equals one inch).
- Grid lines will be displayed on the drawing area.
- Snap Grid will be turned on.

Any of these conditions can be changed before or after you draw an object.

For more information on these default settings, refer to Chapter 1, and the sections “Using the Scale Function” and “Determining the Size of Your Document” in Chapter 6.

Fundamentals of Drawing an Object

To draw any object, you must be in a **drawing mode**. To enter a drawing mode, you must first **activate** the icon in the Tool palette that identifies the **drawing tool** that you want to use. The drawing procedure for most objects is very similar: activate the tool, decide on a starting point, press down the left mouse button, then drag to create the object.

Although the drawing procedures are nearly the same for most objects, the drawing procedures for polygons, arcs, and curves are somewhat different. Step-by-step instructions on how to draw and change the size of each type of object are provided in the following pages.

Drawing Lines

PC Draft offers you two types of line tools: a constrained line tool and an unconstrained line tool. When you use the constrained line tool, the line you draw will snap into alignment at a specified angle. You can use the unconstrained line tool to draw a straight line at any angle.

Constrained diagonal lines can drawn be at angles of 5°, 15°, 30°, 45°, and 90°.

You can also constrain the unconstrained line tool to increments of 45° by holding down the Shift key as you draw.

Choosing Line Tools

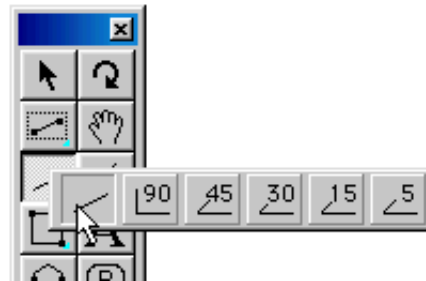
You choose the line tool you want from the Line pop-up menu on the Tool palette.

To choose the line tool you want:

1. **Point on the Line icon on the Tool palette.**
2. **Press down the left mouse button.**

The Line pop-up menu will appear.

3. **While holding down the mouse button, drag until the type of line you want (unconstrained or a line constrained to a certain angle) is highlighted.**
4. **Release the left mouse button.**



The icon representing your choice will appear on the Tool palette. If you choose a line constrained to a certain angle, the chosen angle of constraint will appear on the palette along with the line icon.

To Draw a Constrained Line

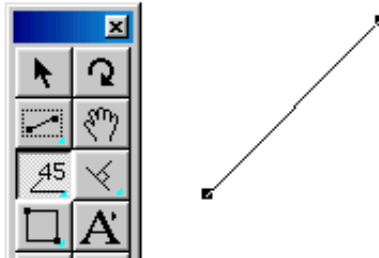
1. **Choose the angle of constraint you want from the Line pop-up menu on the Tool palette.**

Notice that the line icon is now highlighted. This indicates that the tool is activated.

2. **Position the cursor in the drawing area at the point where you want the line to begin.**
3. **Press down the left mouse button.**

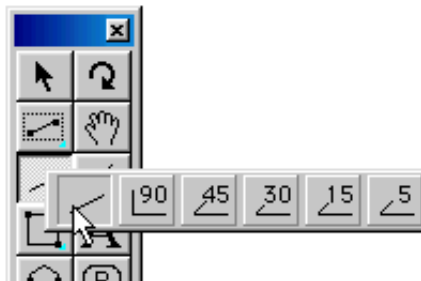
4. **Holding down the left mouse button, drag until you have created a line that is the length you want.**
5. **Release the left mouse button.**

The diagram illustrates the results of this operation.

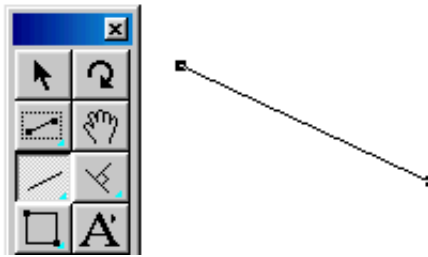


To Draw an Unconstrained Line

1. **Choose the Unconstrained icon (no angle given) from the Line pop-up menu in the Tool palette.**



2. **Position the cursor where you want the line to begin in the drawing area.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag in any direction until you have created a line that is the length you want.**
5. **Release the left mouse button.**



Constrained Drawing Mode

If you hold down the Shift key as you are drawing an unconstrained line, the line will snap at 45-degree angles. This can be useful when you need one horizontal or vertical line, but don't want to switch to the 90° line tool.

Snapping Along the Length

If you hold the Alt key down as you draw a line, its length will change by the increment controlled by the Set Grid submenu.

To Change the Length of a Line

1. **Return to the pointer mode.**
2. **Select the line you want to change.**
3. **Position the tip of the pointer on one of the line's handles.**
4. **Press and hold down the left mouse button.**
5. **Holding down the left mouse button, drag until the line is the length you want.**
6. **Release the left mouse button.**

Rectangle Drawing Modes

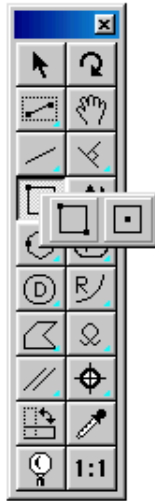
PC Draft allows you to draw rectangles with square, rounded, or elliptical corners.

Choosing a Method for Drawing Square-Corner Rectangles

PC Draft lets you draw square-corner rectangles in two ways: from the corner ("Diagonal"), or from the center ("Centered"). You can specify the method you want to use by making a choice from the Square-Corner Rectangle pop-up menu.

To choose a method for creating square-corner rectangles:

1. **Point on the Square-Corner Rectangle icon on the Tool palette.**
2. **Press down the left mouse button.**



The Square-Corner Rectangle pop-up menu will appear.

3. **Holding down the left mouse button, drag until either Diagonal or Centered is highlighted.**

Diagonal activates the tool used to draw a rectangle from one of its corners.

Centered activates the tool used to draw a rectangle from its center.

4. **Release the left mouse button.**

Drawing a Rectangle From Its Corner

When you choose the diagonal mode for drawing square-corner rectangles, you can define the position of one corner of the rectangle, then project the rest of the rectangle **from that corner point**.

To create a rectangle from its corner:

1. **Choose Diagonal from the Square-Corner Rectangle pop-up menu.**
2. **Point where you want one corner of the rectangle to appear on the drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag in any direction until you have a rectangle with the size and position you want.**
5. **Release the left mouse button.**

Drawing a Rectangle From Its Center

When you choose Centered from the Square-Corner Rectangle pop-up menu, you can center rectangles around a specific point on the drawing.

To draw a rectangle from its center:

1. **Choose Centered from the Square-Corner Rectangle pop-up menu.**
2. **Point where you want the center of the rectangle to appear on the drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until you have a rectangle of the size you want.**
5. **Release the left mouse button.**

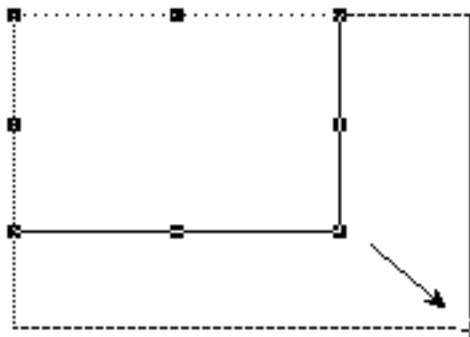
Constrained Drawing Mode

If you hold down the Shift key while drawing a rectangle, it will restrict the shape of the rectangle to a square.

Changing the Size of a Rectangle

To change the size of a rectangle:

1. **Return to the pointer mode.**
2. **Select the rectangle you want to resize.**
3. **Position the tip of the pointer on one of the edit handles.**



4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag until the rectangle is the size you want.**

6. **Release the left mouse button.**

Unconstrained Editing Mode

If you hold down the Control key while editing a rectangle, it will be released from any active grid snap.

Rounded-Corner and Elliptical-Corner Rectangles

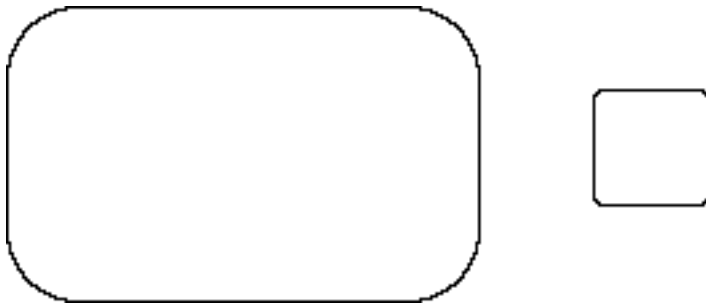
With PC Draft, you can draw rounded-corner rectangles with **proportional (P)** or **constant (C)** corners. In constant-corner rectangles, the radius of the corner arcs remains the same regardless of the rectangle's size. In proportional-corner rectangles, the radius increases or decreases in proportion to the rectangle's size.

You can also draw rectangles with **elliptical (E)** corners.

You can change the corner style by choosing the style you want from the Rounded-Corner Rectangle pop-up menu.

About Proportional-Size Rounded-Corner Rectangles

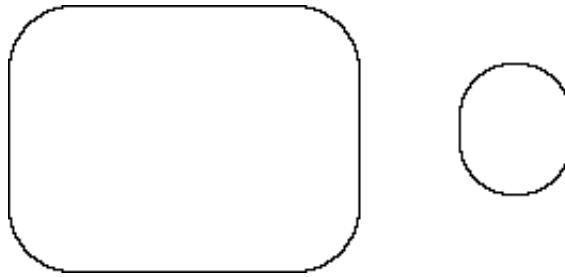
When you draw a rounded-corner rectangle, you will probably want the corners to be proportional to the size of the rectangle.



For example, if you draw a large rectangle with large corners in the constant-corner mode, and you reduce the size of the rectangle, the corners will become too large in relation to the size of the rectangle. This may make the rectangle assume an unwanted elliptical shape. In the proportional-corner mode, rounded-corner rectangles will never become distorted, regardless of size.

About Constant-Size Rounded-Corner Rectangles

When you draw rectangles with constant corners, the corners will always have the same radius regardless of the size of the rectangle.



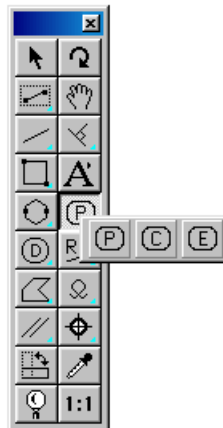
About Rectangles With Elliptical Corners

When you draw a rectangle with elliptical corners, the major and minor axes of the elliptical arcs that form the corners are determined by the size of the rectangle. Therefore, the size of the elliptical arcs on the corners grows or shrinks in proportion to the rectangle's size.

To choose the corner style you want for rounded-corner rectangles:

Choosing a Rectangle Corner Style

1. **Point on the Rounded-Corner Rectangle icon on the Tool palette.**



2. **Press down the left mouse button.**

The Rounded-Corner Rectangle pop-up menu will appear.

3. **Holding down the left mouse button, drag through the menu until the corner style you want is highlighted.**
4. **Release the left mouse button.**

The character representing the Alt you selected ("P" for proportional, "C" for constant, or "E" for elliptical) will appear on the palette.

To Draw a Rectangle With the Chosen Corner Style

1. **Choose the type of corner you want from the Rounded-Corner Rectangle pop-up menu.**
2. **Position the cursor where you want one corner of the rectangle to appear in your drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag in any direction until the rectangle is the size you want.**
5. **Release the left mouse button.**

Constrained Drawing Mode

If you hold the Shift key down as you are drawing a rounded-corner rectangle, it will restrict the shape of the rectangle to a rounded-corner square.

Changing the Shape of the Corners on Rounded-Corner Rectangles

A selected rounded-corner rectangle has an additional edit handle called the **corner-edit handle**, normally inside and near the upper left corner of the rectangle. It is used to change the shape of the corners. With proportional- and constant-corner rectangles, you can drag the corner-edit handle in a diagonal direction to change the radius of the corner arc and reshape the rectangle.

To change the shape of the corners on proportional- and constant-corner rectangles:

1. **Return to the pointer mode.**
2. **Select the rectangle you want to change.**
3. **Position the tip of the pointer on the corner-edit handle.**
4. **Press down the left mouse button.**

Notice that as you drag the handles, the corner shape changes.



5. **Holding down the left mouse button, drag downward to the right to increase the radius of the corners; drag upward to the left to decrease the radius.**

6. **When the corners are the shape you want, release the left mouse button.**

Changing the Shape of Corners on Elliptical-Corner Rectangles

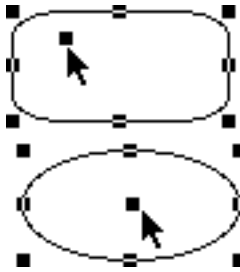
When you create a rectangle with elliptical corners, the elliptical arcs at the corners cover 90 degrees. By dragging the corner-edit handle, you can change the X- and Y-radius of the arcs that form the corners of the rectangle, thereby changing the shape of the corners. When you reshape the corners, the arcs will remain 90 degrees.

To reshape the corners:

1. **Return to the pointer mode.**
2. **Select the elliptical-corner rectangle you want to change.**
3. **Position the tip of the pointer on the corner-edit handle.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag until the corners are the shape you want.**
6. **Release the left mouse button.**

Unlike in other rectangles with rounded corners, you can drag the corner-edit handle on elliptical-corner rectangles in any direction. The direction in which you drag the handle determines the shape of the corners. The figures below show how you can use the corner-edit handle to reshape the corners.

If you hold down the Control key while editing a rounded-corner rectangle, it will be released from any active grid snap.



If you drag the handle to the extreme upper left corner, the corners will appear almost square.

If you drag the handle to the center, the entire rectangle will appear as an ellipse.

Circle Drawing Modes

To Choose a Method for Drawing Circles

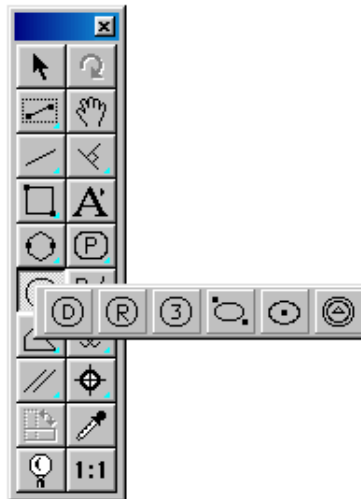
You can draw a circle by its radius, by its diameter, by three points, or as a concentric offset of an existing circle. Drawing by diameter is the default option for circles.

You can specify how you want to create circles by choosing the option you want from the Circle pop-up menu.

1. **Point on the Circle icon in the Tool palette.**
2. **Press down the left mouse button.**

The Circle pop-up menu will appear.

The character representing the method you chose — by radius (R), by diameter (D), or by three points (3) — will appear in the circle icon on the palette.



3. **Holding down the left mouse button, drag through the menu until the option you want is highlighted.**
4. **Release the left mouse button.**

To Draw a Circle by Diameter

1. **Choose Diameter from the Circle pop-up menu.**
2. **Position the cursor where you want to begin drawing the circle.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until you have created a circle that is the size you want.**
5. **Release the left mouse button.**

To Draw a Circle by Radius

1. **Choose Radius from the Circle pop-up menu.**
2. **Position the cursor where you want the center of the circle to be in your drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until you have created a circle that is the size you want.**



5. **Release the left mouse button.**

Constrained Drawing Mode

If you hold down the Shift key while drawing a circle by radius or diameter, it will restrict the radius or diameter to horizontal, vertical, or 45-degree increments.

After you have drawn a circle by radius or by diameter, you can change its size by dragging one of its edit handles.

Changing the Size of a Circle Drawn by Radius or by Diameter

To change the size of a circle drawn by radius or by diameter:

1. **Return to the pointer mode.**
2. **Select the circle you want to change.**
3. **Position the tip of the pointer on one of its handles.**
4. **Press down the left mouse button.**

5. **Holding down the left mouse button, drag the handle until the circle is the size you want.**
6. **Release the left mouse button.**

To Draw a Circle by Three Points

You can use the Circle by Three Points tool to draw a circle that passes through three specific points on your drawing.

To draw a circle by three points:

1. **Choose 3 Points from the Circle pop-up menu on the Tool palette.**
2. **Position the cursor on the first point through which you want the circle to pass.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag to the second point through which you want the circle to pass.**



5. **Release the left mouse button.**
6. **Without pressing down the left mouse button, move the cursor to the third point through which you want the circle to pass.**

7. **Click the left mouse button.**

Three edit handles will appear on the circle. The edit handles correspond to the three points used to define it.

Changing the Size of a Circle Drawn by Three Points

You can change the size of a circle drawn by three points by moving the edit handles.

To change the size of a circle drawn by three points:

1. **Return to the pointer mode.**

2. **Select the circle you want to resize.**
3. **Point on one of the edit handles.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag until the circle is the size you want.**
6. **Release the left mouse button.**

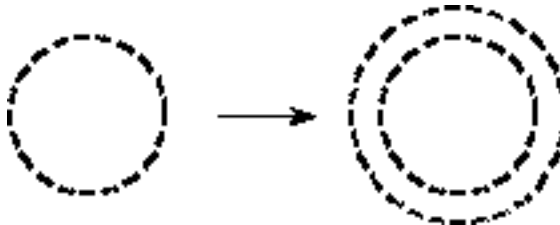
When you release the left mouse button, PC Draft will redraw the circle to pass through the three points represented by the edit handles.

Unconstrained Editing Mode

If you hold down the Control key while editing any circle, it will be released from any active grid snap.

Offset Circles

With PC Draft's Circle Offset tool, you can create new circles, concentric with existing circles. The offset circle will be of the same type and have the same line weight, line style, and pen model as the original circle.

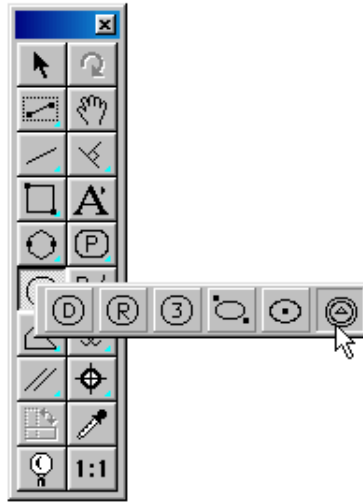


Offset circles can be created from any circle. Once drawn, an offset circle is an independent circle that can be edited, moved, or otherwise manipulated as required.

NOTE: The “parent” circle for the offset circle must be in place before you choose the offset circle tool.

Drawing an offset circle from an existing circle requires two steps: selecting the source circle, then clicking to specify the offset distance.

To draw an offset circle from an existing circle:

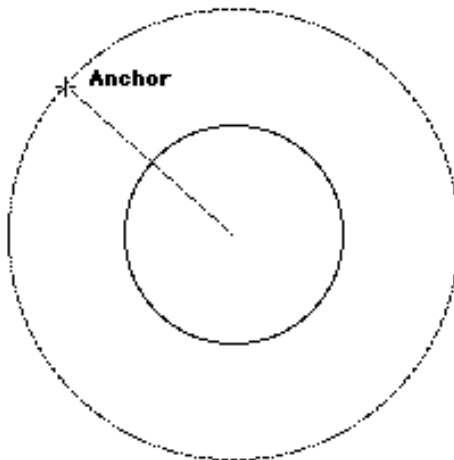


1. **Choose the Offset Circle icon from the Circle Tools pop-up menu.**

The cursor now reads “Click Circle,” to let you know that you need to select a circle.

2. **Click on the circle.**

The cursor now reads “Anchor” and appears near a dotted copy of the source circle, helping you locate the offset.

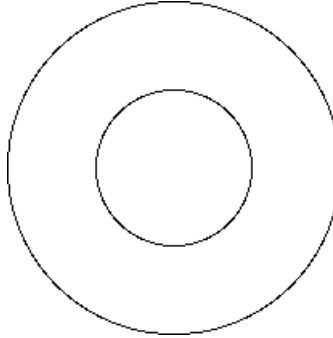


3. Move the cursor to the point where you want the offset to lie.

As you move the cursor, the dotted sketching circle gets larger or smaller.

4. Click the left mouse button.

The offset circle is done. The cursor returns to “Click Circle,” enabling you to create more offsets.



To exit the offset cursor mode, click the Pointer icon in the Tool Palette or hold down the Control key and click on a blank area of the drawing.

As mentioned earlier, the offset is a circle of the same type as the original. You can edit or alter it as needed, or even use it as the base for another offset circle.

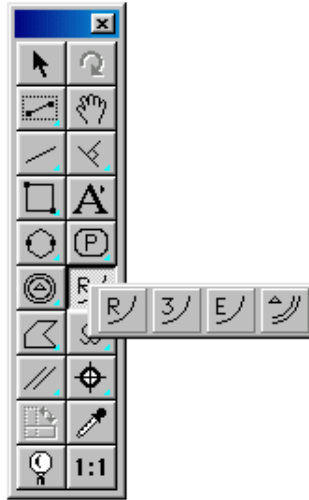
Arc Drawing Modes

With PC Draft you can draw both circular and elliptical arcs. Circular arcs specify three points on the drawing through which you want the arc to pass. With elliptical arcs, you define an ellipse that is a certain size, then project an elliptical arc that is the length you want.

To Choose the Type of Arc You Want to Draw

The arc by radius mode is the default for drawing arcs. You can choose the type of arc you want to draw by choosing an option from the Arc pop-up menu on the Tool palette.

1. Point on the Arc icon on the Tool palette.



2. Press down the left mouse button.

The Arc pop-up menu will appear.

3. Holding down the left mouse button, drag through the menu until the option you want is highlighted.

4. Release the left mouse button.

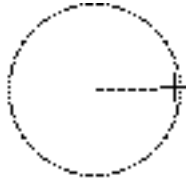
The character representing the type of arc you choose, (“R” for arcs by radius, “3” for arcs by three points, or “E” for elliptical arcs) will appear on the palette.

NOTE: When an arc is drawn with a fill, it will appear as an object shaped like a piece of pie. To draw the arc line only, you must make sure that no objects are selected, then choose “N” (for No fill) from the Fill Pattern or Fill Color submenu before you draw the arc.

To Draw an Arc by its Radius

1. Choose Radius from the Arc pop-up menu.
2. Position the cursor where you want to begin the radius of the arc.
3. Press down the left mouse button.

4. **Holding down the left mouse button, drag in any direction until you have created a line that represents the radius you want.**



5. **Release the left mouse button.**
6. **Without pressing the left mouse button, move the cursor away from the end of the radius line until you have created an arc that is the length you want.**



If you drag outside the border of the arc, a leader line extending from the arc's border to the cursor will be projected. This leader line allows you to align the ending point of the arc with other points on your drawing.

7. **Click the left mouse button.**

Constrained Drawing Mode

If you hold the Shift key down while you define the arc's radius, it will restrict the definition of the arc's radius to 45-degree increments.

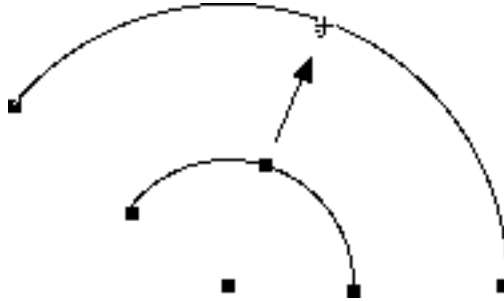
Changing the Size of an Arc Created by its Radius

You can change the size of an arc either by changing the length of the radius, or by changing the length of the arc. The following steps and diagrams will show you both methods, as well as their effect on the shape of the arc.

To Change the Length of an Arc

1. **Return to the pointer mode.**
2. **Select the arc you want to change.**
3. **Position the tip of the pointer on the small handle in the middle of the arc's border.**

4. Press down the left mouse button.

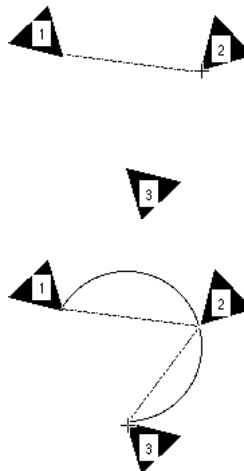


5. Holding down the left mouse button, drag until the arc is the length you want.
6. Release the left mouse button.

To Draw an Arc by Three Points

Sometimes, you may not know the length of the radius of an arc, but do know that the arc passes through three different points in a drawing. You can create an arc that passes through the three known points by following these steps:

1. Choose 3 Points from the Arc pop-up menu.
2. Position the cursor on the first point through which you want the arc to pass.
3. Press down the left mouse button.



4. **Holding down the left mouse button, drag to the second point.**
5. **Release the left mouse button.**
6. **Without pressing the left mouse button, move the cursor to the third point.**
7. **Click the left mouse button.**

NOTE: You cannot create a complete circle using the arc tool. If you drag past the beginning of the arc, it will collapse back to a shorter length.

Changing the Size of an Arc Drawn by Three Points

You can change the size of a three-point arc by moving any one of the three handles that represent the three points originally used to define the arc.

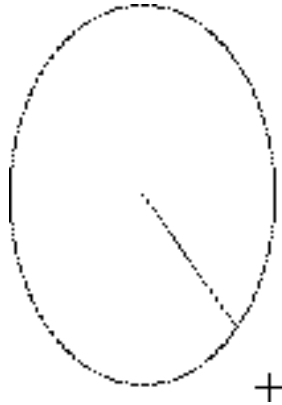
1. **Return to the pointer mode.**
2. **Select the arc you want to resize.**
3. **Position the tip of the pointer on whichever handle you want to move.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag the handle to a new location on the drawing.**
6. **Release the left mouse button.**

NOTE: You may have trouble drawing extremely shallow arcs because the length of the radius may become too great. Likewise, you cannot draw an arc that is absolutely flat (that is, you cannot use the arc tool to draw a straight line) because the radius of such an arc would be virtually infinite.

To Draw an Elliptical Arc

You can use the Elliptical Arc tool to create elliptical arcs of a specific size and length. When you create an elliptical arc, you first project an ellipse, then define an arc representing a portion of the ellipse. The actual size of the arc is determined by the size of the ellipse, and the arc's length is determined by the number of degrees you project it during creation.

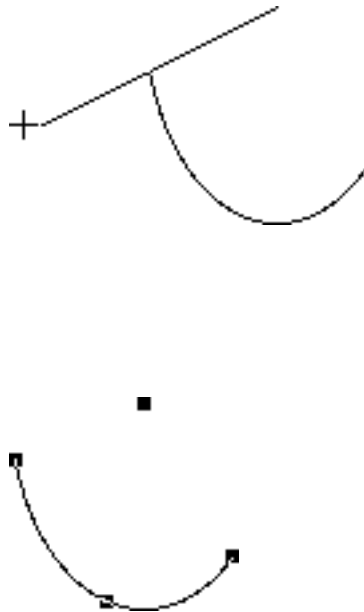
To draw an elliptical arc:



1. **Choose Ellipse from the Arc pop-up menu.**
2. **Point on the desired center point of the ellipse that will be used to define the arc.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until you have created an ellipse that is the size you want.**

5. **Release the left mouse button.**

6. **Without pressing down the left mouse button, move the cursor until you have projected an arc that is the length you want.**



A line will be attached to the cursor. The line will extend from the center of the ellipse to the cursor. This line is used to define the ending angle of the arc. If you drag outside the ellipse, a leader line extending from the ellipse's border to the cursor will be projected. This leader line allows you to align the ending angle of the arc with other points on your drawing.

7. **Click the left mouse button.**

The elliptical arc will appear on the screen.

Changing the Starting Angle of an Elliptical Arc

Part of the process of defining elliptical arcs involves defining the starting angle of the arc. The starting angle's position is determined by where you release the left mouse button after you have projected the ellipse used to define the arc. Normally, you define the size of the ellipse and the starting angle of the arc at the same time. However, by using the Shift key to constrain the size of the ellipse, you can change the position of the starting angle without changing the size of the ellipse.

To change the starting angle of the arc:

1. **Define the arc as you normally would. (That is, choose Ellipse from the Arc pop-up menu, press down on the center point, and drag to project the ellipse.)**
2. **When the ellipse is the size you want, without releasing the left mouse button, hold down the Shift key.**
3. **Drag the line that marks the starting angle to a new position.**

The line marking the starting angle of the arc will follow the cursor's movement, but the ellipse will not be resized.

4. **Release the left mouse button and the Shift key when the line is where you want the starting angle of the arc to appear.**
5. **Continue to define the arc.**

Editing an Elliptical Arc

There are two ways you can edit an elliptical arc: you can change its length, and you can change its shape. When you change its length, you either increase or decrease the number of degrees that make up its length. When you change its shape, you change the major and minor axes of the arc.

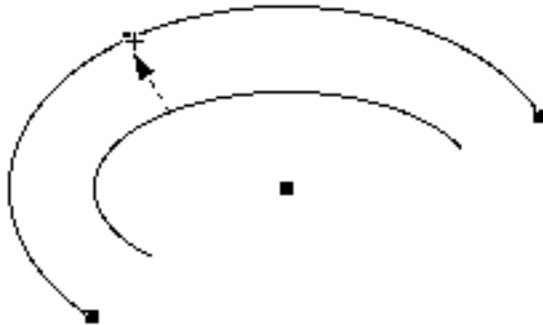
Changing the Shape of an Elliptical Arc

By dragging the edit handle in the middle of the arc's border, you can change the arc's shape without changing its length.

To change the shape of an elliptical arc:

1. **Return to the pointer mode.**
2. **Select the elliptical arc you want to change.**

3. **Position the tip of the pointer on the edit handle located in the center of the arc's border.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag until the elliptical arc is the shape you want.**



6. **Release the left mouse button.**

Changing the Length of an Elliptical Arc

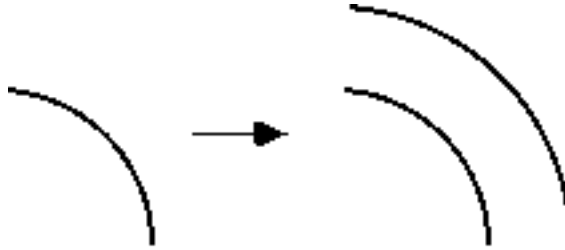
You can use the edit handles on the end points of an elliptical arc to change its length

To change the size of an elliptical arc:

1. **Return to the pointer mode.**
2. **Select the elliptical arc you want to resize.**
3. **Position the tip of the pointer on one of the edit handles located at the end of arc border.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag the handle until the ellipse is the size you want.**
6. **Release the left mouse button.**

Drawing Offset Arcs

With PC Draft's Arc Offset tool, you can create new arcs, concentric with existing circular arcs. The offset arc will be the same type (radial or three-point) and have the same line weight, line style, and pen model as the original arc.



Offset arcs can be created from any circular arc. Once drawn, an offset arc is an independent object that can be edited, moved, or otherwise manipulated as required.

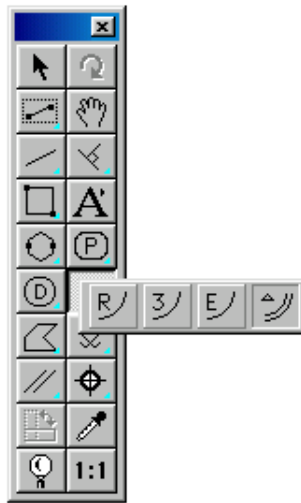
The offset arc will snap to the active grid snap (see Chapter 6) along its radius. If you want to change the increment, choose a different value from the Layout menu's Set Grid submenu.

NOTE: The “parent” arc for the offset arc must be in place before you choose the offset tool.

Drawing an offset arc from an existing arc requires two steps: selecting the source arc, then clicking to specify the offset distance.

To draw an offset arc from an existing arc:

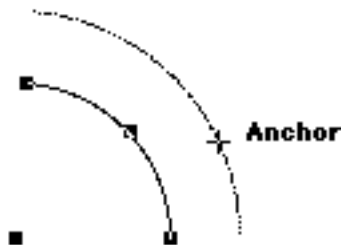
1. Choose the **Offset Arc** icon from the **Arc Tools** pop-up menu.



The cursor now reads “Click Arc”, to let you know that you need to select an arc.

2. Click on the arc.

The cursor now reads “Anchor” and appears near a dotted copy of the source arc, helping you locate the offset.



3. Move the cursor to the point where you want the offset to lie.

As you move the cursor, the dotted sketching arc gets larger or smaller.

4. Click the left mouse button.



The offset arc is done. The cursor returns to “Click Arc,” enabling you to create more offsets.

To exit the offset cursor mode, click the Pointer icon in the Tool Palette or hold down the Control key and click on a blank area of the drawing.

As mentioned earlier, the offset is a normal circular arc of the same type as the parent arc. You can edit or alter it as needed, or even use it as the base for another offset arc.

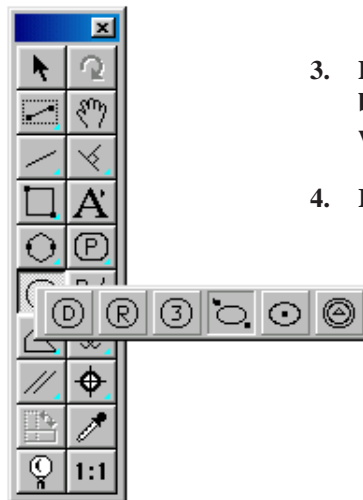
Ellipse Drawing Modes

PC Draft lets you draw two types of ellipses: diagonal and centered. The two types of ellipses differ in the way they are created. You can use the Ellipse pop-up menu to choose the method you want to use to create ellipses.

To choose the method you want to use to create an ellipse:

- 1. Point on the Ellipse icon on the Tool palette.**
- 2. Press down the left mouse button.**

The Ellipse pop-up menu will appear.



- 3. Holding down the left mouse button, drag until the method you want is highlighted.**
- 4. Release the left mouse button.**

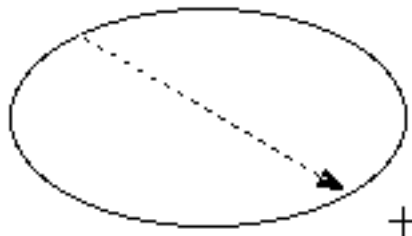
The icon representing the chosen method will appear inside the Ellipse icon on the Tool palette.

Creating a Diagonal Ellipse

When you create a diagonal ellipse, the ellipse is projected as you press down on a starting point and drag to define the extent of the ellipse. (In effect, you define a rectangle whose edges are tangent to the ellipse.)

To create a diagonal ellipse:

1. Choose **Diagonal** from the Ellipse pop-up menu.
2. Point where you want the starting point of the ellipse's bounding rectangle to appear.



3. Press down the left mouse button.
4. Holding down the left mouse button, drag in a diagonal direction until the ellipse is the size you want.

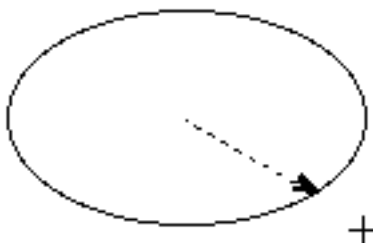
5. Release the left mouse button.

Creating a Centered Ellipse

When you create a centered ellipse (an ellipse drawn from its center), you first define the center point of the ellipse, then its overall size and shape. The ellipse is projected from the specified center point.

To create a centered ellipse:

1. Choose **Centered** from the Ellipse pop-up menu.
2. Point where you want the ellipse's center to appear.



3. Press down the left mouse button.
4. Holding down the left mouse button, drag until the ellipse is the size you want.

5. Release the left mouse button.

Constrained Drawing Mode

If you hold the Shift key down while creating an ellipse, it will restrict the shape of the ellipse to a circle.

Changing the Size of an Ellipse

When using PC Draft, you change the size of an ellipse using the same technique you would use to change the size of a rectangle: dragging one of the eight edit handles.

To change the size of an ellipse:

1. **Return to the pointer mode.**
2. **Select the ellipse you want to resize.**
3. **Position the tip of the pointer on one of the edit handles.**



4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag the handle to a new location on the drawing.**

6. **Release the left mouse button.**

Unconstrained Editing Mode

If you hold down the Control key while editing an ellipse, it will be released from any active grid snap.

Polygon Drawing Modes

You can draw two types of multisided shapes: closed polygons and open polylines.

A polygon is a closed object made of three or more sides. It can be a complex, irregularly shaped object made up of many straight line segments. A polyline is an open object made of at least two straight line segments. The line segments used for either type of object can be any length and oriented at any angle.

The type of multisided shape you draw depends on the item you choose from the Polygon pop-up menu.

Choosing the Polygon or the Polyline Drawing Mode

To choose the polygon or the polyline mode:

1. Point on the Polygon icon on the Tool palette.
2. Press down the left mouse button.

The Polygon pop-up menu will appear.



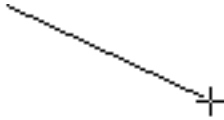
3. Holding down the left mouse button, drag until the Polygon or Polyline icon is highlighted.
4. Release the left mouse button.

Drawing a Polygon or a Polyline

To create a polygon or polyline, you merely move to the starting point you want for the object; press the left mouse button; drag to create the first side; then release the left mouse button. Then you move the cursor to the next point and click. Continue moving and clicking until you have created the shape you want for the object. If you make a mistake as you draw the polygon, you can easily edit the last side drawn by using the Dynamic Editing feature, detailed in the next section.

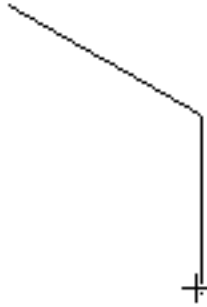
To draw a polygon or a polyline, follow these steps:

1. Choose either Polygon or Polyline from the Polygon pop-up menu.
2. Place the cursor where you want to begin drawing the object.
3. Press down the left mouse button.
4. Holding down the left mouse button, drag until you have created a line segment that is the length you want (the first side of the object).



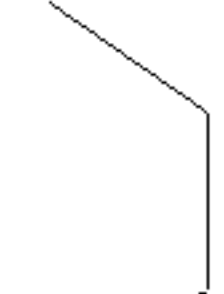
5. Release the left mouse button.

6. Without pressing the left mouse button, move the cursor until the second line segment is the length you want.



7. Click the left mouse button.

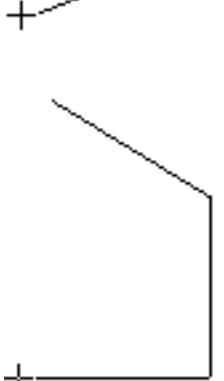
8. Without pressing the left mouse button, move the cursor until the third line segment is the length you want.



9. Click the left mouse button.

Sometimes you may decide that you want to change a line segment after you have clicked the left mouse button to define its end point. You can change the length and orientation of the last line segment drawn by using the Dynamic Editing feature.

10. If you want to change a line segment, move the cursor back to the last defined point and click on it.

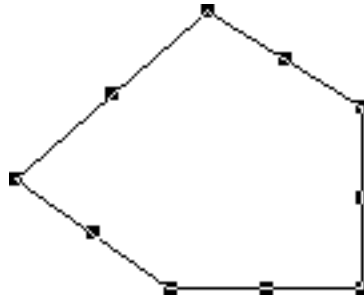


Once you have clicked on this point, the previous line will reattach to the cursor, allowing you to move the end of that older line to a new position on the drawing.

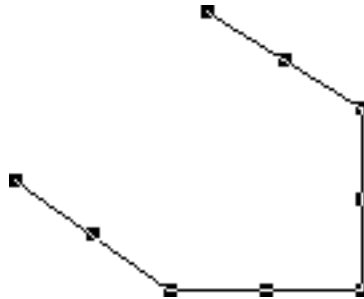
11. Move the cursor to a new position on the drawing and click the left mouse button.

Once you have clicked the left mouse button, the line will be drawn to the new position, and you can then continue to draw the rest of the object.

12. Move the cursor to the next point, then click the left mouse button twice quickly.



This double-click action completes the object. If you are drawing a polygon, PC Draft will automatically close the object. The last point you clicked on will be connected to the starting point of the polygon by a straight line, and the polygon will be shaded with the current fill.



If you are drawing a polyline object, however, PC Draft will leave the object open and selected.

Constraining Line Segments

If you press and hold down the Shift key as you are drawing a polygon or polyline, the current line segment will snap at 45-degree angles.

Snapping Along the Length

If you hold the Alt key down as you draw a polygon or polyline, the current line segment will change by the increment controlled by the Set Grid submenu.

Changing the Shape of a Polygon or a Polyline

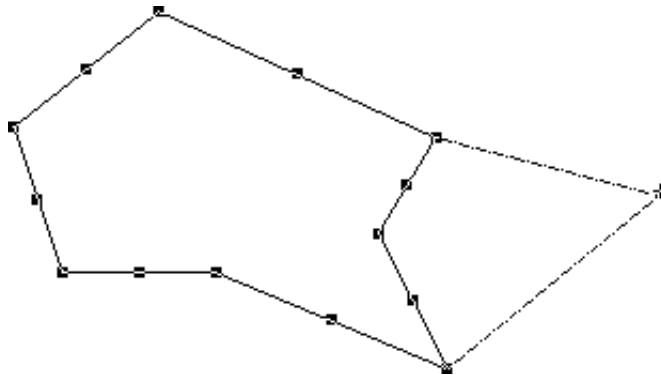
Polygons and polylines, like all objects, display handles when they are selected. Unlike most objects, though, they have two different kinds of handles: **major**, (the handles on the vertex points or corners) and **minor**, (the handles in the middles of the line segments).

The major handles are used to move the end points of lines, which could change both the length and angle of the lines connected to that handle. The minor handles are used to move a line segment without changing its length or angle.

Using the Major Handles

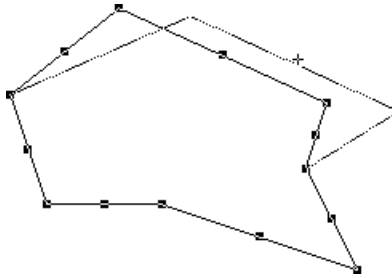
1. **Return to the pointer mode.**
2. **Select the polygon or polyline you want to change.**
3. **Position the tip of the pointer on one of the major handles.**
4. **Press down the left mouse button.**
5. **Holding down the left mouse button, drag the handle to a new location on the drawing.**
6. **Release the left mouse button.**

As the following illustration shows, when you move the handle, the connecting lines will follow. As soon as you release the left mouse button, both lines will be redrawn to the new handle location.



Using the Minor Handles

1. **Position the tip of the pointer on one of the minor handles.**
2. **Press down the left mouse button.**



3. **Holding down the left mouse button, drag the line to a new location.**
4. **Release the left mouse button.**

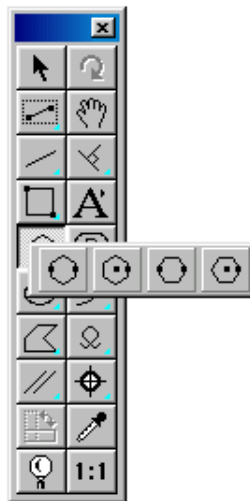
As you drag the minor handle, the line will also move. By using the minor handles, you can move a line and still maintain its original length and angle.

Unconstrained Editing Mode

If you hold down the Control key while editing a polygon or polyline, the current handle will be released from any active grid snap.

Drawing a Regular Polygon

PC Draft's Regular Polygon tool allows you to draw closed polygon figures with sides and angles of equal length. You can preset the tool to draw figures with from 3 to 16 sides.

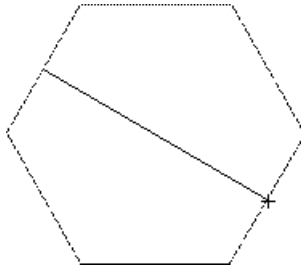


Depending on which variation of the tool you select, you can draw a regular polygon from edge to edge or vertex; center to edge; vertex to vertex or edge; center to vertex (corner).

The number of sides can be set before drawing the object by holding down the Alt key while clicking the Regular Polygon tool icon.

To draw a regular polygon:

1. **Choose the desired tool from the Regular Polygon pop-up menu.**



2. **Press down where you want the center, edge, or vertex of the polygon.**
3. **Holding down the left mouse button, drag until the polygon is the size you want.**

Notice that when you release the left mouse button, the polygon is grouped to itself. If necessary, you can use the Arrange menu's Ungroup Control to ungroup the polygon for reshaping, breaking, and so on. Changing fills and line attributes and resizing can be performed while the object is still grouped.

Optional Constrained Drawing Mode

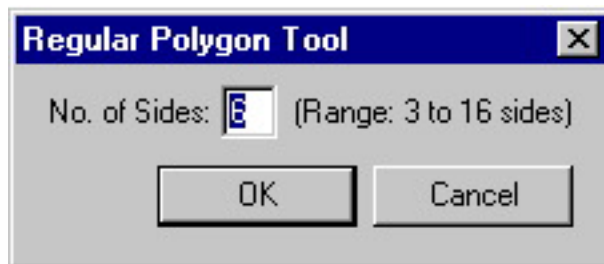
If you hold the Shift key down as you are drawing a regular polygon, the diameter or radius will snap at 45-degree angles.

Changing the number of sides

To set the number of sides before drawing a regular polygon:

1. **Make sure that nothing is selected on the drawing.**
2. **Press and hold down the Alt key.**
3. **Click on the Regular Polygon icon on the Tool palette.**

The Regular Polygon dialog box will appear.



4. **Type the number of sides desired, then press the OK button.**

Using Parallel Lines

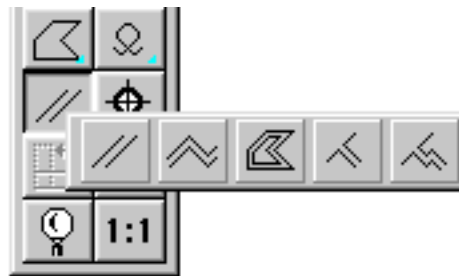
PC Draft's Parallel Lines tool allows you to draw single sets of parallel lines or polygons and polylines with double lines. You can use parallel lines to create drawings of such things as walls, beams, and frames.

There are three Alts associated with parallel lines. You can use parallel lines to draw a single set of straight lines, polylines, or polygons. You choose the type of shape you want to draw by using the Parallel Lines pop-up menu.

To choose the type of parallel line shape you want:

1. **Point on the Parallel Line icon on the Tool palette.**
2. **Press down the left mouse button.**

The Parallel Line pop-up menu will appear.



3. **Holding down the left mouse button, drag until the type of shape you want is highlighted.**

4. **Release the left mouse button.**

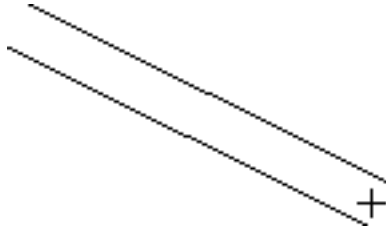
An icon representing your choice will appear on the palette.

Drawing a Pair of Parallel Lines

To draw a single set of parallel line segments:

1. **Choose the Single-Line icon from the Parallel Line pop-up menu.**
2. **Press down where you want the parallel lines to start.**
3. **Holding down the left mouse button, drag until the lines are the length you want.**

4. Release the left mouse button.



Notice that when you release the left mouse button, edit handles appear at the ends of the shape. You can use these handles to change the orientation and the length of the lines.

Constrained Drawing Mode

If you hold down the Shift key while drawing a single set of parallel lines or a polygon or polyline shape with double lines, the lines will snap at 45-degree angles.

Snapping Along the Length

If you hold the Alt key down as you draw a parallel line it will change by the increment controlled by the Set Grid submenu.

Editing a Pair of Parallel Lines

To edit parallel lines:

- 1. Return to the pointer mode.**
- 2. Select the parallel lines you want.**
- 3. Point on one of the edit handles.**
- 4. Press down the left mouse button.**
- 5. Holding down the left mouse button, drag in any direction until the lines are the length you want and oriented the way you want them.**
- 6. Release the left mouse button.**

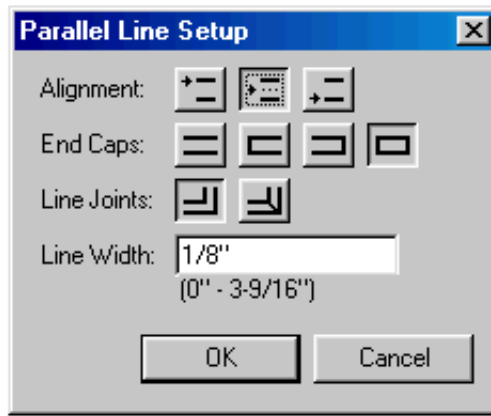
Specifying the Alignment of Parallel Lines

There are three alignment choices for parallel lines: left, center, and right. Alignment controls how lines, polylines, and polygons are drawn and how they can be edited. Specifically, the alignment option determine what the leading edge is and what part of the shape is active. As an example of what active means, when align left is the current option, the left line will be drawn on the grid, and edit handles will appear on the left line when the parallel lines are selected.

To choose the alignment option you want to use to create parallel lines:

1. **Make sure that nothing is selected on the drawing.**
2. **Press and hold down the Alt key.**
3. **Click on the Parallel Lines icon on the Tool palette.**

The Parallel Line Setup dialog box will appear.



The alignment options are represented by three icons at the top of the dialog box. The small arrow indicates what part of the line is active.

4. **Release the Alt key.**
5. **Click on the icon that represents the option you want.**

Changing the Alignment of Existing Lines

To change the alignment of existing lines:

1. **Select the lines you want to change.**
2. **Choose the alignment option you want from the Parallel Line Setup dialog box.**

How the Alignment option Affect Parallel Lines

Align Center

When Align Center is active, the cursor appears between the lines during creation. The center of the two lines will lie on the grid. When the set of parallel lines is selected, two edit handles will appear between the ends of the lines.



Align Left

The Align Left option is used to specify which of the parallel lines is active. The active line is the one that lies on the grid and is used to edit the parallel lines. If you draw parallel lines while the Align Left option is active, the active line is determined by the direction you first drag during the creation of the shape. In general, if you drag up, the left line is active; if you drag down, the right line is active.



Align Right

As with Align Left, the Align Right option determines which of the two lines is active. When the Align Right option is active, the direction in which you first drag during creation determines which line is active. In general, if you drag up, the right line is active; if you drag down, the left line is active.



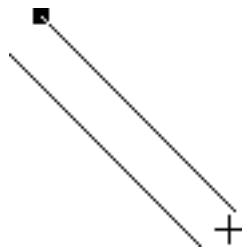
Drawing Polygons and Polylines With Parallel Lines

These general principles apply to polygons and polylines drawn with parallel lines. This means that the active line in the object depends on what the current alignment option is and the direction in which you initially drag during creation.

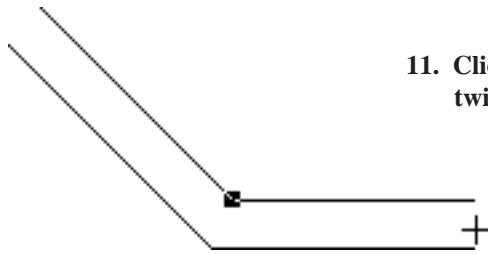
The difference between a polygon and a polyline is that a polygon is a closed object, and a polyline is an open object. When you draw a polygon and specify the end of the object, PC Draft automatically closes the object by drawing two line segments between the starting and ending points. If you draw a polyline object, the object will remain open unless you close it yourself.

To draw a polygon or a polyline, follow these steps:

1. **Make sure that nothing is selected on the drawing.**
2. **Choose the alignment option you want from the Parallel Lines Setup dialog box.**
3. **Choose either Polygon or Polyline from the Parallel Line Setup pop-up menu.**
4. **Position the cursor where you want to begin drawing the object.**
5. **Press down the left mouse button.**
6. **Holding down the left mouse button, drag until you have created a side that is the length you want.**
7. **Release the left mouse button.**



8. **Without pressing down the left mouse button, move the cursor until the second side is the length you want.**
9. **Click the left mouse button.**
10. **Without pressing the left mouse button, move the cursor until the third side is the length you want.**



11. Click the left mouse button twice.

By double-clicking the left mouse button, you specify that the object is complete.

The active alignment option determines how the parallel lines pivot around each ending point. When you define the ending point for a side, the end point of the active line (or the center of the two lines in the case of center alignment) is used as the ending point of the side. The inactive line pivots around the ending point, following the movement of the mouse.

Dynamic Editing of Parallel Polygons and Polylines

As with normal polygons and polylines, you can edit parallel polygons and polylines (that is, polygons and polylines drawn with parallel lines) during creation.

To edit a parallel polygon or polyline during creation:

- 1. Without pressing down the left mouse button, move the cursor back to the last vertex point.**

An edit handle will appear at the last defined vertex point to help you locate it.

- 2. Click the left mouse button.**

The line segment will reattach to the cursor, and you can change the length and angle of the line segment without having to redraw the entire object.

You can continue going back and clicking on previously defined vertex points to edit the object.

Editing Parallel Polygons and Polylines

You can edit parallel polygons and polylines the same way as you would normal polygons and polylines. Both parallel polygons and polylines have major and minor handles.

- 1. Select the polygon or polyline object you want to change.**
- 2a. Drag one of the major handles to change the lengths and angles of two sides.**

or,

- 2b. Drag one of the minor handles to change the position of a side without changing its length and angle.**

Specifying the Distance Between Parallel Lines

You can specify the distance between parallel lines either before or after you draw them. The values you enter for the distance are real-world values that reflect the current size units. For example, suppose you were working on a document in which Fractional Feet & Inches and the scale $1/4" = 1'$ were currently defined. If you entered “6” as the distance, the distance between the lines would represent 6 feet in the real world.

To specify the distance between parallel lines before you draw them:

- 1. Make sure that nothing is selected on the drawing.**
- 2. Alt-click on the Parallel Line icon on the Tool palette.**

The Parallel Lines Setup dialog box will appear.

- 3. Double-click in the text box.**
- 4. Type the distance you want between the lines.**
- 5. Click the OK button.**
- 6. Click on the Parallel Line tool.**
- 7. Draw the parallel lines.**

Changing the Distance Between Existing Parallel Lines

To change the distance between existing parallel lines:

1. **Select the parallel lines you want to change.**
2. **Specify the distance you want between the lines in the Parallel Line Setup dialog box.**

NOTE: You can use patterns and colors to fill the gap between parallel lines. For instructions on how to do this, see the section titled “Filling the Gap Between Parallel Lines” in Chapter 3.

Choosing End Caps for Parallel Lines

You can draw a single set of parallel lines and polylines with butt end caps, that is, with line segments between the end points of parallel lines. You can choose to draw parallel lines with no end caps, with an end cap at either end, or with end caps at both ends.

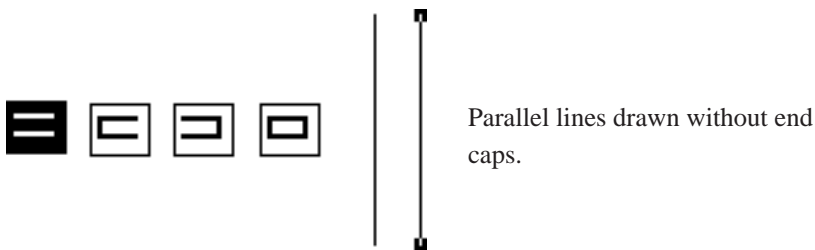
To Draw Parallel Lines With End Caps

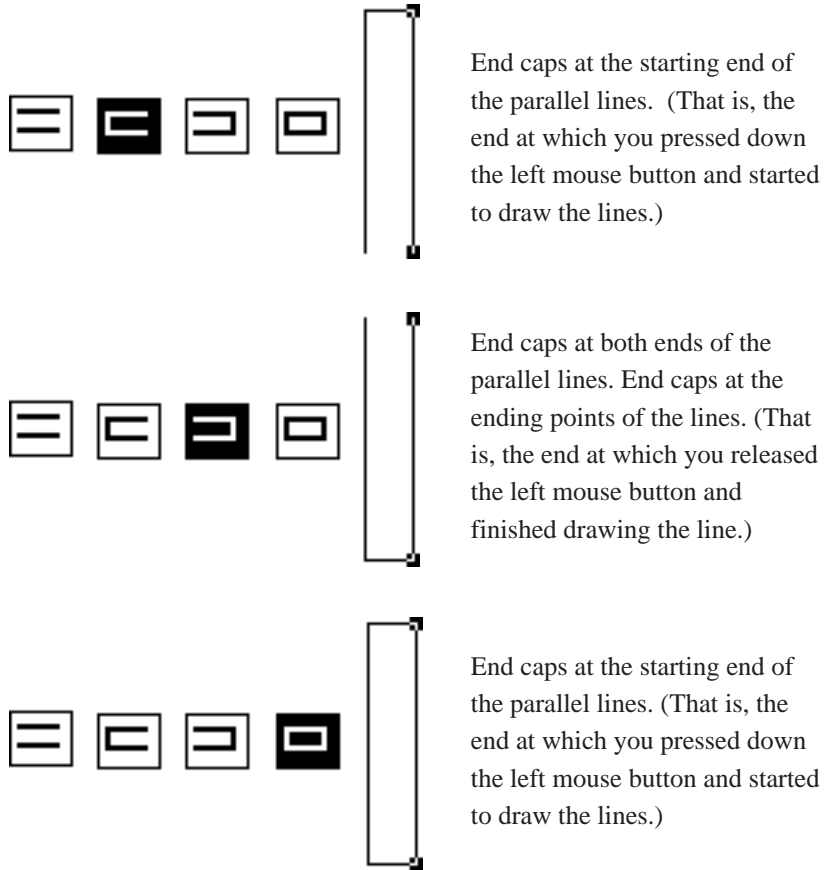
1. **Make sure that nothing is selected on your drawing.**
2. **Alt-click on the Parallel Lines icon on the Tool palette.**

The Parallel Line Setup dialog box will appear.

3. **Click on the icon that represents the end cap option you want.**
4. **Click on the OK button.**
5. **Draw parallel lines**

The following figures show how the end cap option affect the parallel lines you draw.





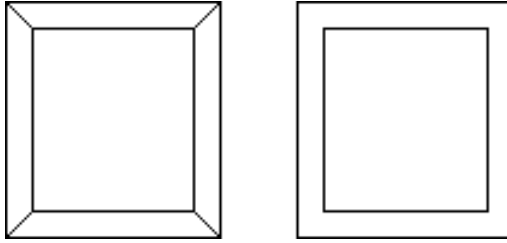
Changing End Caps for Existing Parallel Lines

To change the end caps on existing parallel lines:

1. Select the parallel lines you want to change.
2. Choose the end caps you want from the **Parallel Line Setup** dialog box.

Drawing a Parallel Polygon or Polyline With a Line Joint

You can choose to draw polygons and polyline shapes that have line joints at the corners. When you choose to draw polygons and polyline shapes with line joints, PC Draft automatically draws a line between the inside and outside lines where the sides meet. (This feature can be used to indicate miter joints.)



To draw parallel lines with line joints:

1. **Make sure that nothing is selected on the drawing.**
2. **Alt-click on the Parallel Line icon on the Tool palette.**

The Parallel Line Setup dialog box will appear.



3. **Click on the icon with the line joint.**

To draw parallel lines without line joints:

- **Click on the Plain Line icon.**

To change the option for existing polygons or polylines:

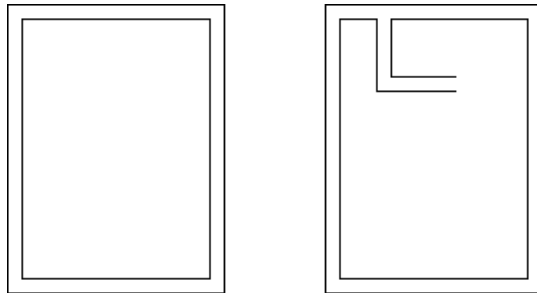
1. **Select the polygon or polyline you want to change.**
2. **Click on either the Plain Line icon or the Line Joint icon in the Parallel Line Setup dialog box.**

Extruding Parallel Lines

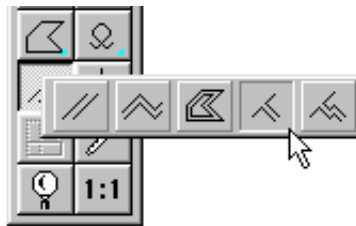
PC Draft's Parallel Extrude tool allows you to draw pairs of lines from existing straight-edged objects, such as lines, rectangles, or polygons. Although the extruded lines are actually separate line segments, they give the appearance of parallel lines.



Lines can be extruded from parallel-line objects, provided that the parallel objects are first separated into single lines or polygons using the Break tool. This is useful in adding interior walls to a floor plan, for example.



Both single lines and connected polylines can be extruded. The icons for these tools are in the Tool palette's Parallel Lines pop-out menu.



The attributes of extruded lines (distance between lines, alignment, and so on) are controlled before drawing using the same setup dialog box as parallel lines.

Extruding Lines from an Edge or Line

To add extruded lines to a straight-edged object or line:

1. Open the Tool palette's Parallel Lines pop-out menu.



2. Choose the single-line extrude icon.

3. **Place the cursor over the edge you wish to extrude from.**
4. **Press the left mouse button and drag so that the extruded lines reach the desired endpoint, then release the left mouse button.**

The new extruded line segment pair will appear on the drawing.

The new segment pair is added to the earlier object as a pair of line segments. This makes the earlier object into either an open polyline (if you started with a closed shape) or two open polylines (if you started with an open shape).

NOTE: Holding down the Alt key will constrain the extrusion to be perpendicular to the original edge and make its length snap to the currently active grid-snap distance (see Chapter 6)

Extruding Multiple Lines (Polylines) from an Edge or Line

Sometimes it's necessary to add jointed segments to a figure. The Extrude tools Polyline option allows this.

To add extruded polylines to an edge or line:

1. **Open the Tool palette's Parallel Lines pop-out menu.**



2. **Choose the polyline extrude icon.**

3. **Place the cursor over the edge you wish to extrude from.**
4. **Press the left mouse button and drag so that the first extruded segment reaches the desired point, then release the left mouse button.**

The first extruded segment will appear on the drawing.

5. **Move the cursor to the next point, then click the left mouse button.**

The next segment will appear.

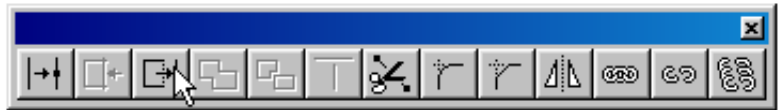
6. **Repeat step 5 until you have all the segments you need, then double-click the left mouse button.**

The new extruded polyline will appear on the drawing.

Extruding Lines from a Parallel Object

To add extruded lines to a parallel-line object:

1. **Select the Parallel Line object.**
2. **Choose the Accessory palette's Break icon.**



The parallel object will be broken apart into the appropriate single-line figures.

3. **Open the Tool palette's Parallel Lines pop-out menu.**



4. **Choose the single-line extrude icon.**

5. **Place the cursor over the edge you wish to extrude from.**
6. **Press the left mouse button and drag so that the extruded lines reach the desired endpoint, then release the left mouse button.**

The new extruded line segment pair will appear on the drawing.

Extruding Multiple Lines (Polylines) from a Parallel Object

Sometimes it's necessary to add jointed segments to a figure. The Extrude tools Polyline option allows this.

To add extruded polylines to a parallel-line object:

1. **Select the Parallel Line object.**
2. **Choose the Accessory palette's Break icon.**



The parallel object will be broken apart into the appropriate single-line figures.

3. **Open the Tool palette's Parallel Lines pop-out menu.**
4. **Choose the polyline extrude icon.**
5. **Place the cursor over the edge you wish to extrude from.**
6. **Press the left mouse button and drag so that the first extruded segment reaches the desired point, then release the left mouse button.**

The first extruded segment will appear on the drawing.

7. **Move the cursor to the next point, then click the left mouse button.**

The next segment will appear.

8. **Repeat step 7 until you have all the segments you need, then double-click the left mouse button.**

The new extruded polyline will appear on the drawing.

Setting the Parallel Attributes of Extruded Lines

To set the parallel-line attributes before drawing an extruded segment pair:

1. **Make sure that nothing is selected on the drawing.**
2. **Alt-click on the Parallel Line icon on the Tool palette.**

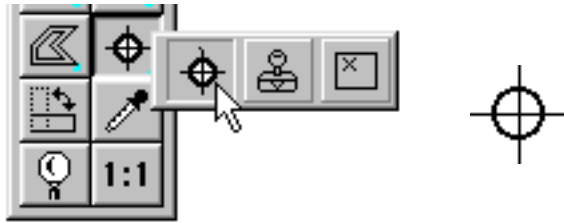
The Parallel Line Setup dialog box will appear.

3. **Change the settings as needed.**
4. **Click the OK button.**

Any extruded lines you draw will now match the settings you just specified.

The Marker Symbol

PC Draft's Marker Symbol tool lets you add a registration-type marker to a drawing in one simple step.



You can select the Marker tool, then click on the drawing one or more times to add as many markers as you need; each marker is centered on the point where you click. You can exit the Marker Symbol mode by holding down the Alt key and clicking on a blank area of the drawing, or by clicking the Pointer tool in the Tool palette.

Once a marker symbol is drawn, it exists as a group. You can ungroup it into a circle and two crossed lines.

To add Marker Symbols to a drawing:

1. **Select the Marker Symbol icon in the Tool palette.**
2. **Place the cursor where you want the marker to appear on the drawing, then click the left mouse button.**

The marker symbol appears.

3. **If you want to add more markers, repeat step 2 as many times as necessary.**
4. **When you are done adding markers, click the Pointer icon or hold down the Alt key and click on the drawing.**

Drawing Perpendicular Lines

PC Draft has a tool for drawing lines perpendicular to existing lines or to the edges of polygons, circles, circular arcs, or square-cornered rectangles.

Once a perpendicular line is drawn, it becomes a normal unconstrained line.

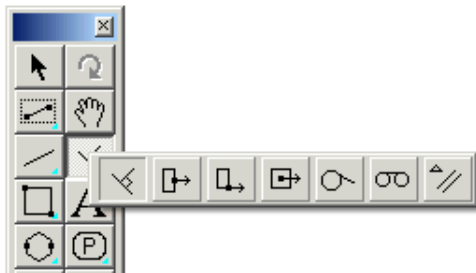
You can edit and resize it, or even move it away from its original position if necessary.

NOTE: The “anchoring” object for the perpendicular must be in place before you choose the perpendicular tool. The end of the line can be at any point on the drawing, even inside an object.

Drawing a perpendicular line from an existing object to a point includes two steps: selecting the object, then clicking the point.

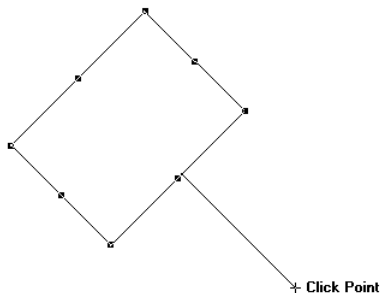
To draw a perpendicular line from an existing object to a point:

1. **Choose the Perpendicular icon from the Special Line Tools pop-up menu.**



The cursor now reads “Click Line/Arc”, to let you know that you need to select a line, circular arc, or edge of an object.

2. **Click on the line or edge.**

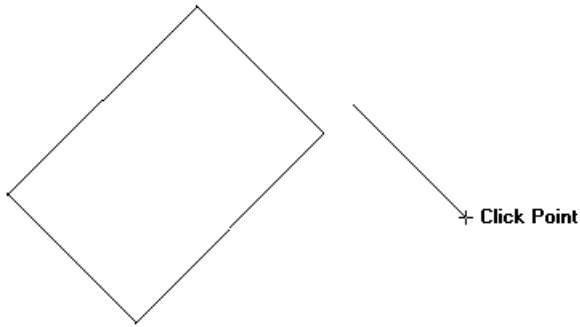


The cursor now reads “Click Point”, meaning that you need to select an endpoint for the perpendicular line.

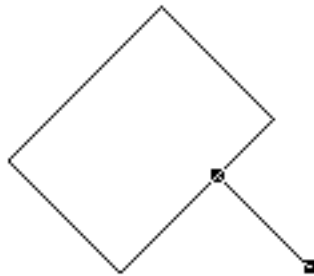
3. **Move the cursor to the point where you want the perpendicular to end.**

The perpendicular line's starting point slides along the edge or line you selected as you move the cursor.

NOTE: You can actually draw a perpendicular from a point not on the original shape, but on an invisible line or circle extended from it.



4. Click the left mouse button.



The perpendicular line is done.

As mentioned earlier, the perpendicular is a normal unconstrained line, which you can edit or alter as needed. You can even use it as the base for a new perpendicular line.

Snapping Along the Length

If you hold the Alt key down as you draw a perpendicular line, it will change by the increment controlled by the Set Grid submenu.

Tangent Line Tools

PC Draft has two ways to draw tangent lines from circles and circular arcs. One tool draws a tangent from a circle or arc to any point outside the circle or arc, and the other draws a tangent from one circle or arc to another. Both of these tools are controlled by the Special Line Tools pop-up on the tool palette.

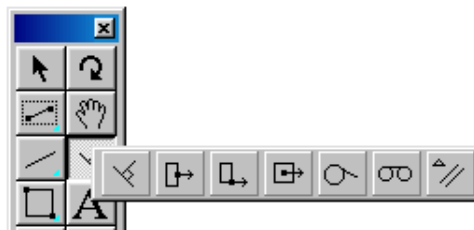
You can specify how you want to draw tangents by choosing the option you want from the Special Line Tools pop-up menu. Each tool gives you a special cursor for selecting the objects you want the tangent drawn from.

Once a tangent is drawn, it becomes a normal unconstrained line. You can edit and resize it, or even move it away from its original position if necessary.

NOTE: The circles or arcs for the tangent must be in place before you choose a tangent tool.

To Choose a Method for Drawing Tangents

1. **Point on the Special Line Tools icon in the Tool palette.**
2. **Press down the left mouse button.**



The Special Line Tools pop-up menu will appear.

3. **Holding down the left mouse button, drag through the menu until the option you want is highlighted.**

4. **Release the left mouse button.**

The icon representing the method you have chosen — from a circle or arc to any point, or from one circle or arc to another circle or arc— appears on the Tool palette, and the cursor changes to let you know that you need to select a circle or arc.

Midpoint, Endpoint and Center Point Lines

Three line tools in PC Draft are: Midpoint, Endpoint and Center line tools. These enable lines to be drawn from the midpoint or endpoint of an existing straight edge or circular arc, or from the center of an existing object. These tools are located in the Special Line Tools popout in the Tool Palette.

Once a line is drawn with the Midpoint, Endpoint or Center line tool, it becomes a normal unconstrained line and can be edited, resized and moved.

The Midpoint and Endpoint line tools can be used with straight edged objects (lines, polylines, polygons and square-corner rectangles) and circular arcs. Any of these objects can be part of a group.

The Center line tool can be used with any individual shape.

Midpoint, endpoint and center lines are drawn in the same way as perpendicular lines. See the User Guide for details.

NOTE: As with other line tools, the line being drawn can be constrained to increments of the active grid snap by holding down the Alt key, or to 45° or 90° increments by holding down the Shift key while drawing.

Now available in PC Draft is the ability to snap the final points of line to the midpoint or endpoint of an existing straight edge or circular arc, or to the center of an existing object. This is done by holding down the "M," "E" or "C" key while drawing a line.

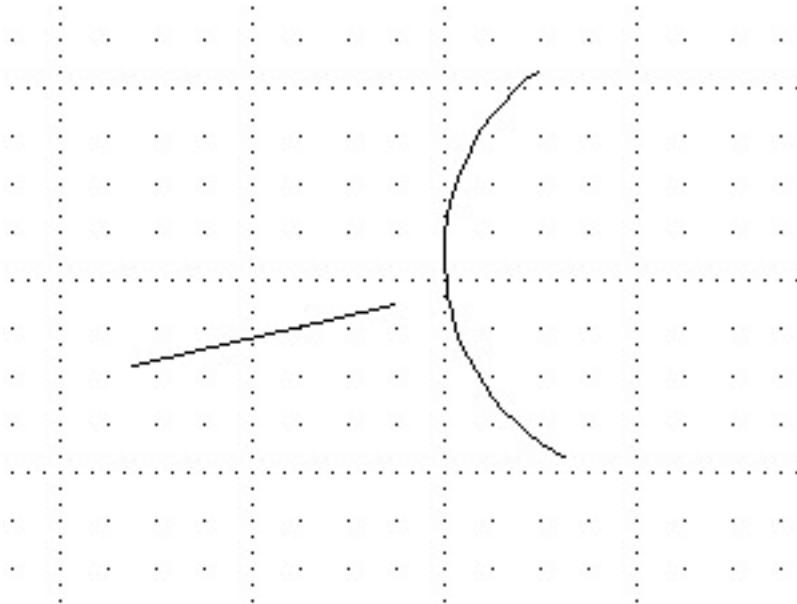
The midpoint and endpoint snap keys, "M" and "E," can be used when drawing lines to straight-edged objects (lines, polygons and square-corner rectangles) and circular arcs. Any of these objects can be part of a group.

The center snap key, "C," can be used with any shape, including shapes within groups except for text objects, dimension objects, and bitmaps or pixel maps.

Note: These snap keys work with any unconstrained lines, including lines drawn with the Special Line popout's Center, Midpoint, Endpoint, or Tangent-to-Point tools.

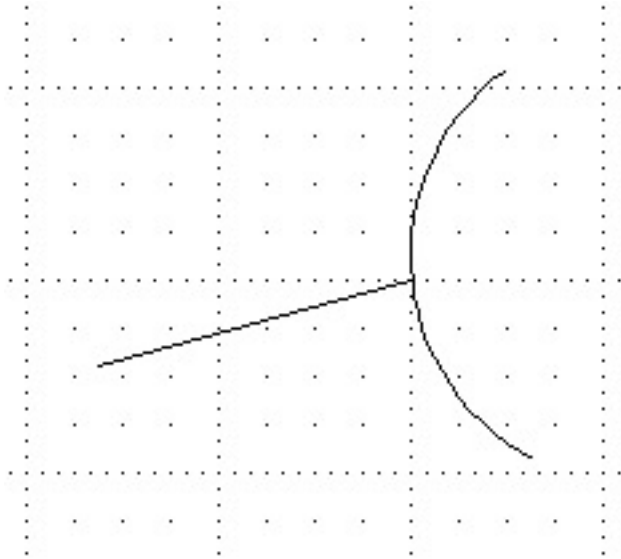
To draw a line to the midpoint of an existing edge, line, or arc;

1. **Choose a line tool from the Tool Palette and begin drawing the line.**
2. **Press and hold down the "M" key. The cursor will read "Mid?"**
3. **Holding down the "M" key, bring the cursor near the desired edge, arc, or line.**
4. **The ghost "sketcher" line will snap to the midpoint of the existing edge, near to the cursor.**



5. **Finish the line by releasing the mouse button or by clicking once**

6. The line will appear on the drawing between the starting point and the midpoint specified. The cursor will revert to the line tool, enabling another line to be drawn if needed.



Draw a line to an endpoint of an existing edge, line, or arc or to the center of an existing object in the same way, but holding down the "E" or "C" key instead of the "M" key.

Drawing a Tangent from a Circle or Arc to a Point

Drawing a tangent from a circle or arc to a point includes two steps: selecting the object, then clicking the point.

Normally, the tangent will be drawn clockwise away from the arc or circle. You can draw the tangent counterclockwise by holding down the Alt key while clicking the tangent's endpoint.

To draw a clockwise tangent from a circle or arc:

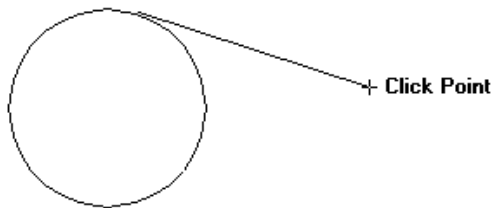
1. **Choose Tangent to Point from the Special Line Tools pop-up menu.**



The cursor now reads “Click Circle/Arc,” to let you know that you need to select a circle or arc.

2. **Click on the circle or arc. (If the object has no fill, you need to click its edge.)**

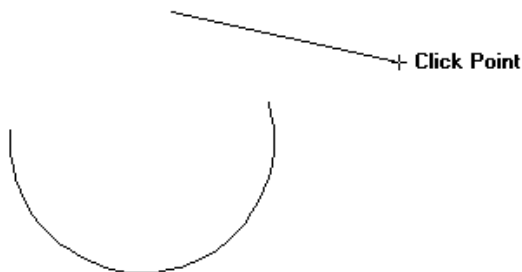
The cursor now reads “Click Point,” meaning that you need to select an endpoint for the tangent line.



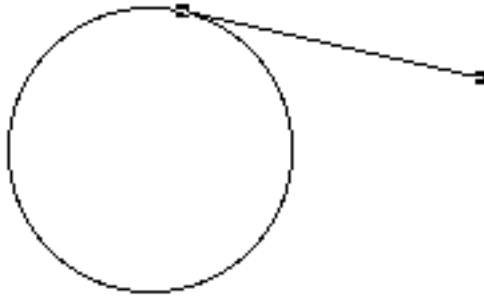
3. **Move the cursor to the point where you want the tangent to end.**

The tangent’s starting point slides around the circle or arc as you move the cursor.

NOTE: With an arc, you can actually draw a tangent from a point not on the visible arc, but on its “invisible circle.”



4. **Click the left mouse button.**



The tangent line is done.

To draw a counterclockwise tangent:

- 1. Choose Tangent to Point from the Special Line Tools pop-up menu.**

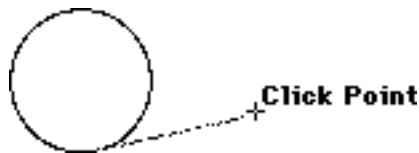
The cursor now reads “Click Circle/Arc.”

- 2. Click on the circle or arc. (If the object has no fill, you need to click its edge.)**

The cursor now reads “Click Point.”

- 3. Press and hold the Alt key.**

The prospective tangent now projects counterclockwise away from the circle or arc.



- 4. Still holding the Alt key, move the cursor to the point where you want the tangent to end.**

- 5. Click the left mouse button.**

Drawing a Tangent Between Circles or Arcs

Drawing a tangent from a circle or arc to another circle or arc includes two steps: selecting the first object, then clicking the second object.

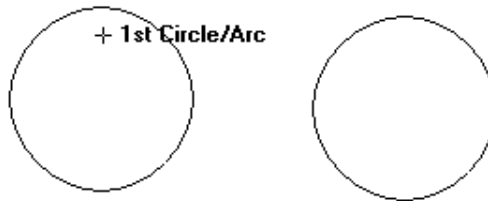
The tangent's final position depends on which half of each object you click.

To draw a tangent from a circle or arc to another circle or arc:



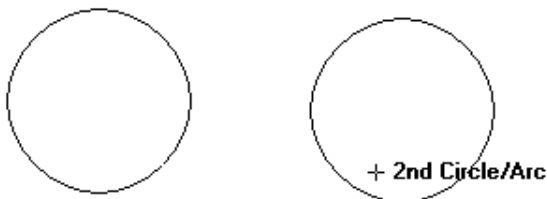
- 1. Choose Tangent Between Objects from the Special Line Tools pop-up menu.**

The cursor now reads “1st Circle/Arc,” to let you know that you need to select a circle or arc.



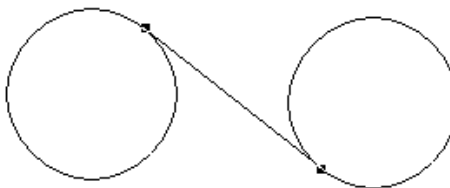
- 2. Click the desired starting point on the circle or arc. (If the object has no fill, you need to click its edge.)**

The cursor now reads “2nd Circle/Arc,” meaning that you need to select another object.

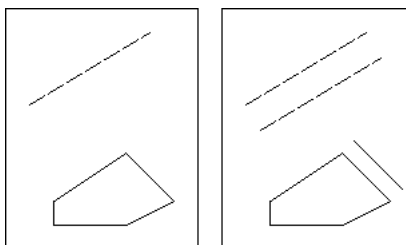


- 3. Move the cursor to the half of the other object where you want the tangent to end, then click the left mouse button.**

Drawing Offset Lines



With PC Draft's Line Offset tool, you can create single lines parallel to existing straight lines or edges. (To create parallel line objects, use the Parallel Line tools, described earlier in this chapter.) The offset line will have the same length, angle, line weight, line style, and pen model as the original line or edge.



Offset lines can be created from any straight line or from any edge of a polygon, polyline, or square-cornered rectangle. Once drawn, an offset line is an independent straight line object that can be edited, moved, or otherwise manipulated as required.

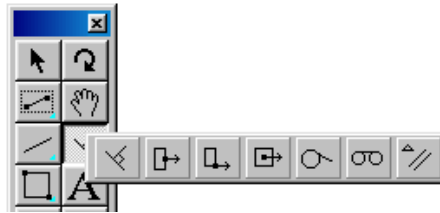
The offset line's distance from the original line or edge normally snaps to the X-Y grid as you drag to an anchor point. You can override the grid and constrain the offset's perpendicular distance to even increments by holding down the Alt key as you drag.

NOTE: The “parent” object for the offset line must be in place before you choose the offset line tool.

Drawing an offset line from an existing object includes two steps: selecting the source line or edge, then clicking to specify the offset distance.

To draw an offset line from an existing object:

1. **Choose the Offset Line icon from the Special Line Tools pop-out menu.**

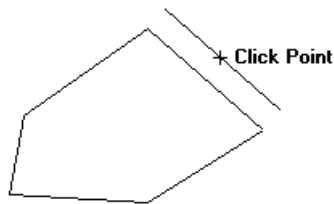


The cursor now reads “Click Line/Edge”, to let you know that you need to select a line or straight edge of an object.

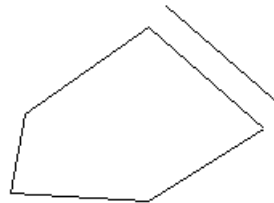
- 2. Click on the line or edge.**

The cursor now reads “Click Point” and appears near a dotted copy of the source line, helping you locate the offset.

- 3. Move the cursor to the point where you want the offset to lie.**



- 4. Click the left mouse button.**



To exit the offset cursor mode, click the Pointer icon in the Tool Palette.

To draw an offset line constrained by the active grid snap:

- 1. Choose the Offset Line icon from the Special Line Tools pop-up menu.**

The cursor now reads “Click Line/Edge,” to let you know that you need to select a line or straight edge.

- 2. Click on the line or edge.**

A dotted copy of the source line appears with the “Click Point” cursor.

3. Hold down the Alt key and move the cursor.

Movement will “snap” to grid increment distances away from the original edge.

NOTE: If you want to change the increment, choose a different value from the Layout menu’s Set Grid submenu.

4. Click the left mouse button.

The offset line is done.

As mentioned earlier, the offset is a normal unconstrained line, which you can edit or alter as needed. You can even use it as the base for a new offset line.

Freehand Drawing Modes

At times you may want to draw an object that has a shape different from those provided for you in the Tool palette. For this reason, PC Draft lets you draw four types of freehand objects: freehand lines, closed freehand shapes, Bezier curves, and spline curves.

The Freehand Shape tool allows you to draw closed freehand objects. When you use this tool, PC Draft draws a line connecting the starting and ending points of the object, and fills the object with the current fill. If you happen to make a mistake as you are drawing either type of freehand object, you can erase it and then continue drawing.

A spline is a curve that is fitted to a series of defined points on your drawing. With a spline curve, the curve passes through all the defined points, or “control points.”

A Bezier curve is a curve that is defined by four control points. The curve itself passes through only two of the control points. The two control points that appear off the curve define the shape of the curve.

You can draw either an open freehand line, a closed freehand shape, a spline curve, or a Bezier curve by first choosing the appropriate item from the Freehand pop-up menu on the Tool palette.

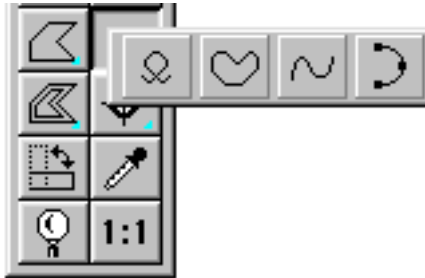
Choosing a Freehand Drawing Mode

To choose the type of freehand object (either an open freehand line, a closed freehand shape, a Bezier curve, or a spline curve) you want to draw:

1. **Point on the Freehand icon on the Tool palette, then press down the left mouse button.**

The Freehand pop-up menu will appear.

2. **Choose a tool.**



To Draw a Freehand Object

1. **Choose the type of object from the pop-up menu.**
2. **Position the cursor where you want to begin drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag the cursor in any direction, creating a line just as you would with a pencil.**
5. **When you have completed the freehand line or shape, release the left mouse button.**



Open Freehand Shape



Closed Freehand Shape

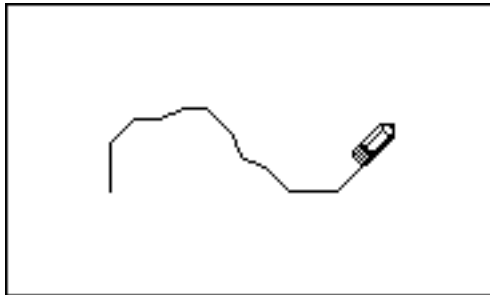
Dynamic Editing of a Freehand Object

If you are drawing a closed freehand, PC Draft will draw a line between the starting and ending point of the object when you release the left mouse button. If you are drawing an open freehand, PC Draft will leave the object open.

When you are using a freehand drawing tool, you can erase portions of the shape that you are drawing by using the Shift key. If you want to erase part of a freehand object while you are drawing it:

1. Continue to hold the left mouse button down, but stop drawing the line by ceasing to move the mouse.
2. Press and hold down the Shift key.

An inverted pencil with an eraser will appear at the end of your freehand line.



- 3. Using the mouse to move the eraser, retrace the portion of the line that you want to remove.**

- 4. Release the Shift key to continue drawing the object.**

Constrained Drawing Mode

The constrained drawing mode for a freehand tool allows you to draw straight line segments as part of a freehand object. Each time you hold the Alt key down, a straight line will be drawn from the point where you initially press the key, to the point where you release it. To do this, follow these steps:

1. Choose the freehand drawing mode you want from the Freehand pop-up menu.

2. **Start drawing the object.**
3. **Press down the Alt key.**
4. **Holding down the Alt key, drag the cursor in any direction until you have created a straight line that is the length you want.**



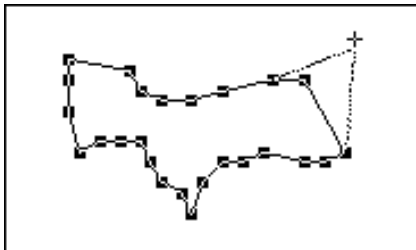
5. **Release the Alt key.**

Changing the Shape of a Freehand Object

You can drag the edit handles on a freehand object to change its shape.

To change the shape of a freehand object:

1. **Return to the pointer mode.**
2. **Select the freehand object you want to change by clicking on it.**
3. **Position the tip of the pointer on one of its edit handles.**
4. **Press down the left mouse button.**



5. **Holding down the left mouse button, drag the handle until you have created the shape you want.**
6. **Release the left mouse button.**

Continue to move each handle until you have obtained the shape that you want.

Choosing Curve Tools

To choose the type of curve you want to draw:

1. **Point on the Freehand icon on the Tool palette.**
2. **Press down the left mouse button.**

The Freehand pop-up menu will appear.

3. **Drag until either Spline or Bezier is highlighted.**
4. **Release the left mouse button.**

An icon representing the chosen type of curve will appear on the palette.

Spline Curves

PC Draft lets you draw a type of curve that passes through a series of defined points on your drawing. This type of object, called a spline, allows you to pick a series of points on a drawing and fit a curve to the points.

To draw a spline:

1. **Choose Spline from the Freehand pop-up menu.**



2. **Position the cursor where you want the spline to start on your drawing.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until you reach one of the points through which you want the curve to pass.**
5. **Release the left mouse button.**

A straight line will appear between the starting point and the cursor to show you the slope of the curve segment.



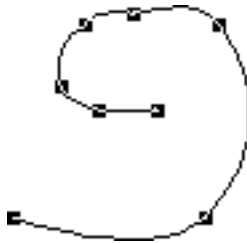
6. **Without pressing down the left mouse button, move the cursor to the next point you want the curve to pass through and click the left mouse button.**

A curve will be fitted to the three points defined so far.



7. **Continue moving the cursor and clicking the left mouse button until you have defined all the points to be fitted.**

8. **When you reach the last point, double-click the left mouse button.**



The completed spline curve will appear. It will contain the current fill, and edit handles will appear on the control points you used to define it.

To view the curve as you are defining end points:

1. **After you have defined the first and second control points, move the cursor close to the next point, as described above.**
2. **Instead of clicking the left mouse button, press it down.**
3. **While holding down the left mouse button, drag to where you want the next control point to appear.**

When you press down the left mouse button, the curve segment will be projected on the screen. By dragging instead of clicking, you can see the shape and length of the curve as you draw it.

4. **Release the left mouse button.**

To make the spline a closed object:

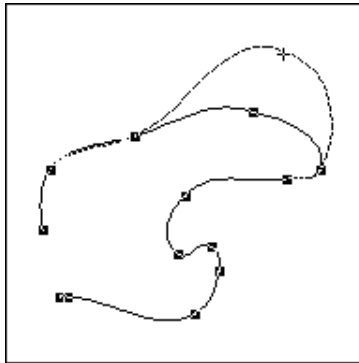
- **Double-click on the starting point.**

Changing the Shape of Splines

You can change the shape of a spline by dragging its control points.

To change the shape of a spline:

1. **Select the spline you want to edit.**
2. **Point on one of the edit handles. (The edit handles represent the control points that were used to define the curve.)**
3. **Press down the left mouse button.**



4. **Holding down the left mouse button, drag to reposition the control point and modify the curve.**
5. **When the curve is the shape you want, release the left mouse button.**

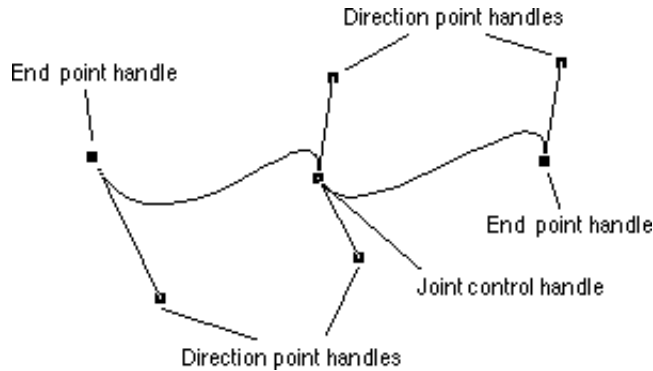
You can use the Add/Delete Handle function to add and delete handles on a spline. (See the section “Adding and Deleting Handles” in this chapter for details.)

Bezier Curves

PC Draft allows you to draw Bezier curves using the Bezier curve tool. Bezier curves give you a great deal of flexibility in creating original designs that feature elegant S-shapes and loops.

A Bezier curve is a type of curve defined at each vertex by four points, called “control points.” Two control points define the end points of the curve, the other control points define the direction in which the curve is

projected. When you select a Bezier curve, the four control points are represented by edit handles on the screen: two handles appear on the end points of the curve, and two middle handles appear on either side of the curve. The two handles on the end points are called “end point handles,” and the other two handles are called “direction point handles.” You can move the handles to modify and change the size of the Bezier curve.



When you create a Bezier curve, direction lines are used to indicate the slope and direction of the curves you draw. A direction line is a line between two direction control points that is tangent to an end point.

You can draw a series of Bezier curves using the Bezier curve tool. Each individual curve actually passes through only the two end control points. The direction lines define the overall shape of the curve. When you draw a series of curves, the curves are connected at “joints,” or end control points that are shared by two curves.

Creating Bezier Curves

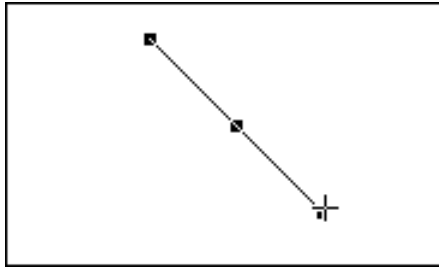
To create a Bezier curve:

1. **Choose Bezier from the Freehand pop-up menu.**



2. **Point where you want the curve to begin.**
3. **Press down the left mouse button.**

This defines the first end control point of the curve.



4. **Holding down the left mouse button, drag in the direction you want to project the curve.**

A line with two handles will be projected in opposite directions from the curve's beginning point. This line is called a "direction line." One of the handles will be attached to the cursor. By dragging the handle, you indicate the direction and slope of the curve. For example, if you drag the handle down all the way to the lower right corner of the screen, a curve sloping toward the lower right corner will result.

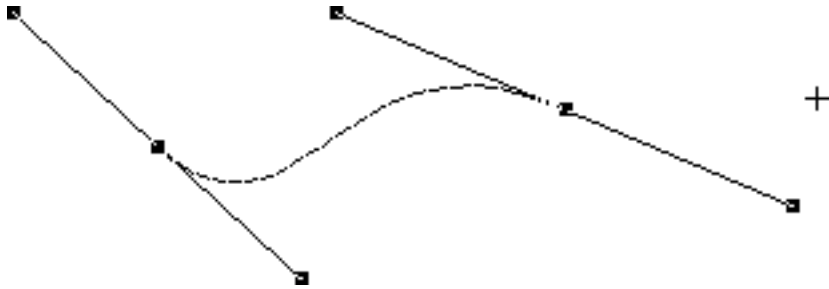
5. **Release the left mouse button.**

The point at which you release the left mouse button defines the first direction point.

6. **Without pressing down the left mouse button, move the pointer to where you want the second end control point to appear.**
7. **Press down the left mouse button.**
8. **Holding down the left mouse button, drag to define the curve's second direction point, as well as the first direction point of the next curve.**

The first direction point of the next curve is associated with the handle attached to the cursor. The second direction point of the first curve is associated with the handle at the opposite end of the direction line.

As you drag, the curve will appear on the screen. The curve's shape will change as you define the second direction point.



9. Release the left mouse button.

With PC Draft, you can join a series of Bezier curves together. The curves are joined at the end points. When you define the second direction point for a curve, you also define the first direction point of the next curve you draw.

If you want to draw just one curve:

10. Click once on the final point you want included on the curve.

11. Drag to the place where you want the control handle for the curve's final point, then double-click the left mouse button.

If you want to continue drawing curves, repeat steps six through nine, described above.

When you want to complete a Bezier curve, after you have created at least one, complete curve:

1. Click once on the final point you want included on the curve.

2. Drag to the place where you want the control handle for the curve's final point, then double-click the left mouse button.

Notice that the last point on the curve is defined by the second-to-last point you click on; when you complete the curve by double-clicking, the point where you double-click defines the control handle, not a point on the curve itself.

Drawing Straight Line Segments

You can also draw straight lines in the midst of Bezier curves by clicking instead of dragging.

To create a straight line segment after you have drawn at least one complete curve and you are still in the Bezier curve drawing mode:

- 1. Without pressing down the left mouse button, move the cursor.**
- 2. Click the left mouse button.**

The resulting line will be curved, but the next line will be straight.

- 3. Without pressing down the left mouse button, move the cursor to where you want the end point of the line to appear.**
- 4. Click the left mouse button.**

Continue moving the cursor and clicking the left mouse button to create a series of straight line segments.

You can create unique designs by dragging the edit handles to modify the Bezier curve. Edit handles appear on Bezier curves that are selected. When you move the end point handles, you drag part of the curve along with the handle. When you drag a direction handle, it exerts a “pull” on the curve closest to it.

To select a Bezier curve:

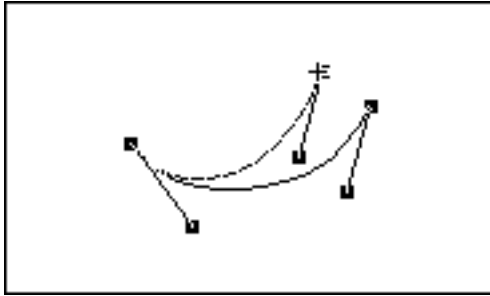
- 1. Return to the pointer mode.**
- 2. Position the tip of the pointer on the curve you want to change.**
- 3. Click the left mouse button.**

Edit handles will appear on the selected curve.

To move the end point handles:

- 1. Point on one of the end point handles on the Bezier curve.**
- 2. Press down the left mouse button.**

3. **Holding down the left mouse button, drag the handle to a different point on the drawing.**



4. **Release the left mouse button.**

The end of the curve will follow the movement of the handle.

To move the direction handles:

1. **Point on one of the direction handles.**
2. **Press down the left mouse button.**
3. **Holding down the left mouse button, drag until the curve is the shape you want.**
4. **Release the left mouse button.**

As you drag, the curve will be reshaped.

When you move a direction handle, the curve may come to a sharp corner at that point. To keep the curve smooth, you can constrain the direction handles so that each pair will move in concert. Pressing the Shift key will produce this constraint.

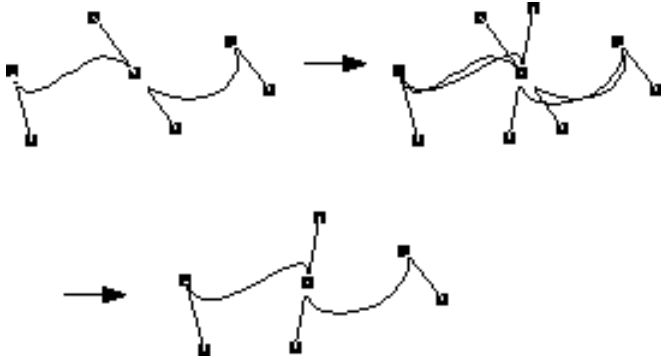
To constrain the direction handles:

1. **Press and hold the Shift key.**
2. **While holding the Shift key, point on one of the direction handles.**
3. **Press down the left mouse button.**

4. **Holding down the left mouse button and the Shift key, drag until the curve is the shape you want.**

The direction handle and its opposite will pivot around the handle on the curve.

5. **Release the left mouse button and the Shift key.**



NOTES: When you constrain with the Shift key and drag an edit handle on a joint (that is, a point at which two end points meet), you change the shape of the two curves controlled by that end control point and its opposite.

When you drag an edit handle on the end point of a straight line segment, you reshape the straight line segment, causing it to become curved.

You can create sharp corners on a Bezier curve by pulling both direction handles to one side, or by dragging the direction handles of a direction line on top of an end control point.

Reshaping Objects

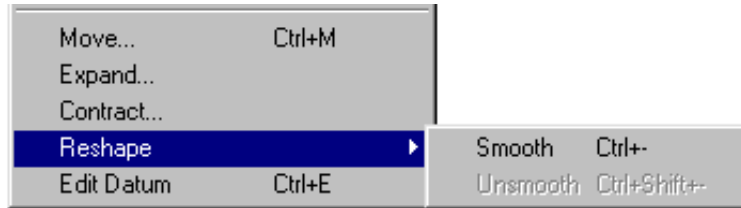
There may be occasions when you want to reshape an object from straight lines and sharp corners to curved lines and rounded corners, the straight lines of an object to smooth lines, or vice versa. You can accomplish this conversion by using the Reshape submenu in the Edit menu.

The objects that the Reshape Control can modify include polygons, polylines, and freehand shapes.

To reshape an object:

1. **Select the object you want to reshape.**
2. **Open the Edit menu and drag until Reshape is highlighted.**

The Reshape submenu will appear.



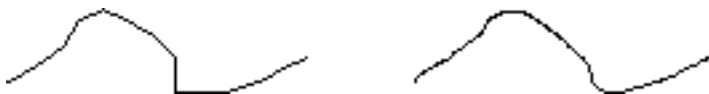
3. **Select Smooth or Unsmooth (detailed explanations of the choices follow).**
4. **Release the left mouse button.**

After you make your choice, the object will be reshaped. You can edit the reshaped object by using the edit handles.

Reshape Option

The Reshape Control's Smooth and Unsmooth Options affect different shapes in different ways.

A freehand can be smoothed to a curve that lies close to the original object, passing near the original vertices (the new edit handles appear at the old vertices). In addition, this new curve can be smoothed repeatedly until the desired effect is obtained.

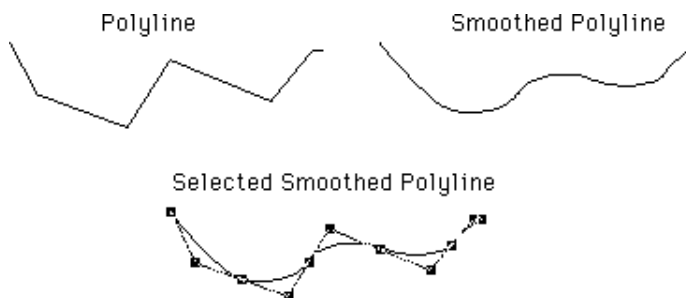


NOTE: With freehand objects that include sharp points, you can often get good results by deleting or adding handles before smoothing. See the section “Adding and Deleting Handles” in this section.



A polygon can be smoothed to a curve that lies inside the original object (intersecting the midpoints of each line segment). When the smoothed polygon is selected, its original shape appears as a ghost outline.

A polyline can be smoothed to a curve that intersects the midpoints of each line segment of the original object, except for the segments closest to the ends. That is, the curve will skip over the first and last midpoints of the original polyline.

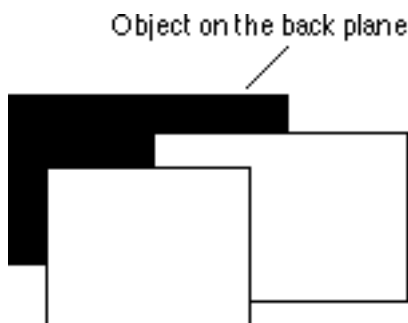


NOTE: A polygon or polyline can be smoothed only once.

Editing an Object's Datum Point

Each object in PC Draft has a datum point, which is a reference point used when you paste the object, rotate it, or manipulate it in other ways. PC Draft lets you change the location of the datum point for any object.

Each type of object has a default datum point. For example, the default datum point for a rectangle is the upper left vertex.



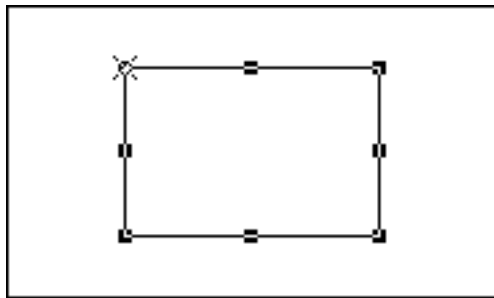
Assigning a New Datum Point to an Object

The default datum point for a grouped object is the default datum point of the element farthest back in the stacking order.

To assign a new datum point to an object:

1. **Select the object to which you want to assign a new datum point.**
2. **Open the Edit menu and choose Edit Datum.**

An “X” marker representing the datum point will appear, and the cursor will change to the Edit Datum cursor.



3. **Click anywhere inside the bounding box (represented by the object's edit handles) to define the new datum point.**

The X marker will appear where you clicked to mark the new datum point.

To place the datum point in the center of the object:

- **Open the Edit menu and choose Center Datum.**

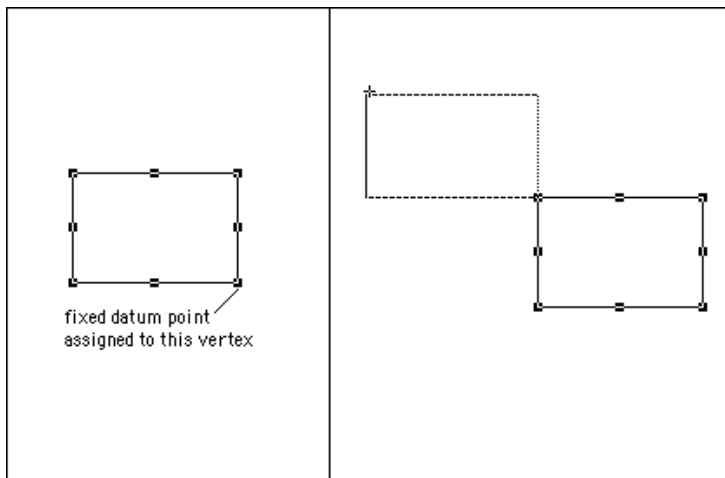
NOTE: The object's center is defined as the center of the object's “extent.” The extent is the overall size of the object.

To exit from the Edit Datum mode:

- **Click on any tool icon in Tool palette, or hold down the Control key and click the left mouse button.**

TECHNICAL NOTE: If you click near a vertex point (that is, a point where two edges meet, such as a corner), the X marker will snap to that vertex. You can place a datum point anywhere within the bounding box defined by an object's or group's extent. However, a datum point located at the center of the object or on a vertex point has some special attributes of which you should be aware. Such a "fixed datum point" retains the same relative position on the object even if you reshape or resize the object. However, if you resize an object with a "free datum point" (a datum point that doesn't appear at a vertex or the center of an object) so that the datum point's old position is outside the object's new bounding box, the datum point will revert to the default position within the object or the group.

For example, suppose you assign a fixed datum point to the lower right vertex on a rectangle. You then reshape the rectangle by dragging the handle associated with the lower right vertex toward the upper left corner of the drawing, as shown in the following figure.



Since a fixed datum point was assigned to the lower right vertex, the datum point will still appear on the lower right vertex.

However, suppose you assign a free datum point **near** the lower right corner of the rectangle, but not on a vertex point. In this case, if you reshape the rectangle as in the above example, the datum point on the object on the drawing will revert to the default datum point for rectangles, which is the upper left vertex. The datum point will revert to its default position because the reshape operation moved the free datum point outside the object's bounding box.

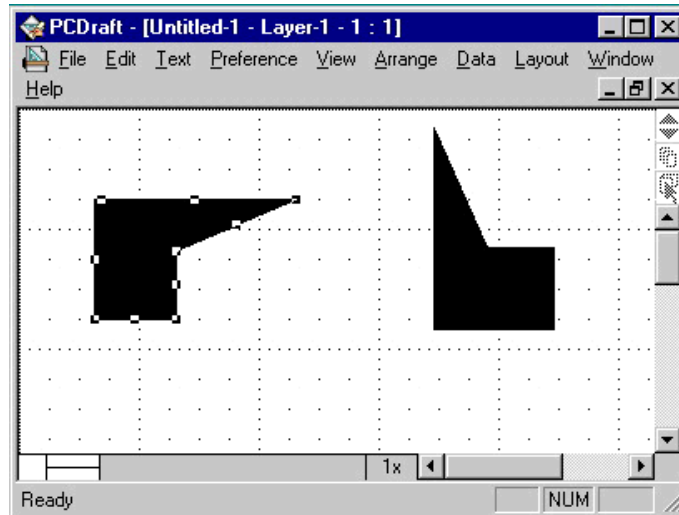
Rotate 90° Tool

The PC Draft Tool Palette now includes a Rotate by 90° tool:

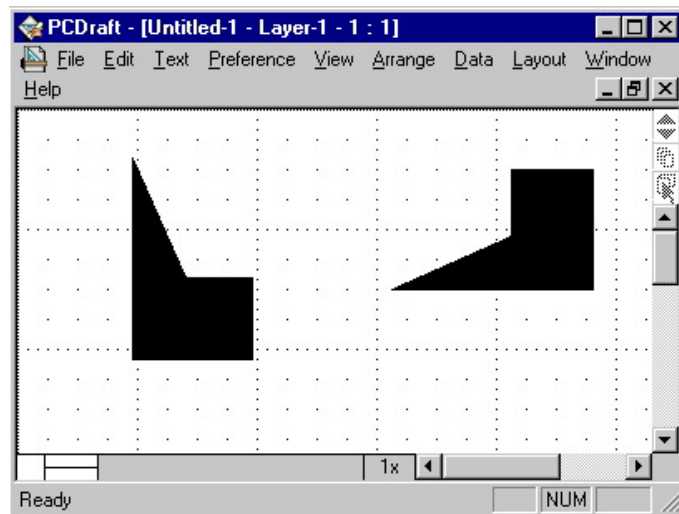


Select an object in the PC Draft drawing then click on the Rotate 90° tool. The object will be rotated 90° anti-clockwise around its center.

Select the object again, hold down the Alt key, and click on the Rotate 90°



tool. The object will be rotated 90° anti-clockwise around its datum point. (In this example, the object's datum point is on the point of the shape.)



The Resize Palette

In addition to the manual resizing possible when you drag an object's edit handles, PC Draft includes a method for resizing objects by typing exact size values. This gives you more precise control over the size of objects on your drawing.

Keyboard resizing is controlled from the Resize palette. You can display the Resize palette using the View menu's Palette submenu. The Resize palette can remain visible indefinitely, and can be dragged anywhere on screen as needed, displaying the size values of the currently selected object.

Different types of objects are resized in different ways. For example, you can resize a rectangle by specifying the exact height and width of the rectangle, whereas resizing an arc includes entering various angle values and a radius length.

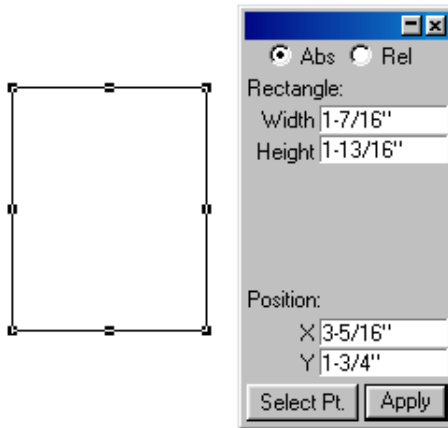
As you select different objects, the types of values displayed in the Resize palette will change automatically to match your selections.

For most objects, there are two approaches to keyboard resizing: you can enter the values for the whole object, or select a point on the object, specifying either that the point will be shifted by the changed values or that the point will be moved to a specific drawing location. The effects the two different methods each have on different object types are detailed on following pages.

In general terms, to resize an object by changing its size values:

1. Open the View menu's Palettes submenu and choose Resize.

The Resize palette will appear. If an object or group is selected, the palette will display the current size of the object; if nothing is selected, the palette will not show any values.

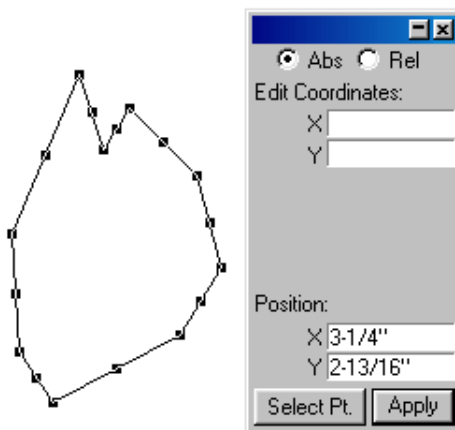


2. If necessary, select the object you want to resize.
3. Enter the new size values (such as Height or Width) you want for the object.
4. Click on the Apply button.

The new size will be applied to the object.

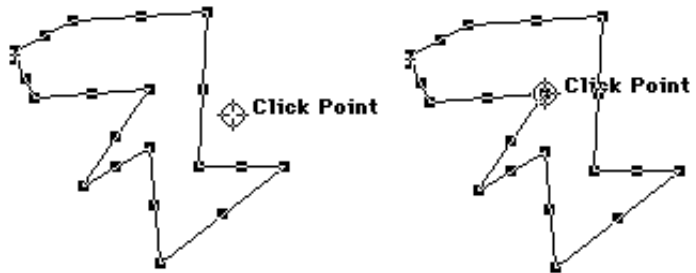
To resize an object by editing a single edit handle

1. Make sure the Resize palette is displayed.
2. If necessary, select the object you want to resize.



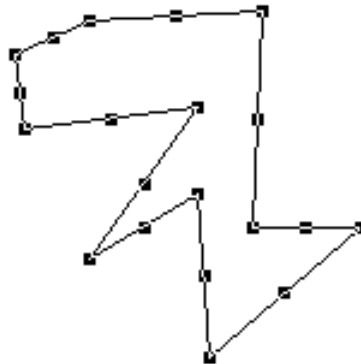
4. Click the Select Point button.

A special gunshot cursor will appear on the drawing.

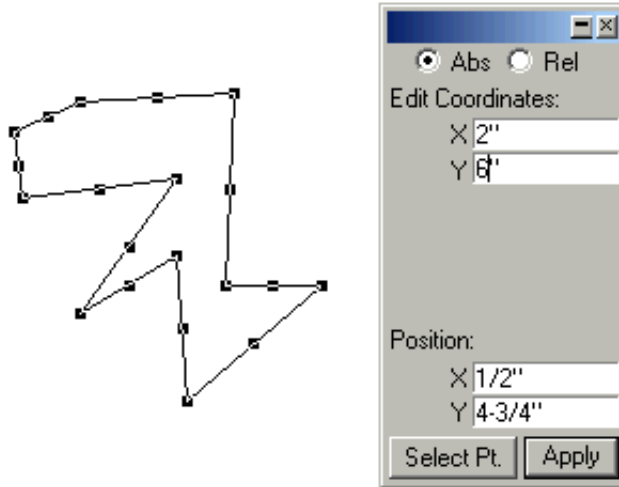


5. Click the cursor on the point (edit handle) you want to resize.

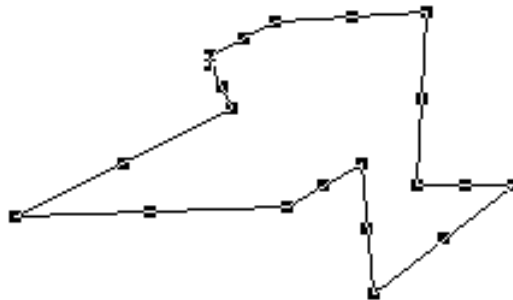
The Resize palette will display either the location of the point or the size values for the object.



6. Enter the new values or location for that edit handle in the Resize palette, then click the Apply button.



The new values or location will be applied to that edit handle, resizing the object.



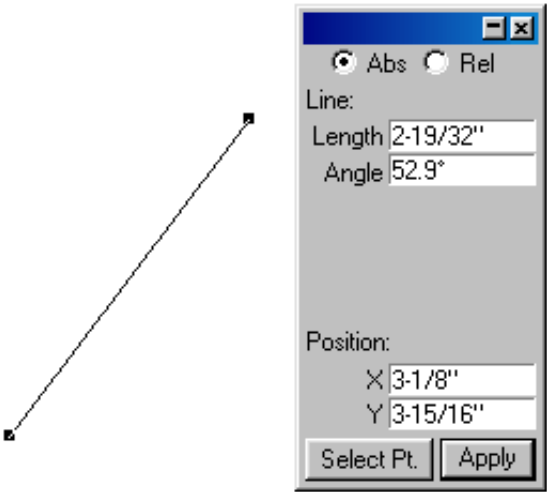
NOTE: If the resize operation requires the object to be enlarged beyond the drawing area, a system beep will sound and an alert will appear..

Object Types and the Resize Palette

This section describes the resizing option for the various types of objects and the information you can enter to resize each type of object.

NOTE: If you select multiple objects, the Resize palette will reflect (and affect) the object selected most recently.

Lines and Parallel Lines



Length & Angle

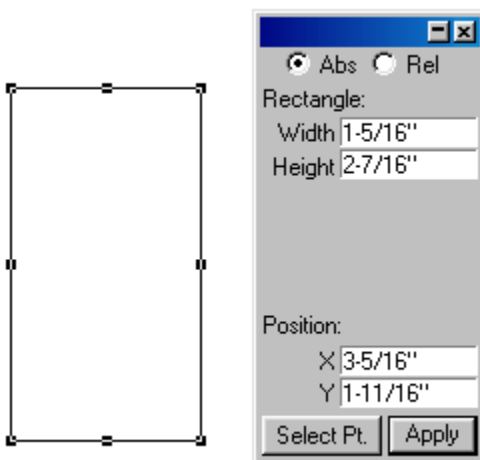
Changes the desired length and angle of the line. The specified angle is measured relative to the X-axis, and the last point drawn on the line — the “finishing point” — will normally be the one that moves.

Select Point

Enables you to select which endpoint of the line will move when you apply a new length or angle value.

NOTE: If you change the angle of a constrained line, it will become an unconstrained line.

Square-Corner Rectangles



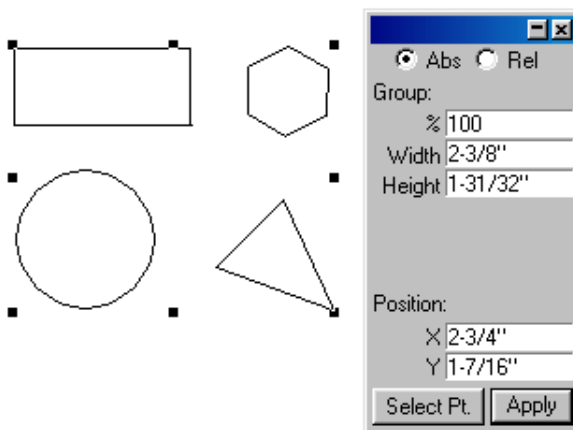
Width & Height

Change the width and height of a rectangle. For example, to enlarge a 1" x 1" rectangle to 3" x 3", enter 3" in both fields. A diagonally drawn rectangle will normally resize by shifting its bottom edge or right-hand edge (or both).

Select Point

Enables you to select which edge or corner of the rectangle will move when you apply a new width or height (or both). For example, if you click Select Pt, then select the rectangle's top middle handle, then enter a new height, the top edge will move up.

Groups



Percent

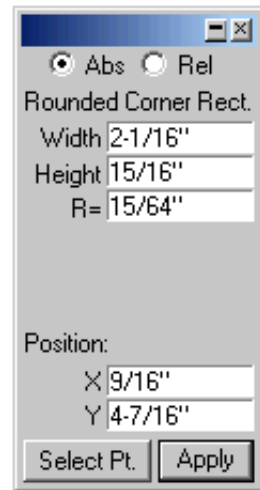
Change size of the group proportionally by percentage. Values larger than 100% will increase its size; values smaller than 100% will reduce it. Normally, the lower right corner will move as the group becomes larger or smaller.

Select Point

Enables you to select which corner of the group will move when you apply a new percentage. For example, if you click Select Pt, then select the group's top left handle, then enter 200%, the top edge will move up and the left edge will move left.

NOTE: Bitmap and pixel map objects can be made “palette resizable” by grouping them to themselves. For example, if you paste in a bitmap or load in a TIFF image, you can make it proportionally resizable by selecting it, then choosing Group.

Rounded-Corner Rectangles (Proportional and Constant)



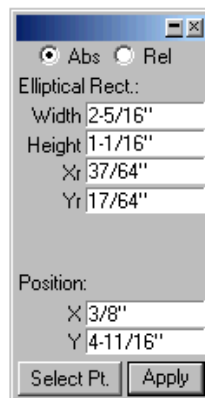
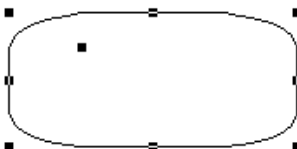
Width, Height, & Radius

Change the width and height, as with square-corner rectangles, and the radius of the corner arc. Normally, the width and height values will resize the rectangle by shifting its bottom edge or right-hand edge (or both).

Select Point

Enables you to select which edge or corner of the rectangle will move when you apply a new width or height (or both). For example, if you click Select Pt, then select the rectangle's top middle handle, then enter a new height, the top edge will move up.

Elliptical-Corner Rectangles



Width, Height, X-Radius, & Y-Radius

Change the width and height, as with square-corner rectangles, and the vertical and horizontal radii of the elliptical corner arc. Normally, the width and height values will resize the rectangle by shifting its bottom edge or right-hand edge (or both).

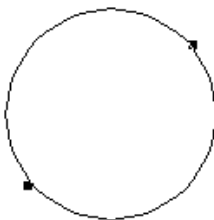
Select Point

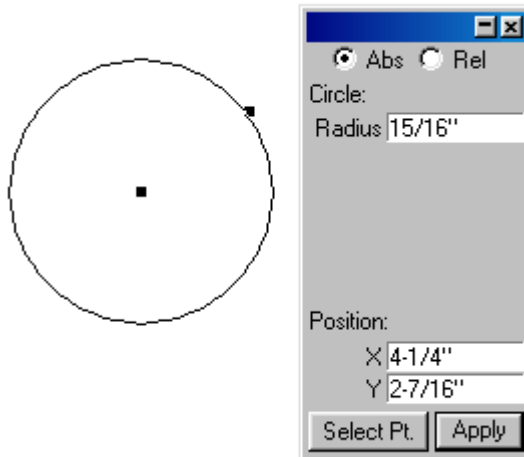
Enables you to select which edge or corner of the rectangle will move when you apply a new width or height (or both). For example, if you click Select Pt, then select the rectangle's top middle handle, then enter a new height, the top edge will move up.

Circles Drawn by Diameter or Radius

Diameter & Radius

Change the diameter or radius of the circle. A circle drawn by diameter will normally move the last point drawn, as with rectangles; a circle drawn by radius will normally change size so that its center doesn't move.

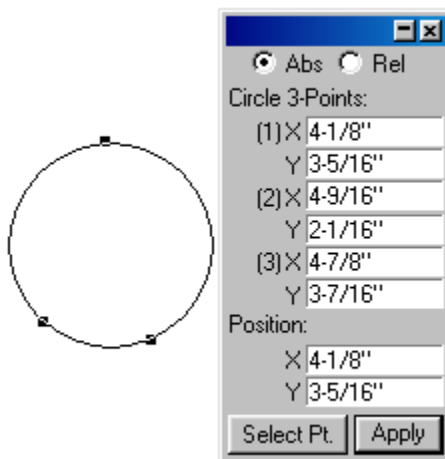




Select Point

Changes the radius or diameter distance for the selected handle. For example, if you click Select Pt, then select a radial circle's center handle, then enter a new radius, the center handle will move as the circle assumes its new size.

Circle Drawn by Three Points



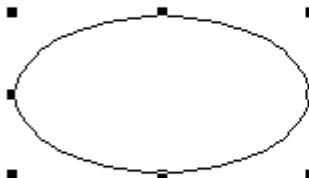
X & Y Locations

Change the X and Y coordinates for the circle's three edit handles. The absolute coordinates you specify are measured from the zero origins of the rulers.

Select Point

Same effect.

Ellipse



<input checked="" type="radio"/> Abs <input type="radio"/> Rel	
Ellipse:	
Width	2-1/16"
Height	1-1/8"
Position:	
X	4-7/32"
Y	2-3/4"
Select Pt. Apply	

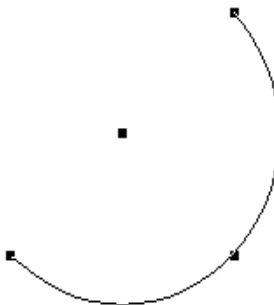
Width & Height

Change the width and height of an ellipse. A diagonally drawn ellipse will normally resize by shifting its bottom right edit handle.

Select Point

Enables you to select which corners of the ellipse will move when you apply a new width or height (or both). For example, if you click Select Pt, then select the ellipse's top middle handle, then enter a new height, the top will move up.

Arcs Drawn by Radius



<input checked="" type="radio"/> Abs <input type="radio"/> Rel	
Radial Arc:	
1st A°	45.0°
End A°	225.0°
Radius	1-1/4"
Position:	
X	3-7/8"
Y	2-7/16"
Select Pt. Apply	

1st A°

Change the angle of the arc's starting point, measured in relation to the X-axis.

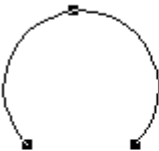
End A°

Change the angle of the arc's ending point, measured in relation to the X-axis.

Radius Change the radius of the arc.

Select Point Same effect.

Arcs Drawn by Three Points



Abs

Rel

Arc 3-Points:

(1)X

4-5/16"

Y

2-11/16"

(2)X

4-5/8"

Y

1-3/4"

(3)X

5-1/16"

Y

2-11/16"

Position:

X

4-5/16"

Y

2-11/16"

Select Pt.

Apply

X & Y Locations Change the X and Y coordinates for the arc's three edit handles. The absolute coordinates you specify are measured from the zero origins of the rulers.

Select Point Same effect.

Elliptical Arcs



Abs

Rel

Elliptical Arc:

1st A°

320°

End A°

130°

Xr

1-31/64"

Yr

45/64"

Position:

X

1-1/16"

Y

5-7/16"

Select Pt.

Apply

1st A°

Change the angle of the arc's starting point, measured in relation to the X-axis.

End A°

Change the angle of the arc's ending point, measured in relation to the X-axis.

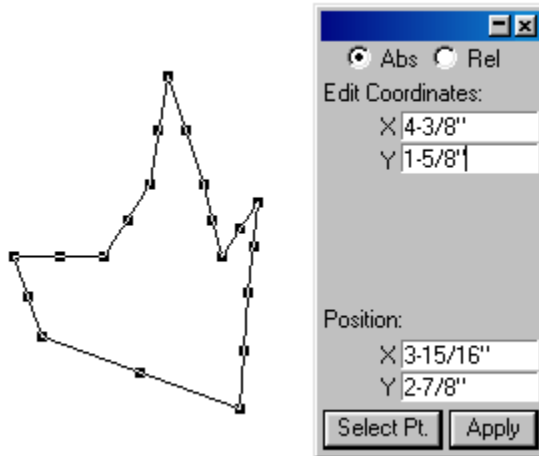
Change the horizontal or vertical radius of the arc.

Select Point

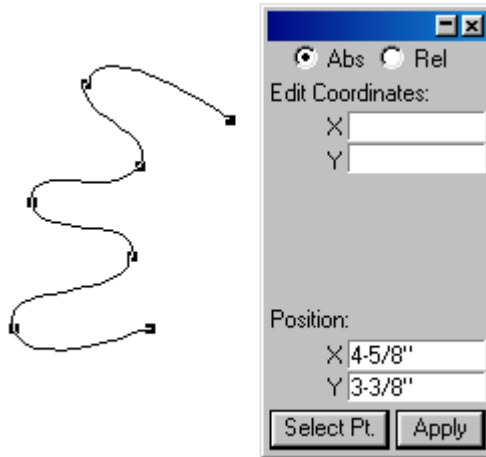
Same effect.

Polygons and Polylines (including Parallel Polygons) Freehands, and Curves

Because of the complexity of these objects, you can only edit them using the Select Point cursor.



For example, if an object has a half-dozen or more edit handles, each handle cannot be shown in the Resize palette. Instead, you use the Select Point button to select a single handle, then give it a new absolute location on the drawing.



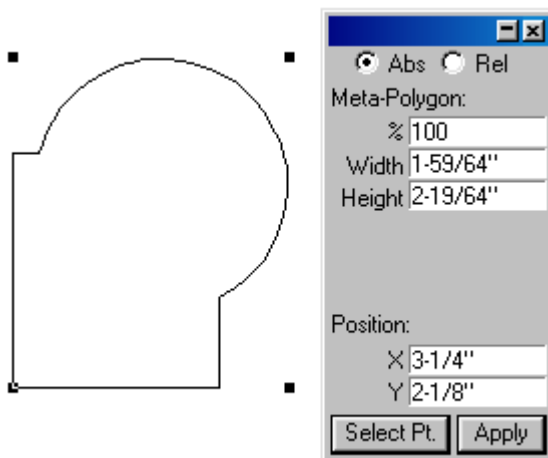
Select Point

Change the X and Y coordinates of the location where you want the selected handle to appear. The coordinate values are measured from the zero origins of the rulers.

NOTE: The Resize palette treats the direction handles on Bezier curve objects like any other edit handles.

Metapolygons

Metapolygons are the objects created when you use the Add, Subtract, or Attach Controls to combine objects with different types of edges. You can only resize them proportionally.



Percentage

Changes the size of the metapolygon proportionally by a percentage of its current size. Absolute values larger than 100% or positive relative values will increase its size; absolute values smaller than 100% or negative relative values will reduce it. Normally, the lower right corner will move as the metapolygon becomes larger or smaller.

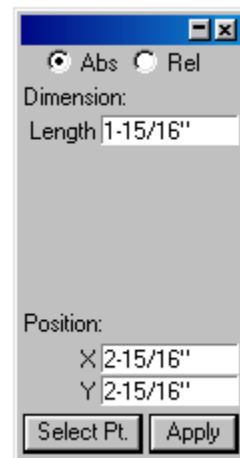
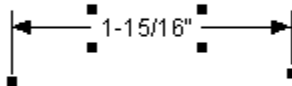
Width and Height

Changes the width and height of the metapolygon. A metapolygon will normally resize by shifting its bottom edge or right edge (or both).

Select Point

Enables you to select which corner of the metapolygons bounding frame will move when you resize it. For example: if you click Select Pt and select the metapolygon's top left handle, then enter an absolute percentage value of 200%, the top edge will move up and the left edge will move left.

Linear and Radial Dimensions



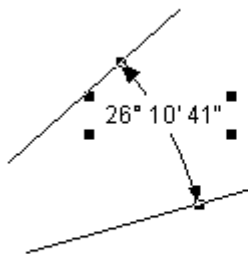
Length

Change length of the dimension object. Normally, the first reference point (the left end of a diameter or the center of a radius) will remain fixed.

Select Point

Enables you to select which reference point will move when you apply a new length.

Angular Dimensions



<input checked="" type="radio"/> Abs <input type="radio"/> Rel	
Angular Dimension:	
1st A°	41° 49' 13"
End A°	15° 38' 32"
Radius	2-31/64"
Position:	
X	4-1/32"
Y	2-3/64"
<input type="button" value="Select Pt."/> <input type="button" value="Apply"/>	

1st A°

Change the angle of the dimension's starting point, measured in relation to the X-axis.

End A°

Change the angle of the dimension's ending point, measured in relation to the X-axis.

Radius

Change the radius of the dimension object.

Select Point

Same effect.

Resize Units

The Resize palette uses the scale and units of the current layer. When you select an object with the Resize palette visible, the values shown will be to scale. When you enter values to resize an object, you should use values appropriate to the current scale.

WARNING: If you enter unscaled units in a scaled drawing (for example, a width “ 4” ” in a 1/8"=1' drawing), you may get unexpected results (in that example, the four inches would appear in the drawing as 1/24 of an inch on screen and on paper).

If you don't specify units with the values you enter, PC Draft will interpret the values according to the document's current size units. (You set the size units using the Document Scale & Units dialog box).

Below are some examples of valid size and coordinate entries for some of the available types of size units.

Decimal Feet and Inches

12.0' 110.3'
10' 10 in
12.3 is interpreted as 12.3'

Fractional Feet & Inches

23" = 1' 11" 1 3/4"
1' 10-3/8"

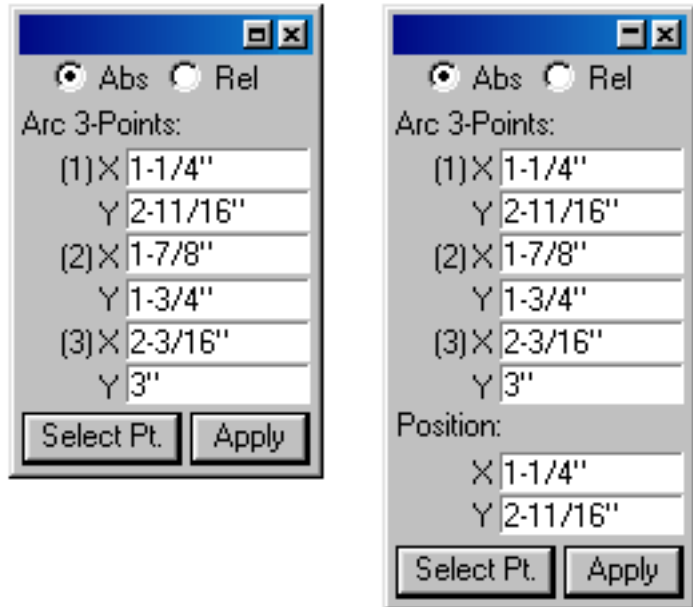
Fractional Inches

1" 123-3/4" 15 1/2
1/2 2-1/4

You can enter values greater than 12 inches if fractional inches are the current size units.

Moving Using The Resize Palette

The Resize Palette has two modes, Normal and Expanded. When the palette is Expanded, it can be used to move a single object or group within the current active layer. Expand the palette by clicking on the Expand/Contract box at the top right of the palette.



The Resize palette's Position X and Y fields move the selected object or group to an absolute position on the drawing or by relative horizontal and vertical distances. All movement is defined in the units and scale of the active layer.

Set the mode to relative or absolute by clicking on the Relative or Absolute button at the top of the palette. Change a selection's position by entering values in the Position X and Y fields, then clicking Apply or pressing the Enter key.

For relative movement, positive distance values will move items to the right (in the ΔX field) or downward (in the ΔY field). Negative values will move items to the left or upward.

Moving Using The Arrow Keys

Selected objects and groups can be moved using the arrow keys on the keyboard. When a grid is active (see Chapter Six of the User Guide), each press of an arrow key will move (or "nudge") the current selection one grid increment in the appropriate direction: left, right, up, or down. If no grid is active, the selection will move one screen pixel ($1/72$ of an inch) for each keystroke. Hold down the Control key and press an arrow key to release the selection from an active grid and allow the selection to be moved one pixel at a time.

Expanding and Contracting Objects

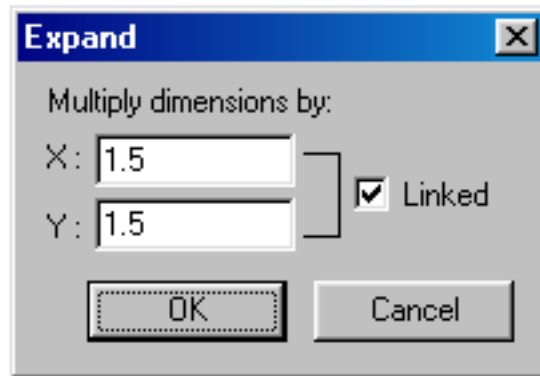
All PC Draft objects can be increased or reduced in size by multiplying or dividing the object's dimensions by specified values. You can choose whether or not to maintain the object's proportions. The Expand and Contract commands in the Edit menu are used to resize objects in this way.

To resize an object using the Expand command:

1. **Select the object to be expanded.**
2. **Select Expand from the Edit menu.**

Expanding

The Expand dialog displays.

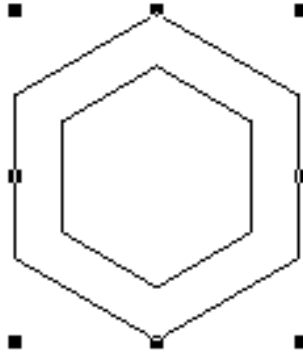


3. **To maintain the object's proportions, ensure that the Linked checkbox is checked.**
4. **To change the object's proportions, uncheck the Linked checkbox.**
5. **Enter a value to multiply the X dimension of the object by.**

NOTE: If the Linked checkbox is checked, the same value will automatically be entered in the Y field.

6. **Enter a different value to multiply the Y dimension of the object by, if necessary.**
7. **Click on the OK button.**
8. **The dimensions of the object are multiplied by the specified values and the object is expanded around its center point.**

NOTE: The screen shot below shows a copy of the original shape in front of the expanded shape.

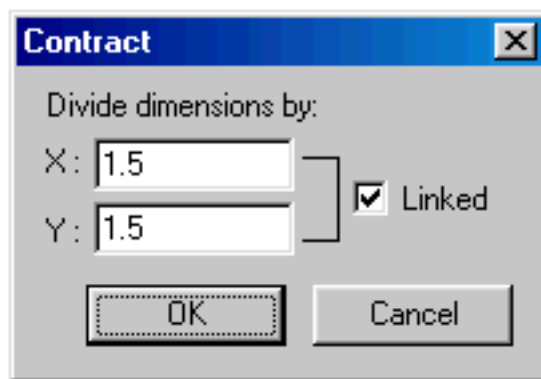


Contracting

To resize an object using the Contract command:

1. **Select the object to be contracted.**
2. **Select Contract from the Edit menu.**

The Contract dialog displays.

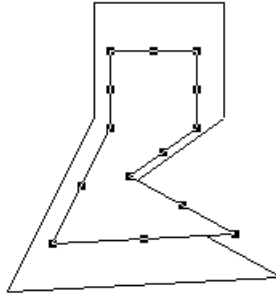


3. **To maintain the object's proportions, ensure that the Linked checkbox is checked.**
4. **To change the object's proportions, uncheck the Linked checkbox.**
5. **Enter a value to divide the X dimension of the object by.**

NOTE: If the Linked checkbox is checked, the same value will automatically be entered in the Y field.

6. Enter a different value to divide the Y dimension of the object by, if necessary.
7. Click on the OK button.
8. The dimensions of the object are divided by the specified values and the object contracts around its center point.

NOTE: The screen shot below shows a copy of the original shape behind the contracted shape.



The Accessory Palette

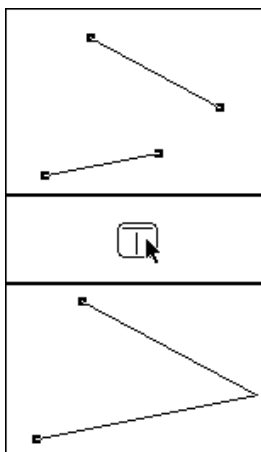
Contains Editing and objects manipulation functions. There are tools to create fillets and chamfers, add handles to objects, break objects into their edges, extend lines to their intersections, and automatically trim lines that overlap. This palette also provides many advanced tools such as the attach function, merge objects, cut, mirror, etc.

Extending Lines to Intersection Points

PC Draft allows you to extend selected lines to various points on your drawing. You have a number of options when you use the Extend function. You can extend two non-parallel lines to the point where they intersect; you can extend lines to make them intersect with a reference line; and you can extend lines to make them intersect with an existing, non-parallel line.

Extending Two Lines to a Common Intersection Point

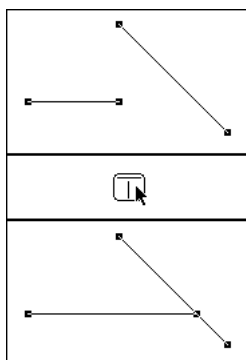
To extend two lines to a common intersection point:



1. Select the two non-parallel lines that you want to extend.

2. Click on the Extend tool on the Accessory palette.

The two lines will be projected to the point at which they intersect.



In some cases, one line might be perpendicular to the other, and the logical operation is to extend one line toward the other. In such cases, PC Draft will extend one line and not the other.

NOTE: If you select more than two lines and click on the Extend icon, a dialog box will appear. The dialog box allows you to extend lines toward a reference line or an existing line on the drawing. These options are discussed in the following pages.

Extending Lines Toward a Reference Line

You can select lines on a drawing, then define an imaginary reference line to which you want to extend the lines. The lines to be extended can be parallel.

To extend lines to a reference line:

- 1. Select the lines you want to extend.**
- 2. Hold down the Alt key.**

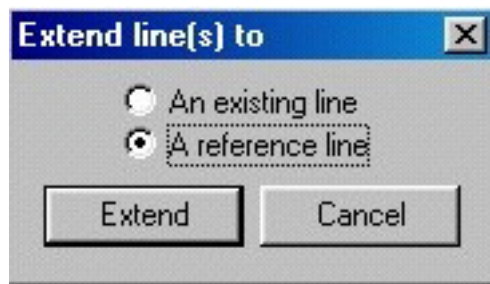
(If more than two lines are selected, holding down the Alt key is not necessary.)

- 3. Click on the Extend icon on the Accessory palette.**

A dialog box will appear.

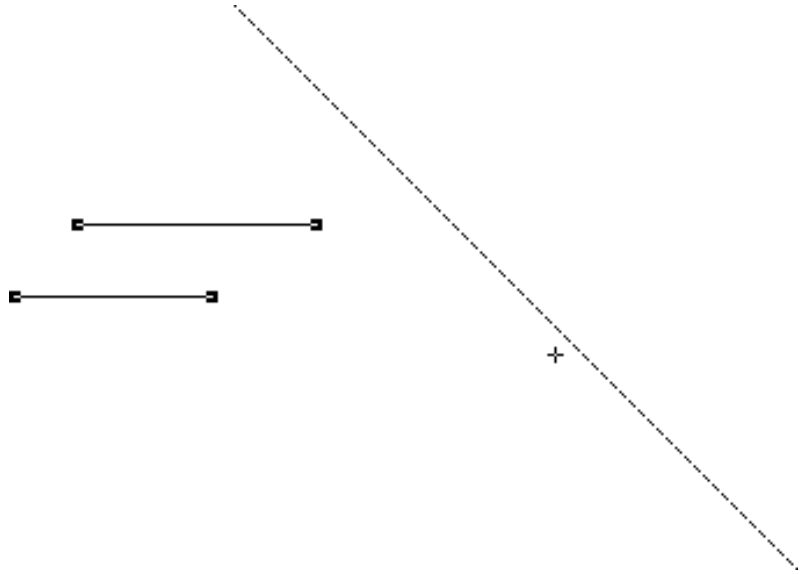
“A reference line” will already be selected as the default option.

- 4. Release the Alt key.**



- 5. Click on the Extend button.**

The dialog box will close and a cursor will appear.



- 7. Without pressing down the left mouse button, move the cursor to the first point used to define the reference line.**

If you move the cursor beyond the borders of the drawing area, the drawing will automatically scroll.

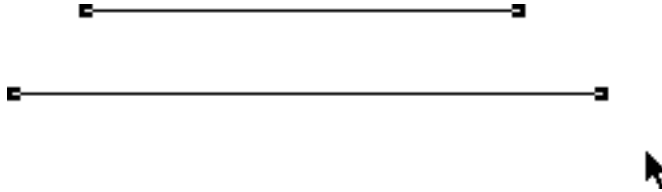
- 8. Press down the left mouse button.**

A reference line will appear.

- 9. Holding down the left mouse button, drag to define the reference line.**

If you hold down the Shift key while you drag, the line will snap in 45-degree increments.

10. Once the reference line is where you want it, release the left mouse button.



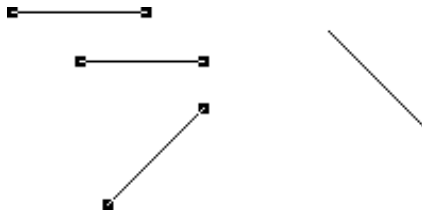
When you release the left mouse button, the lines will be projected toward the reference line, and the reference line will disappear.

Extending Lines Toward an Existing Line on Your Drawing

You can also extend selected lines toward an existing line on a drawing. The lines to be extended can be parallel to each other.

To extend lines toward an existing line on your drawing:

1. Select the lines you want to extend.



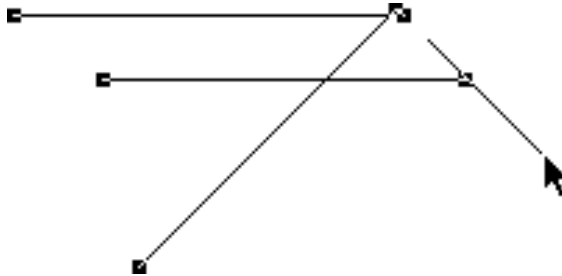
2. Press and hold down the Alt key.
3. Click on the Extend icon on the Accessory palette.

A dialog box will appear.

4. Release the Alt key.
5. Click on the button beside “An existing line.”
6. Click on the Extend button.
7. Without pressing down the left mouse button, position the tip of the pointer on the line to which you want the selected lines extended.

8. Click the left mouse button.

PC Draft will interpret the line you clicked on as being infinite in length and extend the selected lines toward it



Adding and Deleting Handles

With lines, rectangles, polygons, polylines, freehand shapes, Bezier curves, and spline curves, you can add and delete handles. (Handles are associated with edges—line segments—and vertex points. A vertex point is a point at which two edges meet.) Often, adding or deleting handles before a reshape operation can give greater control over the shape of the resulting object.

Adding a Handle

To add a handle to a polygon or freehand:

1. Click the Add/Delete Handle icon in the Accessory palette.



The cursor will turn into an arrow pointer with a plus sign attached to it. This shows you that you are in the Add Handle mode.

2. Position the tip of the pointer on the object's border where you want a new handle to appear.

3. Click the left mouse button.

A new handle will appear on the object where you clicked.

You can drag the handle associated with the new vertex to reshape the object, just as you would any other handle.

When you add a handle to a polygon or a polyline, a minor (midpoint) handle will also be added.

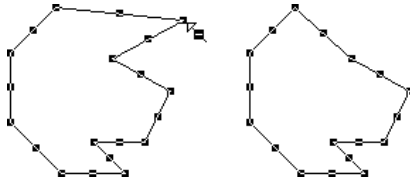
Deleting a Handle

You can also delete handles from an object. Sometimes this, too, is a useful action before smoothing an object. When you delete a handle, the handle will disappear and a straight line (or a curve) will be drawn between the two handles that were closest to the deleted handle.

To delete a handle:

1. Click the **Add/Delete Handle** icon in the **Accessory palette**.
2. Press and hold down the **Alt** key.

A minus sign will appear on the pointer to show you that you are in the delete handle mode.

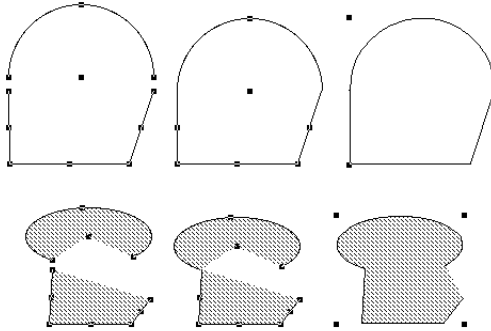


3. Position the tip of the pointer on the handle you want to delete, then click the left mouse button.

The handle will be deleted.

The Attach Tool

The Attach tool, found on the Accessory palette, enables you to join the edges of open objects together at their end points. For example, you can draw any combination of lines, polylines, open freehands, curve objects, or arcs, then arrange them so their endpoints coincide one after another, and finally attach them together to form a single open or closed object.



You can apply a single fill, line weight, line style, or set of object information to the new “attached” object.

If the edges of the combined objects are all straight line segments, the new object will be an ordinary polygon. If any of the edges are curved, the new object will be a “metapolygon.” Metapolygons can only be resized proportionally, by dragging their corner edit handles or with the Resize palette.

You can break a selected object into its separate edges with the Break tool.

NOTE: To align the objects to be attached together, the Snap to Object function can be helpful. The Snap To Object function allows you to align the vertex points of objects as you draw them. It also allows you to reposition the vertex points of objects so the vertex points coincide. When you reposition (drag) vertex points, the object is normally resized. However, if you want to align existing objects without having to resize them, you can press and hold down the Alt key, press down the left mouse button on the vertex point of an object, and then drag the vertex point to another vertex point. This allows you to align the vertex points of existing objects without having to resize the objects.

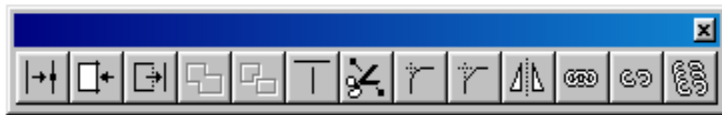
The objects to be attached together must be open. For example, you cannot attach two rectangles together. (Closed objects such as rectangles, polygons, or circles can be combined using the Add tool.)

To attach open objects together:

1. **Align the vertex points of the objects you want to attach together.**

(Notice that edit handles are not displayed on the vertex points that overlap. This shows that the vertex points are aligned.)

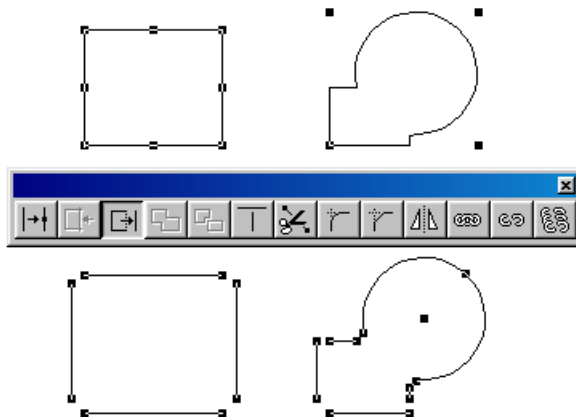
2. **Click on the Attach icon on the Accessory palette.**



Once you click on the Attach icon, the objects will be joined together. You can then fill the new composite object.

If the new object has all straight edges, it will be an ordinary polygon and you can resize it by dragging any of its edit handles. If the new object is a metapolygon (with any curved edges), you can only resize it proportionally by dragging a corner edit handle, but you can change any of its fill and line attributes or apply object information to it.

Breaking Objects You can separate some PC Draft objects into simpler objects using the Accessory palette's Break tool. Rectangles, polygons and polylines, spline or Bezier curve shapes, parallel-line objects, and dimension objects can all be broken as detailed in the following table:



Original Object

Resulting Shapes

Rectangles

Single lines

Circular-Cornered Rectangles
(Constant or Proportional)

Four single lines and four
radial arcs

Elliptical-Cornered Rectangles

Four single lines and four
elliptical arcs

Polygons and Polylines

Single lines

Parallel Lines (single)

Single lines

Parallel Polygons and Polylines

Individual polygons and
polylines

Original Object

Resulting Shapes

Freehand Objects

Single lines

Spline and Bezier Objects

Series of single-segment
Bezier curves

Dimension Objects

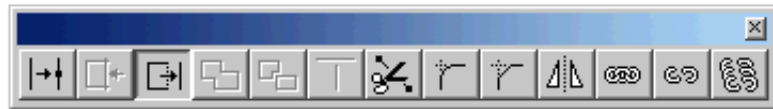
Varies; see Chapter 4 for
details.

Metapolygons (objects with both curved and straight edges, created using the Add, Subtract, or Attach tools): Each edge will become a separate object. For example, an object created by adding a circle and a polygon will break into a radial arc and several straight line segments.

WARNING: Once objects (other than polygons or polylines) are separated using Break, they cannot be re-assembled. The one exception to this is that the Undo Control can reverse the Break tool's effects immediately after an object is broken.

To break an object into its component parts:

1. Select the object to be broken.



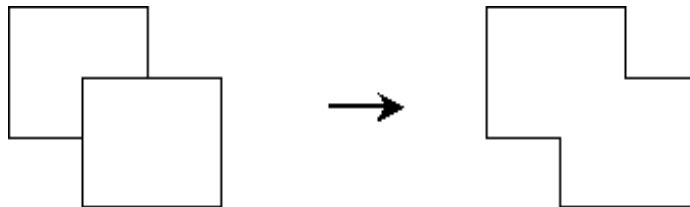
2. Choose the Accessory palette's Break tool.

The object will be broken into simpler objects, as detailed in the table above.

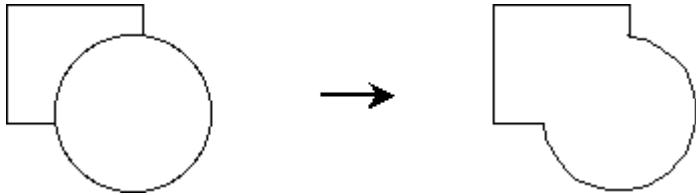
The Add Tool

You can use the Add Objects tool on the Accessory palette to combine two objects.

When you add two overlapping objects, the edges that overlap disappear and the objects are fused together to form a single, composite object. You can apply a single fill, line weight, line style, or set of object information to the new “added” object.



If the edges of the combined objects are all straight line segments, the new object will be an ordinary polygon. If any of the edges are curved, the new object will be a “metapolygon.” Metapolygons can only be resized proportionally, by dragging their corner edit handles or with the Resize palette.



To add two objects:

1. **Select the two overlapping objects you want to add.**
2. **Make sure the Accessory palette is displayed.**
3. **Click on the Add tool.**



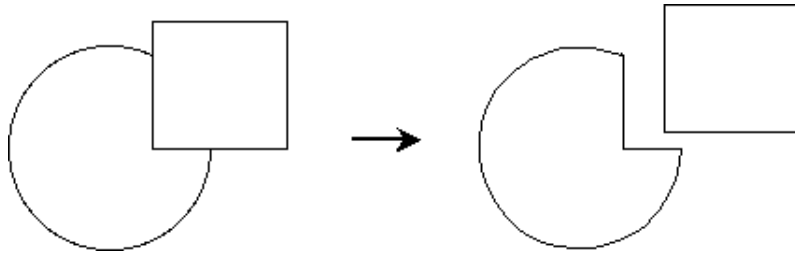
The selected objects will be added together.

If the new object has all straight edges, it is an ordinary polygon and you can resize it by dragging any of its edit handles. If the new object is a metapolygon (with any curved edges), you can only resize it proportionally by dragging a corner edit handle, but you can change any of its fill and line attributes or apply object information to it.

NOTE: You cannot break the merged object into the original, individual components after you have merged them. However, you can use the Break tool to “disassemble” the added polygon or metapolygon into its component edges (straight or curved; see page 2-111).

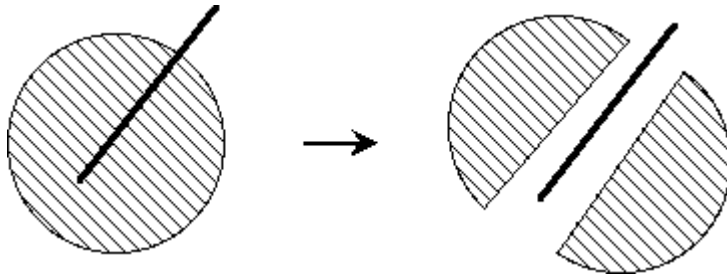
The Subtract Tool

The Subtract Objects function lets you use one object as a “cookie cutter” to slice away part of another object that lies beneath it.



You can also use a straight line object to slice another object in two (this works even if the line doesn’t go all the way across the object).

The portion of the object under the cutter will be removed from the object. You can view the results by moving the cutter to one side.



If the edges of the cut object are all straight line segments, the new object will be an ordinary polygon. If any of the edges are curved, the new object will be a “metapolygon.” Metapolygons can only be resized proportionally, by dragging their corner edit handles or with the Resize palette.

To subtract part of an object using another object:

1. **Position the object to be used as the cutter on top of the object to be cut. (If necessary, use the Arrange menu’s Bring to Front Control.)**

The cutter must overlap part of the object to be cut.

2. **Make sure the Accessory palette is displayed.**
3. **Select the cutter and the object to be cut (that is, the object beneath the cutter).**



4. Click on the Subtract tool icon on the Accessory palette.

If the new object has all straight edges, it will be an ordinary polygon, and you can resize it by dragging any of its edit handles. If the new object is a metapolygon, you can only resize it proportionally by dragging a corner edit handle. You can change any of its fill and line attributes or apply object information to it.

NOTE: The Subtract tool only works with two objects at a time.

When you use a line object and the Subtract tool to cut an object in two, the line only needs to cross part of the object. The Subtract tool automatically continues the cut straight across the rest of the object.

To use a line to cut an object in two:

1. Position the line to be used as the cutter on top of the object to be cut. (If necessary, use the Arrange menu's Bring to Front Control.)

The line must overlap part of the object to be cut; it doesn't need to reach all the way across the object.

2. Make sure the Accessory palette is displayed.

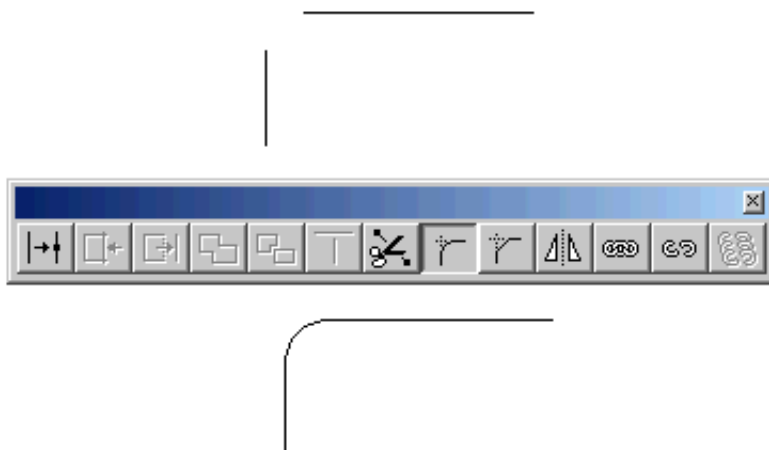
3. Select the cutting line and the object to be cut.

4. Click on the Subtract tool icon on the Accessory palette.

The object under the cutting line will be "sliced" in two. You can view the results by moving the pieces and the cutting-line apart.

Creating Two-Line Fillets

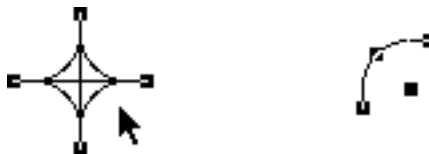
A two-line fillet is an arc of a given radius tangent to two line segments. PC Draft gives you many Alts in creating two-line fillets. You can specify the radius of the arc that results from the operation. You can also choose what to do with the line segments that are left over after the fillet operation is completed. For example, you can choose to have PC Draft automatically remove the extra line segments, trim them and leave them for you to remove, or leave them intact. You can also indicate if you want to create a large or a small arc.



To create a two-line fillet:

1. **Select two lines on the drawing.**
2. **Click on the Fillet tool on the Accessory palette.**

If the two lines intersect each other, there are four possible quadrants in which the arc can be drawn.



3. **Click on the desired quadrant.**

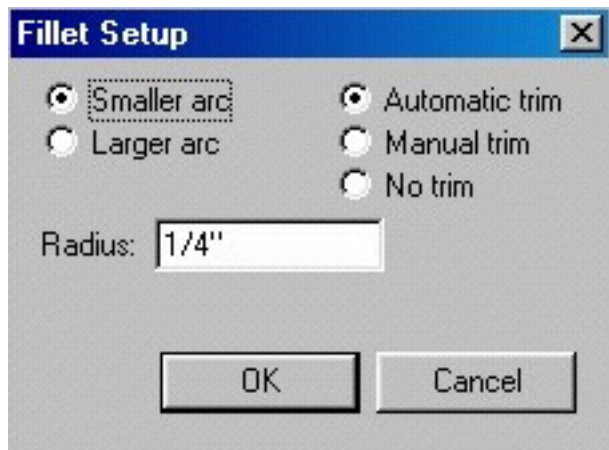
Choosing Fillet Settings

PC Draft uses the settings defined in the Fillet Setup dialog box to perform the fillet operation. You can change these settings. Once you choose the settings you want in the Fillet Setup dialog box, the settings will be used for all fillet operations until you make new choices.

To define the settings for the Fillet tool:

1. **Press down the Alt key.**
2. **Holding down the Alt key, click on the Fillet icon on the Accessory palette.**

The Fillet Setup dialog box will appear.

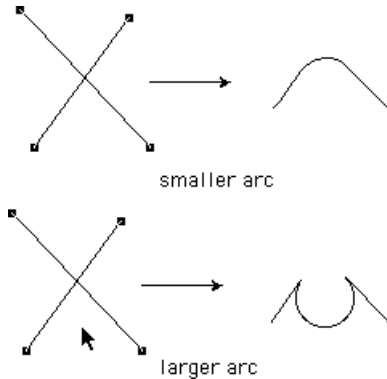


3. **Release the Alt key.**
4. **Type in the desired radius for the arc.**

NOTE: The units for the values you enter are based on the size units that were set up in the Set Scale/Units dialog box.

You have the option of creating a large arc or a small arc. The size of the arc refers to the number of degrees in the arc.

To make your choice:



1. Click on the button beside either **Smaller Arc** or **Larger Arc**.

You have three choices in regards to how PC Draft deals with the line segments after the fillet operation is completed.

The options are:

- ***Automatic trim***

When Automatic trim is selected, PC Draft draws the arc, then removes the extra line segments.



- ***Manual trim***

When Manual trim is selected, PC Draft breaks the lines at the points where they intersect with the arc. You can then select the extra line segments you want to remove.



- ***No trim***

When No trim is selected, PC Draft leaves the lines intact.



Creating Chamfers

PC Draft's Chamfer tool will create a beveled corner at the intersection of two lines. You have several options in creating chamfers, such as specifying the chamfer's distance from the intersection point along each line. You can also choose what to do with the line segments that are left over after the chamfer operation is completed. For example, you can choose to have PC Draft automatically remove the extra line segments, trim them and leave them for you to remove, or leave them intact. Chamfer settings are controlled using the Chamfer Setup dialog box, opened by holding down the Alt key and clicking the Chamfer tool icon in the Accessory palette.



You can create a chamfer between two lines by either selecting the lines, then clicking the Chamfer tool icon, or by activating the Chamfer tool, then selecting the lines.

To create a chamfer:

1. **Select two lines on the drawing.**



2. **Click the Chamfer icon in the Accessory palette.**

or,

1. **Select the Chamfer icon in the Accessory palette.**

The cursor will prompt you to select the first line.

2. **Click the first line.**

The cursor will prompt you to select the other line.

3. Click the second line.

The original lines will be extended or truncated to match the specified chamfer distances (see below).

You can specify how far along each line from the point of intersection (actual or projected) the chamfer is defined.

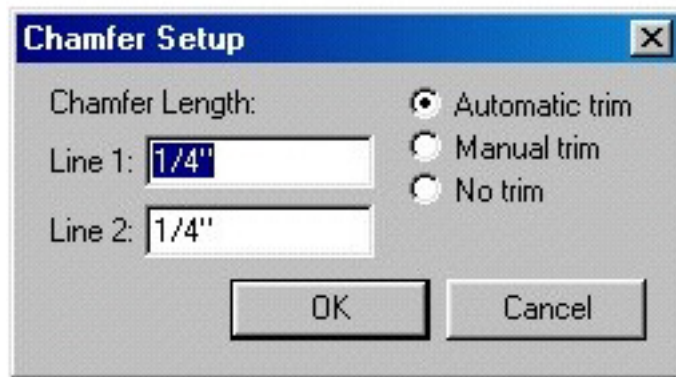
To adjust the chamfer distance:

1. Press down the Alt key.



2. Holding down the Alt key, click on the Chamfer icon on the Accessory palette.

The Chamfer Setup dialog box will appear.



3. Release the Alt key.

4. Type in the desired distances for each line, then press OK.

The dialog box will disappear. Chamfers drawn will now match the settings you specified.

Adjusting the Chamfer Trim

You have three choices in regards to how PC Draft deals with the line segments after the chamfer operation is completed.

The options are:

- *Automatic trim*

When Automatic trim is selected, PC Draft draws the chamfer, then removes the extra line segments.



- *Manual trim*

When Manual trim is selected, PC Draft breaks the lines at the points where they intersect with the chamfer. You can then select the extra line segments you want to remove.



- *No trim*

When No trim is selected, PC Draft leaves the lines intact.



To adjust the chamfer trim:

1. **Press down the Alt key.**
2. **Holding down the Alt key, click on the Chamfer icon on the Accessory palette.**

The Chamfer Setup dialog box will appear.

3. **Release the Alt key.**
4. **Click the desired trim choice, then press OK.**

The dialog box will disappear. Chamfers drawn will now match the settings you specified.

Using the Trim Function

The Trim function allows you to cause breaks in two intersecting lines at the points where the lines intersect.

When you trim lines, PC Draft adds a vertex point at the point of intersection. You have two trim choices: Automatic trim (the default) and Manual trim.

To make your trim choice:

1. **Press and hold down the Alt key.**
2. **Click on the Trim icon (the scissors) on the Accessory palette.**



The Trim Setup dialog box will appear.



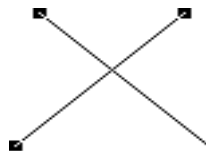
You use the Trim Setup dialog box to choose the trim option you want. The trim option you choose will be used for all trim operations until you make another choice from the dialog box.

3. **Click on the button beside either Automatic trim or Manual trim.**
4. **Click on the OK button.**

If you choose Automatic trim, PC Draft will automatically remove the shorter pair of lines that result from the trim operation. If you choose Manual trim, PC Draft will leave the pieces for you to remove at your discretion.

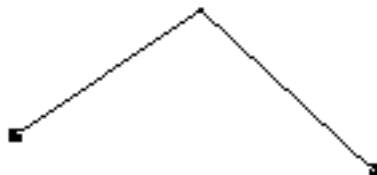
To trim two intersecting lines:

1. **Select the two lines you want to trim.**



2. **Click on the Trim icon on the Accessory palette.**

The two lines will be broken at their point of intersection.

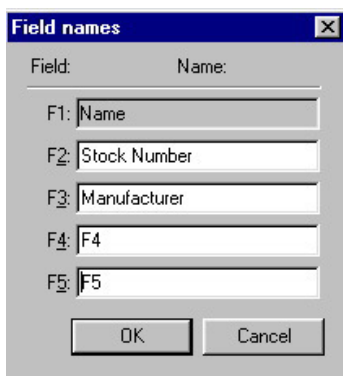


Object Information

PC Draft now allows you to associate names and other text information (including numerals) with objects or groups. For example, if an object or group represents a machine part with a particular name, stock number, and manufacturer, you can name it and assign it the appropriate information. Then if you move or copy the shape, even into a symbol library or a different drawing, its name and various other pieces of information will remain with it.

Object information can be used as criteria for searches using the Find and Replace feature (see Chapter 5) or for functions in a PC Draft Report Format (see Chapter 9).

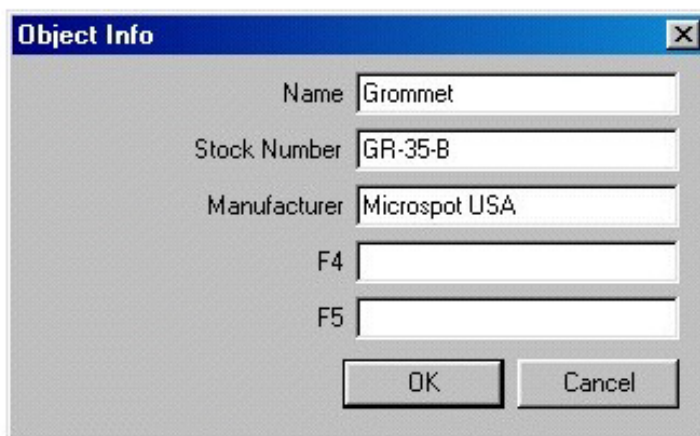
Each object or group can have up to five text strings assigned to it, in “fields.” The first field is always called “Name” and can be used to name the object. You can give the other four fields different type-names, depending on what each field represents in your drawing’s objects.



The "Field names" dialog box is used to assign names to fields. It has a title bar with a close button. Inside, there are two columns: "Field:" and "Name:". Below these are five rows of input fields. The first row is labeled "F1:" and contains the text "Name". The second row is labeled "F2:" and contains "Stock Number". The third row is labeled "F3:" and contains "Manufacturer". The fourth row is labeled "F4:" and contains "F4". The fifth row is labeled "F5:" and contains "F5". At the bottom are "OK" and "Cancel" buttons.

Field:	Name:
F1:	Name
F2:	Stock Number
F3:	Manufacturer
F4:	F4
F5:	F5

For example, if objects in a drawing need names, stock numbers, and manufacturers (as mentioned above), you can define the second and third fields as “Stock Number” and “Manufacturer.” You can then apply those types of data to individual objects.



The "Object Info" dialog box is used to enter information for a specific object. It has a title bar with a close button. Inside, there are five rows of input fields. The first row is labeled "Name" and contains the text "Grommet". The second row is labeled "Stock Number" and contains "GR-35-B". The third row is labeled "Manufacturer" and contains "Microspot USA". The fourth row is labeled "F4" and is empty. The fifth row is labeled "F5" and is empty. At the bottom are "OK" and "Cancel" buttons.

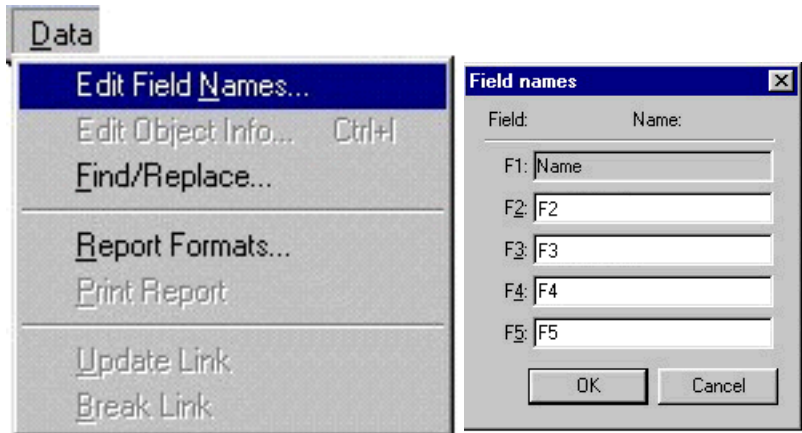
Name	Grommet
Stock Number	GR-35-B
Manufacturer	Microspot USA
F4	
F5	

In PC Draft, you name data fields using the Edit Field Names Control, and put data in them for an object or group using the Edit Object Info Control. Both Controls are in the Data menu.

To set the field names for a drawing:

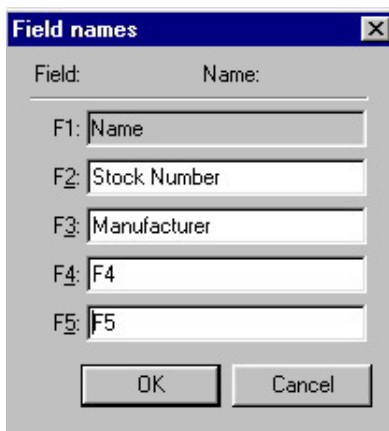
1. Choose the Data menu's Edit Field Names Control.

The Edit Field Names dialog box appears.



2. Double-click in a field-name field and type the desired name, then press the Tab key to move to the next field.

NOTE: The field name can be up to 12 characters long, and can contain any letters, numerals, or punctuation marks (including spaces).



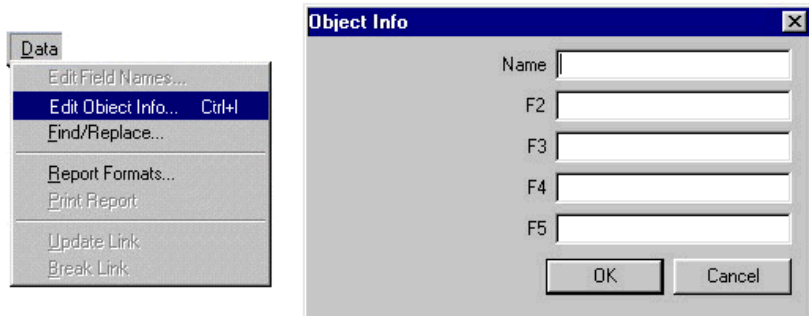
3. Repeat the previous step until all the field names read as you want them to, then click OK.

The Edit Field Names dialog box disappears, and you have changed the field-name defaults of the drawing.

Any object that you enter data for will use the field names you have defined.

To assign object information to an item:

1. **Select the object or group.**
2. **Choose the Data menu's Edit Object Info Control.**



The Edit Object Info dialog box appears, displaying the field names defined for the drawing.

3. **Double-click in a field and type the desired text, then press the Tab key to move to the next field.**

NOTE: Each field's information can be up to 25 characters long, and can contain any letters, numerals, or punctuation marks (including spaces).



4. **Repeat the previous step until all the data fields read as you want them to, then click OK.**

The Edit Object Info dialog box disappears, and you have assigned one or more types of data to the item. You can now use the data as criteria for Find and Replace, or manipulate them using the Report feature.

The item will retain its data if you copy and paste it, duplicate it, or move it — even if you put it in a different PC Draft document.

NOTE: If you copy or move the item to a document with different field names, it will retain its object information, but the field names of the “host document” will appear if you select the item and choose Edit Object Info.

Once an object or group has object information, you can change it at any time.

To edit existing object information:

1. Select the object or group.

2a. Choose the Data menu’s Edit Object Info Control.

or

2b. Hold down the Alt key and click on the object.

The Edit Object Info dialog box appears, displaying the field names defined for the drawing and any existing object information for the selected item.

3. Double-click in a field and edit the text as desired.

4. Repeat the previous step until all the data fields read as you want them to, then click OK.

The Edit Object Info dialog box disappears, and you have changed one or more types of data for the item.

NOTE: You can also change the object information of an object or group in a symbol library; see Chapter 7.

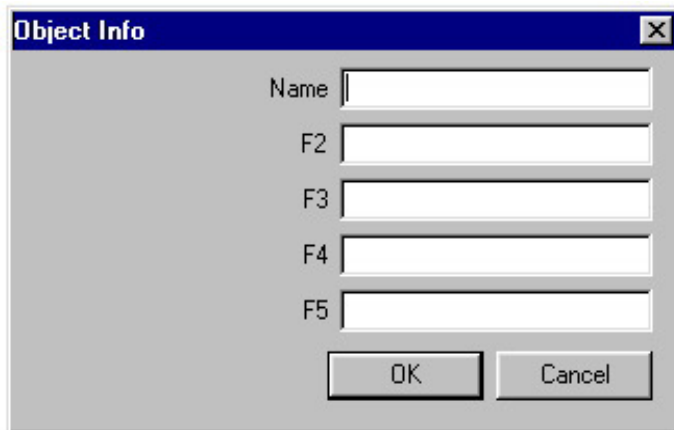
Object Information In Multiple Objects

Object information for more than one item can be added to, or edited, at the same time. The object information can then be used as criteria for Find and Replace operations or for creating reports.

NOTE: If you edit the object information of multiple items, only the fields you edit will change.

To add object information to, or edit object information for, multiple items:

1. **Select the objects or groups (or both) to add object information to or edit object information for.**
2. **Choose Edit Object Info from the Data menu or hold down the Alt key and click one of the selected objects. The Object Info dialog box will appear. The fields will be empty as the various items you selected may already have different object information in the same field.**



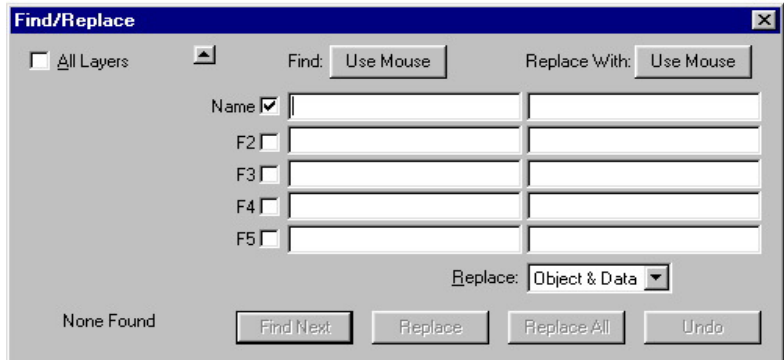
3. **Add the desired text information to the appropriate fields.**
4. **Click the OK button. All the selected objects and groups will have the object information you specified. However, any object information fields you did not edit will remain unchanged.**

Replacing Objects Or Object Information

Items can be found according to their object information, then either the entire object (including its data), the data only (leaving the visible object), or the visible object (leaving the data intact), can be replaced. The default setting is to replace the object and data together.

To replace only an object's data:

1. **Open the Data menu and choose Find/Replace. The Find/Replace dialog box will appear:**



2. Define the appropriate object information in the Find and Replace With sections (see Chapter 5 of the User Guide).
3. Open the Replace popout menu and choose Data Only.



4. Proceed with the Find and Replace operation as required. Any items chosen for replacement will have only their object information replaced, the visible objects will remain unchanged.

To replace only an object, leaving its object information data, follow the same instructions again, but choose Object Only in the Replace popout menu. Any item chosen for replacement will be visibly replaced, but its object information will remain the same as before. The new object will effectively inherit the replaced object's data.

Reversing Changes: Undo, Redo, and Revert

If you do something unintentionally, or want to correct a mistake, PC Draft lets you reverse certain actions. The Undo Control reverses execution of the last action; the Redo Control executes the previously reversed action; and the Revert Control returns you to the last saved version of the document.

Undo

If you choose a Control or perform an action and then change your mind, in most cases you can choose Undo to reverse the action or the effects of the Control.

To undo an action or Control:

- **Open the Edit menu and choose Undo.**

If the action or Control is “Undo-able,” the Control will be listed beside Undo in the Edit menu (Undo Delete after a deletion, for example).



If the action or Control is not Undo-able, Undo will appear dimmed in the Edit menu.

Redo

You can use Redo to re-execute an action or Control that you just reversed using Undo. By using Undo and Redo together, you can experiment with your drawing and PC Draft's features. For example, you could delete an object, observe the effect on your drawing, and choose Undo to reverse the deletion. If you then decided that the deletion produced the desired effect, you could choose Redo and the same object would be re-deleted.

To redo an action or Control:

- **Open the Edit menu and choose Redo.**

The name of the Control you reversed by previously choosing Undo will be listed in the Edit menu.



NOTE: In most cases, in order to undo or redo a Control, you must choose Undo or Redo before you perform any other action. However, there is an exception to this rule. You can switch back and forth between documents, performing actions on the various open documents, and PC Draft will “remember” the last action performed in each document. This allows you to return to an open document and undo or redo the last action you performed in it.

Revert

If you execute a Control that is not Undo-able, or you make changes you are unable to delete but do not wish to save, you can eliminate any unsaved changes by reverting to the last saved version of your document. You should use this Control with caution, since it will obliterate anything that has not been saved.

To revert to a previously saved version of your document:

1. **Open the File menu and choose Revert.**



A dialog box will appear to confirm that you want to proceed. The dialog box will show you the date and time when the document was last saved.

To revert to the last saved version of the document:

2a. Click on the Revert button.

To return to the current version of your document:

2b. Click on the Cancel button.

WARNING: If you revert to a previously saved version of the document, all changes made since the last save will be deleted.

Drawing views

PC Draft offers various features for changing the view of your drawing. Using these features you can move the drawing in the document window so that you view a different part of the drawing, or you can zoom in or out on a portion of the drawing to see it in more detail or to see an overall view. Any view can be saved.

Changing the position of the drawing in the document window

To change the position of the drawing within the document window, you can scroll the drawing, use the Hand tool or use the arrow keys on the keyboard.

NOTE: You can easily return to the top left corner of your drawing by using the Home View command (see Home view on page 2-140).

Scrolling

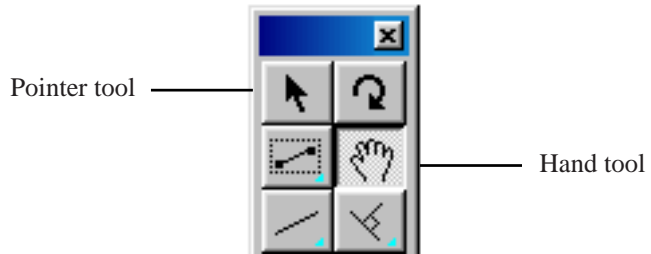
Scrolling in PC Draft drawings is accomplished just as it is in other PC windows by using the scroll bars at the edges of the windows. See your system documentation for details.

The Hand tool

The Hand tool provides an alternative method of moving the drawing within the document window.

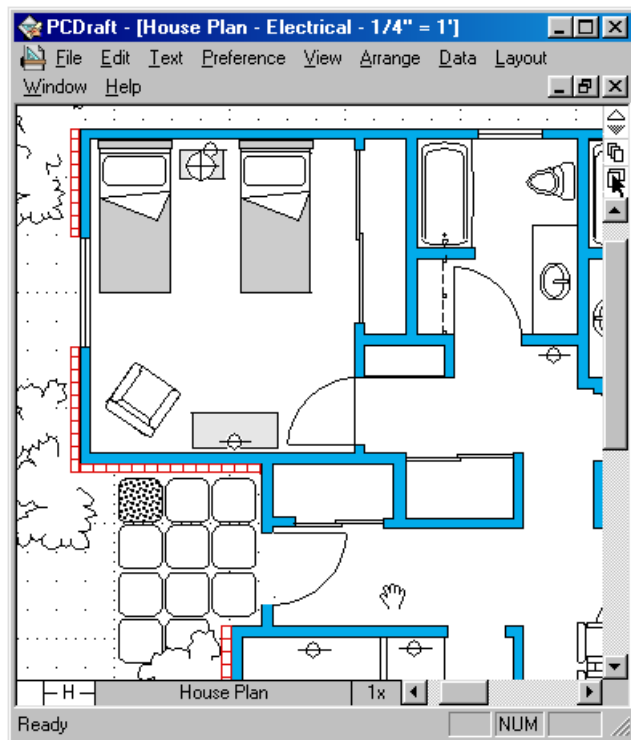
To use the Hand tool:

1. Click on the Hand tool in the Tool palette.



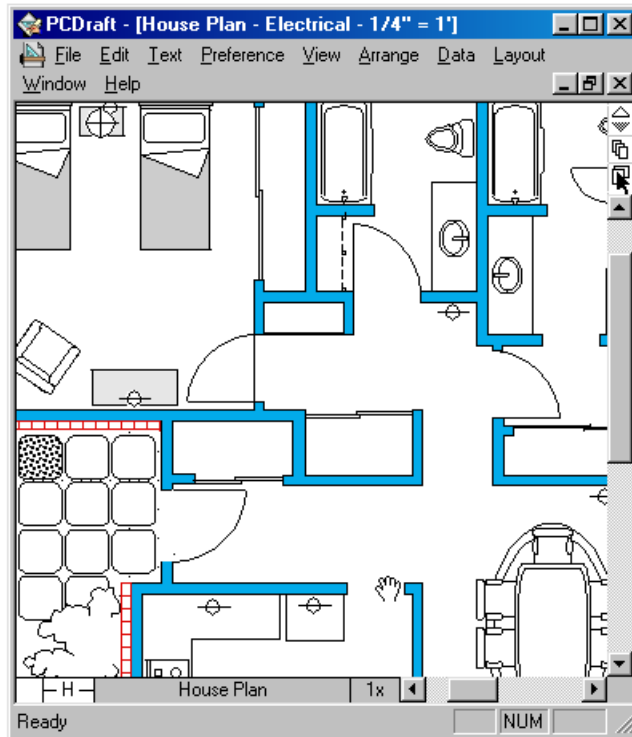
The cursor will change to a hand.

2. **Position the cursor over the drawing area and press the mouse button.**



3. **Holding down the mouse button, drag in any direction.**

The view will move with the hand.



4. **Release the mouse button when the desired section of the drawing is displayed in the document window.**

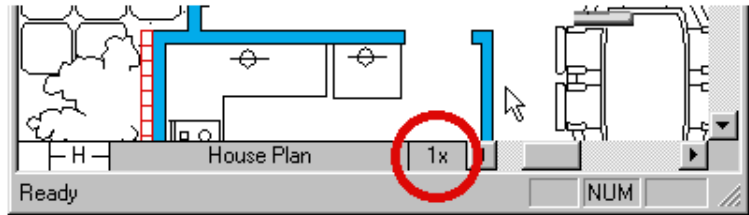
NOTE: You can also access the hand tool by pressing the space bar while the Pointer tool is active.

Zooming In or Out on a Drawing

When you work with a large document you may need to see the entire drawing at one time. Or, you might need to obtain a close up view of a particular area so that you can add small details. PC Draft gives you the ability to change the view of your drawing in either of these cases by providing features that allow you to zoom in or out on an area of the drawing. Zoom controls are provided via the Zoom tool in the Tool palette, by commands in the View menu and by a popup menu at the bottom of the document window. There are also features that allow you to easily return to a preset or saved view.

PC Draft usually allows you to magnify a drawing up to 32 times, or down to -8 times its normal size.

NOTE: The current magnification of the drawing view is shown at the bottom of the document window.



NOTE: If you zoom out several consecutive times, and have text on your drawing, the text will become too small to be displayed and only its edit handles will display.

Using the Zoom tool



Click on the Zoom tool in the Tool palette to select it.

NOTE: You can also activate the Zoom tool by holding down the Shift key and clicking on the Pointer tool at any time.

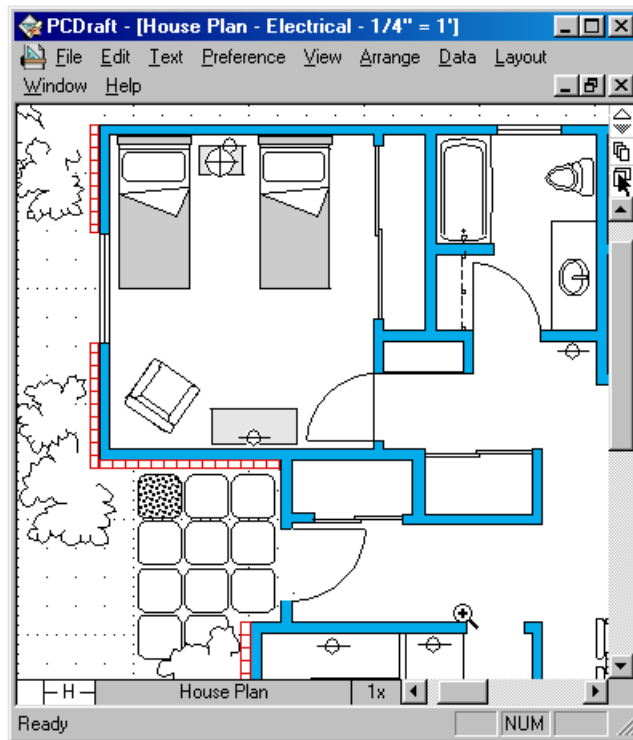
Zoom In

To use the Zoom tool to zoom in on an area of the drawing:

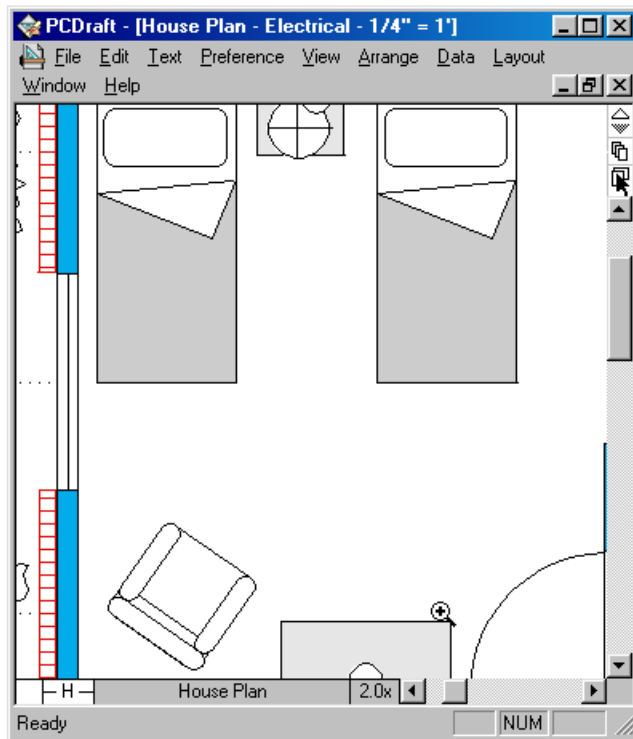
1. Select the Zoom tool.

The cursor will change to a magnifying glass with a plus sign inside it to show that you are about to increase the magnification of the drawing.

2. Position the cursor over the area of the drawing you wish to zoom in on and click the mouse button.



The magnification of the drawing view will be increased one level, and the view will be centered around the position of the cursor.



3. **Continue to click the mouse button to zoom in further.**

Zoom Out

To use the Zoom tool to zoom out on an area of the drawing:

1. **Select the Zoom tool.**
2. **Press and hold down the Alt key.**

The cursor will change to a magnifying glass with a minus sign inside it to show that you are about to decrease the magnification of the drawing.

3. **Position the cursor over the area of the drawing you wish to zoom out on and click the mouse button.**

The magnification of the drawing view will be decreased one level, and the view will be centered around the position of the cursor.

4. **Continue to click the mouse button to zoom out further.**

Marquee Zoom

The Zoom tool can also be used to perform marquee zooms.

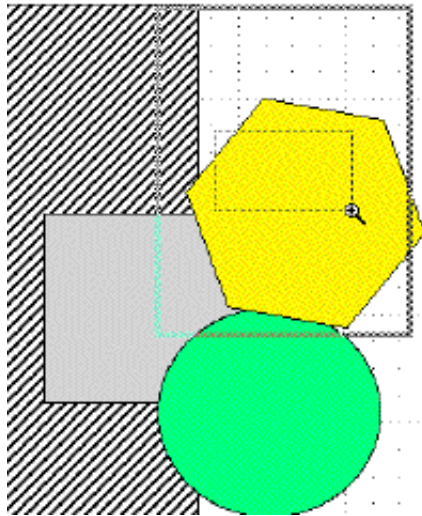
To use the Zoom tool to perform a marquee zoom:

- 1. Select the Zoom tool.**

The cursor will change to a magnifying glass with a plus sign inside it to show that you are about to increase the magnification of the drawing.

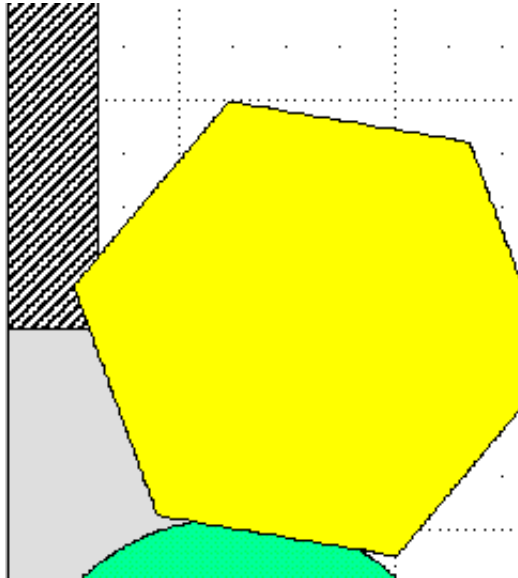
- 2. Position the cursor over the drawing.**

- 3. Press and hold down the mouse button, and drag over the area you want to zoom in on.**



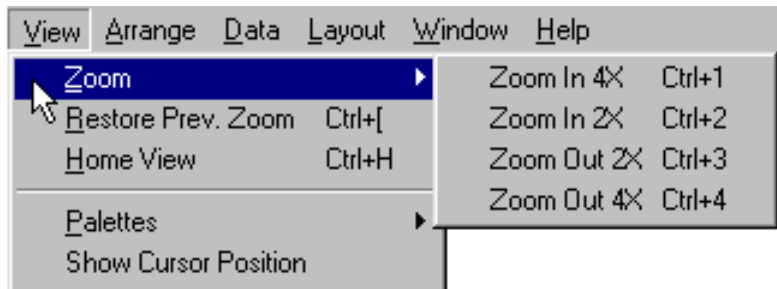
The inner rectangle shown in the screen shot above is the area selected with the Zoom tool. The outer rectangle represents the actual area that will be displayed in the document window when the mouse button is released.

4. Release the mouse button to display the portion of the document selected.



Zoom Commands

The Zoom commands are found in the Zoom submenu in the View menu.



NOTE: You can choose Zoom commands several consecutive times, each time further increasing or decreasing the level of magnification of your view.

Zoom Out

To use the Zoom out commands:

- **Select Zoom Out 2X or Zoom Out 4X from the Zoom submenu in the View menu.**

The magnification of the drawing view will be decreased by the specified amount.

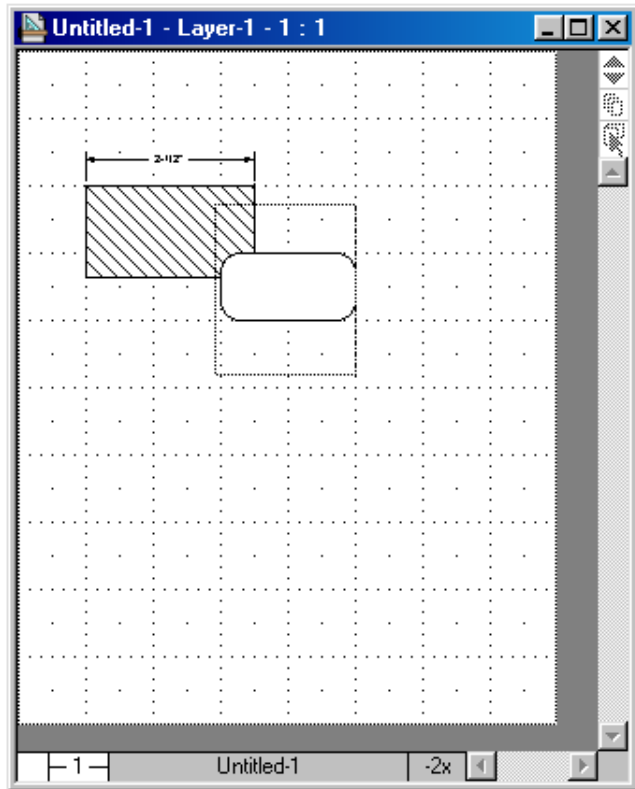
Zoom In

To use the Zoom in command:

1. **Select Zoom In 2X or Zoom In 4X from the Zoom submenu in the View menu.**

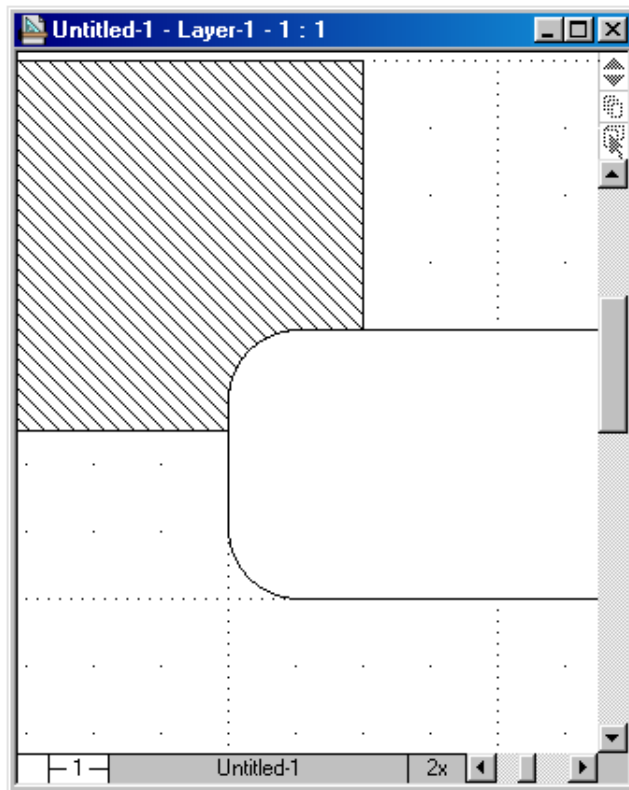
The view finder box and a cross cursor will appear on your drawing. This gives you a visual indication of the portion of your drawing that will be included in the magnified view.

2. **Move the cursor to position the view finder over the area of the drawing you want to zoom in on.**



3. Click the mouse button.

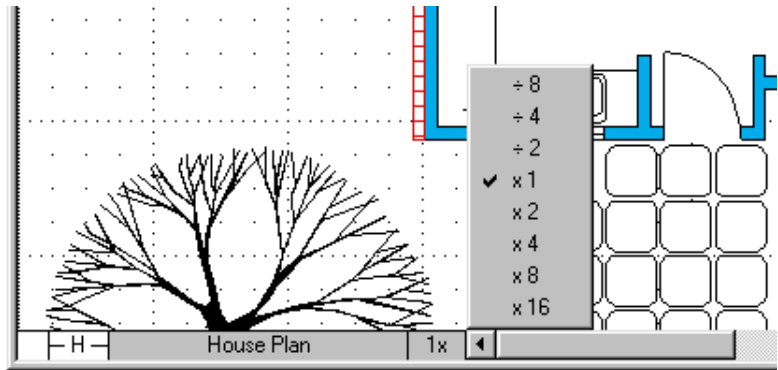
The magnification of the drawing view will be increased by the specified amount, and the selected portion will display in the document window.



NOTE: If the complete zoomed in view will fit in the document window, the view finder will not be displayed; the new view will be displayed immediately.

Magnification Popup Menu

The current magnification of the drawing view is shown at the bottom of the document window. If you click on this area, a magnification popup menu will display.



- Select a magnification value from this popup menu to zoom in or out on your drawing.

Restore Previous Zoom

The Restore Previous Zoom function allows you to return to the previous magnification of your drawing, regardless of the current magnification.

To return to the previous magnification:

- Select **Restore Prev. Zoom** from the **View** menu.

The view will zoom in or out to the previous magnification.

NOTE: You can use this command to alternate between two magnification levels. For example, you could do some detailed editing at high magnification, use Restore Previous Zoom to examine the whole image, then use Restore Previous Zoom again to zoom back in and continue the detail work.

Controlling the appearance of lines and borders in zoomed-in views

When you zoom in on objects, you can decide if you want to have lines and borders become magnified in proportion to the current zoom factor.

Normally, lines and borders are not magnified. For example, a 3-pixel line will appear as a 3-pixel line even in a view magnified two times (2x).

However, you can choose that lines and borders should be magnified when you zoom in on them. For example, that a 3-pixel line will appear to be 6 pixels in width if you zoom in to 2x magnification.

The command that controls the appearance of lines and borders in zoomed in views is **Zoom Line Weights** in the **Preference** menu.

To make line weights appear larger in zoomed-in views than in the normal view:

- **Select Zoom Line Weights in the Preference menu.**

A check mark will appear by the menu item, and line weights will be magnified in zoomed in views.

To make line weights remain constant regardless of the current magnification factor:

- **If there is a checkmark against Zoom Line Weights in the Preference menu, select Zoom Line Weights.**

The check mark will be removed, and lines and borders will not be magnified by the current zoom factor.

Home view

The view which appears on the screen when you first open a PC Draft document is called the Home View. This view displays the an unmagnified view of the upper left corner of the document.

To display the home view:

- **Select Home View from the View menu.**

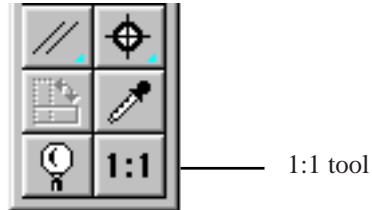
An unmagnified view of the upper left corner of the document is displayed.

1:1 tool

You can easily return to an unmagnified view of the current area of the document by using the 1:1 tool in the Tool palette. This is useful if you have zoomed in on a detail and now want to see it at single magnification, but don't want to return to the upper left corner of the drawing as when using the Home View command (see Home view on page 2-156).

To return to an unmagnified view of the current working area:

- **Click on the 1:1 tool on the Tool palette.**



The view will change to an unmagnified view of the current area.

Saved view

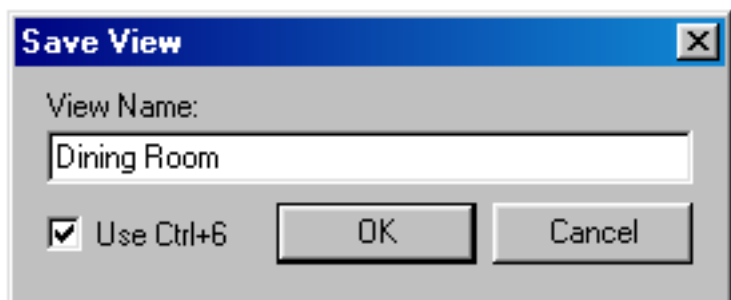
You can save any view of your drawing. Saved views can be of any part of the image and at any magnification. This feature allows you to move quickly to and from different areas of your drawing and different magnifications.

Saving a view

To save a view:

1. **Display the view you want to save.**
2. **Select Save View from the View menu.**

The Save View dialog will display.



3. **Enter a name for the view.**

By default, PC Draft will assign a Control key equivalent to the first five views you save. This means that you will be able to display a saved view by pressing down the Control key and typing the number that corresponds to the saved view; Control-5, Control-6 and so on.

4. **If you don't want a Control key equivalent to be assigned to a view, click on the Use CTRL+6 check box to deselect it.**
5. **Click on the OK button to save the view.**

The name of the view is added to the bottom of the View menu.



Displaying saved views

You can display a previously saved view in two ways: by choosing the view's name from the View submenu or by using the Control key equivalent (this method can only be used for up to five views).

To display a saved view:

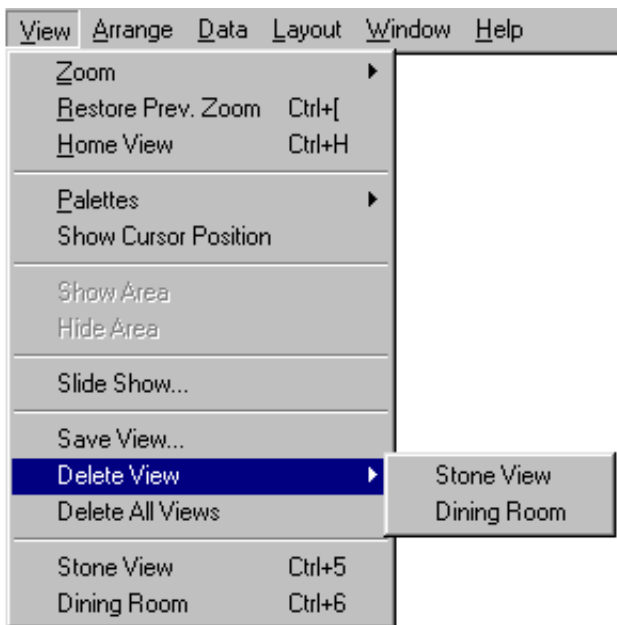
- **Select the name of the desired view from the View menu.**

Deleting saved views

When you save a view, the commands Delete View and Delete All Views are added to the View menu.

To delete a saved view:

1. **Open the Delete View submenu in the View menu.**



2. **Select the name of the view you want to delete from the Delete View submenu.**

The saved view will be deleted. If the view had a Command key equivalent associated with it, that number will now be available for use with another view.

To delete all views:

1. **Select Delete All Views from the View menu.**

An alert will appear asking you to confirm that you want to delete the view.

2. **Click on the OK button to delete all views.**

Chapter 3

Changing the Appearance of Objects

Changing the appearance of objects

In many drawings, you may want to change the appearance of objects to help differentiate between them. You can change their appearance by filling objects with washes (solid fills) and patterns; by drawing lines and object borders with different colors, patterns, line weights, line styles and pen styles; by drawing lines with different end marks; and by choosing different positions for object borders.

You can define attributes for fills and lines that will be applied to all objects you draw or you can change the attributes of existing objects.

When the application is launched, the default values are white fill, black pen, no pattern, line weight 1 point, plain line style.

Object attributes

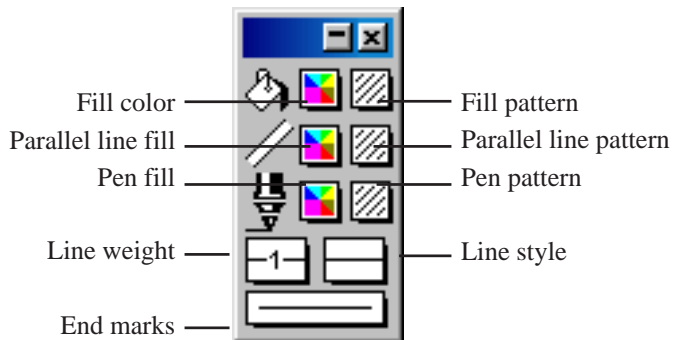
Most attributes are chosen from various pop-up menus on the Attributes palette or the indicator boxes at the bottom left of the document window. Others are chosen from the Preference menu.

The Attributes palette

Displaying the Attributes palette

To open the Attributes palette:

- **Choose Attribute from the Palettes submenu in the View menu, or**
- **Choose Attribute from the pop-up menu at the bottom left of the document window.**



Selecting attributes using the Attributes palette

Selecting attributes is discussed in detail in later sections of this chapter, but in general:

- **Change the attributes of existing objects by selecting the object, opening the appropriate menu in the Attributes palette, then making your choice.**
- **Change the drawing's default attributes (the fill, line weight and so on that will be applied to all new objects you draw) by making sure nothing is selected, then opening the appropriate menu and choosing an attribute.**

The fill and line indicator boxes offer an alternative method of selecting some attributes.

The fill and line indicator boxes

The default attributes for the fill color or pattern and the line weight are shown in the Fill and Line indicator boxes in the lower left corner of the document window.



Selecting attributes using the fill and line indicator boxes

The Fill and Line indicator boxes can be used to select attributes by accessing the appropriate pop-up menu and selecting the desired attribute.

Opening the attribute pop-up menus from the fill and line indicator boxes

To open the Fill color and pattern pop-up menus:

- **Click the Fill color/pattern box.**
- **Hold down the Control key and click on the Fill color/pattern box to display the alternate popup menu..**

To open the Parallel line fill color and pattern pop-up menus:

- **Position the pointer on the Fill color/ pattern box, holding down the Alt key press left mouse button.**
- **Hold down the Alt and Control keys and click the Fill color/ pattern box to open the alternate pop-up menu.**

To open the Pen color and pattern pop-up menus:

- **Hold down the Shift key and click the Fill color/pattern box.**
- **Hold down the Control and Shift keys and click the Fill color/ pattern box to open the alternate pop-up menu.**

To open the Line weight pop-up menu:

- **Click the Line weight box.**

To open the Line style pop-up menu:

- **Hold down the Alt key and click the Line weight box.**

Default attributes

The attributes that you can select for objects before you draw them are Fill color and pattern, and Parallel line fill color and pattern. The pen attributes (that is, the attributes associated with lines and object borders) that you can define for objects before you draw them include pen style, color and pattern, line weight (thickness), line style (solid and dashed lines), end marks (symbols at the ends of lines), and border position. The option for each of these attributes that is currently active is called the 'default attribute'.

The current default fill and pen attributes appear on the lines and borders of the objects you draw.

NOTE: You cannot apply both a fill color and fill pattern to an object unless you define a colored fill pattern.

When nothing is selected on the drawing, the default attributes are shown on the Attributes palette. When an object is selected, the Attributes palette shows the attributes of that object.

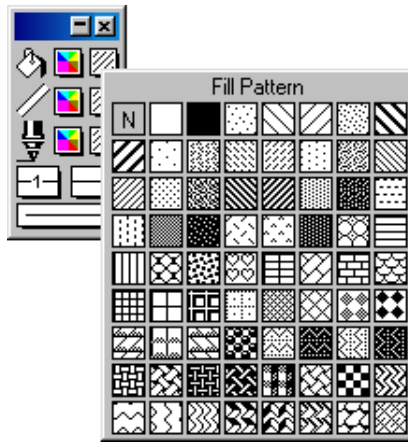
Setting default attributes:

To change the current default attributes for fills and lines

1. Activate the Pointer tool on the Tool palette.

NOTE: Make sure that nothing is selected on the drawing.

2. From the pop-up menus on the Attributes palette (or the fill and line indicator boxes), choose the fill and/or line attributes you want to apply to all objects you create.



The attributes you choose will automatically be applied to all objects until you make other choices for the default attributes.

Selecting attributes for specific objects

You can change the fill and line attributes for selected objects without affecting the default fill and line attributes.

To define the fill and/or line attributes for selected objects:

1. Select the object or objects you want to change.

2. From the pop-up menus on the Attributes palette (or the fill and line indicator boxes), choose the fill and/or line attributes you want to apply to the selected objects.

The chosen attributes will be applied only to the selected objects. The default attributes will not be changed.

Using color

With PC Draft you can use color in a variety of ways: to fill objects with solid colors, to fill objects with color patterns, to draw the borders of objects and to color text. The use of solid colors is referred to as a "wash," and the use of colors to draw lines and object borders is referred to as the "pen color." The color you choose for the pen is applied to text as well. You can also use colors in fill patterns and to fill the gaps between parallel lines.

Choosing the number of colors to display

A Windows® color system is capable of reproducing over 16 million colors, but the number of colors you can display depends on the amount of video RAM (Random Access Memory) in your computer, and on the specification of your monitor.

There are certain trade-offs to be aware of in choosing the number of colors to set your monitor to display. If you choose to display millions of colors, the rate at which the screen is redrawn will be slowed down. If you choose to display fewer colors, the screen redraw will be faster, but there will be fewer color choices available to you, and the system may not be able to display all of the colors used in an existing document. The system will attempt to display all the colors used in an existing document by using a process called 'dithering'. With dithering, the system clumps together pixels of different colors to simulate the specified color.

To set the number of colors to display

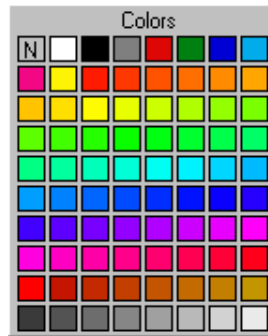
The display choices available to you will be determined by the specifications of your monitor and the system software you are running. Refer to the system software documentation for details of setting the number of colors to display on your monitor.

NOTE: If you want to use only grayscale, but you have a color or true monochrome monitor, you will still be able to access color items, such as Edit Colors, but in 256 shades of gray.

The color table

The color table contains the colors used in a document. Each new document contains a number of preset colors, which you can edit. The preset colors and the colors you edit or create are stored in the document's color table.

The color table is represented on your screen as a submenu that shows all the preset colors and all the colors that have been used in the document.



The colors in the color table can be chosen from the Attributes palette, the Fill indicator box and the Edit Colors command in the Preference menu.

NOTE: When you paste objects from a different document that has colors that are not present in the target document's color table, the colors from the source document are preserved in the objects that are pasted, but are not added to the target document's color table.

Editing colors

You can edit the existing colors in the color table to add your own colors.

When you edit an existing color, the existing color is replaced with the new color in the color table.

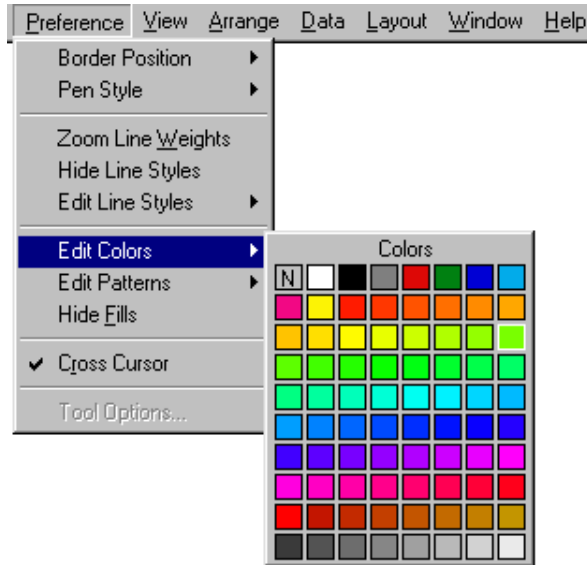
NOTE: If you edit a color that has been used in the document, the objects that contain the edited color will be updated with the new color.

To edit a color in the color table:

1. Choose Edit Colors from the Preference menu.

The color table appears.

2. **Holding down the mouse button, drag through the table until the color you want to edit is highlighted.**

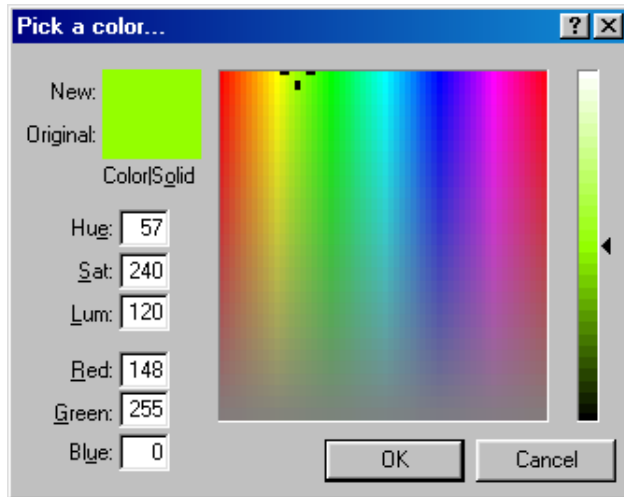


3. **Release the mouse button.**

The Pick a Color dialog appears.

NOTE: You cannot edit the No fill (N), the solid white or the solid black colors. If you try to edit one of these colors, the Color Picker dialog will not open, and an alert will inform that you are unable to modify this fill.

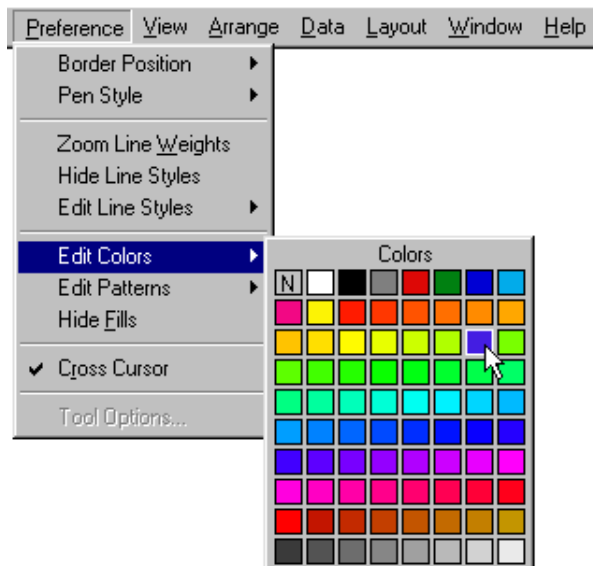
4. **Use the controls in the Pick a Color dialog to choose a new color.**



NOTE: The Pick a Color dialog is specific to the operating system. For full details on how to use it refer to the operating system documentation.

5. When you have chosen a new color, click the OK button to close the Pick a Color and return to PC Draft.

The new color you chose replaces the color you selected to edit.



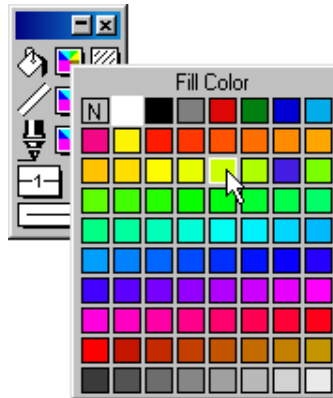
Object fill color

You can use a solid color to fill the interiors of objects. Filled objects are opaque and you can select them by clicking their borders or anywhere within them. If a filled object is on top of another object, it hides the object beneath it from view.

Selecting the fill color

To select the fill color:

1. **Open the Fill Color pop-up menu in the Attributes palette.**
2. **Drag until the fill color you want is highlighted.**



3. **Release the mouse button. The selected fill color will be shown on the Attributes palette.**

NOTE: If you choose "N" (for No fill) from the Fill Color submenu as the current fill color, the objects you draw will be wire frame shapes.

You can change the fill color before or after you draw the object.

Drawing an object with a selected fill color

To draw an object with a selected fill color:

1. **Return to the pointer mode. (Make sure that nothing on the drawing is selected.)**
2. **Select the desired fill color from the Fill Color pop-up menu in the Attributes palette.**
3. **Draw an object.**

The object will be drawn with the specified fill color.

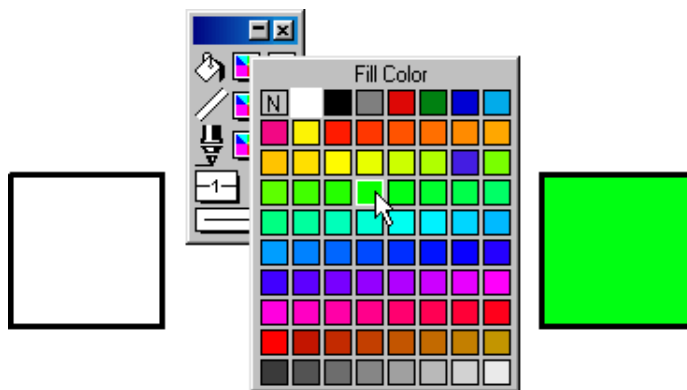
The Fill Color Indicator box in the lower left corner of the window will change color to indicate the color you chose.

NOTE: The chosen fill color will be used for objects until you choose another fill color as the default.

Changing the fill color of an existing object

To change the fill color of an existing object:

1. **Select the object to change the fill color of.**
2. **Choose the desired fill color from the Fill Color pop-up menu in the Attributes palette.**



The fill of the selected object will be changed to reflect the chosen fill color.

Parallel fill color

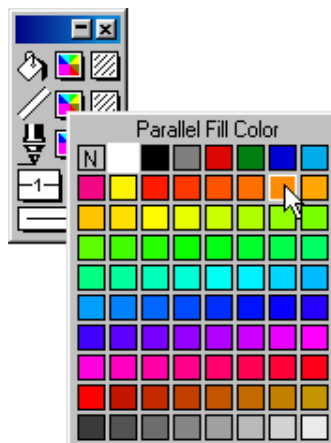
PC Draft's parallel-line objects (single parallel lines, open parallel polylines and closed parallel polygons) can include fill colors (including No Fill) between their component edges.

NOTE: In addition to parallel fills, parallel objects can also have pen colors, patterns and object fills.

Selecting the parallel fill color

To select the parallel fill color:

1. **Open the Parallel Fill color pop-up menu in the Attributes palette.**
2. **Drag until the parallel fill color you want is highlighted.**



3. **Release the mouse button. The selected parallel fill color will be shown on the Attributes palette.**

You can change the parallel fill color before or after you draw the parallel line object.

Drawing a parallel line object with a selected fill color

To draw a parallel line object with a selected fill color:

1. **Return to the pointer mode. (Make sure that nothing on the drawing is selected.)**

2. Select the desired parallel fill color from the Parallel Fill color pop-up menu in the Attributes palette.
3. Draw a parallel line object.

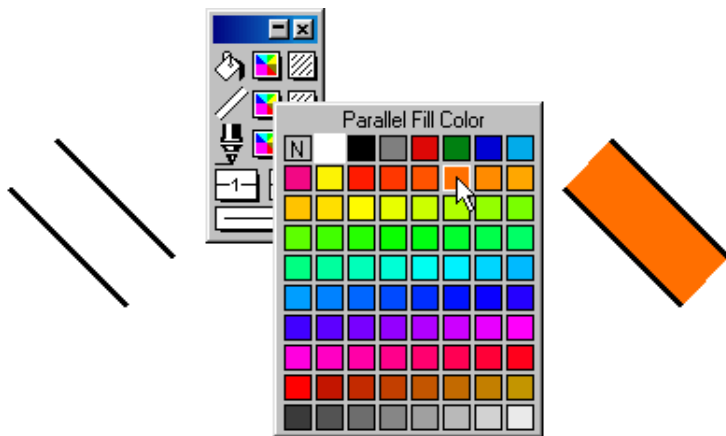
The object will be drawn with the specified fill color.

NOTE: The chosen parallel fill color will be used for objects until you choose another parallel fill color as the default.

Changing the fill color of an existing parallel line object

To change the fill color of an existing parallel line object:

1. Select the parallel line object to change the fill color of.
2. Select the desired parallel fill color from the Parallel Fill color pop-up menu in the Attributes palette.



The fill of the selected parallel line object will be changed to reflect the chosen fill color.

Pen color

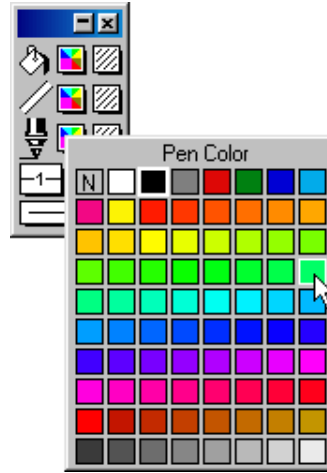
This section describes how to use colors to draw lines, borders and text. You use the Pen Color pop-up menu in the Attributes palette to choose pen colors.

You can use different pen colors to help distinguish between objects.

Selecting the pen color for lines, borders and text

To select the pen color:

1. Open the Pen Color pop-up menu in the Attributes palette.
2. Drag until the pen color you want is highlighted.



3. Release the mouse button. The selected pen color will be shown on the Attributes palette.

NOTE: If you choose "N" (for No ink) from the Pen Color submenu as the current pen color, the lines, borders or text you draw will be invisible. Edit handles appear on selected objects drawn with no ink, but the lines, borders or text will not appear on the screen or on printed drawings.

You can change the pen color before or after you draw the object or enter the text.

Drawing a line or object, or entering text, with a selected pen color

To draw a line or object, or enter text, with a selected pen color:

1. Return to the pointer mode. (Make sure that nothing on the drawing is selected.)
2. Select the desired pen color from the Pen Color pop-up menu in the Attributes palette.

3. Draw a line or object or enter the text.

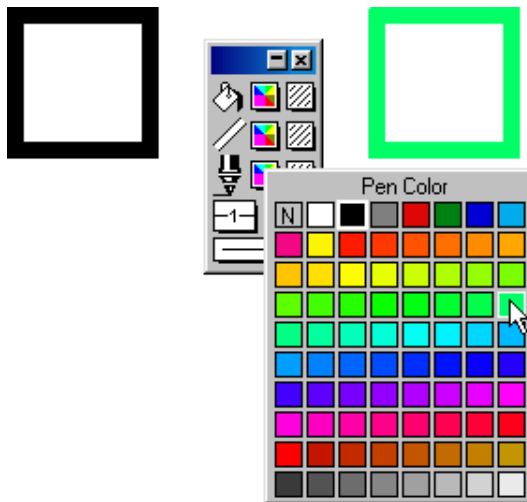
The line, object or text will be drawn with the specified pen color.

NOTE: The chosen pen color will be used for lines, borders and text until you choose another pen color as the default.

Changing the pen color of an existing line, object or piece of text

To change the pen color of an existing line, object or piece of text:

1. Select the line, object or text to change the pen color of.
2. Choose the desired pen color from the Pen Color pop-up menu in the Attributes palette.



The line or border of the selected object, or the selected text, will be changed to reflect the chosen pen color.

Showing and hiding fills

You can choose to hide fills, including colors and patterns, on your drawing. When you turn fills off, only the borders of filled objects appear.

To hide line fills:

- **Open the Preference menu and choose Hide Fills.**

Objects appear as wire frame shapes, and a checkmark appears next to the Hide Fills command.

To display fills:

- **Open the Preference menu and choose Hide Fills again.**

Objects will be drawn with their respective fills, and the checkmark disappears from next to the Hide Fills command.

Using patterns

Fill patterns provide an effective way to distinguish between objects. Two reasons you might want to use different fill patterns within a drawing would be to improve its esthetics or to add meaningful information to the drawing. In a technical drawing, an architect or engineer might use a variety of fill patterns and inks to differentiate between various object types or textures within the drawing. PC Draft offers a menu selection of standard fill patterns to complement your drawing. You can use the existing patterns, customize them or create your own. You can have up to 64 patterns in each PC Draft document.

Customizing patterns

The Edit Patterns feature allows you to change the patterns available in the pattern fill submenus from the Attributes palette. When a pattern is edited, the pattern fill submenus will be updated to show the new pattern, and the new pattern will be saved with the document. If a pattern that has been used to fill objects is edited, the objects will be changed to reflect the revised pattern.

The Edit Pattern dialog

To open the Edit Pattern dialog:

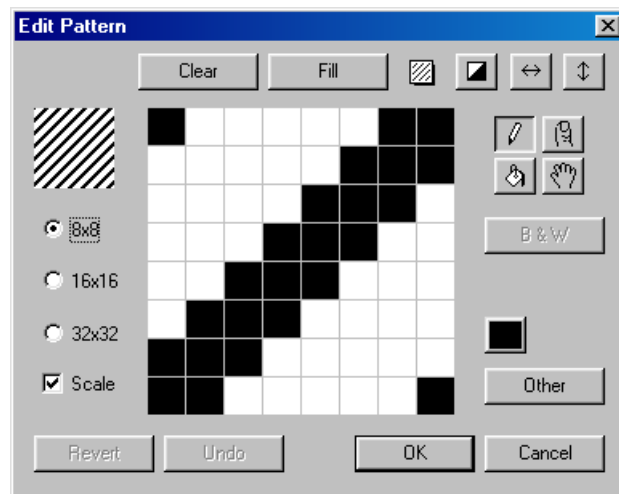
Opening the Edit pattern dialog

1. **Open the Preference menu and drag until Edit Patterns is highlighted.**

The Edit Patterns submenu appears.

2. **Holding down the mouse button, drag until the pattern you want to edit is highlighted and release the mouse button.**

The Edit Pattern dialog appears.



NOTE: You cannot edit the No Fill ("N"), the solid white or solid black patterns. If you try to do so, the Edit Pattern dialog will not open, and an alert appears informing that the selected pattern may not be edited.

The edit pattern field

The large box in the center of the Edit Patterns dialog is the edit pattern field. It shows a magnified view of the bits that make up the pattern. The pattern is edited within this field.

Pattern preview

The box in the upper left corner of the Edit Pattern dialog shows a preview of the pattern as it appears on the drawing. It is updated as the pattern is edited in the Edit Pattern field.

The pattern grid

The pattern grid can be defined as 8 x 8, 16 x 16 or 32 x 32 grid squares.

To specify the pattern grid:

- **Click the 8 x 8, 16 x 16, or 32 x 32 buttons on the left of the Edit Pattern dialog.**

NOTE: 16 x 16, or 32 x 32 patterns will not be printed on some printers or output devices.

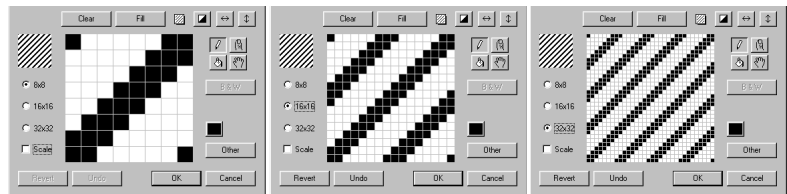
Scale

Scale turned off

Grid size increased

If the Scale box is turned off, as the grid size is increased, the pattern is replicated to fill the new area.

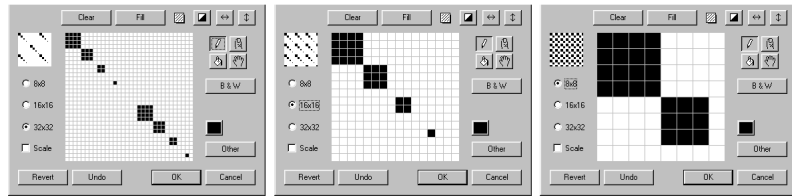
For example: In the dialogs below, the grid size is increased from 8 x 8 to 16 x 16, then to 32 x 32. At each stage, four copies of the contents of the Edit Pattern field are used to fill the new grid. Notice that although the contents of the Edit Pattern field change, the Pattern Preview field remains the same.



Grid size decreased

If the Scale box is turned off, as the grid size is decreased, the pattern is divided and applied to the new area.

For example: In the dialogs below, the grid size is decreased from 32 x 32 to 16 x 16, then to 8 x 8. At each stage, the contents of the top left quarter of the Edit Pattern field are used to fill the new grid.

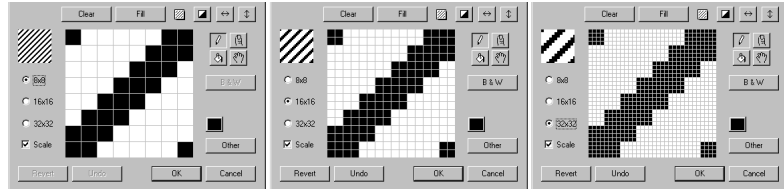


Scale on

Grid size increased

If the Scale box is on, as the grid size is increased, the pattern in the Edit Pattern field remains the same, but is divided up into more squares.

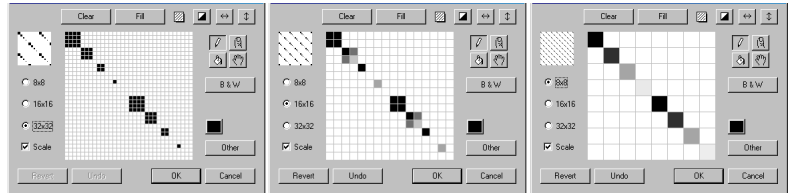
For example: In the dialogs below, the grid size is increased from 8 x 8 to 16 x 16, then to 32 x 32. At each stage, the contents of the Edit Pattern field remain the same, but the pattern is divided into more grid squares. Notice that the contents of the Pattern Preview field are scaled up at each stage.



Grid size decreased

If the Scale box is on, as the grid size is decreased, the pattern in the Edit Pattern field remains the same but is divided into less grid squares. Colors are averaged out in this process.

For example: In the dialogs below, the grid size is decreased from 32 x 32 to 16 x 16 then to 8 x 8. At each stage, as four grid squares are combined to make one new grid square, the average color of the four squares is used for the new square. Notice that the contents of the Pattern Preview box are scaled down at each stage.



Color mode

Patterns can be edited in two modes: black and white, and color/grayscale. If you have a monochrome system, color options will still be available in the Edit Pattern dialog, but as colors/grayscales cannot be seen, they cannot be used effectively. In this case, patterns will consist of black and white bits, the black bits representing the pattern design and the white bits the background. If you have a color system, you can edit patterns using an unlimited number of colors.

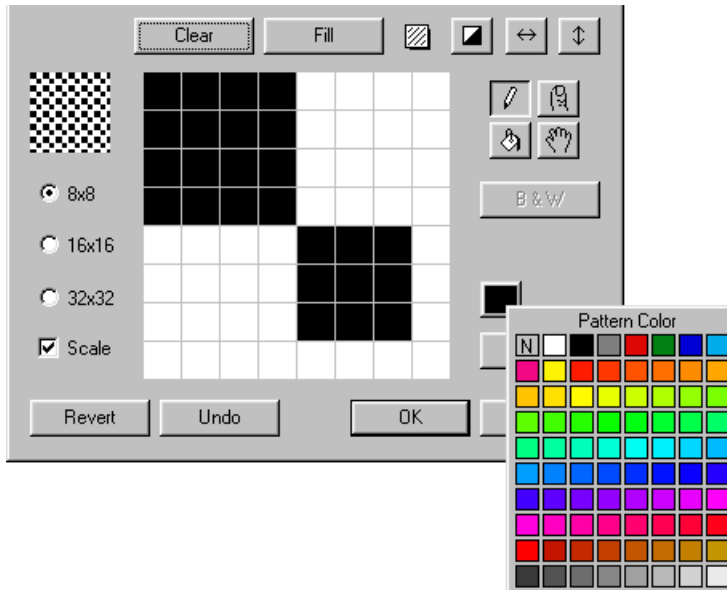
You can work with only one color at a time while editing patterns. The selected color is called the current color and is displayed in the small box on the right of the dialog, above the Other button. This box is also a button used to access the Pattern Color menu.

The current color button

To change the current color:

1. **Click on the Current Color button and hold down the mouse button.**

The Pattern Color pop up menu will appear:



2. **Hold down the mouse button, drag to select the color you want to use, and release the mouse button.**

The selected color will display on the Current Color button. This color will be used for pattern editing until another color is chosen.

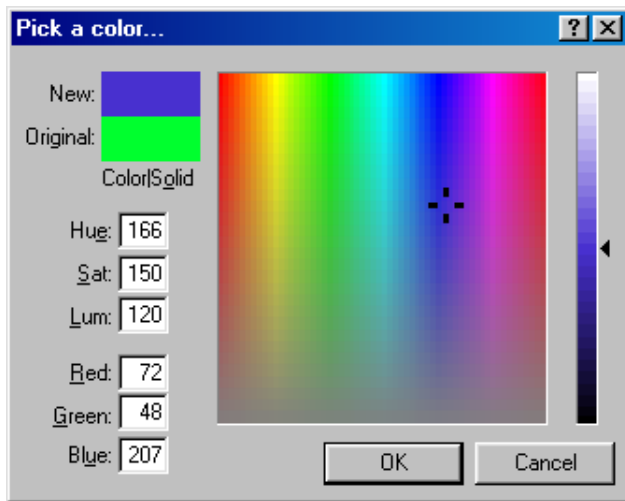
NOTE: The current color is always black when you operate in black and white mode.

Choosing a color which is not available in the Pattern Color menu

The Other button allows you to select colors that are not available in the Pattern Color menu.

To choose a color which is not available in the Pattern Color menu:

1. **Click on the Other button. The Pick a Color dialog box will appear.**



2. **Select a color from the Pick a Color.**
3. **Click OK to close the Pick a Color dialog box and return to the Edit Pattern dialog box.**

The color selected from will be displayed on the Current Color button.

Clearing the current pattern

At times, you may want to clear all the bits from the Edit Pattern field and start afresh rather than alter an existing pattern.

To clear all the bits from the Edit Pattern field:

- **Click on the Clear button**

The field will be cleared.

Filling the entire field

If you need to fill the entire field with the current color you can do this with one mouse click using the Fill button.

To fill the entire field:

- **Click on the Fill button.**

The entire Edit Pattern field will be filled with the current color.

Pattern editing tools

The tools at the right of the pattern edit field are used to edit the current pattern.

The Overlay tool

The Overlay tool is used to apply a pattern over the one in the Edit Pattern field.

To apply a pattern over the one in the Edit Pattern field:

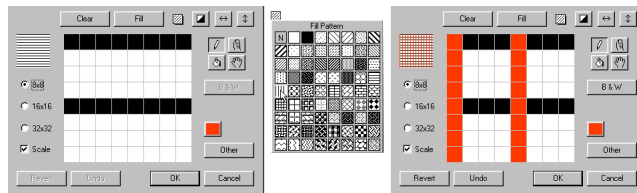
1. **Click the Overlay tool and hold down the mouse button.**



The Fill Patterns submenu appears.

2. **Holding down the mouse button, drag the cursor over the pattern you wish to apply, and release the mouse button**

The selected pattern will be applied over the current contents of the Edit Pattern field using the current color.



The Invert tool

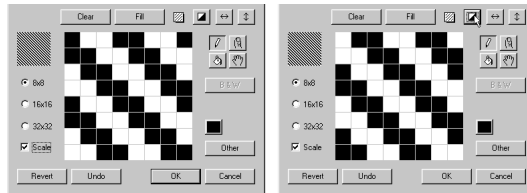
The Invert tool is used to invert the color of the bits in the Edit Pattern field. In black and white mode, this action will change all the black bits to white and all the white bits to black. If color bits are included in the pattern, when the Invert tool is used, each bit will be changed to the color on the opposite side of the color wheel to the original color, and the brightness will also be inverted. For example, a light pink color will become a dark green/blue, while a dark red will become a light green/blue.

To invert the color of the bits in the Edit Pattern field

- **Click the Invert tool.**



The color of the bits in the Edit Pattern field will be inverted



The Flip horizontal tool

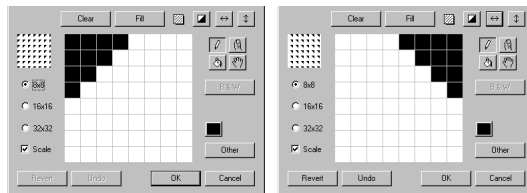
The Flip Horizontal tool is used to flip the pattern in the Edit Pattern field around the vertical axis.

To flip the pattern in the Edit Pattern field around the vertical axis:

- **Click the Flip Horizontal tool.**



The pattern will be flipped.



The Flip vertical tool

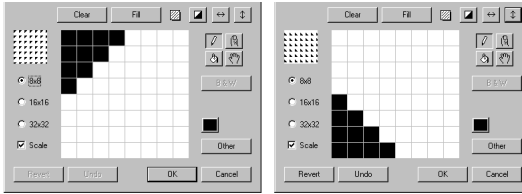
The Flip Vertical tool is used to flip the pattern in the Edit Pattern field around the horizontal axis.

To flip the pattern in the Edit Pattern field around the horizontal axis:

- **Click the Flip Vertical tool.**



The pattern will be flipped.



The Pencil tool

The Pencil tool is used to add or delete individual bits or series of bits, or to draw lines in the Edit Pattern field.

To add bits to the Edit Pattern field one at a time:

1. Click the Pencil tool and move the cursor over the Edit Pattern field.



2. Click the Edit Pattern field to add a square of the current color.

To add a series of bits:

1. Click in the Edit Pattern field and drag, holding down the mouse button.
2. Bits showing the current color will be added to the pattern as you drag.
3. Release the mouse button when you are finished.

To draw lines:

- Constrain the movement of the Pencil tool to a horizontal or vertical direction by holding down the Shift key while you drag.

To delete black bits in Black and White mode:

- Select the Pencil tool and click the black bits you want to delete.

To delete color bits in the Color mode:

- **Hold down the Control key, then click the color bits to be deleted.**

The Eye dropper tool

You can use the Alt key to change the pencil tool to an eye dropper, and use this to choose the color of any bit in the Edit Pattern field as the current color.:

1. **Select the Pencil tool, hold down the Alt key and move the pointer into the Edit Pattern field.
The pointer will change to an Eye Dropper tool.**
2. **Click the Eye Dropper tool on the bit of the color you require to be the current color.**

The current color will be changed to reflect your choice.

The Finger tool

The Finger tool is used to blend together the current color and the color of any bit in the Edit Pattern field, or the colors of adjacent bits in the Edit Pattern field.

To blend the current color with the color of any bit in the Edit Pattern field:

1. **Select the Finger tool.**



The Finger cursor shows the current color, which is the first of the two colors to be used in the blending process.

2. **Move the cursor over the Edit Pattern field and click the bit with which you want to blend the current color.**

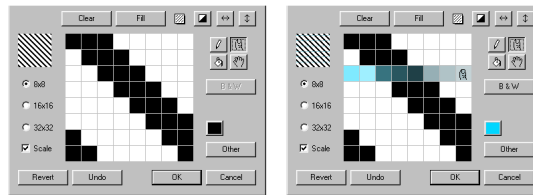
The bit clicked will change to a new color that is the average of the Finger cursor color and the color of the bit clicked. The Finger cursor color will also be updated to show the new color.

To blend the colors of a series of bits:

1. **Select the Finger tool.**
2. **Click in the Edit Pattern field and, holding down the mouse button, drag the Finger cursor across bits of varying colors.**

The average of the color values of the Finger cursor color and the bits dragged across will be calculated, and applied to the bit.

NOTE: If you hold down the Shift key while dragging, the movement of the Finger cursor will be constrained to a horizontal or vertical direction.



When you release the mouse button, the Finger cursor shows the color last applied to a bit. To reset the Finger cursor color to the current color, click the Finger tool icon again. To reset the Finger cursor color to a color in the pattern, hold down the Alt key and click one of the colors in the pattern.

NOTE: The Finger tool can be selected in Black and White mode, but the mode is automatically changed to color.

The Paint bucket tool

The Paint Bucket tool is used to change bits in the Edit Pattern field to the current color.

To change bits in the Edit Pattern field to the current color:

1. **Click the Current Color button and choose the color from the Pattern Color pop-up menu.**



2. **Click the Paint Bucket icon and then click a bit in the Edit Pattern field.**

The bit clicked and all bits of the same color connected to it, are changed to the current color.

3. If you hold down the Alt key with the Paint Bucket tool selected, the tool will be changed to the Eye Dropper tool. Click a bit in the Edit Pattern field with the Eye Dropper tool to select the color of that bit as the current color.

The Hand tool

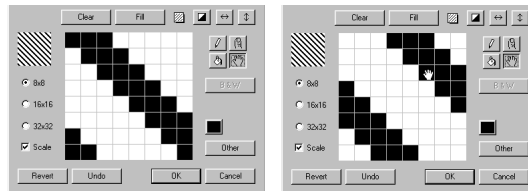
The Hand tool is used to move the pattern within the Edit Pattern field.

To move the pattern within the Edit Pattern field:

1. Click the Hand tool and move the cursor over the Edit Pattern field.



2. Holding down the mouse button, drag the pattern to reposition it within the Edit Pattern field, and release the mouse button.



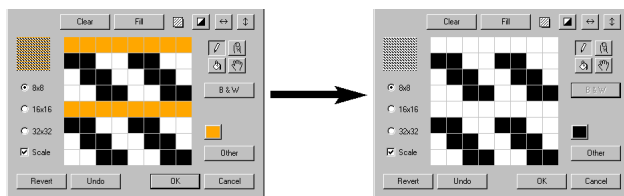
The B&W button

The B&W button is used to convert patterns to black and white.

To convert patterns to black and white:

- click the B&W button.

Any bits used in the pattern that are more than 50% saturated will be changed to black. Bits that are less than 50% saturated will be changed to white.



Revert

- Click the **Revert** button to return to the pattern you originally selected to edit. Any changes you have made will be lost.

Undo

- Click the **Undo** button to remove the effects of your last action only.

Cancel

- Click the **Cancel** button to close the **Edit Pattern** dialog and return to your **PC Draft** drawing without making any changes to the fill patterns.

OK

- Click the **OK** button to close the **Edit Pattern** dialog and return to your **PC Draft** drawing accepting the changes you have made to the selected fill pattern. The **Fill Pattern** pop-up menu will be updated to show the new pattern, and the new pattern will be saved with the document. If a pattern that has been used to fill objects is edited, the objects will be changed to reflect the revised pattern.

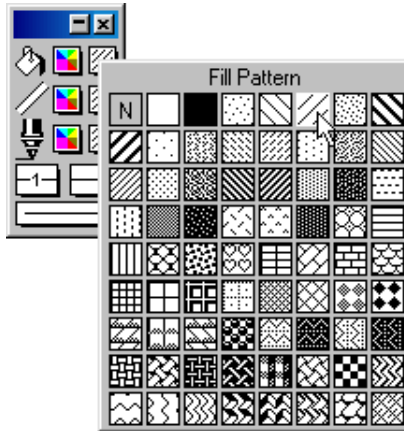
Object fill patterns

You can use a pattern to fill the interiors of objects. Filled objects are opaque and you can select them by clicking their borders or anywhere within them. If a filled object is on top of another object, it hides the object beneath it from view.

Selecting the fill pattern

To select the fill pattern:

1. Open the **Fill Pattern** pop-up menu in the **Attributes** palette.
2. Drag until the fill pattern you want is highlighted.



3. **Release the mouse button. The selected fill pattern will be shown on the Attributes palette.**

NOTE: If you choose `N` (for No fill) from the Fill Pattern submenu as the current fill pattern, the objects you draw will be wire frame shapes.

Drawing an object with a selected fill pattern

You can change the fill pattern before or after you draw the object.

To draw an object with a selected fill pattern:

1. **Return to the pointer mode. (Make sure that nothing on the drawing is selected.)**
2. **Select the desired fill pattern from the Fill Pattern pop-up menu in the Attributes palette.**
3. **Draw an object.**

The object will be drawn with the specified fill pattern.

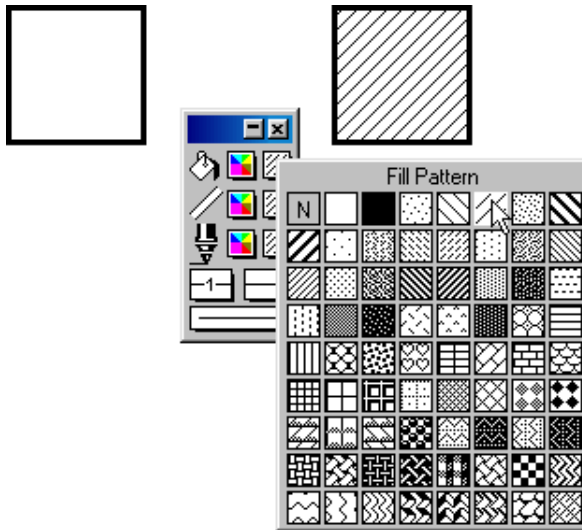
The Fill Pattern Indicator box in the lower left corner of the window will change to indicate the pattern you chose.

NOTE: The chosen fill pattern will be used for objects until you choose another fill pattern as the default.

Changing the fill pattern of an existing object

To change the fill pattern of an existing object:

1. Select the object that you want to change.
2. Select the desired fill pattern from the Fill Pattern pop-up menu in the Attributes palette.



The fill of the selected object will be changed to reflect the chosen fill pattern.

Parallel fill pattern

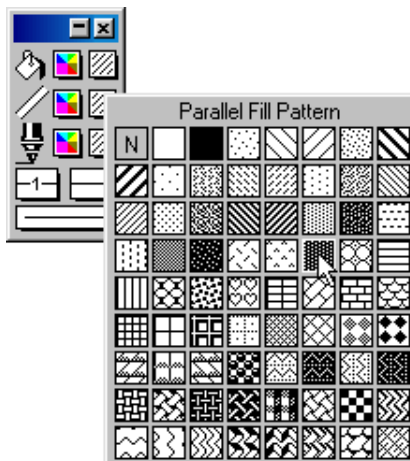
PC Draft's parallel-line objects (single parallel lines, open parallel polylines and closed parallel polygons) can include fill patterns (including No Fill) between their component edges.

NOTE: In addition to parallel fills, parallel objects can also have pen colors and patterns, and object fills.

Selecting the parallel fill pattern

To select the parallel fill pattern:

1. Open the Parallel Fill Pattern pop-up menu in the Attributes palette.
2. Drag until the parallel fill pattern you want is highlighted.



3. Release the mouse button. The selected parallel fill pattern will be shown on the Attributes palette.

You can change the parallel fill pattern before or after you draw the parallel line object.

Drawing a parallel line object with a selected fill pattern

To draw a parallel line object with a selected fill pattern:

1. Return to the pointer mode. (Make sure that nothing on the drawing is selected.)
2. Select the desired parallel fill pattern from the Parallel Fill pattern pop-up menu in the Attributes palette.
3. Draw a parallel line object.

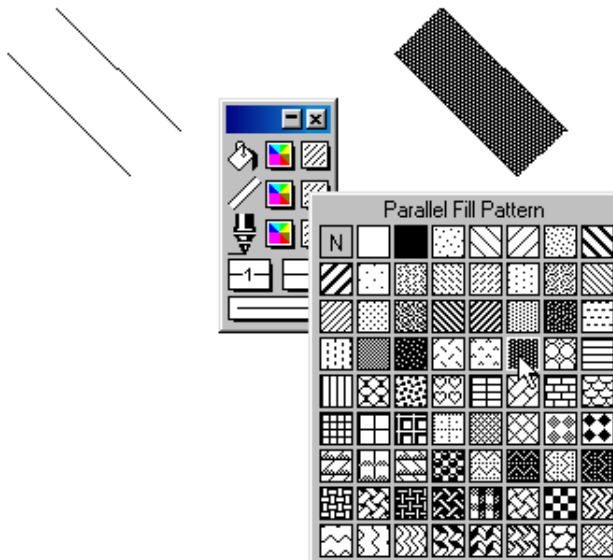
The object will be drawn with the specified fill pattern.

NOTE: The chosen parallel fill pattern will be used for objects until you choose another parallel fill pattern as the default.

Changing the fill pattern of an existing parallel line object

To change the fill pattern of an existing parallel line object:

1. Select the parallel line object that you want to change.
2. Choose the desired parallel fill pattern from the Parallel Fill pattern pop-up menu in the Attributes palette.



The fill of the selected parallel line object will change to reflect the chosen fill pattern.

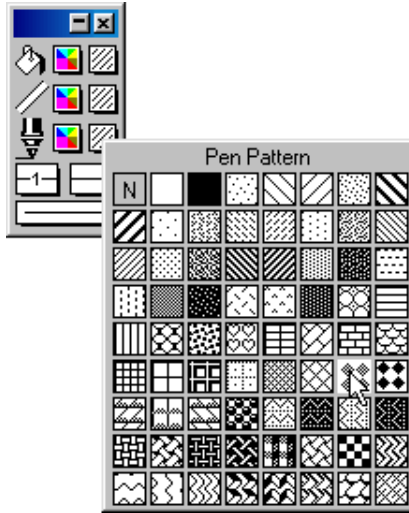
Pen pattern

This section describes how to use patterns to draw lines and borders. Use the Pen Pattern pop-up menu in the Attributes palette to choose pen patterns. You can use different pen patterns to help distinguish between objects.

Selecting the pen pattern for lines and borders

To select the pen pattern:

1. Open the Pen Pattern pop-up menu in the Attributes palette.
2. Drag until the pen pattern you want is highlighted.



3. **Release the mouse button. The selected pen pattern will be shown on the Attributes palette.**

NOTE: If you choose `N` (for No ink) from the Pen Pattern submenu as the current pen pattern, the lines and borders you draw will be invisible. Edit handles appear on selected objects drawn with no ink, but the lines or borders will not appear on the screen or on printed drawings.

You can change the pen pattern before or after you draw the object.

Drawing a line or object with a selected pen pattern

To draw a line or object with a selected pen pattern:

1. **Return to the pointer mode. (Make sure that nothing on the drawing is selected.)**
2. **Choose the desired pen pattern from the Pen Pattern pop-up menu in the Attributes palette.**
3. **Draw a line or object.**

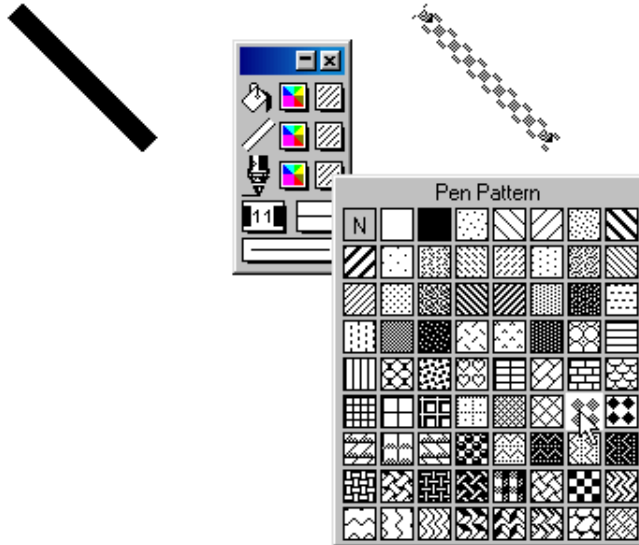
The line or object will be drawn with the specified pen pattern.

NOTE: The chosen pen pattern will be used for lines and borders until you choose another pen pattern as the default.

Changing the pen pattern of an existing line or object

To change the pen pattern of an existing line or object:

1. **Select the line or object that you want to change.**
2. **Choose the desired pen pattern from the Pen Pattern pop-up menu in the Attributes palette.**



The line or border of the selected object will be changed to reflect the chosen pen pattern.

Showing and hiding fills

You can choose to hide fills, including colors and patterns, on your drawing. When you turn fills off, only the borders of filled objects appear.

To hide fills:

- **Open the Preference menu and choose Hide Fills.**

Objects appear as wire frame shapes, and a checkmark appears next to the Hide Fills command.

To show fills:

- **Open the Preference menu and choose Hide Fills again.**

Objects will be drawn with their respective fills, and the checkmark disappears from next to the Hide Fills command.

Line and border attributes

The attributes that define the appearance of lines and borders are sometimes referred to as the 'pen model' or simply, the 'pen'. The attributes for the pen include pen style, line weight, line style and end marks. The border position of an object can also be specified. The various options for each attribute are selected using pop-up menus in the Attributes palette or, in the case of pen style and border position, from the Preference menu.

Pen color or pattern are discussed in other sections of this chapter.

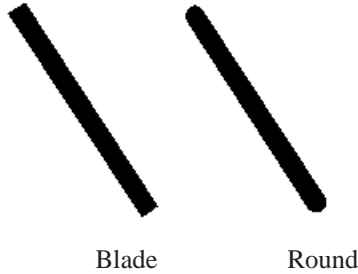
NOTE: Many of the pen model attributes you choose do not affect only lines, they also affect the borders of objects. For example, when you select a certain line weight and color, these attributes will be applied to line segments used to draw rectangles, circles, polygons and so on.

Pen styles

There are two types of pen style: Blade and Round. The pen style options apply to lines and objects.

The pen style affects the width of angled lines and the appearance of the ends of lines and of joins:

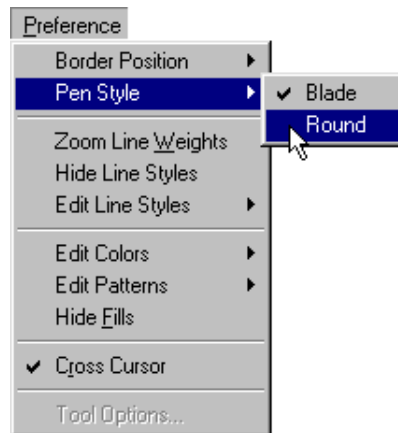
- **Blade (Accurate width): Lines remain a constant width regardless of their angle. The line ends will be straight.**
- **Round (Accurate width): Lines remain a constant width regardless of their angle. The line ends will be rounded.**



Selecting pen styles

To select a pen style:

1. **Open the Pen Style submenu in the Preference menu.**
2. **Drag until the desired pen style is highlighted.**



3. **Release the mouse button. A checkmark appears next to the selected pen style on the submenu.**

You can change the pen style before or after you draw the line or object.

Drawing an object with a selected pen style

To draw an object with a selected pen style:

1. **Return to the pointer mode. (Make sure that no objects on the drawing are selected.)**
2. **Select the desired pen style from the Pen Style submenu in the Preference menu.**
3. **Draw an object.**

The object will be drawn with the specified pen style.

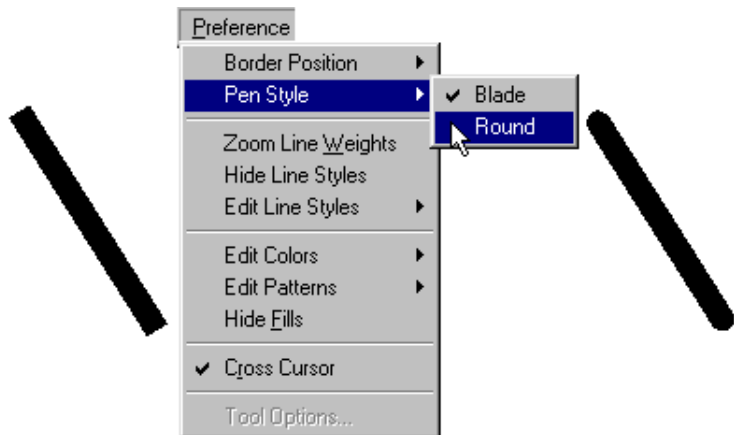
NOTE: The chosen pen style will be used for objects until you choose another pen style as the default.

Changing the pen style of an existing object

To change the pen style of an existing object:

1. Select the object to change the pen style of.
2. Select the desired pen style from the Pen Style submenu in the Preference menu.

The selected object will be changed to reflect the chosen pen style.



Line weight

Line weight refers to the thickness of lines and borders. Line weight is measured in pixels (picture elements).

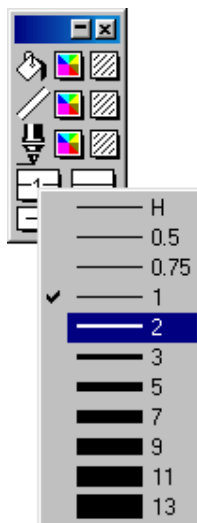
There are eleven different line weights. They vary in size from hairline to 13 pixels. The numbers beside the line weights indicate the number of pixels that make up the line weight.

NOTE: Although the hairline, 0.5 and 0.75 line weights appear as one point thick on the screen, they will print at their designated weights on any printer with a resolution of 300 dpi or more.

Selecting line weights

To select the line weight:

1. **Open the Line Weight pop-up menu in the Attributes palette.**
2. **Drag until the line weight you want is highlighted.**



3. **Release the mouse button. The selected line weight will be shown on the pop-up menu.**

You can change the line weight before or after you draw the line or object.

Drawing a line or object with a selected line weight

To draw a line or object with a selected line weight:

1. **Return to the pointer mode. (Make sure that no objects on the drawing are selected.)**
2. **Choose the desired line weight from the Line Weight pop-up menu in the Attributes palette.**
3. **Draw a line or object.**

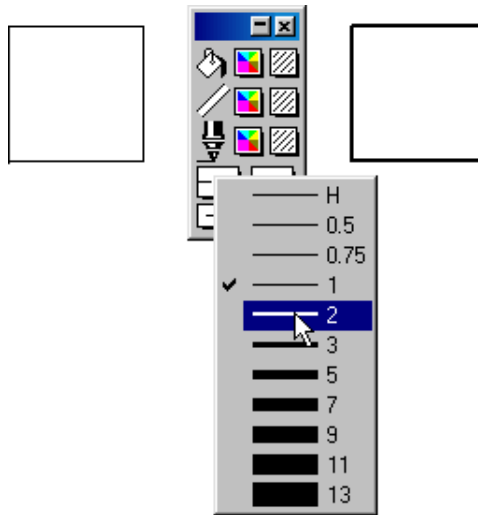
The line or object will be drawn with the specified line weight.

NOTE: The chosen line weight will be used for lines and borders until you choose another line weight for the default line weight attribute.

Changing the line weight of an existing line or object

To change the line weight of an existing line or object:

1. Select the line or object to change the line weight of.
2. Choose the desired line weight from the Line Weight pop-up menu in the Attributes palette.



The line or border of the selected object will be changed to reflect the chosen line weight.

NOTE: For information about how to make line weights appear either magnified or at their normal size while in a zoomed in view.

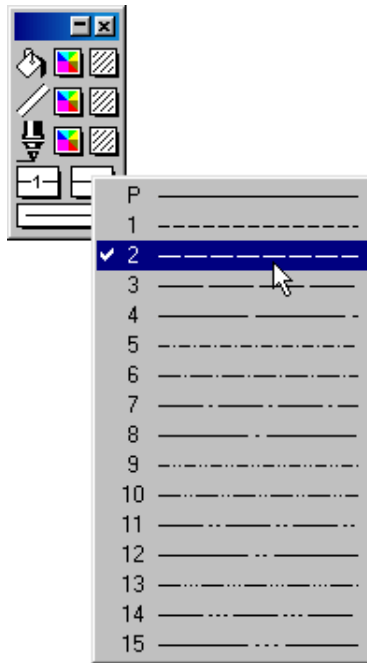
Line style

The term 'line style' refers to whether a line is solid or one of an assortment of dashed lines. You can use the preset line styles provided with PC Draft or customize them to make your own. You can use line styles in object borders and straight lines.

Selecting line styles

To select the line style:

1. Open the line style pop-up menu in the Attributes palette.
2. Drag until the line style you want is highlighted.



3. Release the mouse button. The selected line style will be shown on the pop-up menu.

You can change the line style before or after you draw the line or object.

Drawing a line or object with a selected line style

To draw a line or object with a selected line style:

1. Return to the pointer mode. (Make sure that no objects on the drawing are selected.)
2. Choose the desired line style from the line style pop-up menu in the Attributes palette.
3. Draw a line or object.

The line or object will be drawn with the specified line style.

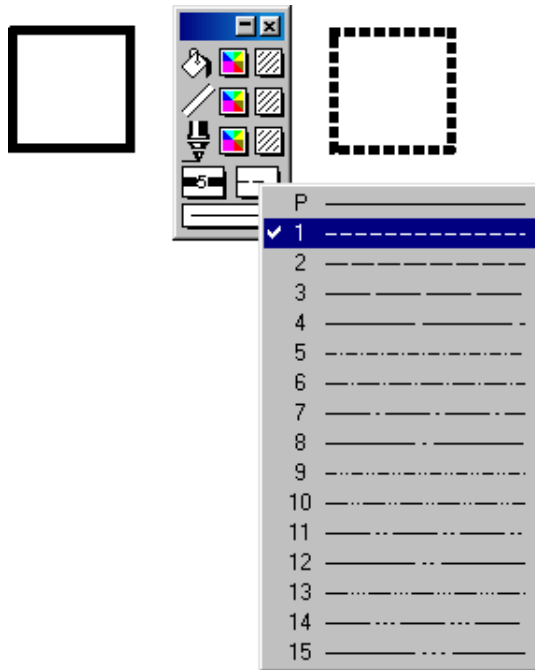
NOTE: The chosen line style will be used for lines and borders until you choose another line style for the default line-style attribute.

Changing the line style of an existing line or object

To change the line style of an existing line or object:

1. Select the line or object to change the line style of.
2. Choose the desired line style from the line style pop-up menu in the Attributes palette.

The line or border of the selected object will be changed to reflect the chosen line style.



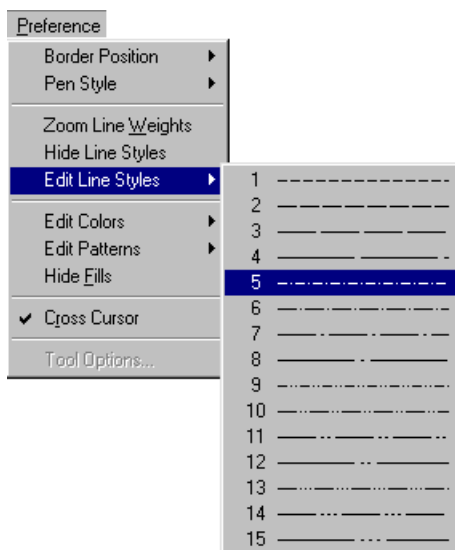
Editing line styles

PC Draft provides you with a variety of preset line styles. You can use these line styles or customize them to suit your needs. When you create your own custom line styles, each line style can be made up of numerous dashes and gaps. You can specify the length of each dash and gap.

To select a line style to edit:

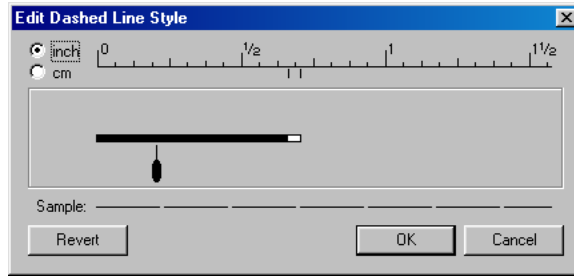
1. **Open the Preference menu and drag until Edit Line Styles is highlighted.**

The Edit Line Styles submenu appears.



2. **Holding down the mouse button, drag until the line style you want to edit is highlighted, and release the mouse button.**

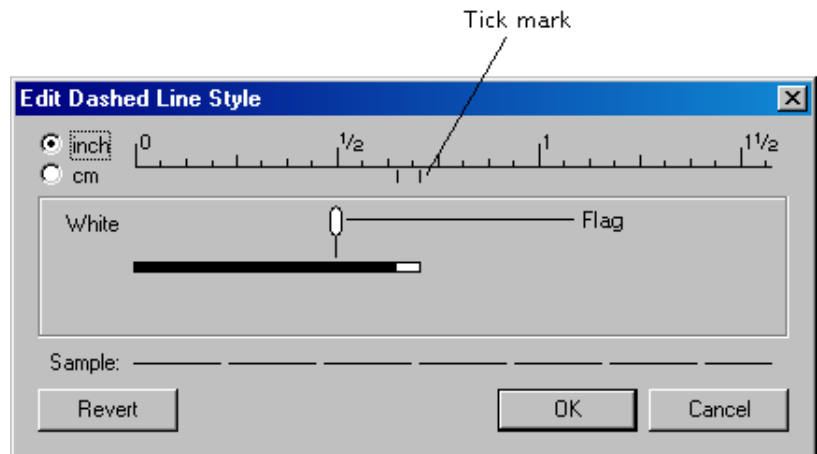
The Edit Dashed Line Style dialog appears. The line style you chose to edit appears in a box below the ruler.



To edit the line style:

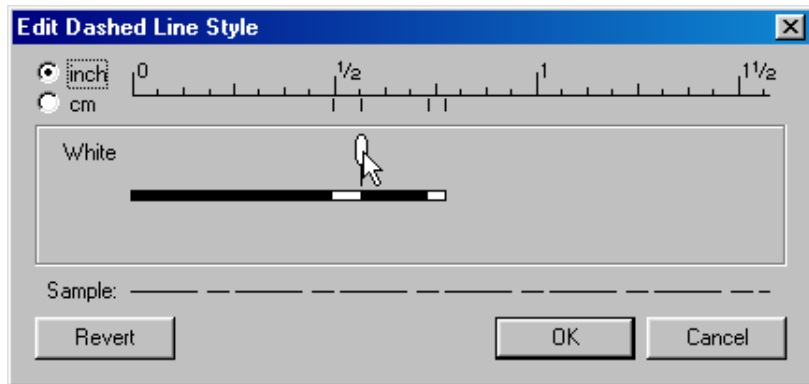
1. The default measurement for the lengths of dashes and gaps is inches. To use centimeters to measure the lengths of dashes and gaps, click the cm radio button.
2. Without pressing down the mouse button, move the cursor onto the box containing the line.

Notice that a flag appears above or below the line style (depending on whether you point above or below the line). You use the flag to specify the length of dashes and gaps. When you point above the line, the flag turns white to show you are ready to add gaps to the line. When you point below the line, the flag turns black to show you are ready to add dashed segments.



3. You can edit the line in the following ways:

- To add a gap or a dashed segment: Position the cursor above the line to add a gap or below the line to add a dashed segment. Without pressing down the mouse button, move the pointer to where you want the dash or gap to begin. As you move the pointer, notice that the flag moves along with it. Press and hold down the mouse button, drag to the right until the dash or gap is the length you want and release the mouse button.



- To shorten a segment: Position the cursor near the segment you want to shorten. Holding down the mouse button, drag to the left until the segment is the length you want and release the mouse button.
- To erase the line style: Position the cursor near the right end of the line. Hold down the mouse button, drag to the extreme left end of the line and release the mouse button.

Notice that a tick mark on the ruler follows the movement of the flag. The tick marks show the beginning and end of each segment (either dash or gap). Notice also that the sample line style below the line will be changed to reflect the new style and shows you how the line style will appear on a document.

NOTE: You can create a line style with segments that extend beyond the limit of the edit box. Although the edit box will not show these segments, the sample below the box shows you how the line will appear on the drawing.

The line style will be repeated after the last segment of the line:

4. **When you have finished editing the line style, click one of the following buttons.**
 - **OK:** To accept the modified line style and place the line style into the Line Style pop-up menu for use with lines and borders.
 - **Revert:** To revert to the original line style (the line style you originally chose to edit).
 - **Cancel:** To close the dialog without applying your changes.

Showing and hiding line styles

If your drawing contains many objects with line styles, you might want to increase the rate at which the screen is redrawn by hiding the line styles while you work. When line styles are hidden, solid lines appear on the lines and objects instead of the line styles.

To hide line styles:

- **Open the Preference menu and choose Hide Line Styles.**

Lines will be drawn with solid lines, and a checkmark appears next to the Hide Line Styles command.

To display line styles:

- **Open the Preference menu and choose Hide Line Styles again.**

Lines will be drawn with their respective line styles, and the checkmark disappears from next to the Hide Line Styles command.

End marks

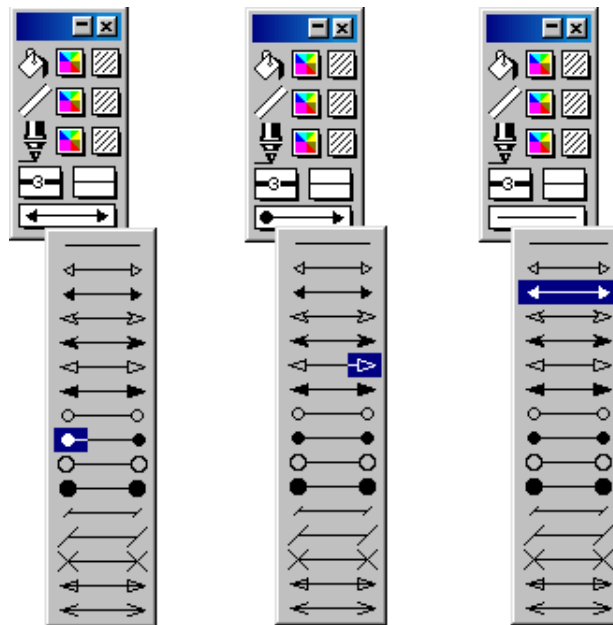
End marks are symbols on the ends of lines that are used for annotating drawings. You can make end marks appear on lines by using a set of end marks in combination with the Line tools, the Polyline tool, the Freehand Line tool, the Bezier curve tool or the Spline tool.

NOTE: The end marks you can use for the above objects are separate from the end marks you use for dimension lines .

Selecting end marks

To select end marks:

1. Open the end marks pop-up menu in the Attributes palette.
2. Drag until the desired end marks are highlighted.
 - Drag down the left side of the pop-up menu to choose a left end mark; it appears at the beginning of a line.
 - Drag down the right side of the pop-up menu to choose a right end mark; it appears at the end of a line.
 - Drag down the centre of the pop-up menu to choose both left and right end marks; these appear at each end of a line.



3. Release the mouse button. The selected end marks will be shown on the pop-up menu.

You can change the end marks before or after you draw the line or object.

Drawing a line or object with selected end marks

To draw a line or object with selected end marks:

- 1. Return to the pointer mode. (Make sure that no objects on the drawing are selected.)**
- 2. Choose the desired end marks from the end marks pop-up menu in the Attributes palette.**
- 3. Draw a line or object.**

The line or object will be drawn with the specified end marks.

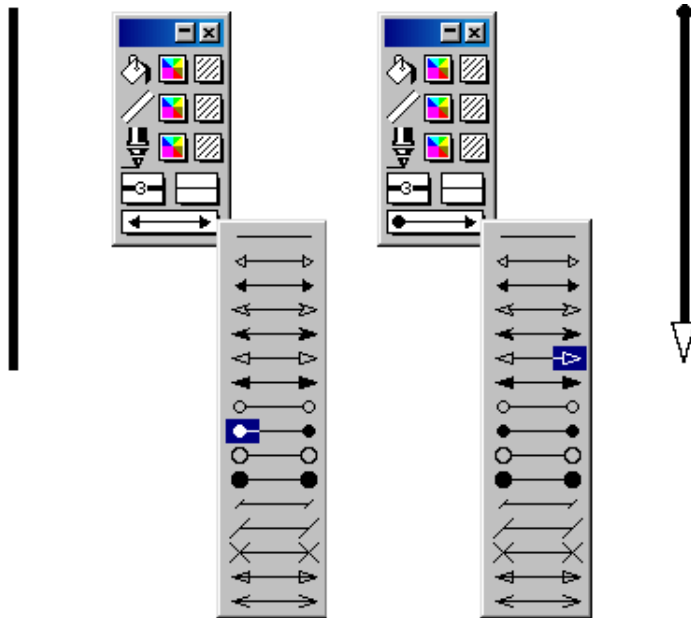
NOTE: The chosen end marks will be used for lines and borders until you choose other end marks for the default end marks attribute.

Changing the end marks of an existing line or object

To change the end marks of an existing line or object:

- 1. Select the line or object to change the end marks of.**
- 2. Choose the desired end marks from the end marks pop-up menu in the Attributes palette.**

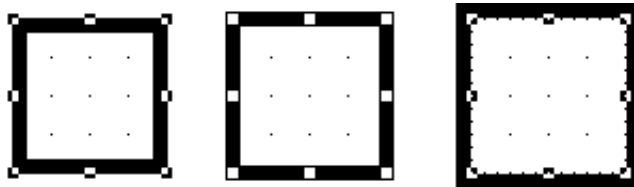
The end marks will be changed to those chosen from pop-up.



Border positions

There are three types of border position: Line Inside, Line Centered and Line Outside. The border position options apply to objects only, not to lines.

All three border positions affect objects differently, these differences are discussed later in this chapter. In general though, border position is important with regard to how objects are aligned. PC Draft uses the position of an object's edit handles to align objects. It is important to keep this in mind when you align objects, as border position controls the position of the edit handles relative to the width (that is the line weight) of the border .

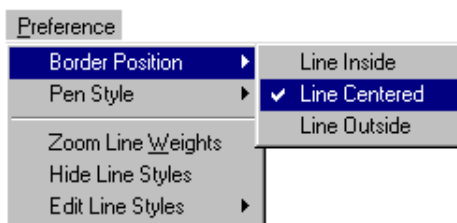


Border position applies only to square-corner and rounded-corner rectangles, parallel line objects, circles and arcs. You can draw these objects with a certain border position or change the border position of selected objects.

Selecting border positions

To select a border position:

1. **Open the Border Position submenu in the Preference menu.**
2. **Drag until the desired border position is highlighted.**



3. **Release the mouse button. A checkmark appears next to the selected border position on the submenu.**

You can change the border position before or after you draw the line or object.

Drawing an object with a selected border position

To draw an object with a selected border position:

1. **Return to the pointer mode. (Make sure that no objects on the drawing are selected.)**
2. **Choose the desired border position from the Border Position submenu in the Preference menu.**
3. **Draw an object.**

The object will be drawn with the specified border position.

NOTE: The chosen border position will be used for objects until you choose another border position as the default.

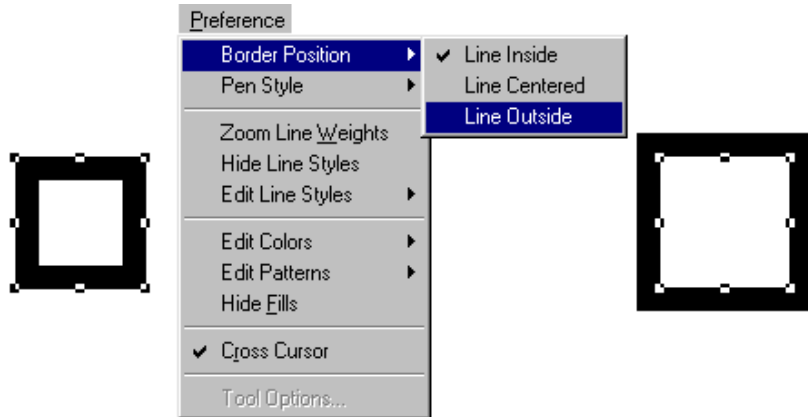
Changing the border position of an existing object

To change the border position of an existing object:

1. **Select the object to change the border position of.**

2. Choose the desired border position from the Border Position submenu in the Preference menu.

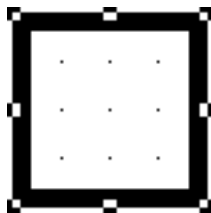
The border of the selected object will be changed to reflect the chosen border position.



How border position affects objects

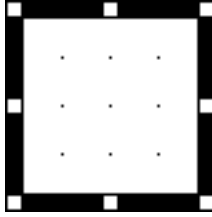
Border position determines the location of the edit handles on the border of an object, and as PC Draft uses the edit handles as reference points for alignment and size calculations, border position affects the alignment and size readings of objects.

Line Inside



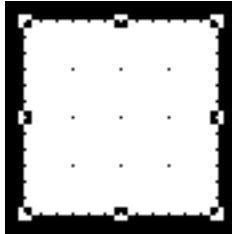
When you draw an object with the border position Line Inside, the border of the object appears between the cursor and the object during creation. When you select an object created with the border position Line Inside, the edit handles appear on the outside of the object. When Show Size is on, the size shown represents the entire object, including its borders.

Line Centered



When you draw an object with the border position Line Centered, the cursor appears centered within the object's borders during creation. When you select an object created with the border position Line Centered, the edit handles appear in the center of the object's borders. When Show Size is on, the size shown is the size of the object measured from the center of the object's borders.

Line Outside



When you draw an object with the border position Line Outside, the border of the object appears outside the cursor during creation. When you select an object created with the border position Line Outside, the edit handles appear on the inside of the object. When Show Size is on, the size shown is the size of the object's interior, excluding the object's borders.

Copying attributes

An object's graphic attributes (fill, pen color or pattern, line weight and line style etc.) and object information can be copied and applied to another object using either the Attributes tool or the Copy Attributes and Apply Attributes commands in the Edit menu. The Apply Attributes command can be used to apply changes to all of the objects selected, while the Attributes tool applies changes only to the object clicked.

Any settings for applying attributes will be stored only while the application is running.

The default options for applying attributes are to apply only graphic attributes, not object information.

Copying attributes using the Attributes tool

To copy attributes using the Attributes tool:

1. Click the Attributes tool in the Tool palette

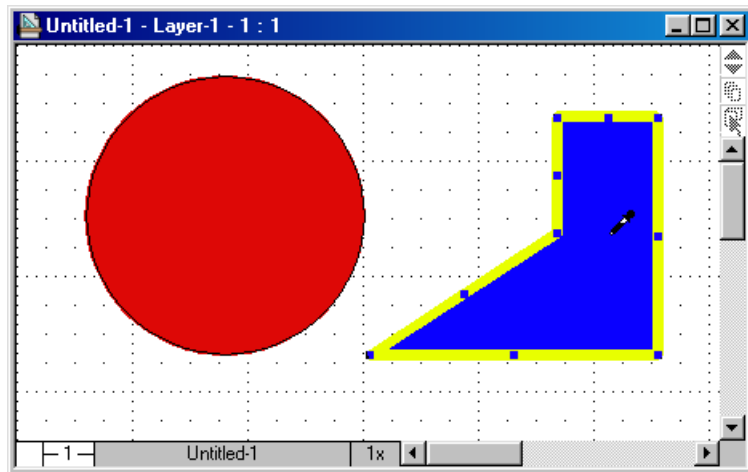


2. Click an object.

The default attributes will be applied to the object.

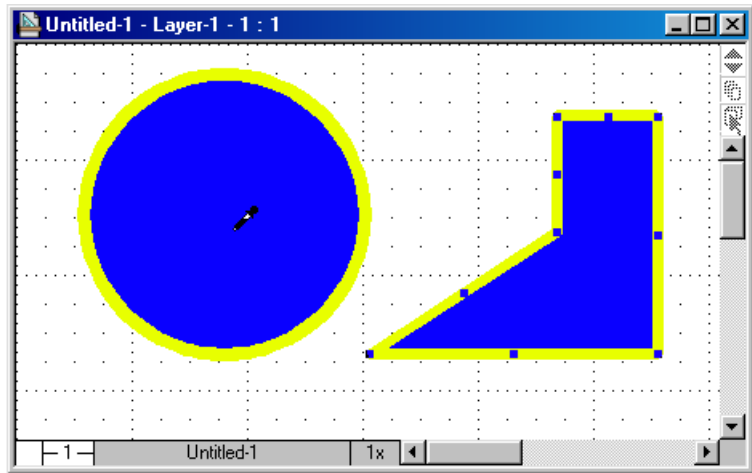
3. With the Attributes tool still selected, hold down the Alt key and click an object.

The cursor turns into an empty eye dropper.



The object's pen and fill attributes will be copied

4. Release the Alt key, the cursor turns into a full eye dropper.
5. Click another object to apply the copied pen and fill attributes to it.



NOTES:

- Attributes will be applied only to the object clicked, even if that object is part of a group.
 - The apply action can be undone by selecting Undo Eye Dropper from the Edit menu immediately after the apply action.
 - Hold down the Alt key and click in the drawing window with the Attributes tool, and the tool reverts to the Arrow tool.
-

Checking and changing attributes before applying them

You can check and, if necessary, change copied attributes before applying them. There are two ways of doing this when you use the Attributes tool. The first is to use the Apply Attributes dialog, in which case any changes will be applied to that action only. The second is to use the Attributes Options dialog, in which case the settings remain as specified until changed or until the application is closed.

Using the Apply Attributes dialog

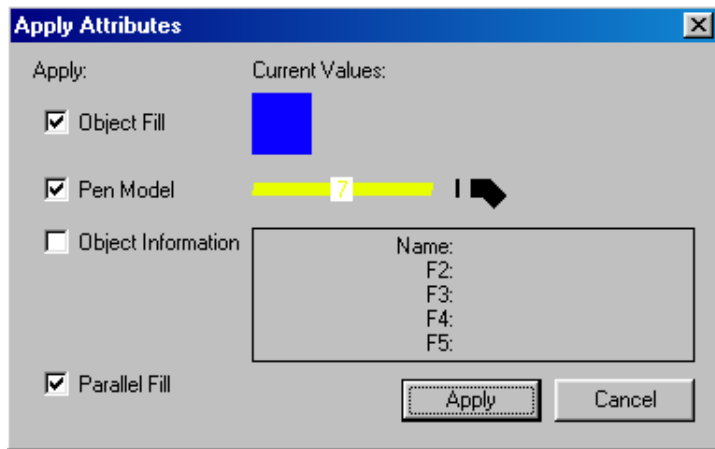
To open the Apply Attributes dialog before applying attributes to an object:

- 1. Select the Attributes tool and hold down the Shift key.**

The full eye dropper icon is followed by three dots to show that the Apply Attributes dialog will appear when an object is clicked.

2. Click an object.

The Apply Attributes dialog appears.



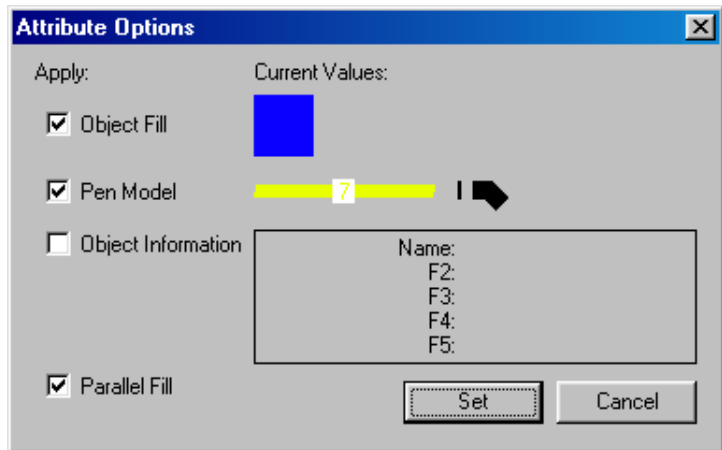
- 3. Click the Object Fill, Pen Model, Object Information and Parallel Fill boxes to specify that these attributes should be applied to the object you have clicked. Any changes made to the Apply Attributes dialog relate to this apply action only.**

Using the Attributes Options dialog

To open the Attributes Options dialog:

- 1. Hold down the Alt key and click the Attributes tool, or select the Attributes tool and choose Tool Options from the Preference menu.**

The Attribute Options dialog appears.

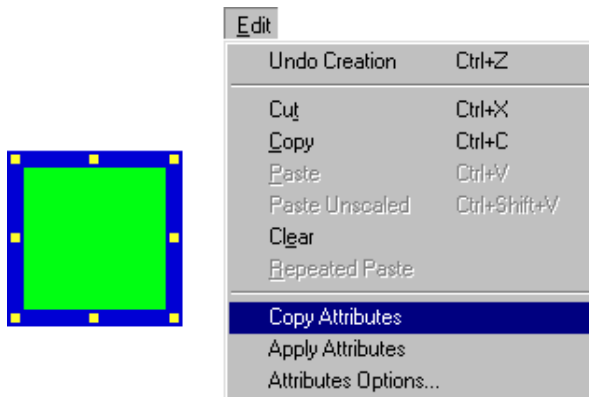


2. Click the Object Fill, Pen Model, Object Information and Parallel Fill boxes to specify that these attributes should be applied to objects. Settings remain as specified until changed or until the application is closed, rather than just for the next use of the tool.

Copying attributes using the Edit menu

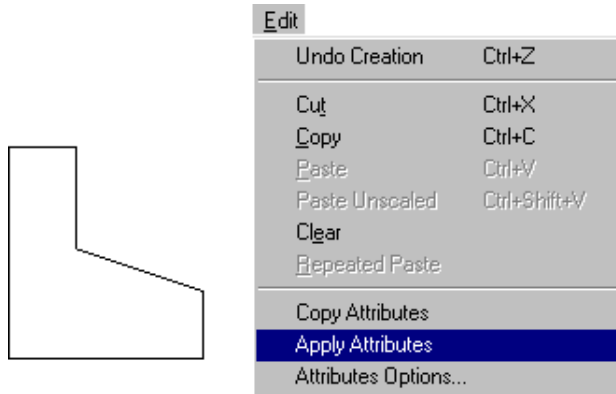
To copy attributes using the Edit menu:

1. Select the object from which you want to copy attributes.
2. Open the Edit menu and choose Copy Attributes.

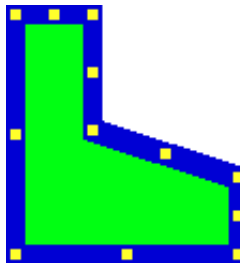


The object's graphical attributes and object information will be stored.

3. **Select the object or objects to which you want to apply these attributes.**
4. **Open the Edit menu and choose Apply Attributes.**



The copied attributes will be applied to the selected object or objects.



NOTE: The apply action can be undone by choosing Undo Apply Attributes from the Edit menu immediately after the apply action.

Checking and changing the attributes before applying them

As when using the Attributes tool, there are two ways of checking and changing the attributes before applying them when you use the Edit menu. You can use the Apply Attributes dialog, or use the Attributes Options dialog.

Using the Apply Attributes dialog

To open the Apply Attributes dialog before applying attributes to an object:

1. **Hold down the Shift key when you choose the Apply Attributes command in the Edit menu.**

The Apply Attributes dialog appears.

2. **Click the Object Fill, Pen Model, Object Information and Parallel Fill boxes to specify that these attributes should be applied to the selected object or objects. Any changes made to the Apply Attributes dialog relate to this apply action only.**

Using the Attributes Options dialog

To open the Attributes Options dialog:

1. **Choose Attributes Options from the Edit menu.**

The Attributes Options dialog appears.

2. **Click the Object Fill, Pen Model, Object Information and Parallel Fill boxes to specify that these attributes should be applied to objects. The settings remain as specified until changed or until the application is closed, rather than just for the next use of the Apply Attributes command.**

Picture backgrounds

There may be occasions when you position a picture object on top of another object, and want the lower object to show through the background of the foremost object. PC Draft allows you to do this using the Fill Pattern pop-up menu in the Attributes palette.

Transparent picture backgrounds

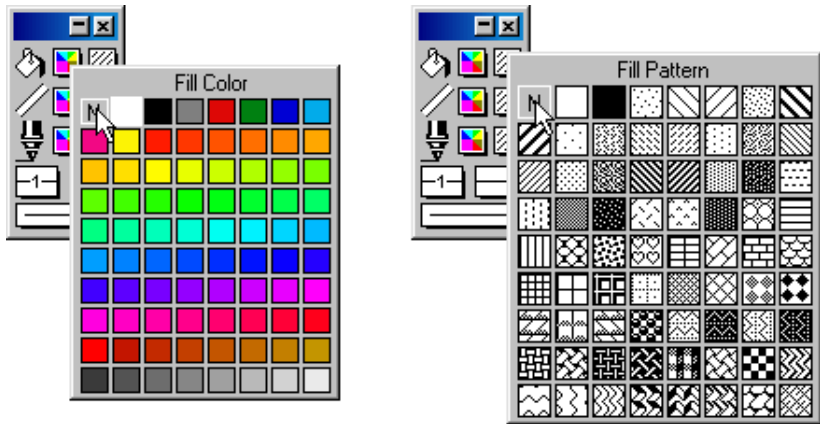
To make the background of a superimposed picture transparent:

1. **Select a superimposed picture.**

In the example below, a stylized picture of the sun has been placed on top of a picture of the world map. Note that the opaque white background of the sun picture is obscuring part of the map.



2. Choose 'N' (for 'No Fill') from the Fill Color pop-up menu, or 'N' (for 'No Fill') from the Fill Pattern pop-up menu in the Attributes palette.



The background of the foremost picture becomes transparent, allowing the picture beneath to be shown through.



Opaque picture backgrounds

The background of a picture can be given a colored or patterned fill in the same way as other objects. Select the picture and choose a color from the Fill Color submenu or a pattern from the Fill pattern submenu in the Attributes palette.

Chapter 4

Annotating Your Drawing

Annotating Your Drawing

Annotation describes or gives information about an object in a drawing. In PC Draft, annotation is of three kinds: **text**, **area calculation**, and **dimension objects**. Text, in a PC Draft document, consists of all letters, punctuation, and numbers. Once text is created, it is recognized as a single object and you can then use most functions with it, such as moving and duplicating.

The **Text function** allows you to use a variety of fonts, styles, and character sizes. You can arrange text lines with single spacing, one and a half spacing, or double spacing. Text can also be justified to the left, center, or right within each individual text block.

Entering Text

You can enter text in two ways: using the regular text mode or the paragraph text mode. In the regular text mode, you click on the drawing to define an insertion point, then type in the text. You define the end of a line of text by pressing the Enter key. In the paragraph text mode, you drag to define a text rectangle of a certain size (either with the Text tool or another drawing tool), and the text you enter into the rectangle automatically “wraps” when it reaches the side of the rectangle.

Entering Regular Text

To enter regular text, that is, text that does not automatically “wrap”:

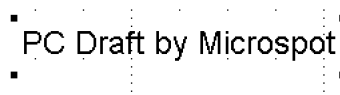
1. **Activate the Text icon in the palette by clicking on it.**

You will notice that when you activate the text icon and then move the cursor onto the drawing area, the cursor changes into an I-beam pointer. The I-beam pointer indicates that you are in the text insertion mode.

2. **Position the I-beam pointer where you want to begin inserting text.**
3. **Click the left mouse button.**

A flashing vertical bar will appear at the point where you clicked to show that you can now begin typing.

4. **Enter the text by typing on the keyboard.**



You can continue to enter text in various places on your drawing by moving the I-beam pointer to the desired place, clicking the left mouse button, and typing.

If you make a typing mistake as you are entering text, simply use the Delete key to remove the error and then type the correct character. To start a new line in the same text block, just press the Enter key and continue to type.

5. After you have finished entering text, click on the Pointer tool.

Entering Paragraph Text

On many occasions, you may wish to enter a paragraph of text and restrict it to a certain rectangular shape, such as a column. PC Draft's paragraph text feature allows you to define a rectangle of any size, then type text into it. As you enter the text into the rectangle, the words will automatically wrap around to the next line when the letters reach the edge of the rectangle. If you type to the bottom of the rectangle, the text will scroll within the rectangle to keep the line you are typing visible. Paragraph text cannot extend beyond the drawing edge.

You can define the paragraph text rectangle by drawing a rectangle with the Text tool, by drawing a rectangle or other object, or by selecting an existing rectangle or other object. (If you draw or select a non-rectangular object and start typing, the text will appear in a rectangle superimposed over the object.)

To use the paragraph text feature with the Text tool:

- 1. Activate the Text tool.**
- 2. Position the I-beam pointer where you want to begin entering text.**
- 3. Press down the left mouse button.**
- 4. Holding down the left mouse button, drag in a diagonal direction until you have defined a rectangle that is the size you want.**



5. **Release the left mouse button.**
6. **Start entering text from the keyboard.**

7. **When you are done, click on the Pointer tool to end the text entry.**

To use the paragraph text feature with the Rectangle tool (or other drawing tool):

1. **Activate the Rectangle tool (or other drawing tool).**
2. **Position the pointer where you want to begin entering text.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag in a diagonal direction until you have defined an object that is the size you want.**
5. **Release the left mouse button.**



6. **Start entering text from the keyboard.**
7. **When you are done, click on the Pointer tool to end the text entry.**

NOTE: The text and the object you drew to locate the text are separate objects; you can move and reshape them separately.

To use the paragraph text feature with an existing rectangle or other shape:

1. **Select the object.**
2. **Start entering text from the keyboard.**

3. When you are done, click on the Pointer tool to end the text entry.

NOTE: The text and the object you selected to locate the text are separate objects; you can move and reshape them separately.

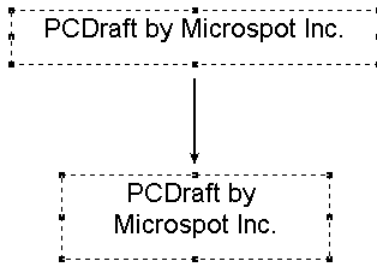
Reshaping a Block of Paragraph Text

Once the paragraph of text is entered, you can reshape the paragraph using the edit handles. To reshape the paragraph:

1. Return to the pointer mode.
2. Select the paragraph of text by clicking on it.

Edit handles should appear on the text block.

3. Position the tip of the pointer on one of the edit handles.



4. Press down the left mouse button.
5. Holding down the left mouse button, drag until the paragraph is the shape you want.
6. Release the left mouse button.

Selecting Text for Editing

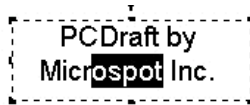
Sometimes you will want to edit text you have previously entered on your drawing. PC Draft has three ways to edit text: replacing an existing word or line of text by selecting it and retyping in its place; inserting characters or words at any selected point in the text; and backspacing to delete text.

Before you can edit a piece of text, you must select it. You can select text by using the pointer while in the pointer mode, or by using the I-beam pointer. (When you select text using the pointer mode, any changes you make will affect the entire text block.)

Using the I-Beam Pointer

To select text using the I-beam pointer:

1. Click on the Text tool icon in the palette.
2. Position the I-beam pointer to either side of the text you want to change.
3. Press down the left mouse button.



4. Holding down the left mouse button, drag through all the text you want to edit.
5. Release the left mouse button.

Notice that the text becomes highlighted as you drag through it. Using this method of selecting allows you to select a single character or an entire block of text.

Selecting a Word

You can select an individual word by double-clicking on it.

To select a word:

1. Position the I-beam pointer on the word you want to select.
2. Double-click the left mouse button.

Extending the Selection of Text

Once you have double-clicked on a word, you can extend the selection to include other words in the text block by following these steps:

1. After the second click, hold the left mouse button down.
2. Drag through the text until all the words you want to select are highlighted.
3. Release the left mouse button.

Selecting a Range of Text

You can select a range of text in a block, including multiple lines of text, by using the Shift-click method.

To select a range of text:

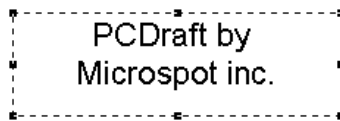
1. **Position the I-beam pointer at the starting point for the range.**
2. **Click the left mouse button.**
3. **Press down the Shift key.**
4. **Position the I-beam pointer on the ending point for the range.**
5. **Holding down the Shift key, click the left mouse button.**
6. **Release the left mouse button and the Shift key.**

The text between the specified starting and ending points will be selected.

Using the Arrow Pointer to Select Text

To select text using the arrow pointer:

1. **Position the pointer tip on the block of text that you want to select.**



2. **Click the left mouse button.**

Notice that a rectangle and/or a set of edit handles appears around the text, indicating that it is selected. This method of selecting text allows you to change the text attributes (including the font, size, and style) of the selected text block.

Selecting Rotated Text for Editing

To select rotated text:

1. **Activate the Text tool in the palette.**
2. **Click on the block of rotated text you want to edit.**

The text will temporarily be rotated to zero degrees (horizontal orientation) to allow you to edit it.

When you are through editing the text:

3. Click on the Pointer tool.

Once you click on the Pointer tool, the text will return to its rotated position.

NOTE: If you print rotated text on most printers that are not PostScript®-compatible, the text will print out at the resolution of the printer hardware.

Selecting All Text

You can select all the text on the active layer if you want to make a global change to text attributes. This feature is useful if you change the scale of the drawing and then want to change the size of the text to make it conform with the new scale.

To select all the text on the active layer:

- 1. Return to the pointer mode.**
- 2. Open the Text menu and choose Select All Text.**

Hiding All Text

At times, you may want to temporarily remove the display of all text from the document. If you choose to hide the text and then print or plot the document, the text will not appear on the output. You might use this feature to hide all the text before you generate a test plot of a drawing to shorten the plotting time. If you are working on a complex drawing with many elements, you could use this feature to minimize the amount of time it takes to redraw the screen after you scroll or zoom.

To hide all text:

- Open the Text menu and choose Hide Text.**

All the text on the drawing will be temporarily removed from the screen and from any output until you choose to re-display the text. A check mark will appear beside Hide Text in the Text menu.

Redisplaying All Text

When you want to make the text appear on the screen and on your output, you can choose the Hide Text command again.

To redisplay all text:

- **Open the Text menu and choose Hide Text (with the check mark).**

The check mark will disappear from beside Hide Text in the Text menu, and the text in the drawing will be visible.

Replacing Existing Text

Once you have selected any portion of text, you can immediately replace it by simply typing in the new text. As soon as you begin typing, the old text will disappear. As you enter the new text, all of the non-selected text in the line will automatically adjust to make room for the text you are entering.

Inserting Text Into Existing Text

On many occasions you will want to insert a single character, a word, or a sentence into an existing piece of text.

To insert text:

1. **Activate the Text tool in the palette by clicking on it.**
2. **Position the I-beam pointer on the desired insertion point.**
3. **Click the left mouse button.**
4. **Type in the character or words that you wish to insert. (Keep in mind that you can press the Delete key to backspace over characters or words.)**

In this mode, you can continue to pick insertion points in other pieces of text on your drawing and edit them as well.

Once you have completed all the editing that you want to do:

5. **Click on the Pointer icon in the palette.**

Deleting Selected Text

There are two simple ways to delete text that you have selected. You can either:

- **Open the Edit menu and choose Cut or Clear**

or,

- Press the **Delete** key

Changing the Appearance of Text

You can choose the way you want to present text either prior to entering the text, or by changing the text after it has been entered. There are many options to choose from to obtain the effect that you desire. PC Draft allows you to use many different font types, sizes, and styles for text.

Determining Font, Style, and Size Before Text Entry

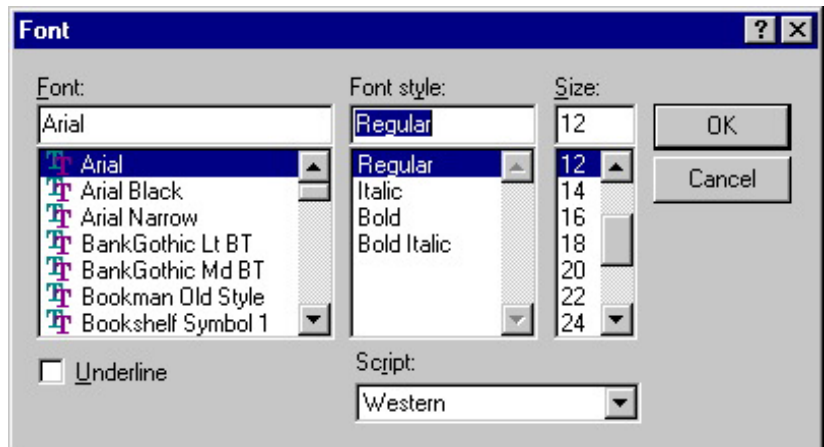
To define attributes for text before you enter it:

- Make sure that no text is selected on the drawing before you make each choice.

To define the font, size and style:



1. Open the text menu and select **Font**.



2. **Select the font, size and style that you want.**
3. **Click on the OK button.**

After you have made your choices for text:

1. **Activate the Text icon in the palette by clicking on it.**
2. **Position the I-beam pointer where you want to add text.**
3. **Click the left mouse button.**
4. **Enter the text on your drawing.**

Changing the Appearance of Existing Text

You can change the font, size, and style of any existing text. You can check to see which attributes a given piece of text possesses by selecting the text and the submenu associated with the attribute of interest.

To assign an attribute to text on the drawing:

1. **Select the text you wish to change. (You can select and change single characters using the Text tool's I-beam cursor, or all the words in a text block using the pointer.)**
2. **Choose the text attributes you want from the Text menu's Font.**

Each time you make a choice from the Text menu, the selected text will change to reflect that choice.

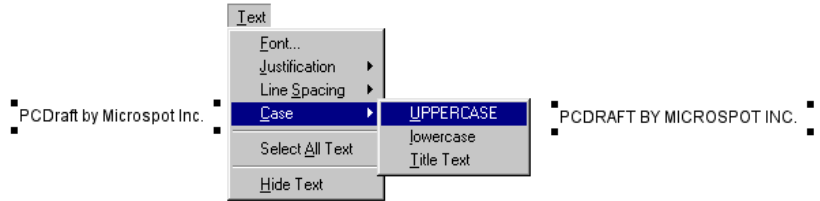
Changing the Case of Text

On some occasions you may enter a piece of text in one case, such as lowercase, and then decide that you want it in uppercase or in title format. You could clear the text and re-enter it; however, PC Draft offers you the ability to change the case of existing text.

To change the case of text:

1. **Select the text that you want to change by clicking on it.**
2. **Open the Text menu's Case submenu.**

3. Drag until the case option you want is highlighted.



The results of each choice are as follows:

UPPERCASE: Converts all selected text to uppercase.

lowercase: Converts all selected text to lowercase.

Title Text: Capitalizes the first character of each word in selected text.

Choosing Line Spacing

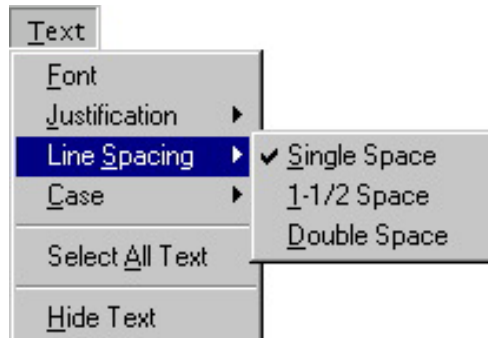
PC Draft offers you flexibility in choosing line spacing (also called “leading”) options to suit your needs. You can have one, one and a half, or two spaces between lines of text. You can choose the line spacing attribute prior to entering text, or you can change the spacing on existing text.

Choosing the Line Spacing Before Entering Text

To choose the line spacing prior to entering text:

- 1. Make sure that no text is selected on the drawing.**
- 2. Choose Line Spacing from the Text menu.**

The Line Spacing submenu will appear.



3. Drag the cursor until the line spacing you want is highlighted.
4. Click the left mouse button.
5. Enter text as you would normally.

Changing the Line Spacing of Existing Text

To change the line spacing of existing text:

1. Select the block of text to be changed by clicking on it.
2. Choose Line Spacing from the Text menu.

The Line Spacing submenu will appear.

3. Drag the cursor until the line spacing you want is highlighted.
4. Click the left mouse button.

Moving Text

Once you have created a block of text, you can move it to a different location on your drawing if you want. Notice that when you create a line of text and then click anywhere else, the text becomes surrounded by a box or edit handles. This indicates that PC Draft recognizes the piece of text as an object. You can move the text just as you would move any other object.

To move a piece of text:

1. Point on the text block.
2. Press down the left mouse button and hold it until the white arrow pointer appears.

3. Drag the text to its new position.

4. Release the left mouse button.

Aligning Text

There are two ways to align text: justifying a line of text with another line during text entry; and aligning text with an object or another piece of text that is treated as an object.

Justifying Text During Text Entry

To justify text as you enter it:

- 1. Make sure that no text is selected on the drawing.**
- 2. Open the Text menu's Justification submenu.**
- 3. Drag until the type of justification you want (Left, Center, or Right) is highlighted.**
- 4. Click the left mouse button.**
- 5. Activate the Text tool by clicking on it.**
- 6. Click where you want the text to appear.**
- 7. Begin typing.**

Notice that each time you press the Enter key, the next line of text is justified according to your choice (Left, Center, or Right).

You can change the justification of an existing text block by selecting the text block and then choosing the justification option you want from the Text menu's Justification submenu.

Aligning Text as an Object

To align text with another piece of text or an object:

- 1. Select the piece of text to be aligned by clicking on it.**
- 2. Open the Arrange menu and choose Alignment Options .**

3. **Once the Alignment dialog box is displayed, choose the alignment method you want.**
4. **Click on the OK button.**
5. **Click on the object with which you want the text block aligned.**

Once you have clicked on one of the text blocks, all selected text and objects will snap into alignment with the text on which you clicked according to the specified alignment attribute.

For more information on using the Align command, see the section called “Aligning Objects,” beginning in Chapter 5.

Dimensions

PC Draft’s **Dimension** tools allow you to add dimension lines to your drawing so that you can display and print the sizes of (or distances between) various lines and objects. Dimensions display sizes and distances in real-world units according to the scale of the drawing.

Dimension lines in PC Draft show the distance between two points on the drawing. If you change the length of the dimension line, the value associated with it will be updated to reflect the new length, according to the current scale.

In addition, PC Draft can show and print the size of an angle. **Angular dimensions** appear in degrees of arc, regardless of the scale of a drawing. Like dimension lines, angular dimension objects display updated values after editing.

PC Draft’s **dimensions** are specialized objects that can incorporate a range of recognized drafting formats and standards, including witness lines, extension gaps, and so on.

Linked dimensions

Dimension objects that are drawn with reference to object vertices will be linked to those points by default. This means that if the object is resized, the dimension object and the value associated with it will be updated to reflect the new size.

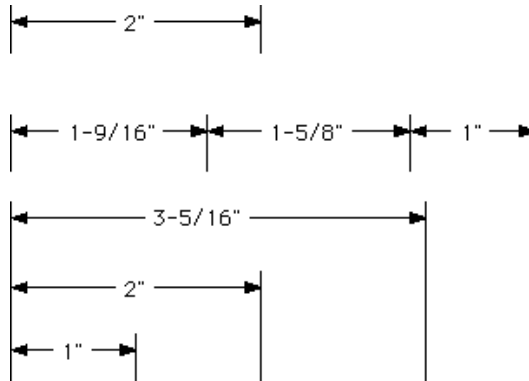
Object vertices and dimension objects can be linked and unlinked using some of the tools in the Accessory palette.

Types of Dimension Objects

The dimension objects are created and controlled using the tools and popout menus of the **Dimension Palette**. The Dimension Palette can be displayed using the View menu's Palettes submenu.

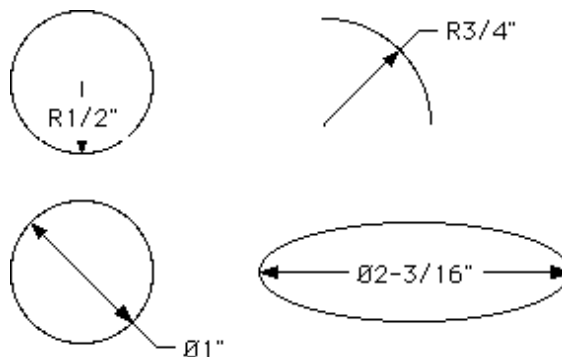
The dimension tools can create **linear** (horizontal, vertical, sloped, or perpendicular), **radial** (radius or diameter), and **angular** dimensions.

Linear dimensions can consist of a single dimension span, several dimensions chained together, or several dimensions measured from the same baseline, as shown below.



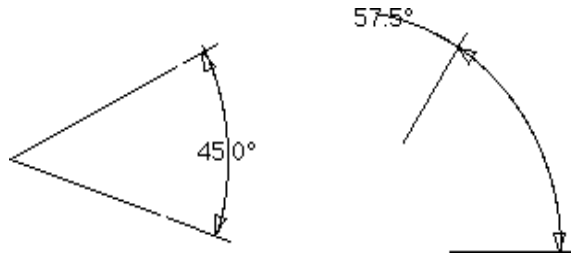
Linear dimensions are created independently of existing objects, but can use existing vertices, corners, and so on as their points of reference. If the Snap to Object feature is active, the dimension tools will snap the reference points to existing corners and handles.

Radial dimensions appear as straight lines (like linear dimensions), but measure the radius or diameter of an existing circle, ellipse, or arc.



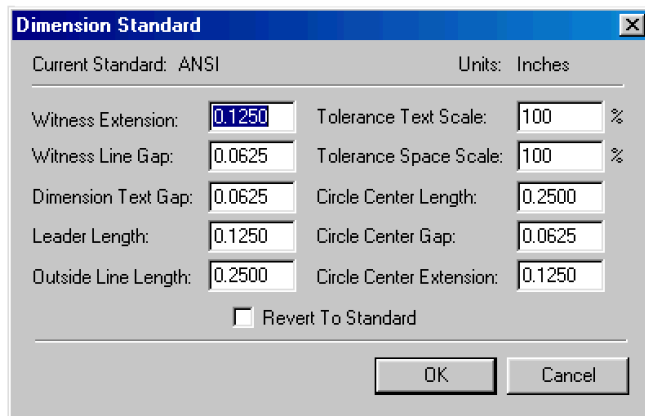
Angular dimensions measure the angle of arc between any two straight lines or edges of square-cornered rectangles, polygons, or polylines (single-line or parallel). The lines or edges need not intersect.

In addition to the three types of dimension tools, PC Draft includes a Circle Center mark tool, for marking the center of a circle, arc, or ellipse.

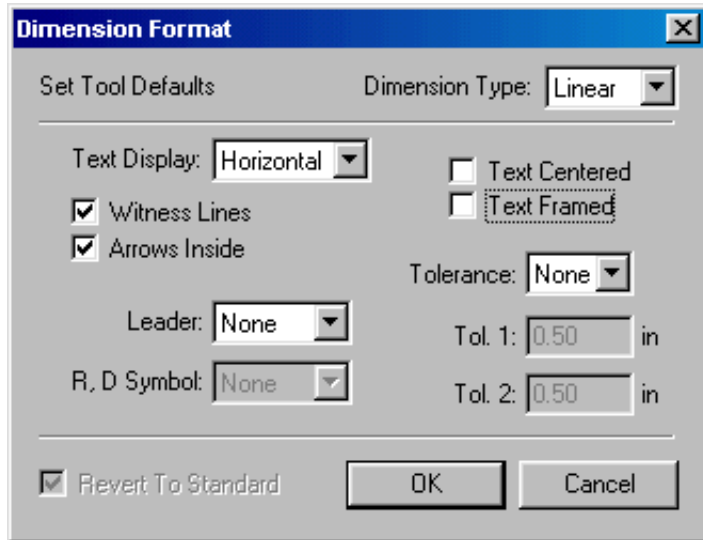


Dimension Standards and Formats

PC Draft follows recognized drafting and design standards for dimensioning in English units (as mandated by the American National Standards Institute, or ANSI) and metric units (matching the BS-308, DIN, ISO, and JIS standards). These standards, which you can modify in PC Draft to meet your own needs, control the sizes and lengths of such dimension elements as witness lines, leader lines, gaps between elements, and so on. A drawing's dimension standards are displayed and set using the Dimension Standards dialog box (see below), which is opened using the Dimension Standards: Custom button in the Set Scale/Units dialog box.



PC Draft also allows you to control the formats of dimension objects. You can define whether a dimension object's text is displayed horizontally, how dimension arrows are positioned, where (and whether) leader lines appear, and so on. The Dimension Format dialog box is opened using the Format button in the Dimension palette.



The use of each element in the Dimension Format dialog box is detailed beginning on page 4-25.

Standards

Although PC Draft's dimension standards follow approved guidelines for English-unit and metric drawings, you can adjust them to meet your own needs.

These attributes are controlled using the Dimension Standards dialog box. They can be adjusted for selected dimension objects or defaults, to determine the attributes for dimension objects drawn subsequently.

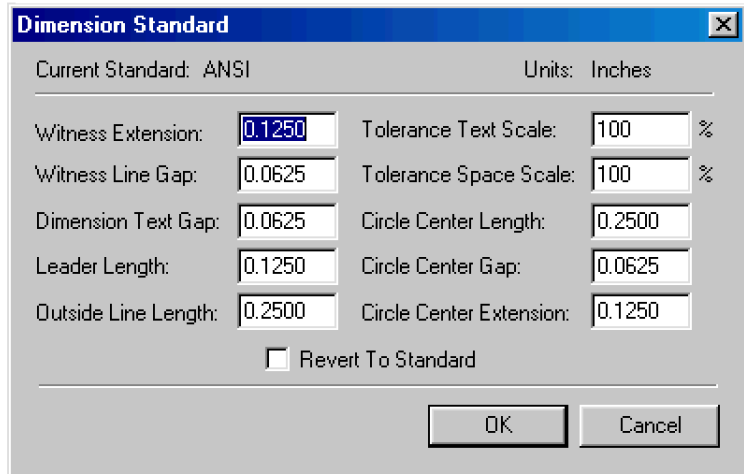
To change the dimension standard defaults for a drawing:

1. **Open the Layout menu and choose the Set Scale/Units command.**

The Document Scale & Units dialog box will appear.

2. **Click the Dimension Standard: Custom button.**

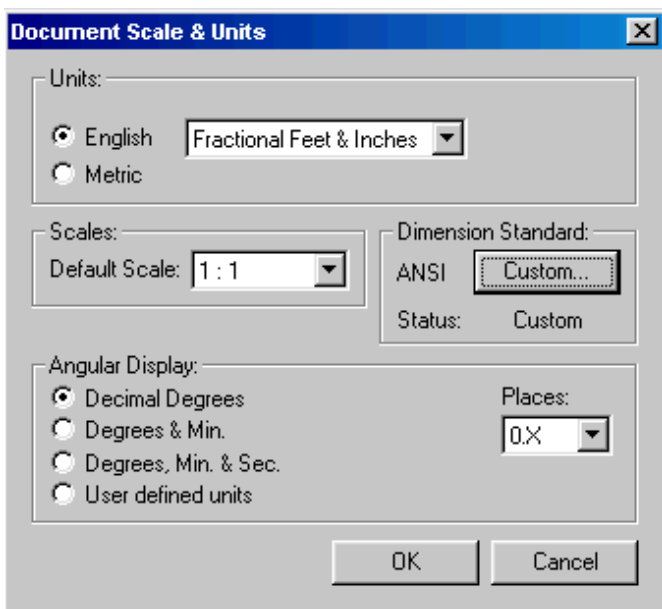
The Dimension Standards dialog box will appear.



3. Click and type in the appropriate fields to change standards as needed.

4. Click the OK button.

The Document Scale & Units dialog box will appear again. The Dimension Standard: Status field will now read “Custom.”



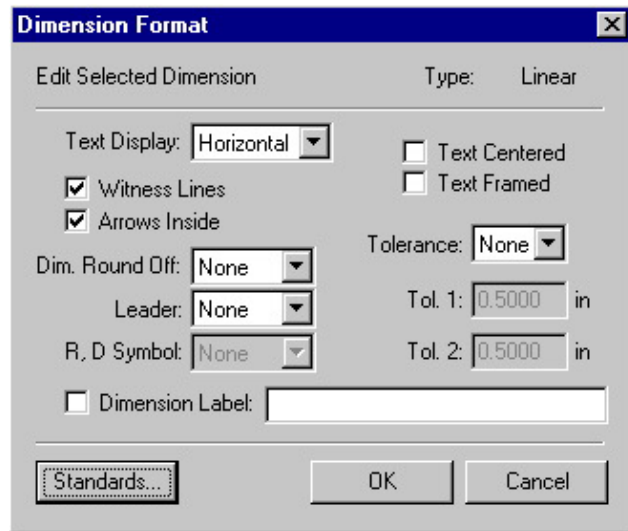
5. Click the OK button.

The dimension standards you revised will now be the standards for all new dimension objects.

To Change the Dimension Standards for Existing Dimension Objects:

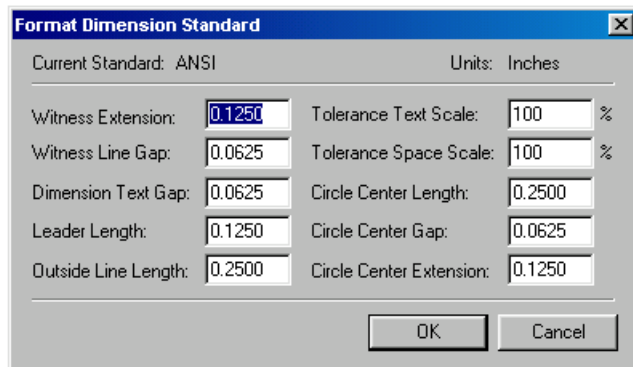
1. Select the dimension object or objects.
2. Click the Format button in the Dimension palette.

The Dimension Format dialog box will appear.



3. Click the Standards... button

The Dimension Standards dialog box will appear.



3. **Click and type in the appropriate fields to change standards as needed.**
4. **Click the OK button.**

The Dimension Format dialog box will appear again.

5. **Click the OK button.**

The dimension objects you selected will now appear revised as you specified. For details on the effects of each standard attribute, see the following section.

Dimension Standard Attributes

Witness Extension

The Witness Extension is the length the witness line extends beyond the dimension line itself. (Units indicate distance on screen and on the printed drawing, not in scaled units.)

Witness Line Gap

The distance from each reference point to the beginning of its witness line. (Units indicate distance on screen and on printed drawing, not in scaled units.)

Dimension Text Gap

The distance from any side of the dimension text to the dimension line or arc. (Units indicate distance on screen and on printed drawing, not in scaled units.)

Leader Length

The length of the leader line connecting the dimension text to the dimension line or arc. (Units indicate distance on screen and on printed drawing, not in scaled units.)

Outside Line Length

The length of the lines indicating a linear dimension when the dimension object is formatted so that the lines are outside the witness lines, pointing “inward.” (Units indicate distance on screen and on printed drawing, not in scaled units.)



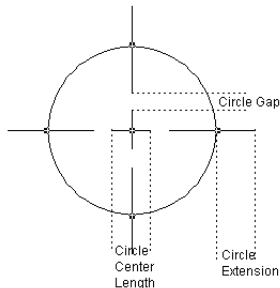
Tolerance Text

A percentage value determining the point size of tolerance text (if any) relative to the dimension value text. Values can range from 25% (one-fourth the size of the dimension text) to 200% (twice the size of the dimension text).

Tolerance Space Scale

A percentage value determining the line spacing when two lines of tolerance value text appear together (either two tolerance values or tolerance limits). The percentage is relative to the size of tolerance text itself, and ranges from 25% (one-fourth of a line) to 200% (two lines, or double spacing). Since a 100% setting single-spaces the text, values less than 100% percent may result in overlapping, depending on the font chosen for the dimension object.

Circle Center Length, Gap, and Extension



These settings determine the size attributes of the Circle Center mark (made with the Circle Center mark tool), as shown.

Although the values are given in screen units rather than scale units, Circle Center marks will change size as appropriate if a whole drawing is rescaled.

Revert to Standard

Clicking this check box instantly returns all the settings in the dialog box to the ANSI or Metric standard values.

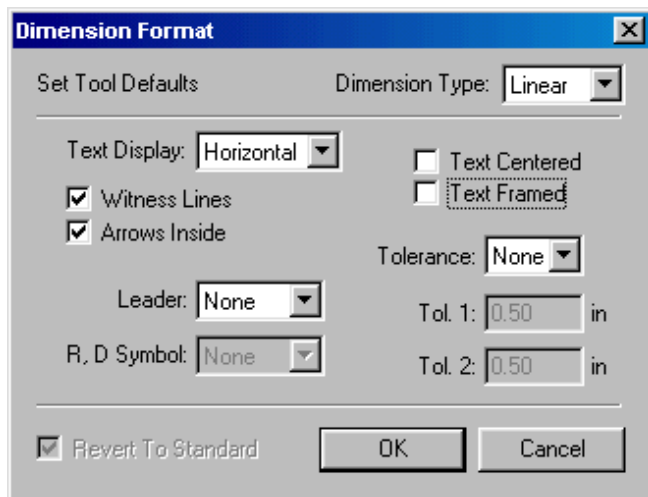
Formats

Some of the display attributes for dimension objects can be adjusted for existing dimensions. These attributes are controlled using the Dimension Format dialog box. They can also be adjusted as drawing defaults, to determine the attributes for dimension objects drawn subsequently.

To change dimension format defaults for a whole drawing:

1. **Make sure no objects are selected by clicking on a blank area of the drawing.**
2. **Click the Format button in the Dimension palette.**

The Dimension Format dialog box will appear.



3. **From the Dimension Type pop-out menu, choose the type of dimension (Linear, Radial, or Angular) that you want to change.**

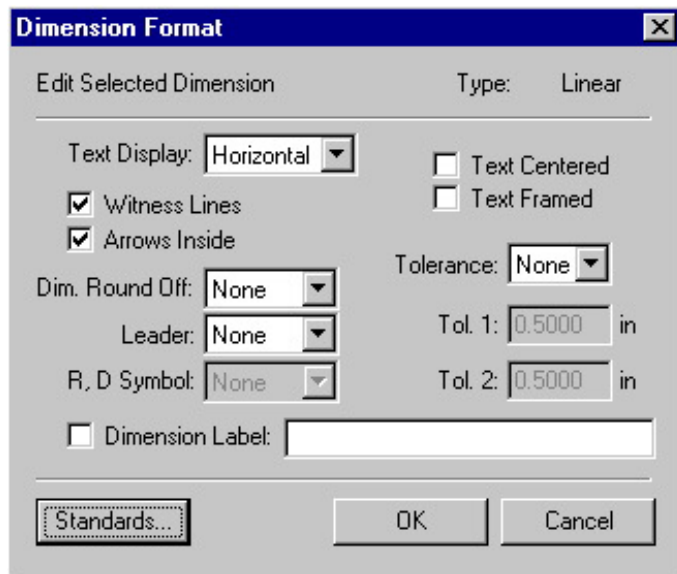
4. **Adjust the settings as needed.**
5. **If you want to set defaults for more than one dimension type, repeat steps 3 and 4.**
6. **When you are done, click the OK button.**

The dialog box will disappear, and the formats you revised will now be the defaults for all new dimension objects.

To change the dimension formats for existing dimension objects:

1. **Select the dimension object or objects.**
2. **Click the Format button in the Dimension palette.**

The Dimension Format dialog box will appear.



3. **Adjust the settings as needed, then click the OK button.**

The dialog box will disappear, and the selected objects will be changed as you specified.

For details on the effects of each format attribute, see the following section.

**Dimension
Format
Attributes**

Dimension Type

If no object is selected, this pop-out menu controls which type of dimension object tool's defaults are adjusted: linear, radial, or angular.

Text Display

This pop-out menu controls whether dimension text is displayed horizontally on the drawing, or along, above, or below a dimension, extension, or leader line.

Text Centered

Controls whether dimension text is centered on a dimension line or dimension arc.

Text Framed

Controls whether dimension text appears within a frame.

Witness Lines

Controls whether witness lines are displayed.

Arrows Inside

Controls how end marks (usually arrowheads) appear on dimension objects.

Round Off

Controls whether dimension values are rounded off. (The values available for rounding off are in the scale and units of the drawing.)

Leader

Applicable only when dimension text appears horizontally outside a dimension object, this item controls whether a leader line extends from a dimension line to the left or to the right.

R, D Symbol

Applicable only to radial dimensions, this item controls whether the radius or diameter symbol leads or follows the dimension value.

Tolerance

This pop-out menu controls how many tolerances are displayed: None; One, for a single “plus/minus” value determined by the Tol. 1 field below; Two, for a “plus” value from the Tol. 1 field and a “minus” value from the Tol. 2 field (as in “333 cm +1cm -2cm”); or Limits, for two dimension values calculated from the Tol. 1 and Tol. 2 fields in place of original dimension value (as in “331 cm / 334 cm” in place of “333 cm”).

Tol. 1, Tol. 2

These fields control the default values for tolerance displays, as described above.

Dimension Label

When this box is checked, you can replace an existing object’s dimension text with a text string of your own choosing. Any tolerances will be hidden if this option is chosen.

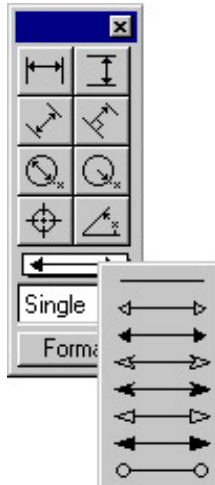
NOTE: If you need to type an angular degree symbol (°) in the label, use Alt-248.

Dimension End Marks

PC Draft’s dimension lines and dimension objects can have end marks, usually arrows or slashes at the ends of a dimension line. The end marks for dimension objects are controlled by the pop-out menu near the bottom of the Dimension palette; the end marks for ordinary lines are controlled by the End Marks popup menu in the Attribute palette, as described in Chapter 3.

With both dimensions, you can specify different end marks for each end of the line. To change the end marks of an existing dimension object:

1. Select the object.
2. Move the cursor to the Dimension palette's End Marks pop-up menu and click the left mouse button.

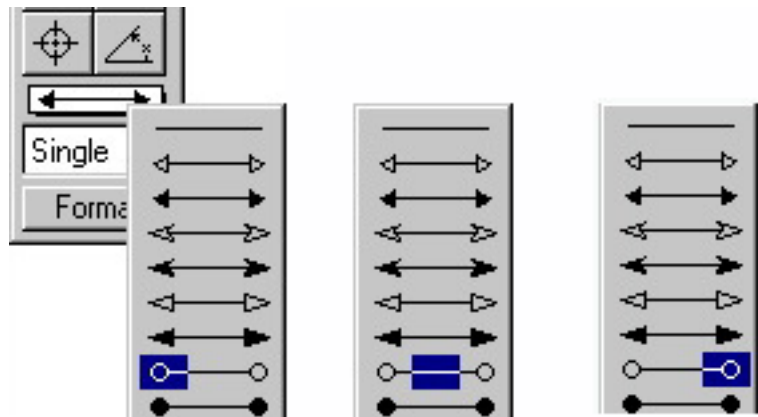


The pop-out menu will open.

3. Move the cursor to highlight the desired end marks: Highlight the left end for the end mark to appear at the start of the line or arc, the right end for it to appear at the finish of the line or arc, or in the middle for it to appear at both ends.

4. Click the left mouse button.

The end marks you specified will appear on the object.



To change the end marks before drawing dimension object.

1. Make sure nothing is selected.
2. Move the cursor to the Dimension palette's End Marks pop-out menu and click the left mouse button.

The pop-out menu will open.

3. **Move the cursor to highlight the desired end marks: Highlight the left end for the end mark to appear at the start of the line or arc, the right end for it to appear at the finish of the line or arc, or in the middle for it to appear at both ends.**

4. **Click the left mouse button.**

The end marks you specified will appear on any new dimension objects you draw.

Drawing Dimension Objects

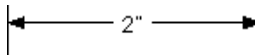
PC Draft's dimension objects include linear (horizontal, vertical, sloped, or perpendicular), radial (radius or diameter), and angular dimensions. The creation of each type is detailed over the following pages.

Once created, dimension objects can be independently resized and edited much like other PC Draft shapes. In addition, their attributes, such as color, line style, text font, and so on can be controlled in the standard fashions. Different components of a dimension object can be treated independently once the object is disassembled using the Accessory palette's Break tool.

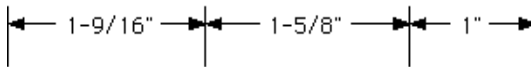
Linear Dimension Objects

PC Draft's linear dimension tools (horizontal, vertical, slope, and perpendicular) let you display and print distances between points, either in pairs (single dimensions), strung together (chained dimensions), or from a single starting point (baseline dimensions).

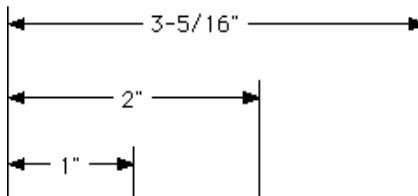
Single:



Chained:



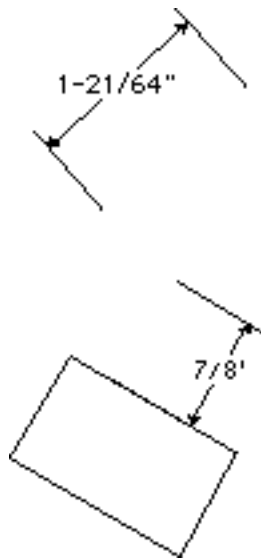
Baseline:



The user-defined reference points for linear dimensions can be either part of existing objects (on corners or edges) or independent points on the drawing.

To show an object's size precisely, it's usually necessary to put the dimension's reference points on the object's corner points (or other edit handles).

The horizontal and vertical dimension tools create dimension lines that are constrained to horizontal or vertical orientations. When edited, moved, or resized, horizontal and vertical dimension objects retain their original angles of orientation.



The slope dimension tool can create dimension lines running in any direction on a drawing. Slope dimensions can be edited, moved, or resized to any angle.

The perpendicular dimension tool creates dimensions perpendicular to lines or to the edges of square-cornered rectangles, polygons, and polylines (single-line or parallel). When edited, moved, or resized, perpendicular dimension objects retain their original angles of orientation.

Horizontal Dimension Objects

To create a single horizontal dimension line:



1. **Select the horizontal dimension tool from the Dimension palette.**

The cursor will now read “1st point.”

2. **Click the first point for the dimension line (on an object's corner, if desired).**

The cursor will now read “2nd Point.”

3. **Click the second point for the dimension line.**

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

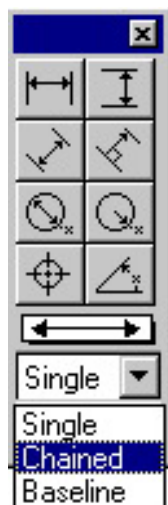
4. **Click on the drawing where you want the text value to appear.**

The dimension object will be complete, with the horizontal distance between the two points displayed where you specified.

To change the attributes of a horizontal dimension object, select the object, click the Format button in the Dimension palette, and change the various settings as required.

Chained Linear Dimensions

For all linear dimension tools, you can also draw a string (or chain) of linear dimension lines, one after the other.



To create a chain of linear dimension lines:

1. **Open the modes pop-out menu in the Dimension palette and choose Chained.**

2. Select a linear dimension tool from the Dimension palette.

The cursor will now read “1st point.”

3. Click the first point for the dimension line.

The cursor will now read “Next Point.”

4. Click the second point for the dimension line.

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

5. Click on the drawing where you want the text box to appear.

The distance between the first two points will appear, and the cursor will now read “Next Point.”

6. Click the next point for the dimension line.

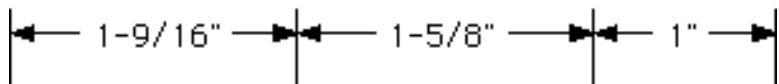
The cursor will read “Anchor” again.

NOTE: If you hold down the Shift key, you can constrain the placement of the next dimension text block to the same plane as the first segment’s text.

7. Click on the drawing where you want the next text box to appear.

The distance between the second and third points will appear, and the cursor will now read “Next Point.”

8. Continue as in steps 6 and 7 until you want to exit the dimension-drawing mode, then click the Pointer tool in the Tool palette.

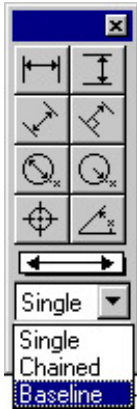


The dimension objects will be complete, with the appropriate distances between the various points displayed where you specified.

The Chained mode of the dimension tool creates a series of single dimension objects, which can be moved, resized, or edited independently.

Baseline Linear Dimensions

PC Draft lets you draw several linear dimension lines from one starting point.



1. **Open the modes pop-out menu in the dimension section of the Dimension palette and choose Baseline.**
2. **Select a linear dimension tool from the Dimension palette.**

The cursor will now read “1st point.”

3. **Click the first point for the dimension line. (This will be the base point for all the dimension objects created in this process.)**

The cursor will now read “Next Point.”

4. **Click the second point for the dimension line.**

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

5. **Click on the drawing where you want the text box to appear.**

The distance between the first two points will appear, and the cursor will now read “Next Point.”

6. Click the next point for the dimension line.

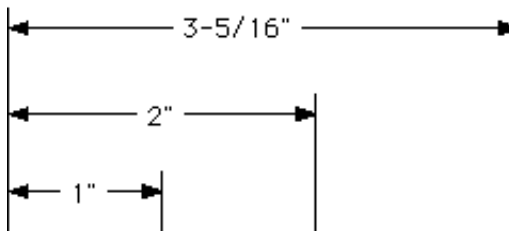
The cursor will read “Anchor” again.

7. Click on the drawing where you want the next text box to appear.

The distance between the first and third points will appear, and the cursor will now read “Next Point.”

8. Continue as in steps 6 and 7 until you want to exit the dimension-drawing mode, then click the Pointer tool in the Tool palette.

The dimension objects will be complete, with the appropriate distances from the first baseline point to the various other points displayed where you specified.



The Baseline mode of the dimension tool creates a series of single dimension objects, which can be moved, resized, or edited independently.

Vertical Dimension Objects

To create a single vertical dimension line:

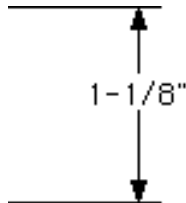


- 1. Select the vertical dimension tool from the Dimension palette. The cursor will now read “1st point.”**
- 2. Click the first point for the dimension line.**

The cursor will now read “2nd Point.”

3. Click the second point for the dimension line.

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.



4. Click on the drawing where you want the text value to appear.

The dimension object will be complete, with the vertical distance between the two points displayed where you specified.

You can also draw vertical dimension lines in a string (or chain) one after the other, or emanating from one starting point (or baseline); see the “Chained Linear Dimensions” and “Baseline Linear Dimensions” sections earlier in this chapter for details.

To change the attributes of a vertical dimension object, select the object, click the Format button in the Dimension palette, and change the various settings as required. (See pages 4-23 and 4-28 for information on the effects of the different dimension format and standards settings.)

Slope Dimension Objects

To create a single slope dimension line:

1. Select the slope dimension tool from the Dimension palette.

The cursor will now read “1st point.”



2. Click the first point for the dimension line.

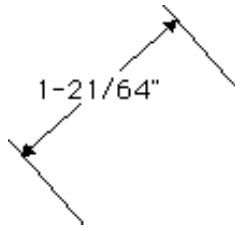
The cursor will now read “2nd Point.”

3. Click the second point for the dimension line.

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

4. Click on the drawing where you want the text box to appear.

The dimension object will be complete, with the distance along the slope between the two points displayed where you specified.



You can also draw slope dimension lines in a string (or chain) one after the other, or emanating from one starting point (or baseline); see the “Chained Linear Dimensions” and Baseline Linear Dimensions” sections earlier in this chapter for details.

To change the attributes of a slope dimension object, select the object, click the Format button in the Dimension palette, and change the various settings as required. (See pages 4-23 and 4-28 for information on the effects of the different dimension format and standards settings.)

PC Draft has a specific tool for creating dimension lines perpendicular to existing lines or to the edges of square-corner rectangles, polygons, or polylines (single-line or parallel).

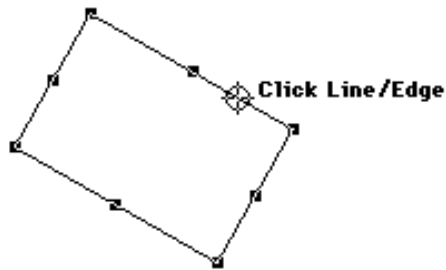
Perpendicular Dimension Objects

To create a perpendicular dimension line:



- 1. Select the perpendicular dimension tool from the Dimension palette.**

The cursor will now read “Click Line/Edge.”



- 2. Click the line or edge for the first point of the dimension line.**

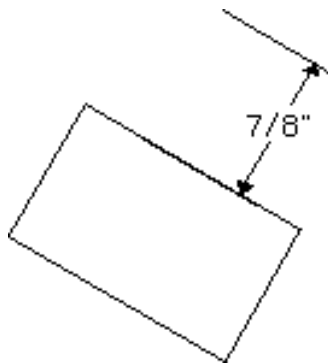
The cursor will now read “2nd point.”

- 3. Click the second point for the dimension line.**

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

- 4. Click on the drawing where you want the text box to appear.**

The dimension object will be complete, with the perpendicular distance from the edge of the object to the point you chose displayed.



NOTE: If you hold down the Alt key while drawing a perpendicular dimension line, its length will be constrained to increments of the current snap-grid distance.

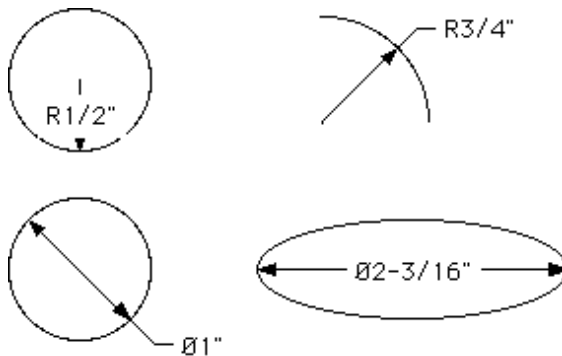
If you move, edit, or resize the perpendicular dimension line, it will retain its original orientation (its “perpendicularity”).

You can also draw perpendicular dimension lines in a string (or chain) one after the other, or emanating from one starting point (or baseline); see the “Chained Linear Dimensions” and “Baseline Linear Dimensions” sections earlier in this chapter for details.

To change the dimension attributes of a perpendicular dimension object, select the object, click the Format button in the Dimension palette, and change the various settings as required.

Radial Dimension Objects

PC Draft’s radial dimension tools let you display and print the radius or diameter of a circle, arc, or ellipse.



To apply a radial dimension to an object:

1. **Select the radial dimension tool from the Dimension palette.**



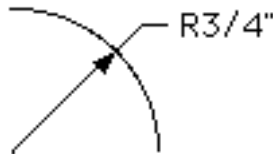
The cursor will now read “Click Circle/ Arc.”

2. **Click the circle, arc, or ellipse.**

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

NOTE: To constrain the angle of the dimension line to 45° increments, hold down the Shift key after selecting the circle, while clicking the anchor point where the dimension text is to appear.

3. **Click on the drawing where you want the text value to appear.**

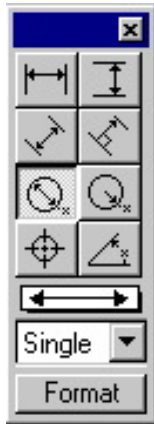


The dimension object will be complete, with the radial distance displayed where you specified.

Diameter Dimensions

Diameter dimensions are drawn in much the same manner.

To create a diametric dimension:



1. Select the diameter dimension tool from the Dimension palette.

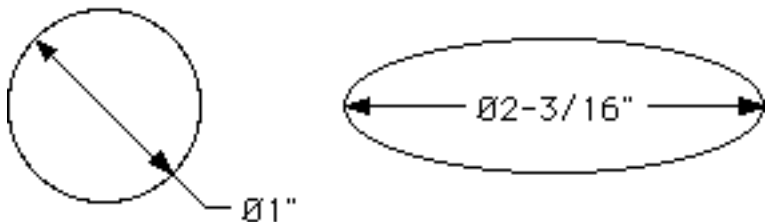
The cursor will now read “Click Circle/ Arc.”

2. Click the circle, arc, or ellipse.

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

NOTE: To constrain the angle of the dimension line to 45° increments, hold down the Shift key after selecting the circle, while clicking the anchor point where the dimension text is to appear.

3. Click on the drawing where you want the text box to appear.



The dimension object will be complete, with the diametric distance appearing where you specified.

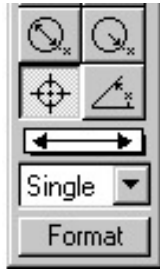
Circle Center Marks

PC Draft includes a special tool for indicating the center of circles, ellipses, and arcs. It appears in the Dimension palette.

NOTE: Circle Center marks cannot be applied to ellipses and elliptical arcs that have been rotated.

To apply a Circle Center mark:

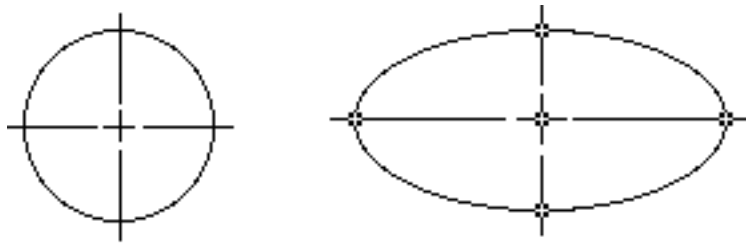
1. **Select the Circle Center Mark tool in the Dimension palette.**



The cursor will read “Click Circle/Arc.”

2. **Click the circle, arc, or ellipse.**

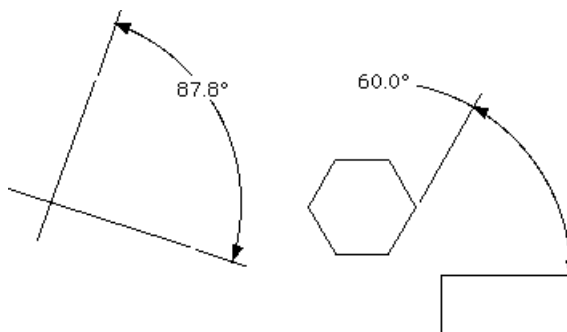
The Circle Center mark will appear over the object



The mark can be disassembled (using the Accessory palette’s Break tool) and edited if necessary. In addition, you can change the tool’s size defaults; see page 4-23 for details.

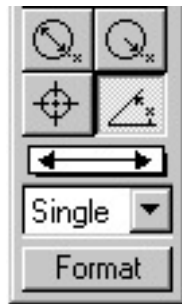
Angular Dimension Objects

PC Draft’s angular dimension tool lets you display and print the angles between different lines or edges, whether they intersect or not. You can apply an angular dimension object to any pair of straight lines or edges of square-cornered rectangles, or polygons or polylines (single-line or parallel).



To create an angular dimension:

1. **Decide which two lines or edges you want to apply a dimension object to.**



- 2 **Select the angular dimension tool from the Dimension palette.**

The cursor will now read “1st Line/Edge.”

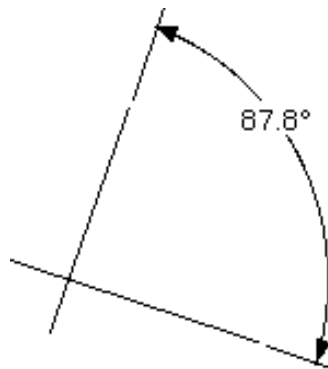
3. **Click the first line or edge.**

The cursor will now read “2nd Line/Edge.”

4. **Click the second line or edge.**

The cursor will now read “Anchor,” and include an outline of the dimension’s text box.

5. **Click on the drawing where you want the text value to appear.**



The dimension object will be complete, with the angle between the two edges displayed where you specified.

NOTE: To display the obtuse rather than acute angle between two lines or edges, hold down the Alt key after selecting the second edge, while clicking the point where the dimension text is to appear.

To change the attributes of an angular dimension object, select the object, click the Format button in the Dimension palette, and change the various settings as required.

Linking and unlinking dimension objects

Dimension objects that are drawn with reference to object vertices will be linked to those points by default. This means that if the object is resized, the dimension object and the value associated with it will be updated to reflect the new size.

Object vertices and dimension objects can be linked and unlinked using some of the tools in the Accessory palette. These tools can also be used to link object vertices with other object vertices in the same way.

Displaying the Accessory palette

To display the Accessory palette:

- **Select Accessory from the Palettes submenu in the View menu,**
- **or**
- **Select Accessory from the Window menu, or**
- **Select Accessory from the popup menu at the bottom left of the document window.**



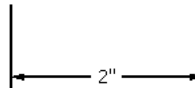
Dimension objects (and other objects) can be linked by positioning the dimension object on an object vertex and using the Link tool from the Accessory palette to link the two objects at that point. Once linked, a dimension object will be automatically updated if the object it is linked to is resized.

NOTE: Many dimension objects are automatically linked to object vertices when they are first drawn.

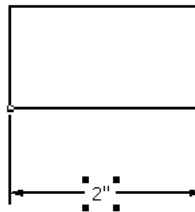
Link

To link objects:

1. Draw or locate the objects, or object and dimension object, to be linked.



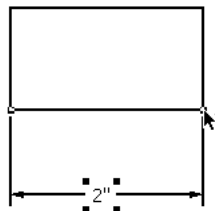
2. Position the objects so that a vertex point of one object is at the same location as a vertex point of the other object.



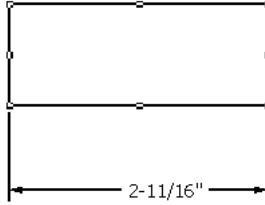
3. Open the Accessory palette (if necessary) and select the Link tool.

The cursor will display with a question mark next to it.

4. Click on the points that are to be linked.



The vertex point of the dimension object will be linked to the other object. If the object is resized the dimension object will be automatically updated.



Other vertex points can be linked in the same way.

Dimension objects (and other objects) can be unlinked from an object by using the Unlink tool from the Accessory palette to break the link between the two objects at a specific point. Once unlinked, a dimension object will not be updated if the object it was previously linked to is resized.

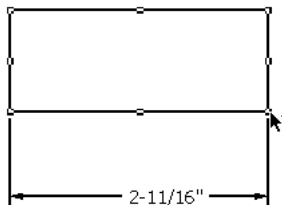
Unlink

To unlink objects:

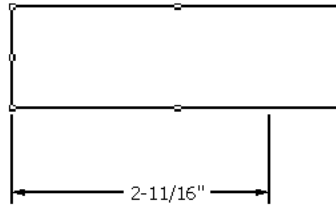
1. **Locate the objects, or object and dimension object, to be unlinked.**
2. **Open the Accessory palette (if necessary) and select the Unlink tool.**

The cursor will appear with a question mark next to it.

3. **Click on the points that are to be unlinked.**



The vertex point of the dimension object will be unlinked from the other object. If the object is resized the dimension object will not be updated.



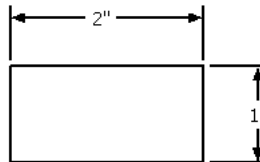
Other linked objects can be unlinked in the same way.

You can break all the links for an object by using the Unlink All tool from the Accessory palette to break all the links associated with a selected object. This will be faster than using the Unlink tool if an object is linked to another object at more than one point, or is linked to several different objects, and you want to remove all the links.

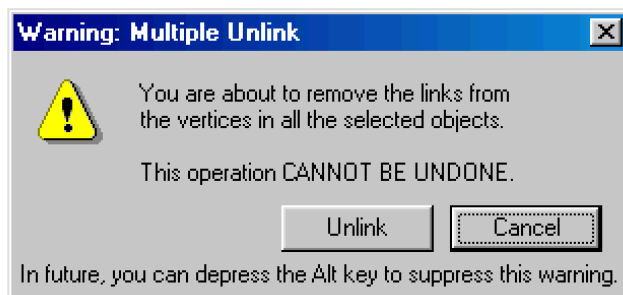
Unlink all

To break all an object's links:

1. **Select the object (or dimension object) you wish to remove all links from.**

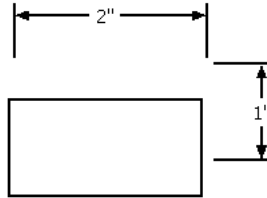


2. **Open the Accessory palette (if necessary) and select the Unlink All tool. An alert will appear warning that you are about to remove the all the links from the selected objects.**



3. Click Cancel to return to the drawing without removing the links, or click Unlink to remove all the links from the selected objects.

If you click Unlink, all the links will be removed from the selected object. If dimension objects were selected, or linked to the selected objects, they will no longer update if the object is resized.



Breaking Dimension Objects

The Accessory palette's Break tool can be used to separate dimension objects into distinct lines and so on. This is necessary when you want to give different line attributes to different parts of a dimension object.

In most cases, the components of a dimension object will appear the same after the use of the Break tool; that is, their positions and attributes will not change. Once the object is broken apart into separate objects, each new object can be moved, edited, resized, or otherwise changed like any other PC Draft object.

WARNING: A dimension object that has been broken apart cannot be converted back ("reassembled") into a dimension object. The partial exception to this is the fact that the Undo command will reverse any immediately preceding Break tool. However, if elements from a broken-apart dimension object are edited, moved, or de-selected, the Undo command will no longer be able to reverse the Break tool.

To break apart a dimension object:

1. Select the dimension object you want to break apart.
2. Open the Accessory palette and click the Break icon.



The dimension object will become several objects of different types, each editable individually.

The various kinds of dimension objects are affected in different ways by the Break tool. In all cases, reference points will be lost.

Effects of the Break tool on Dimension Objects

A linear or radial dimension will become an unconstrained point-to-point dimension line, with or without end marks as determined by the original object. Any witness, extension, or leader lines will become unconstrained individual lines, and any frame around the dimension text will be deleted.

An angular dimension will become an unfilled radial arc. Any extension arcs will become separate unfilled radial arcs, and witness or leader lines will become unconstrained individual lines.

Dimension labels and tolerances will become ordinary text objects. Any frame around the dimension text will be deleted.

Circle center marks will become individual unconstrained lines.

Area Calculation

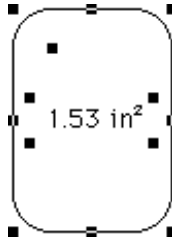
PC Draft's automatic Area Calculation feature can determine and display the area of a selected object for you. If you later change the size of the object, the displayed size is changed automatically.

This feature can calculate the areas of simple objects, like rectangles and circles, or complex objects, such as complex polygons and freehand shapes. When the area of an object is calculated, it always reflects the current scale and units of the drawing.

There are two ways to use this feature: to calculate the areas of individually selected objects, or to obtain the net area of several overlapping objects. These two methods are explained below.

Calculating the Area of Individual Objects

1. Select the object whose area you want to determine.
2. Open the View menu and choose Show Area.



Once you have made your choice, the area will be displayed approximately in the center of the object.

Calculating the Net Area of Overlapping Objects

There might be occasions when you will want to calculate the net area of objects that overlap. Selecting each object and choosing Show Area will only calculate the areas of the individual objects — and totalling those figures would yield a larger value than the actual net area. To obtain the net area of overlapping objects, you need to trace the borders of the area to be calculated using either the polygon or freehand drawing tool. (What you are actually doing is creating a shape that overlays your existing set of objects.) PC Draft will treat the resulting traced shape as an individual object. By choosing Show Area for this object, you can obtain the net area of all of the overlapping objects.

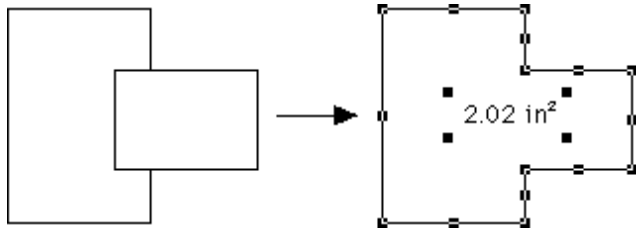
To calculate the net area using the Polygon tool to trace the boundary, follow these steps:

1. Activate the Polygon icon in the palette.
2. Trace the outermost borders of the overlapping objects.

Once you have finished tracing the boundaries of the overlapping objects, the polygon will be complete. It should already be selected. If it is not, click on the polygon to select it.

3. Open the View menu and choose Show Area.

After you have done so, the polygon will appear like the figure below.



The area value displayed will be the net area, and the portions of the objects that overlap will be compensated for. If you want to see the individual objects that are currently hidden by the polygon, choose N (for No fill) from the Fill Pattern submenu before you trace the boundary.

NOTE: If the overlapping objects contain reshaped objects, you will have to use the freehand drawing tool or one of the curve tools to trace them, thereby obtaining an approximation of their net area.

Hiding the Area Calculation Display

To hide the Area Calculation display:

1. **Select the object with the area display you wish to hide.**
2. **Open the View menu and choose Hide Area.**

Modifying or Moving Area Calculation Values

There may be many occasions when you will want to have control over the appearance and/or positioning of area values. PC Draft uses the current font attributes for such values. These attributes include the current attributes for the font type and size. PC Draft uses the Windows system font (usually 12-point Arial) as the preset font and size when you create a new document. There may be times when this font size is inconvenient, such as when you are displaying area values on small objects, and the size of the text value overwhelms the size of the object.

For this reason, PC Draft gives you the flexibility to change the values of font type and size. In addition, it allows you to separate the values from their related objects and move them to any location on your drawing. In the case of small objects with area values, you can move the displayed values away from the object. If you want to tidy up your drawing, you can move these values into an information table. Remember, if you change the size of an object, the calculated value in the table will automatically be updated to reflect the object's or line's new size.

To Change the Font Attributes Before You Use Show Area

1. **Return to the pointer mode. (Make sure that no objects on the drawing are selected.)**
2. **Open the Text menu's Font submenu and choose the font, size and style you want.**

To Change the Font Attributes for Existing Area Calculation Values

1. **Select the area value you want to change.**
2. **Open the Font submenu and choose the font you want.**
3. **Open the Size submenu and choose the size you want.**

NOTE: If you are a PostScript printer user, you can choose a laser printer font to obtain a high-quality output.

Moving Area Calculation Values

You can move or detach the text of area values from objects. The Ungroup command will detach area calculation values completely, and the Shift key can be used to move area calculation values away from objects.

By selecting the object and then choosing Ungroup, you can detach the text value and move it to a different location on the drawing, where it will remain even if you move the object. This unique feature offers an extreme level of flexibility, especially if you want to place the values into an information table.

By holding down the Shift key, you can move the area calculation value away from an object. If the object is then moved to a different location on the drawing, the text will move with the object and maintain the same position relative to the object. For example, suppose you detached area value from a rectangle, then moved the value one grid division above the rectangle. If you dragged the rectangle to the left, the value would follow the rectangle's movement, but it would still remain one grid above it.

Using Ungroup to Detach and Move Values

To move or detach text values by ungrouping the text from an object:

1. **Select the area value you want to move.**

2. **Open the Arrange menu and choose Ungroup.**
3. **Click on a blank part of the drawing to deselect the object and value.**
4. **Position the tip of the pointer on the text value.**
5. **Press and hold down the left mouse button.**
6. **Holding down the left mouse button, drag the text to the desired location (into an information table, for example).**
7. **Release the left mouse button.**

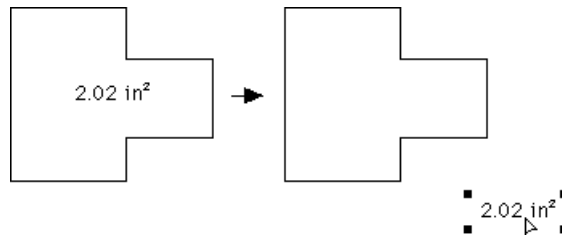
Using the Shift Key Method to Move Values

Now if you move the object with a calculated area, the value will remain where you placed it. The value will remain associated with the object. This means that if you change an object's area, the value in the table will be automatically updated to reflect the new area.

To move an area value using the Shift key method:

1. **Position the tip of the pointer on the area value.**
2. **Press down the Shift key.**
3. **Press and hold down the left mouse button.**
4. **Release the Shift key.**
5. **Holding down the left mouse button, drag the value to the desired location.**
6. **Release the left mouse button.**

If you want to constrain the movement of the value to a horizontal or vertical direction, keep the Shift key down as you drag.



Chapter 5

Moving and Arranging Objects

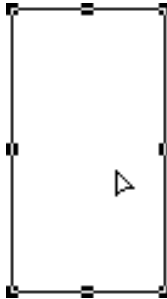
Moving Objects

Often you may create an object, then decide to move it to a new location on your drawing. PC Draft allows you to move lines and objects to any location within your drawing. There are four methods you can use to move objects: selecting and dragging; cutting or copying, then pasting; the Move command; and the Position command.

Using the Select and Drag Method

To move an object using the select and drag method:

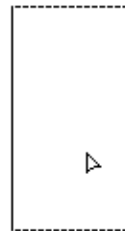
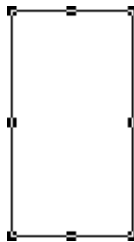
1. **Select the object you want to move by clicking on it.**
2. **Point on the object.**



3. **Press and hold down the left mouse button until the white arrow pointer appears.**
4. **Holding down the left mouse button, drag the object to the new position.**
5. **Release the left mouse button.**

Be careful not to position the pointer on an edit handle when you move an object. Edit handles are for changing the size and shape of an object.

When you drag objects, ghost images of the objects will be visible as you drag them. When you drag an object or group of objects, the original stays in place until you release the left mouse button.



If you drag an object beyond the borders of the drawing area, the drawing will automatically scroll to keep the object visible.

If you want to move multiple objects or grouped objects, simply select the objects or group you want to move, then drag the objects or group to a new position.

Constraining the Movement of Objects

If you hold down the Shift key while you are moving objects, the object's movement will be restricted to a horizontal or vertical direction.

Using Cut, Copy, and Paste

By using the Cut and Paste functions, you can remove objects from one location of your drawing, then paste them in a different location. The Cut function deletes selected objects from the drawing and places them on the Clipboard. The Copy function makes a copy of selected objects and places the copy on the Clipboard, while leaving the original objects in place. You can place several objects on the Clipboard as long as they are selected and cut or copied at the same time. The objects are stored on the Clipboard until you use Cut or Copy on a different object.

To Cut and Paste an Object

1. **Select the object you want to move.**
2. **Open the Edit menu and choose Cut.**

Notice that the selected object is removed from the drawing.

3. **Position the pointer where you want to paste the cut object.**
4. **Click the left mouse button.**
5. **Open the Edit menu again and choose Paste.**

Once you have chosen Paste, the object will reappear where you clicked on the drawing. (Or, if you didn't click anywhere, in the center of the drawing window.)

To Copy and Paste an Object

The Copy and Paste functions allow you to make a copy of an object and paste the copy into another area of the drawing without affecting the status of the original.

To copy an object and paste the copy into a different location:

- 1. Select the object you want to copy.**
- 2. Open the Edit menu and choose Copy.**

A copy of the object will then be stored on the Clipboard for your use.

- 3. Position the pointer where you want to paste the copy, then click the left mouse button.**
- 4. Open the Edit menu again and choose Paste.**

The object will be pasted into this new location.

You can continue to paste objects that have been cut or copied into as many areas on your drawing as you like by simply selecting the insertion point, and choosing Paste from the Edit menu. The objects will remain on the Clipboard until you cut or copy a different object on your drawing, at which time the first object will be erased from the Clipboard and replaced with the new object.

You may often want to use an object within your drawing in more than one location. To accomplish this you can use either the Copy and Paste functions, as described above, or the Duplicate function. These functions will save you the time of re-drawing the object again and again.

Using the Repeated Paste Function

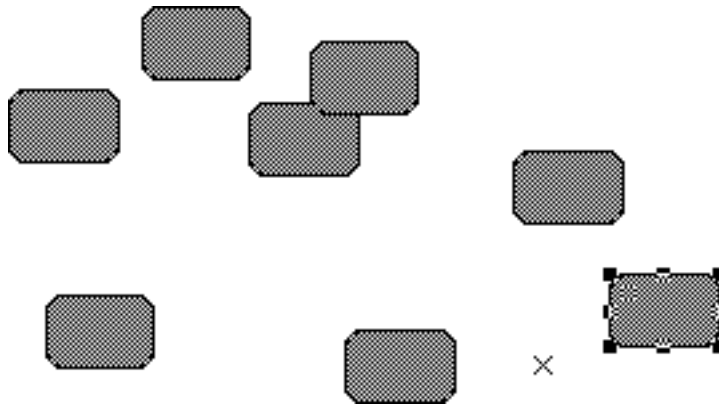
You can use the Repeated Paste function, accessed from the Edit menu, to paste multiple copies of the same object into various locations on a drawing.

To use the Repeated Paste function:

1. **Copy the object you want.**
2. **Open the Edit menu and choose Repeated Paste.**

When you choose Repeated Paste, the pointer changes to an “X,” and any object on the Clipboard (that is, the object you cut or copied) is pasted into the drawing at each point you click on. While in this mode, you can scroll the window and continue to paste objects.

3. **Click where you want the object to appear.**



4. **Repeat the last step until you've pasted as many copies of the object as you want.**

A copy of the object will appear at each point you click on the drawing. The object's datum point will be used as the reference point for the paste operation.

5. **Click on the Pointer tool when you are done pasting.**

Using cut/copy and paste to transfer items from one PC Draft document to another

PC Draft allows you to cut/copy and then paste all or part of a drawing into another PC Draft document.

To cut or copy part of a drawing:

1. **Select all or part of the drawing you wish to move.**

2. Open the Edit menu and choose Cut or Copy.

The selected objects will be stored on the Clipboard.

To paste objects into a different PC Draft document:

- 1. Open the document where you wish to paste the objects stored on the Clipboard.**
- 2. Point where you want to paste the objects into the drawing.**
- 3. Click the left mouse button.**
- 4. Open the Edit menu and choose Paste.**

The objects that you cut or copied will be pasted into the specified area.

NOTE: When you cut or copy objects from one drawing and paste them into another drawing, the objects that you pasted will automatically take on the scale of the new drawing. For example, if you were to cut or copy an object from a drawing with a scale of 1" = 20', and then paste it into a different drawing with a scale of 1" = 10', the object would appear twice as large as it did on the original drawing. In reality, the object is still the same size, but it is represented at the new scale.

With the Edit menu's Move command, you can move objects or groups with great precision by entering values from the keyboard. The coordinates of the selected objects are shown in the current layer's scale and units.

The "Move a Copy" option sends a copy of the selection to a particular location while leaving the original in place.

You can also move objects or groups you select to another layer. Because the Move dialog box opens with the selection's current location entered, you can easily move or copy it to the same spot on a different layer. This can be useful, for example, if you need to show walls or posts in the same location on many layers in a plan view drawing.

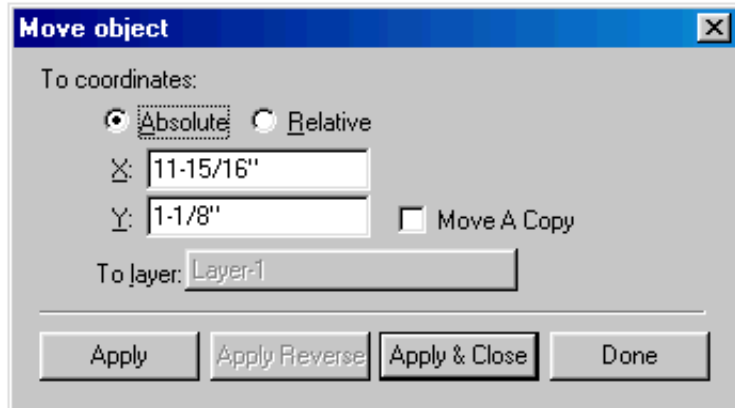
NOTE: The Move command can only move or copy objects between layers that have the same scale. To move objects between layers with different scales, use the Cut or Copy and Paste commands.

The datum point of the selected object or group (see Chapter 2 for information about datum points) is used as the reference for moving. Therefore, to move an object, you specify the desired location (the X and Y coordinates) of the object's datum point. If you select multiple objects or groups, PC Draft will use the datum point of the top left item as the reference.

To move objects or groups to a particular location on the drawing:

- 1. Select the objects or groups you want to move.**
- 2. Open the Edit menu and choose Move.**

The Move dialog box appears, displaying the current location of the selection (for example, 2 3/4" from the top edge of the drawing and 2 1/16" from the left).



- 3. Type in the X and Y coordinate values for the new location.**
- 4. If you want to move the selection to another layer, choose the layer name from the To Layer drop - down.**

5. If you want to leave the original in place, moving only a copy, check **Move a Copy**.
6. Click on the **Move** button.

The selection is moved to the new location.

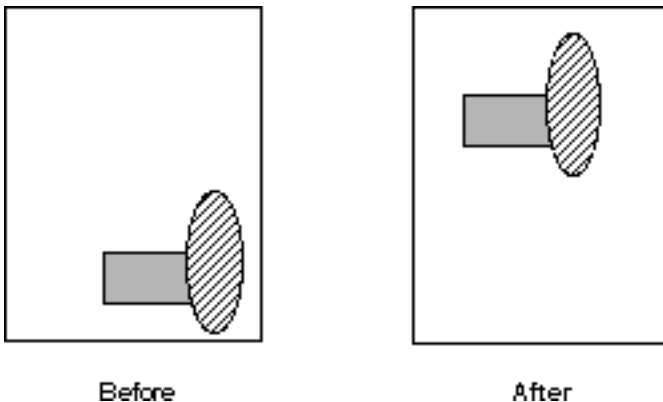
The default zero origin for both rulers (the point where $X=0$ and $Y=0$) of the coordinate system is the upper left corner of the window. The rulers along the top and left sides of the window are used to control the zero origins. In this default coordinate system, X values increase from left to right and Y values increase from top to bottom.

You can change the zero origins of the rulers. For instructions on how to do this, see “Setting the Rulers’ Zero Points” in Chapter 6.

NOTE: If the move operation requires the object to be moved beyond the edge of the drawing, an error message will appear.

The Position Command

Sometimes you may decide that a drawing you have started needs to be moved so it will appear in a different area on the page when printed (as in the illustration below).

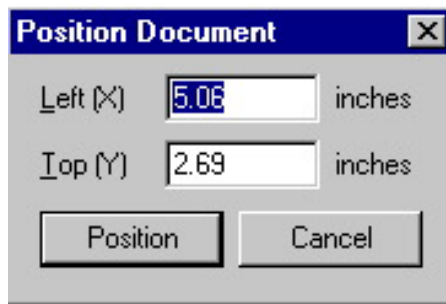


One way to move the whole drawing is to select all objects, then drag them to a better position. However, that method will work in only one layer at a time.

PC Draft's Position command lets you move all objects on all layers at one time. With this command, you specify where you want the top left corner of the image to be. You enter numbers showing how far the image will be from the top and left edges of the drawing window. (When a drawing is printed, the edge of the drawing window represents the edge of the printable area on the page, which is usually a little smaller than the whole page. See Chapter 8 of the PC Draft Reference section for more information about the printable area of the page.)

To change the drawing's position on the page:

1. **Choose Position... from the Layout menu.**



If the document contains objects, the Position Document dialog box will appear, with the current upper left corner's onscreen position displayed. (If the document contains no objects, nothing will happen.) There may not be an object at that location, because the corner is defined by an imaginary rectangle that encloses all objects on all layers of the drawing.

NOTE: The location displayed will reflect all layers, even those that are currently hidden.

Because the box controls positioning on the printed page, the values displayed do not reflect the drawing's scales or rulers, but the actual distance on the screen (and on the printed page). That is, even if the drawing is set to show ten feet per inch, with the zero points of both rulers in the center of the image, the Position Document values will display the onscreen distances from the left and top edges of the drawing window.

NOTE: The dialog box will display the measurements in the current document's onscreen units, whether inches or centimeters.

2. **Select the Left (X) field and enter the distance you want the image to be from the left edge of the drawing window (and of the print area on the finished page).**
3. **Select the Top (Y) field and enter the distance you want the image to be from the top edge of the drawing window (and of the print area on the finished page).**

NOTE: PC Draft will let you move objects partly or entirely off the page. That will happen if you enter either a negative value or an extremely large positive value for one or both fields. Negative values will move the top left corner of the image beyond the top or left edge of the document, and large positive values can move the bottom right corner of the image beyond the bottom or right edge (depending on drawing size).

If you accidentally move part of your drawing beyond the drawing window, you can bring it back by using the Edit menu's Undo command immediately or by using the Position command again and entering different values in the X and Y fields as needed.

4. Click the Position button.

Your entire drawing will be moved within the document window according to your specifications.

NOTE: If you enter values that are too large (or too "small," in the case of negative numbers), you will see an alert box telling you the range of possible values. If this happens, click the alert box's OK button, then enter new values in the X and Y fields as needed.

Using the Clear Function

Objects can be removed from the drawing using the **Clear** function. Clearing an object deletes it permanently. However, it can be recalled by using Undo before you perform any other action.

To Clear a Single Object

1. **Select the object to be deleted from the drawing by clicking on it.**
2. **Open the Edit menu and choose Clear.**

The selected object will be erased from the drawing.

To Clear Multiple Objects

1. **Select the objects to be deleted from the drawing by Shift-clicking on them, or by using the selection rectangle.**
2. **Open the Edit menu and choose Clear.**

To Clear the Entire Contents of a Layer

There might be times when you want to throw away all the contents of the active layer and start over again. To accomplish this:

1. **Open the Edit menu and choose Select All.**

Notice that all the objects on the active layer are now selected.

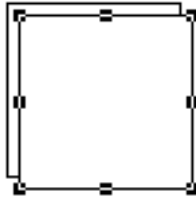
2. **Open the Edit menu again and choose Clear.**

NOTE: You can also press the Delete key to delete selections.

The Duplicate command makes an exact copy of any object or line you have created. The duplicate object is placed on top of the original in a slightly offset position, and is selected. You can then drag the duplicate into position on your drawing.

To duplicate an object:

1. **Select the object you want to duplicate.**



2. **Open the Edit menu and choose Duplicate.**

To make a second or third duplicate, simply choose the Duplicate command again, and again. Each new duplicate will appear on top of the previous one in a slightly offset position.

Auto-Spacing of Duplicate Objects

If you want to create a row or column of identical, evenly spaced objects, the Duplicate function incorporates an auto-spacing feature that allows you to determine the distance and angle you want between objects. You can then make new duplicates that will be automatically placed at that distance and angle.

To automatically distribute duplicates during creation:

1. **Select the object to be duplicated.**
2. **Open the Edit menu and choose Duplicate.**
3. **Position the pointer on the selected duplicate.**
4. **Holding down the left mouse button, drag the duplicated object to the desired position, relative to the original.**
5. **Release the left mouse button.**
6. **Open the Edit menu and choose Duplicate again.**

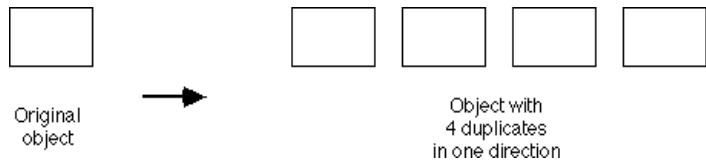
Notice that the second duplicate is automatically placed. Keep choosing Duplicate to produce as many duplicates as you need.

NOTES:

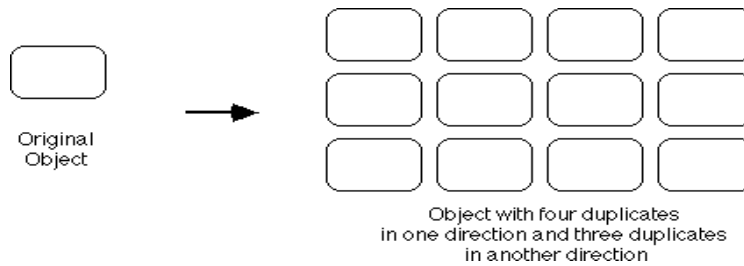
- Hold down the Shift key and choose the Duplicate command to create duplicate with no offset. Use this option to create a duplicate that is placed directly on top of the original.
 - Hold down the Control+Alt key to avoid duplicating locked objects. All other objects in the selection will be duplicated.
-

Linear Duplication

The Linear Duplication feature enables you to make many duplicates of objects or groups, laid out in straight lines or arrays, in just a few steps.

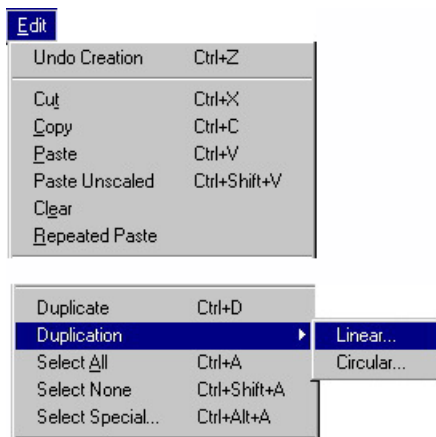


The Linear Duplication dialog box (opened by choosing Linear from the Edit menu's Duplication submenu) gives you choices regarding the distance and angle of duplication, as well as number of directions (one or two) for duplicating selections. You can also define the duplication interval by horizontal and vertical offset. (Duplication distances appear in the scale and units of the drawing.)



To duplicate an object or group in a single direction:

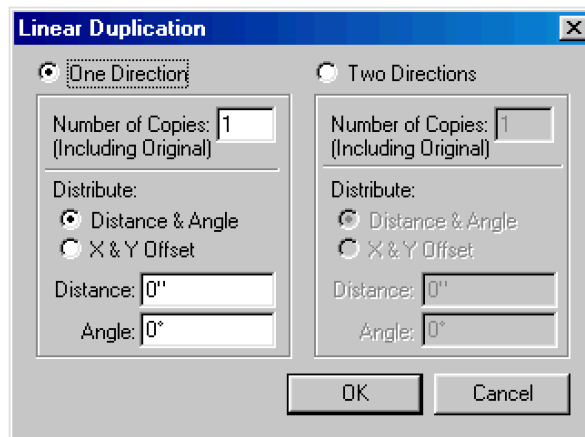
1. Select the object or group for duplication.



2. Open the Edit menu's Duplication submenu.

3. Choose Linear...

The Linear Duplication dialog box appears.



- 4. In the Number of Copies field, type the total number of copies you want (including the original).**
- 5. In the Distance field, type the distance you want between copies**

Distances between objects will be in the drawing's scale and units.

- 6. In the Angle field, type the desired angle of duplication.**

Angle values increase counter-clockwise: zero degrees is straight to the right, 90° is straight up, 180° is straight to the left, and 270° is straight down the page. Negative values make the angles increase in the opposite (clockwise) direction.

- 7. Click OK.**

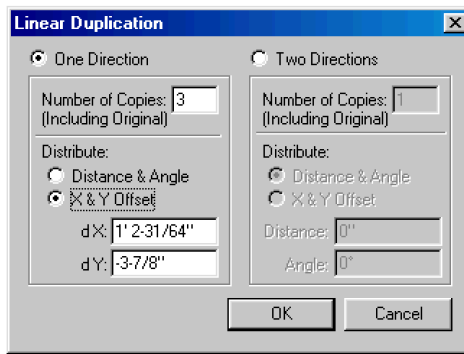
A row or column of duplicates appears, beginning with the original selection.

You can also define the duplication interval by horizontal and vertical offset, entering an X and Y value to determine the positions of the copies.

To perform duplication with X and Y values defining the offset:

- 1. Select the object or group for duplication.**
- 2. Choose Linear... from the Edit menu's Duplication submenu.**

The Linear Duplication dialog box appears.



3. Click the **Distribute: X & Y Offset** radio button.

The X and Y distance fields appear.

4. In the **Delta-X** field, type the desired horizontal offset for each duplicate.

5. In the **Delta-Y** field, type the desired vertical offset for each duplicate.

Negative values move duplicates up or to the left.

6. Enter the number of copies desired, then click **OK**.

A row or column of duplicates appears, set apart by the values you entered in the X and Y offset fields.

Duplication in Two Directions

With Linear Duplication, you can duplicate an object or group in two directions at the same time. You create a row or column of duplicates, as detailed above, and simultaneously create duplicates of that row or column.

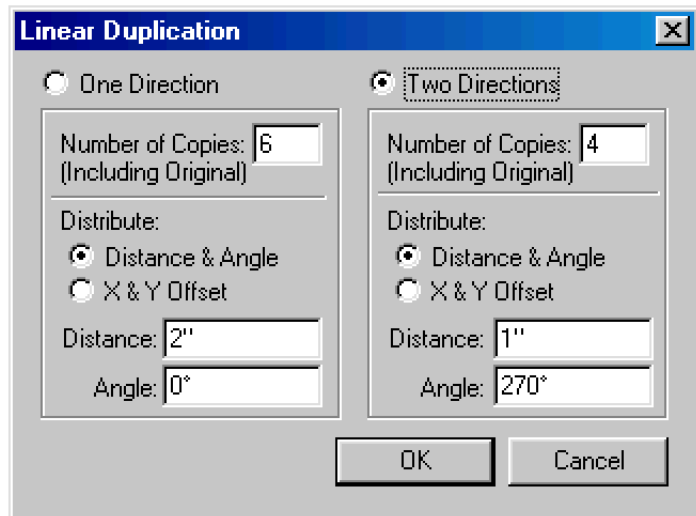
Two-direction duplication can create rectangular arrays, in the simplest case, or sets of rows and columns offset at any combination of distances or angles.

For example, one-direction duplication settings of 6 copies at 2 feet and zero degrees (0°) would give you five duplicates, each 2 feet apart, appearing in a horizontal row to the right of the original selection.

Combining those one-direction settings with two-direction settings of 4 copies at 1 foot and 270° would give you 3 duplicates of the first row, one foot apart, directly below (270°) the first row.

To duplicate in two directions:

1. Select the object or group for duplication.
2. Choose **Linear...** from the Edit menu's Duplication submenu.



The Linear Duplication dialog box appears.

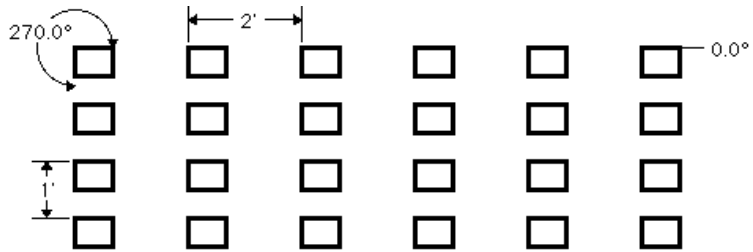
3. As detailed in the preceding section, specify the first direction's number of copies and their duplication offset, by distance and angle or X/Y offset (in the example above, that would be six copies at a distance of two feet and an angle of zero degrees).
4. Click the **Two Directions** radio button.

The choices for Two Directions become active.

5. Enter the second direction's number of copies and their duplication offset, by distance and angle or X/Y offset (in the example given, that would be four copies at one foot and 270 degrees).

The Two Directions settings define the number and locations of the duplicates of the row or column defined by the One Direction settings.

6. Click **OK**.

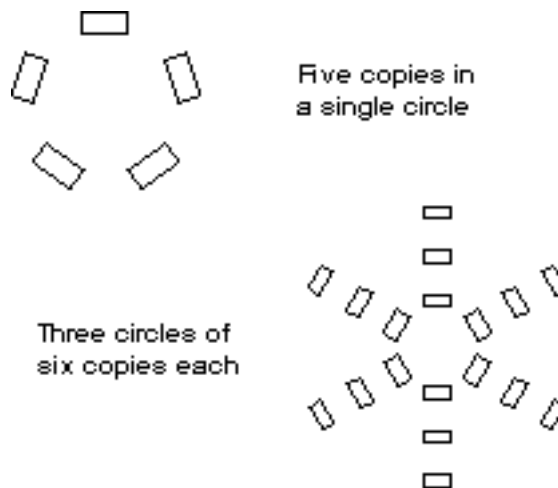


The duplicates appear: an “original” row or column as defined by the settings under One Direction, and duplicates of that row or column defined by the settings under Two Directions.

Circular Duplication

Sometimes it’s useful for multiple copies of shapes or groups to appear in circular arrangements in a drawing. You can get that effect by carefully copying, dragging, and rotating objects, but it’s usually easier to use PC Draft’s Circular Duplication feature.

With Circular Duplication, you can duplicate objects or groups so that they appear arranged along a circle or arc, or in concentric circles or arcs.

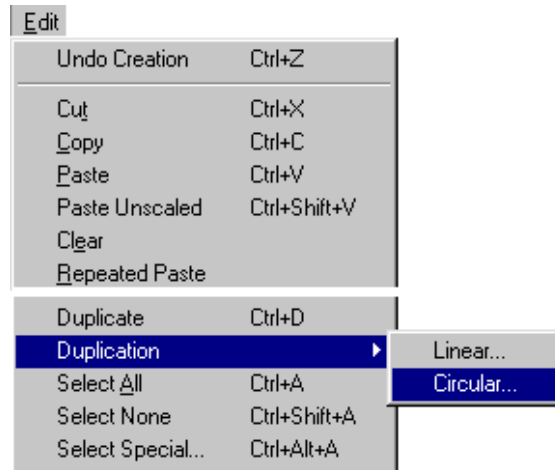


The Circular Duplication dialog box (opened by choosing Circular from the Edit menu’s Duplication submenu) gives you choices regarding the number of copies in each circle, the total sweep of duplication (so that you can have the copies appear proportionally around a full circle or any size of arc) or

number of incremental degrees between duplicates, the number of concentric rings or arcs, the distance (in the scale and units of the drawing) between concentric rings or arcs, the amount of angular shift between rings, and the center of the array.

To duplicate an object or group in a single circle:

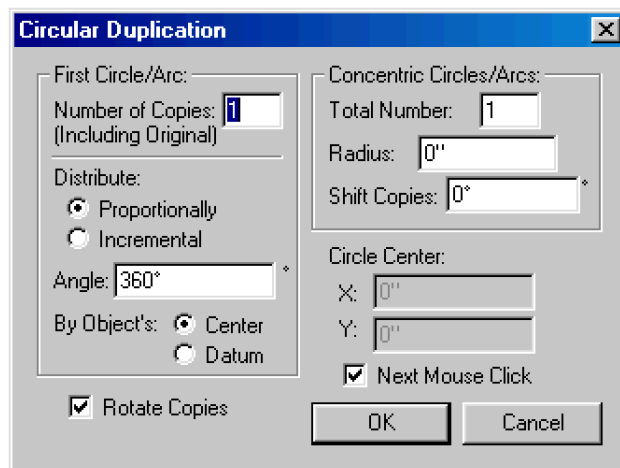
1. Select the object or group you want to duplicate.



2. Open the Edit menu's Duplications submenu.

3. Choose Circular...

The Circular Duplication dialog box will appear.

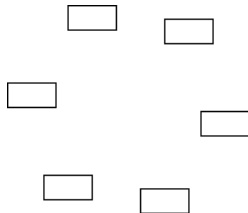


4. In the Number of Copies field, type the total number of copies you want (including the original).

5. **Make sure that Distribute: Proportionally is selected and that the angle entered is 360°.**

These settings ensure that the distribution will be all the way around a circle.

6. **Click Datum or Center to fix the distribution between the duplicates' datum points or between their centers.**
7. **If you want each copy to be rotated according to its position on the circle, make sure Rotate Copies is checked.**



If you uncheck Rotate Copies, each duplicate in the ring or arc will have the same angle orientation as the original object, as shown.

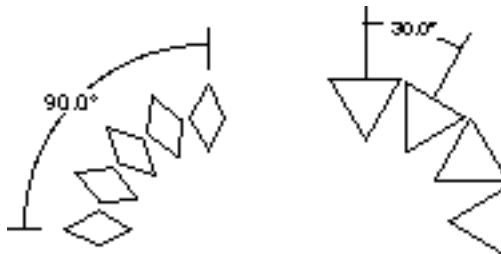
- 8a. **To locate the Circle Center (the center of distribution), enter X and Y values (in the drawing's scale and units), then click OK;**

or,

- 8b. **Make sure the Next Mouse Click choice is checked, click OK, then click the centering cursor at the desired center point after the dialog box disappears.**

A ring of duplicates will appear, centered around the point you specified (either with the X-Y location or with the mouse click).

You can also duplicate an object or group around part of a circle, distributing them either proportionally along a “sweep” you define or incrementally (with a specified angular distance between the items).



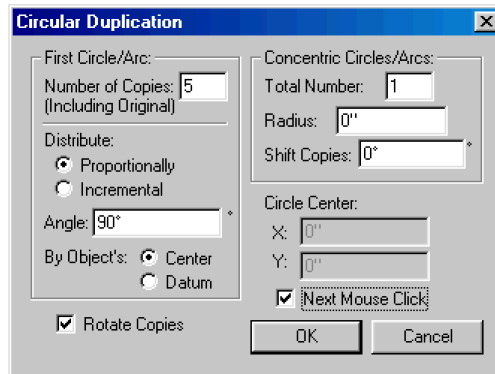
Duplication in Concentric Circles or Arcs

To duplicate an object or group proportionally along an arc:

1. **Select the object or group you want to duplicate.**
2. **Open the Edit menu's Duplication submenu, then choose Circular...**

The Circular Duplication dialog box will appear.

3. **Enter the total number of copies you want (including the original).**

The image shows the 'Circular Duplication' dialog box. It has a title bar with a close button. The dialog is divided into several sections. On the left, under 'First Circle/Arc:', there is a 'Number of Copies: (Including Original)' field with the value '5'. Below this is a 'Distribute:' section with two radio buttons: 'Proportionally' (selected) and 'Incremental'. An 'Angle:' field shows '90°'. Below that is a 'By Object's:' section with two radio buttons: 'Center' (selected) and 'Datum'. At the bottom left is a checked checkbox for 'Rotate Copies'. On the right, under 'Concentric Circles/Arcs:', there is a 'Total Number:' field with the value '1'. Below this are 'Radius:' and 'Shift Copies:' fields, both showing '0\"/>

4. **Make sure Distribute: Proportionally is selected.**

That setting will distribute the copies evenly along the arc you specify in the next step.

5. **In the Angle field, enter the total degrees for the sweep of the arc.**

NOTE: A positive angle value yields a counterclockwise sweep, a negative value yields a clockwise sweep.

6. **Click Datum or Center to fix the distribution between the duplicates' datum points or between their centers, and check Rotate Copies if you want each copy to be rotated .**



7. **To locate the Circle Center, enter X and Y values (in the drawing's scale and units), then click OK, or select Next Mouse Click, click OK, then click the centering cursor at the desired center point after the dialog box disappears.**

The duplicates will appear, proportionally filling the arc you defined, centered around the point you specified.

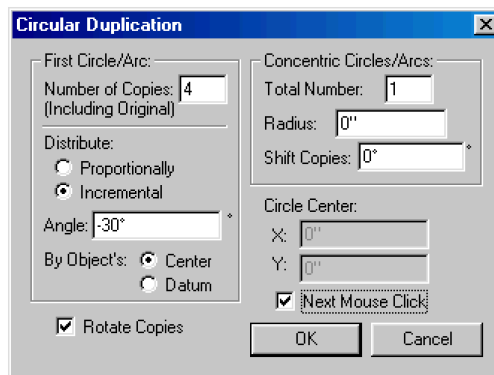
The position of the original object relative to the circle center will determine the starting angle and the distribution radius of the duplicates.

To duplicate an object or group incrementally along an arc:

1. **Select the object or group you want to duplicate.**
2. **Open the Edit menu's Duplication submenu, then choose Circular...**

The Circular Duplication dialog box will appear.

3. **Enter the total number of copies you want (including the original).**

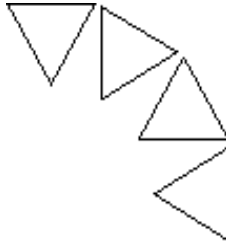


4. **Make sure Distribute: Incremental is selected.**
5. **In the Angle field, enter the degrees desired between copies.**

That setting will space each copy the number of degrees you specify.

NOTE: A positive angle value yields a counterclockwise sweep, a negative value yields a clockwise sweep.

6. **Click Datum or Center to fix the distribution between the duplicates' datum points or between their centers, and check Rotate Copies if you want each copy to be rotated.**
7. **To locate the Circle Center, enter X and Y values (in the drawing's scale and units), then click OK, or select Next Mouse Click, click OK, then click the centering cursor at the desired center point after the dialog box disappears.**



The duplicates will appear, incrementally spaced at the angle you specified. The position of the original object relative to the circle center will determine the starting angle and the distribution radius of the duplicates.

Duplicating a selection in multiple circles or arcs, you use the same methods as in single-circle duplication to define the number of copies in each ring or arc, distribution and angle within each ring, distribution by center or datum point, rotation of copies, and center point of the array. In addition, you can specify the number of concentric circles or arcs, the distance between additional circles or arcs, and the shift angle (if any) for each circle or arc.

To duplicate a selection in basic multiple arcs or circles:

1. **Select the object or group you want to duplicate.**
2. **Open the Edit menu's Duplication submenu, then choose Circular...**

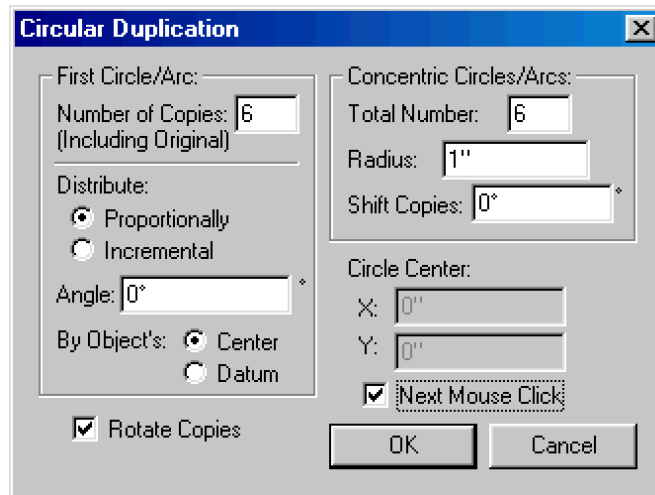
The Circular Duplication dialog box will appear.

3. **Enter the number of copies you want in each concentric circle or arc (including the original).**
4. **Check Distribute: Proportionally or Incremental.**
5. **In the Angle field, enter the degrees for the sweep of the arc (if proportional) or angular distance between copies (if incremental).**

NOTE: A positive angle value yields a counterclockwise sweep, a negative value yields a clockwise sweep.

6. **Click Datum or Center to fix the distribution between the duplicates' datum points or between their centers, and check Rotate Copies if you want each copy to be rotated.**

7. In the Concentric Circles/Arcs: Total Number field, enter the number of circles or arcs desired.



Circular Duplication

First Circle/Arc:
Number of Copies:
(Including Original)

Distribute:
☒ Proportionally
☐ Incremental

Angle: *

By Object's: ☒ Center
☐ Datum

☒ Rotate Copies

Concentric Circles/Arcs:
Total Number:
Radius:
Shift Copies: *

Circle Center:
X:
Y:
☒ Next Mouse Click

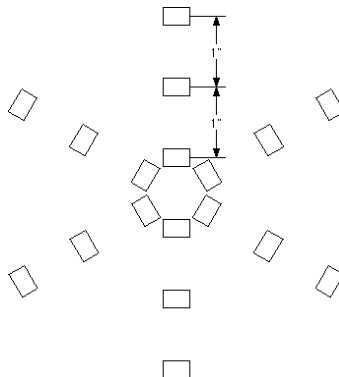
OK Cancel

8. In the Radius field, enter the distance desired (in the drawing's scale and units) between concentric circles or arcs.

This value defines the distance each additional arc or circle will appear outside the first arc or circle; it does not affect the distance from the innermost circle or arc to the center of the array.

9. To locate the Circle Center, enter X and Y values (in the drawing's scale and units), then click OK, or select Next Mouse Click, click OK, then click the centering cursor at the desired center point after the dialog box disappears.

The duplicates will appear, in the number of concentric circles or arcs you defined, centered around the point you specified.



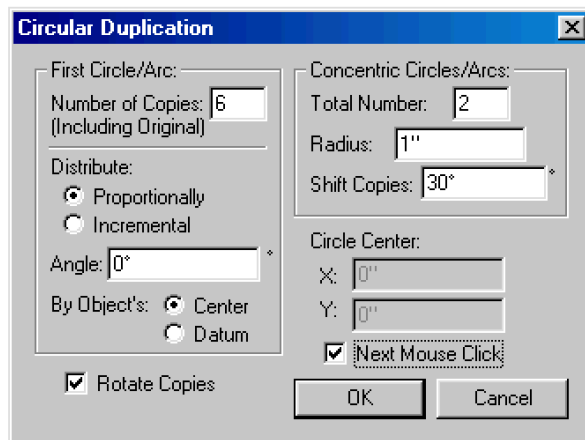
As mentioned above, you can shift each concentric circle or arc of duplicates by a specified number of degrees.

To duplicate a selection using the Shift Copies option:

1. **Select the object or group you want to duplicate.**
2. **Open the Edit menu's Duplication submenu, then choose Circular...**

The Circular Duplication dialog box will appear.

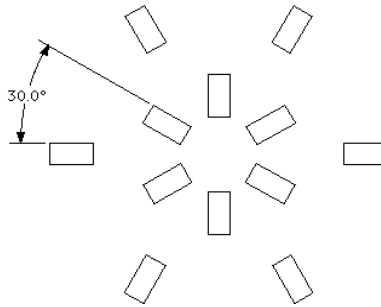
3. **Enter the number of copies you want in each concentric circle or arc (including the original).**
4. **Check Distribute: Proportionally or Incremental and enter the degrees for the sweep of the arc (if proportional) or angular distance between copies (if incremental).**
5. **Click Datum or Center to fix the distribution between the duplicates' datum points or between their centers, and check Rotate Copies if you want each copy to be rotated .**
6. **In the Concentric Circles/Arcs: Total Number field, enter the number of circles or arcs desired and in the Radius field, enter the distance desired (in the drawing's scale and units) between concentric circles or arcs.**
7. **In the Shift Copies field, enter the number of degrees to shift each concentric circle or arc from its inner neighbor.**



This angle defines the angular shift of each additional arc or circle, moving outward from the innermost arc or circle; it does not affect the incremental or sweep angle within each circle or arc.

8. **To locate the Circle Center, enter X and Y values (in the drawing's scale and units), then click OK, or select Next Mouse Click, click OK, then click the centering cursor at the desired center point after the dialog box disappears.**

The duplicates will appear, in the number of concentric circles or arcs you defined, each shifted by the specified angle.



Arranging Objects

You can use the commands in the Arrange menu to manipulate the positions of objects. You can perform the following actions using the commands in the Arrange menu: align objects, flip objects, group and ungroup objects, send objects to the back, bring objects to the front, move objects forward and backward, lock and unlock objects, and distribute objects on a line. The commands in the Arrange menu affect the objects on the active layer. (See the section titled “Using Layers” in Chapter 7 for information about using multiple layers in a document.)

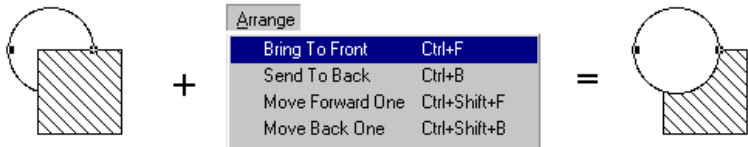
When you create multiple objects on the same layer, the newest object created appears on the top plane, while the oldest object appears on the bottom plane: each new object appears on the plane above the last object. At times, you might want to move an object in front of or behind other objects on the same layer. The functions that allow you to do this are Bring to Front, Send to Back, Move Forward One, and Move Back One.

Bring to Front

If an object is currently behind other objects, you can move it in front of the other objects by using the Bring to Front function.

To bring an object to the front:

1. **Select the object you want to move to the foreground.**
2. **Open the Arrange menu and choose Bring to Front.**



Send to Back

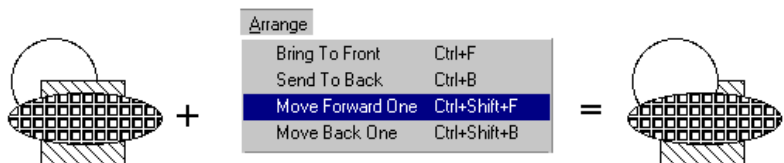
To reposition an object behind all other objects in a layer:

1. **Select the object you want to move to the background.**
2. **Open the Arrange menu and choose Send to Back.**

Move Forward One

To move an object forward one level:

1. **Select the object you want to move forward.**
2. **Open the Arrange menu and choose Move Forward One.**



Move Back One

To move an object back one level:

1. **Select the object you want to move back one level.**
2. **Open the Arrange menu and choose Move Back One.**



Grouping Objects

Sometimes you might create an image that includes several individual objects. In such instances, you might want to group the individual objects together so that you can treat them as a single object. When objects are grouped together, most functions you choose thereafter will be performed on the entire group just as though it were a single object.

To group several objects together:

1. **Select all objects that you want in a group.**
2. **Open the Arrange menu and choose Group.**



Notice that the objects are now surrounded by a single set of edit handles. This indicates that all objects within the edit handles are part of this group and will be treated as a single object. You can perform any function on the group, such as move, duplicate, or fill, and the entire group will respond to that command. Once you have grouped several objects, you cannot reposition or edit any individual object or piece of text within the group unless you first ungroup the objects.

Resizing Groups of Objects

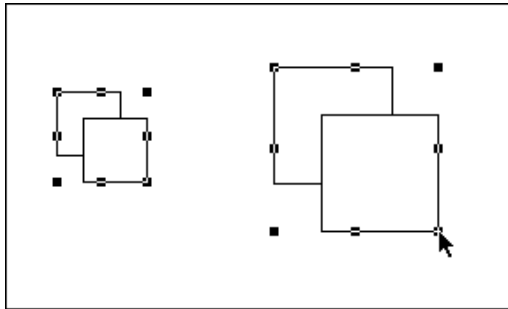
There may be times when you would like to enlarge or reduce the size of a group of objects (objects that have been grouped together using the Group function). PC Draft gives you the ability to change a group's size proportionally or non-proportionally (vertically or horizontally).

By changing the size of a group proportionally, you can maintain the original shapes of the individual objects within the group. Objects within the group will become larger or smaller without becoming distorted.

To proportionally resize a group of objects:

1. **Select the group you want to resize.**
2. **Position the tip of the pointer on one of the edit handles on the corners of the group.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, drag until the group is the size you want.**
5. **Release the left mouse button.**

The grouped object will change in size proportionally to its original size.



To resize a group of objects non-proportionally:

1. **Select the group you want to resize.**
2. **Position the tip of the pointer on one of the edit handles on the corners of the group.**
3. **Press down the left mouse button.**
4. **Holding down the left mouse button, press the Alt key.**
5. **Holding down the left mouse button and the Alt key, drag until the group is the size you want.**
6. **Release the left mouse button and the Alt key.**

Effects of Group Resizing on Automatic Features

There are some unique advantages that you should know about when you change the size of a group. Because several of PC Draft's features are automatic, they are conveniently active when you change the size of a group.

Automatic Area Calculation

If any of the objects in the group contain an area calculation display, the area of each of those objects will be recalculated automatically to reflect the new size of the object.

Dimension Lines

If any of the objects in the group are dimension lines, the numerical value of the dimension line will automatically change to reflect the new length.

Show Size

If the Show Size window is displayed, it will indicate the overall size of the group.

Ungrouping Objects

If you no longer require a set of objects to be grouped, or if you need to edit one of the individual objects, you can use the Ungroup function to return the objects to their individual status.

To ungroup objects:

1. **Select the group of objects by clicking on one of the objects.**
2. **Open the Arrange menu and choose Ungroup.**



Notice that each object has its own set of edit handles again. This is an indication that the objects are no longer part of a grouped set, and that you can now select and edit each object individually.

Aligning Objects

Aligning objects means to line objects up relative to some other point. You can specify exactly how the objects should be aligned using the Alignment

Options dialog, the Alignment command and the Alignment palette. The Alignment palette is used to align objects with each other; the Alignment palette is used to align specified parts of objects with specified parts of other objects, a reference point or the grid; the Alignment command is used to align objects according to the current settings in the Alignment Options dialog.

The alignment choices for a vertical plane are: Align Left Sides, Align Centers, and Align Right Sides. The choices for a horizontal plane include: Align Tops, Align Middles, and Align Bottoms. You can combine a horizontal choice with a vertical choice, and also align objects to the current grid setting.

To use the Alignment function, follow these steps:

Arrange	
Bring To Front	Ctrl+F
Send To Back	Ctrl+B
Move Forward One	Ctrl+Shift+F
Move Back One	Ctrl+Shift+B
Group	Ctrl+G
Ungroup	Ctrl+U
Rotate	Ctrl+R
Rotate To Zero	Ctrl+Shift+R
Rotate Options...	Ctrl+Alt+R
Flip Horizontal	
Flip Vertical	
Align Again	Ctrl+T
Alignment Options...	Ctrl+Alt+T
Distribute On Line	Ctrl+Shift+T
Lock	Ctrl+L
Unlock	Ctrl+Shift+L

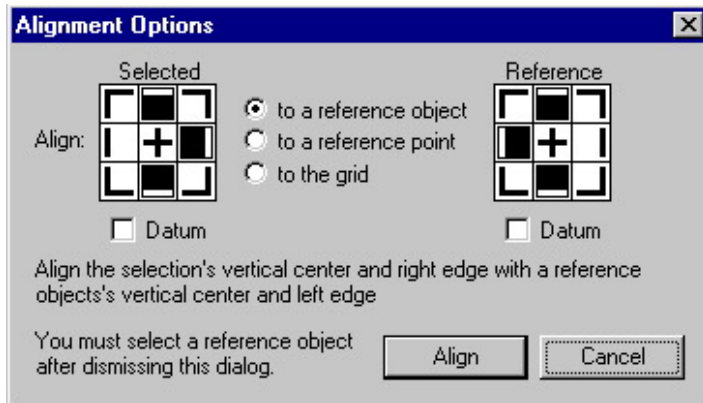
1. Select the object you wish to align.

2. Open the Arrange menu and choose Alignment Options.

The Alignment dialog box will appear.

3a. Click on the icon that represents the desired alignment option.
or,

3b. Click on up to two buttons (one each from the horizontal row and the vertical row) that represent the desired alignment option.



4. Click on the Align button.

The cursor should change to a click Reference Object and arrow combination.

5. Click on the selected object to be used as a reference for the alignment.

To align selected objects to the current grid setting:

- **Click on the box beside “to the grid” in the Alignment Options dialog box.**

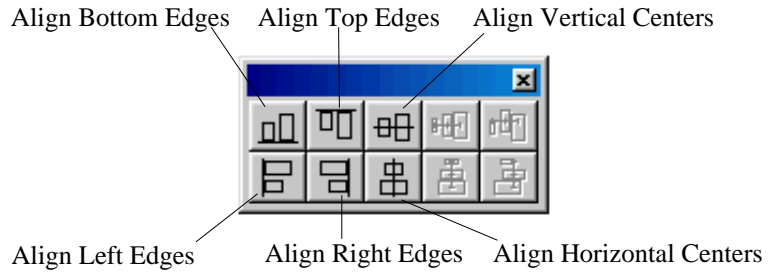
To align objects to one element of a group (rather than to the group as a whole), hold down the Alt key when the question-mark cursor appears, then click on the element with which you want to align the other objects.

Alignment palette

The Alignment palette provides tools for you to carry out the most common alignments without having to access the Alignment Options dialog.

To display the Alignment palette:

- **Choose Alignment from the Palettes submenu in the View menu, or**
- **Choose Alignment from the Window menu, or**
- **Choose Alignment from the popup menu at the bottom left of the document window.**



NOTE: The remaining buttons are used to distribute objects along a line.

To use the Alignment palette:

- 1. Select the objects to be aligned.**
- 2. In the Alignment palette, click on the desired alignment button.**

The Click Reference Object will appear.

- 3. Click on the object to align the other object(s) with.**

The objects will be aligned according to your specifications.

Distributing objects

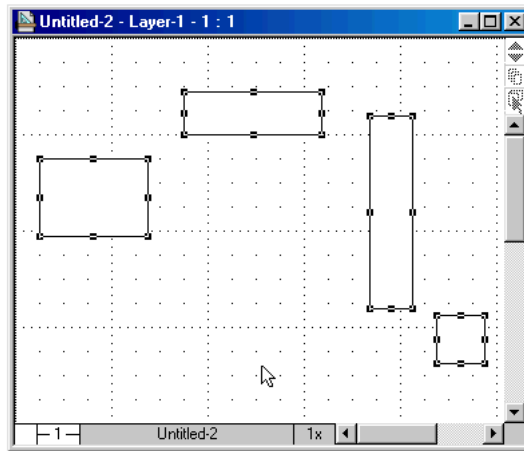
Objects can be positioned and aligned along a defined line. This can be done using the Distribute On Line command or using options in the Alignment palette.

Distribute on line command

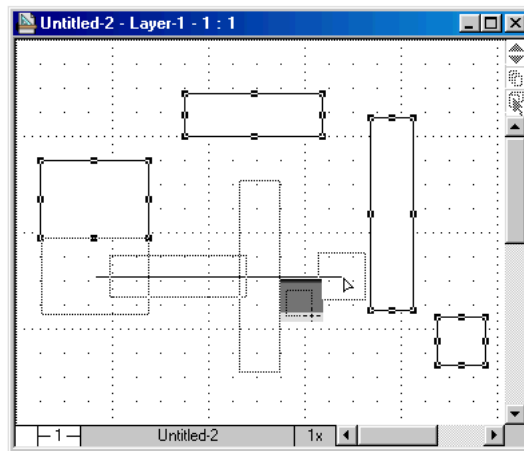
The Distribute on Line function allows you to position and align selected objects along a line that you define. The objects are distributed according to their level on the drawing, i.e. the object farthest back will appear on the distribution line first, and the foremost object will appear last. By default, the objects will automatically align themselves along their centers, and will be equally spaced apart on the line. You can also choose to align the objects according to their datum points.

To distribute objects on a line:

1. **Select the objects to be distributed.**

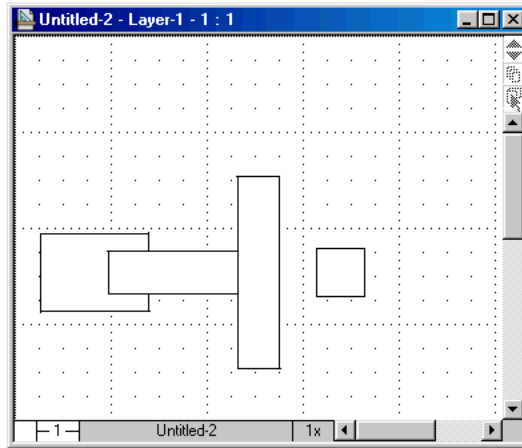


2. **Open the Arrange menu and choose Distribute on Line.**
3. **Move the pointer to the point on your drawing where you would like to place the first object.**
4. **Press down the left mouse button.**
5. **Hold down the mouse button and drag in the direction you want to distribute the objects.**



6. Release the left mouse button.

The objects will be distributed along the line you specified. Their center points will be spaced equally apart along the line.



NOTES:

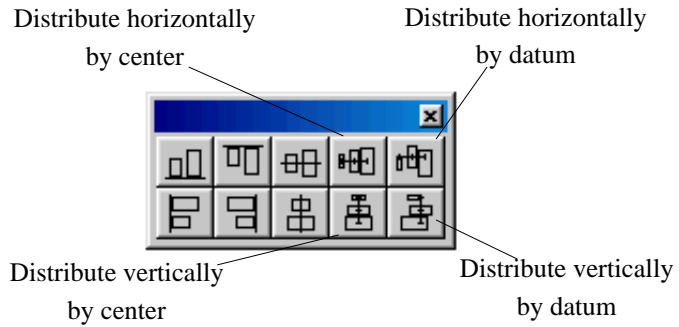
- To align objects according to their datum points, press and hold down the Alt key after you open the Arrange menu and choose Distribute on Line.
 - To constrain the line the objects are to be distributed along, hold down the Shift key as you define the line and it will snap to 45-degree increments.
-

Alignment palette

The distribute controls in the Alignment palette distribute objects in the same way as the distribute command, but the line is defined for you.

To display the Alignment palette:

- **Select Alignment from the Palettes submenu in the View menu, or**
- **Select Alignment from the Window menu, or**
- **Select Alignment from the popup menu at the bottom left of the document window.**



To use the distribute controls in the Alignment palette:

1. **Select the objects on the drawing to be distributed.**
2. **Click on the appropriate button to distribute the objects horizontally or vertically by center or by datum point.**

The objects will be distributed along an line in the manner specified.

Flipping Objects

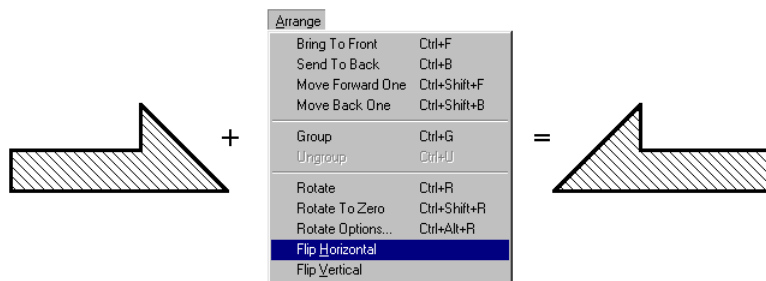
Sometimes you may want to display the reverse image of an object. For this reason, PC Draft offers the **Flip** function. The Flip function allows you to flip both horizontally and vertically to achieve a variety of effects.

You can duplicate an object and then use the Flip function to create the other side of that object for the sake of symmetry, as well as convenience.

Flipping an Object Horizontally

To flip an object horizontally:

1. **Select the object you want to flip.**
2. **Open the Arrange menu and choose Flip Horizontal.**

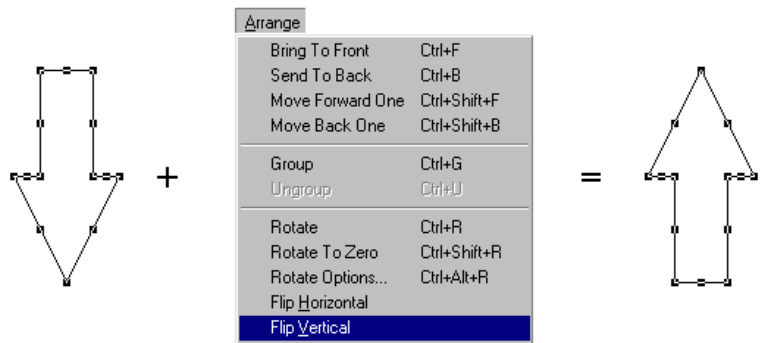


Flipping an Object Vertically

To flip an object vertically:

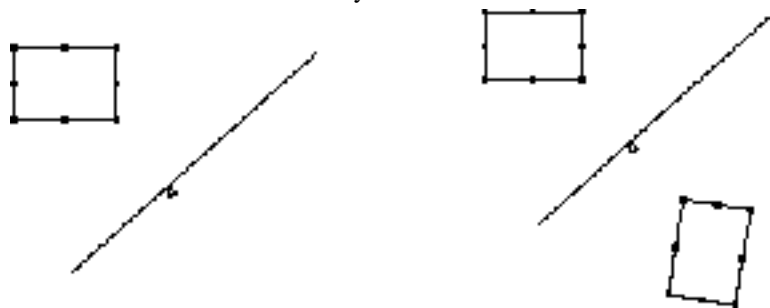
- 1. Select the object that you want to flip.
- 2. Open the Arrange menu and choose Flip Vertical.

Once you have made your choice, the object will be flipped vertically.



The Mirror Tool

In addition to the Flip commands, PC Draft has a tool for mirroring an object or group at any angle you define, not just horizontally or vertically. The Mirror Tool is in the Accessory Palette.



The mirroring can either move and “turn around” the original selection or make a turned copy while leaving the original in place. The mirror image of your selected items will appear across the axis you define, opposite the original’s position, and the same distance from the axis as the original. You define the axis of mirroring with a temporary onscreen reference line.

NOTE: Text objects and bitmap or pixel-map objects (such as those pasted in from a paint-type program or loaded in from TIFF files) will not be reversed, but will appear at the position defined by the mirror operation.

To mirror an object or group:

1. **Select the object or group for mirroring.**
2. **Make sure the Accessory palette is displayed.**



3. **Click the Mirror tool.**

The cursor will change to a white arrowhead.

4. **Before pressing the left mouse button, move the cursor to the first point you'll use to define the reference line.**
5. **Press and hold the left mouse button.**

A dotted reference line will appear.

6. **Holding down the left mouse button, drag to define the reference line (the axis of mirroring).**

If you hold down the Shift key, the line will snap in 45-degree increments.

7. **Once the reference line is at the desired angle, release the left mouse button.**



The selection will be mirrored across the plane you defined with the reference line.

NOTE: By leaving the Show Size palette open as you mirror an object, you can get precise control of the mirroring line's angle.

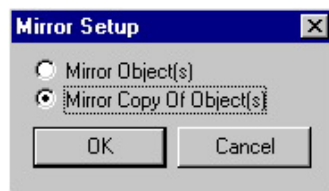
Mirroring a Copy of an Object

Sometimes you may need a mirror-image of an object, but still want to leave the original in place. You can specify that a copy is mirrored using the Mirror Tool configuration dialog box.

To mirror a copy of an object or group:

1. **Make sure the Accessory palette is displayed.**
2. **Hold down the Alt key and click the Mirror tool.**

The Mirror Tool configuration dialog box will appear.

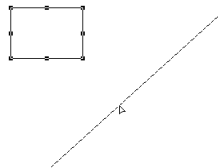


3. **Click the “Copy of Object(s)” radio button, then click OK.**

4. **Select the object or group for mirroring.**
5. **Click the Mirror tool.**

The cursor will change to a white arrowhead.

6. **Before pressing the left mouse button, move the cursor to the first point you’ll use to define the reference line.**



7. **Press and hold the left mouse button.**

A dotted reference line will appear.

8. **Holding down the left mouse button, drag to define the reference line (the axis of mirroring).**

9. **Once the reference line is at the desired angle, release the left mouse button.**



A copy of the selection will be mirrored across the axis you defined with the reference line, while the original remains in place.

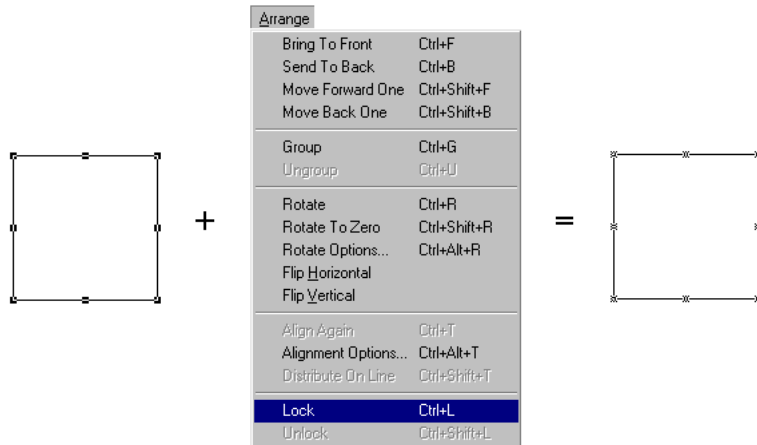
Lock and Unlock

When more than one user has access to the same document, you may want to protect your work from being changed by mistake. You may also want to ensure that an object isn't accidentally moved once it is in its proper position. In these circumstances, you can use PC Draft's Lock feature to make sure certain objects remain unchanged.

To Lock Objects

Objects locked on the drawing cannot be edited, moved, copied, pasted, or deleted. None of PC Draft's functions will affect locked objects.

1. **Select the objects you want to lock.**
2. **Open the Arrange menu and choose Lock.**



To Unlock Objects

Notice that the edit handles are dimmed, indicating that the objects are locked.

1. **Select the locked objects you want to unlock.**
2. **Open the Arrange menu and choose Unlock.**

Rotating objects

PC Draft provides several tools and commands that can be used to rotate objects freely or by specified amounts.

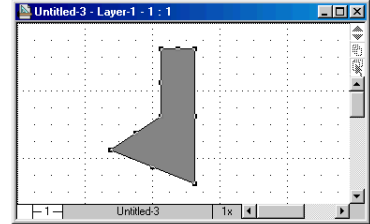
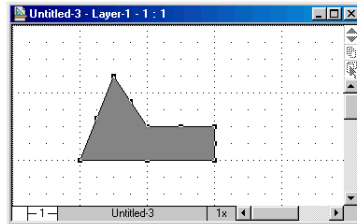
Rotate by 90° tool

The PC Draft Tool palette includes a Rotate by 90° tool:



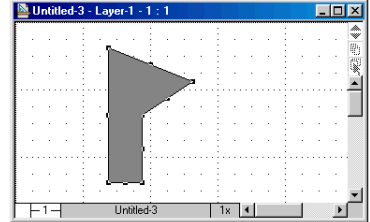
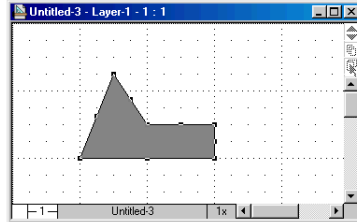
To rotate an object 90° anti-clockwise around its center:

- Select an object in the drawing then click on the Rotate 90° tool.



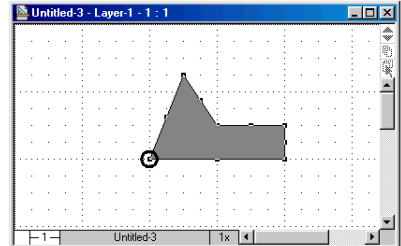
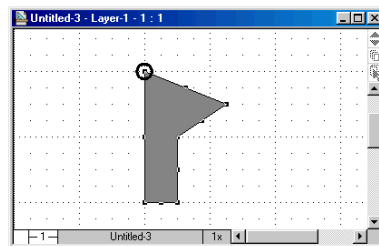
To rotate an object 90° clockwise around its center:

- Select an object in the drawing, hold down the Shift key, then click on the Rotate 90° tool.



To rotate an object 90° anti-clockwise around its datum point:

- Select an object in the drawing, hold down the Alt key, then click on the Rotate 90° tool. In this example the datum point is marked by a small circle.



Rotate tool and Rotate command

The Rotate tool and Rotate command allow you to rotate objects by any angle you want.

You can rotate objects in various increments using the mouse; to enter a specific value via the keyboard, use the Rotate Options.

You can rotate single objects, multiple objects, or grouped objects. Unless you specify otherwise, selected single or multiple objects will rotate around their individual centers. If you wish you can also specify the center of rotation for selected objects.

To enter rotation mode:

- **Select Rotate from the Arrange menu, or**
- **Click on the Rotate tool in the Tool palette**



To exit rotation mode:

- **Click on the Pointer tool.**

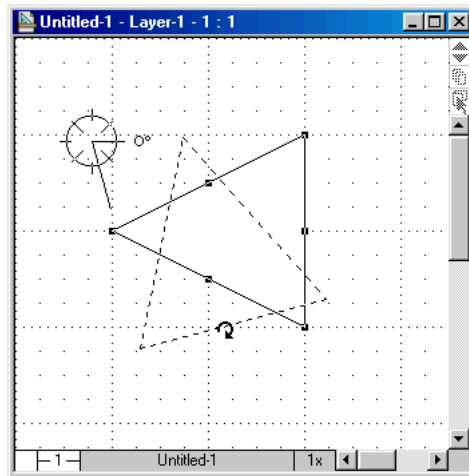
Rotating an object

To rotate an object in five-degree increments (the default):

1. **Select the object to be rotated.**
2. **Select the Rotate tool or choose Rotate from the Arrange menu.**
3. **Position the cursor in the window and press down the mouse button.**

The cursor will change into a rotation indicator.

4. **Hold down the left mouse button, drag in a circular direction until you have rotated the object the desired number of degrees, and release the mouse button.**



To see the exact number of degrees an object is being rotated, open the Show Size window.



To rotate an object in one-degree increments:

- **Press and hold down the Control key while rotating an object.**

To rotate an object in minutes or decimal fractions:

1. **Press and release the Shift key while rotating an object.**
2. **Continue to drag the mouse in a circular direction to rotate the objects in minutes.**

The number of degrees will remain fixed.

To rotate an object in seconds:

1. **Press and release the Shift key twice while rotating an object.**
2. **Continue to drag the mouse to rotate the objects in seconds.**

As you rotate the object in seconds, the number of degrees and minutes are constrained.

Returning to previous rotation units

You can return to the previous rotation units (from seconds to minutes, and minutes to degrees) by using the Control key.

To return to the previous rotation units:

- **Press the Control key while in the rotation mode.**

Rotating multiple objects

When rotating multiple objects, by default each object rotates around its individual center.

Rotating grouped objects

When rotating a grouped object, all the objects in the group rotate around the center of the group, unless you specify a different center of rotation.

Rotating text

The rotation feature works exactly the same way when you rotate a text block as it does when you rotate other objects.

Bitmaps cannot be rotated.

Choosing the centre of rotation

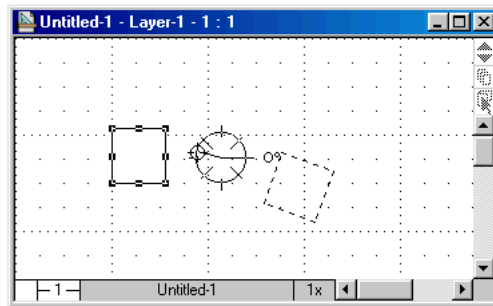
Objects are usually rotated about their centers, however you can also specify any point on the drawing as the center of rotation.

To rotate objects around a specified point:

1. **Select the objects you want to rotate.**
2. **Select the Rotate tool or choose Rotate from the Arrange menu.**
3. **Position the cursor on the point you want to use as the center of rotation.**

You can use the scroll controls to move to a part of the drawing that is outside your current view.

4. **Press down the Alt key.**
5. **Press down the mouse button.**
6. **Hold down the mouse button and the Alt key, drag in a circular direction until you have rotated the object the desired number of degrees.**



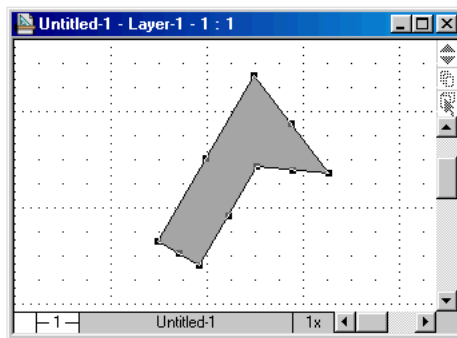
7. **Release the mouse button and the Alt key.**

Rotate to zero command

The Rotate to zero command allows you to return an object to its original angle of rotation.

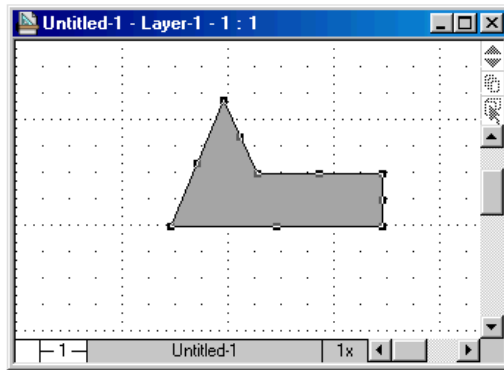
To return an object to its original angle of rotation:

1. **Select a rotated object.**



2. Choose Rotate to Zero from the Arrange menu.

The object will be returned to its original angle of rotation.



Rotate options

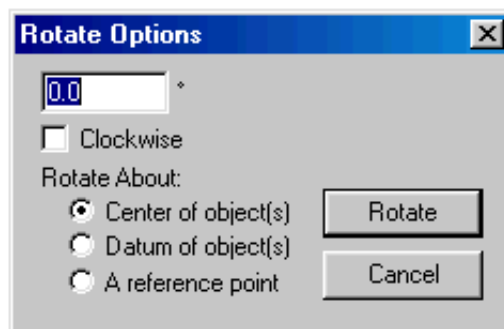
You can use the keyboard to directly enter the rotation values in degrees, minutes, and seconds, via the Rotate Options dialog.

The Rotate Options dialog

To display the Rotate Options dialog:

1. Select the object or objects you want to rotate.
2. Choose Rotate Options from the Arrange menu.

The Rotate Options dialog will appear.



Amount of rotation

The fields available to enter the rotation amount will vary depending on the Angular Display option selected in the Document Scale and Units dialog.

The above screen shot shows the field that will display when decimal degrees is selected as the unit of angular display.

To enter an amount for rotation, double-click in the appropriate field and type in a value.

Direction of rotation

The default direction for rotation is counterclockwise. To rotate an object in a clockwise direction, click on the Clockwise checkbox.

Center of rotation

The default center of rotation is the center of the selected object or objects.

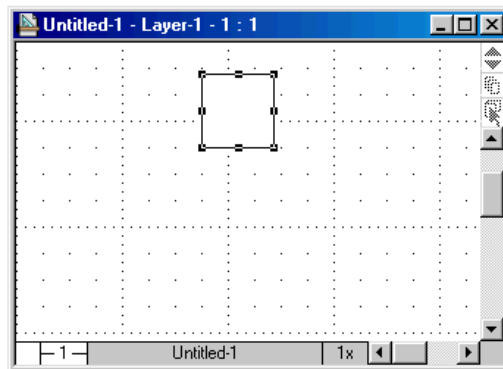
To rotate objects about their datum points, click on the Datum of object(s) radio button. To rotate objects about a specified reference point, click on the A reference point radio button.

If the A reference point radio button is checked, the Rotate Options dialog will disappear and the Rotation cursor will display over the drawing.

Position the cursor at the point you want to use as the center of rotation and click the left mouse button.

To rotate an object or objects:

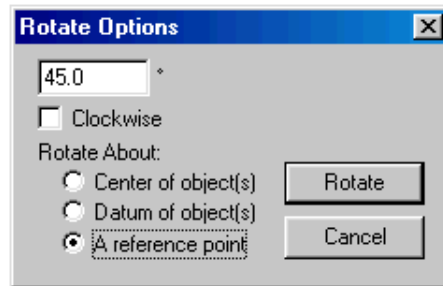
- 1. Select the object or objects you want to rotate.**



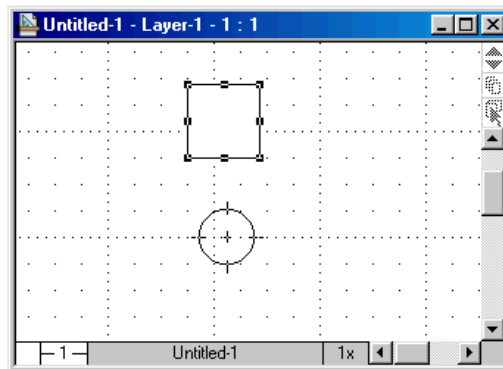
- 2. Choose Rotate Options from the Arrange menu.**

The Rotate Options dialog will appear.

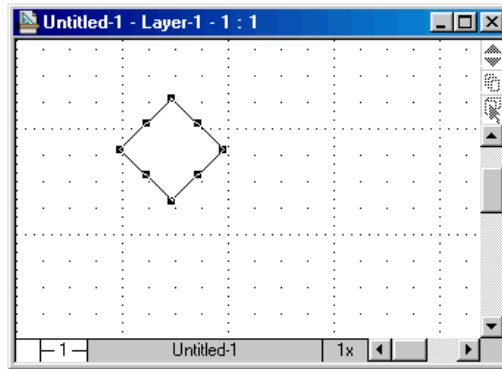
3. Enter the desired angle of rotation.
4. Specify the direction and center of rotation.



5. Click on the Rotate button.
6. Specify the reference point to rotate about if necessary.



The selected object or objects will be rotated the specified number of degrees, minutes, and seconds around the requested center of rotation.



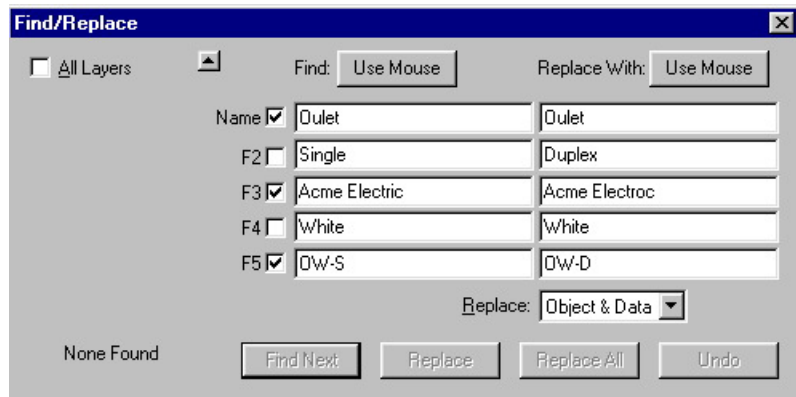
To rotate an individual object (in five-degree increments, which is the default):

1. **Select the object to be rotated.**
2. **Choose Rotate in the Arrange menu.**
3. **Position the cursor in the center of the window.**
4. **Press down on the drawing area.**

Sometimes you may need to quickly find certain objects or groups in a large drawing. Scrolling and examining all the items in a drawing to find the one you want can be time-consuming and inaccurate, so PC Draft includes a Find and Replace feature.

You can automatically find and select objects or groups that have names or other object information assigned to them. The feature is most useful for finding items that have been copied many times in a drawing (for example, pieces of furniture in an office layout or architectural features in a plan view). The Data menu's Find/Replace command will display a dialog box that enables you to instantly locate certain items, and even replace them with other objects.

Find and Replace



You can define the objects to be found by using checkboxes to specify all or some of the object information fields assigned to them. For example, you can find objects that have particular data in all fields by checking all the field boxes, or find objects that have a particular name and part number by checking only those boxes. (For more information about defining field names and assigning object information, see Chapter 2.) The quickest way to define search criteria is with the “Use Mouse” button, which lets you enter all of an item’s object information instantly by clicking on it; you can then de-check unwanted fields, if necessary. You can also manually type the desired object information in the appropriate fields; keep in mind, though, that any typing errors will affect the results of the search, and may cause the wrong objects to be found.

Objects or groups will be found and replaced in either the current layer or in all layers of a drawing, depending on whether the “All Layers” option is checked.



For repeated find actions, you can shrink the dialog box (by clicking the arrow check) so that it doesn’t block as much of the drawing.

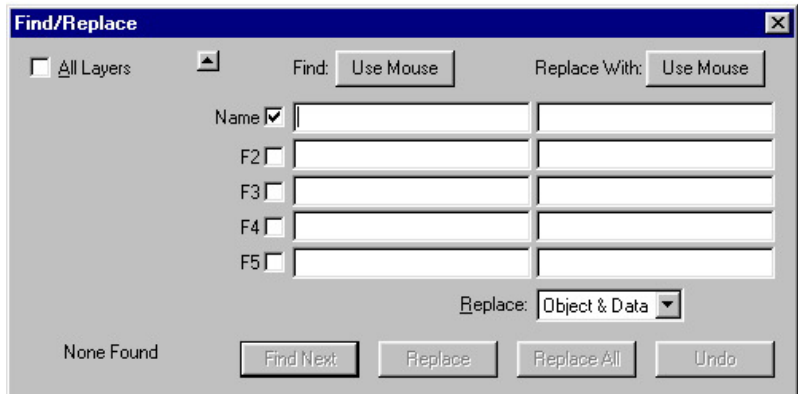
Finding Objects

To find objects or groups with particular object information:

1. **Make sure the objects or groups you want to find have object information, and that one of them is visible in the drawing window.**

2. Choose Find/Replace from the Data menu.

The Find/Replace dialog box will appear, with no information entered.



3a. Under “Find,” type in the desired object information for each field

or,

3b. Click the Find: Use Mouse button.

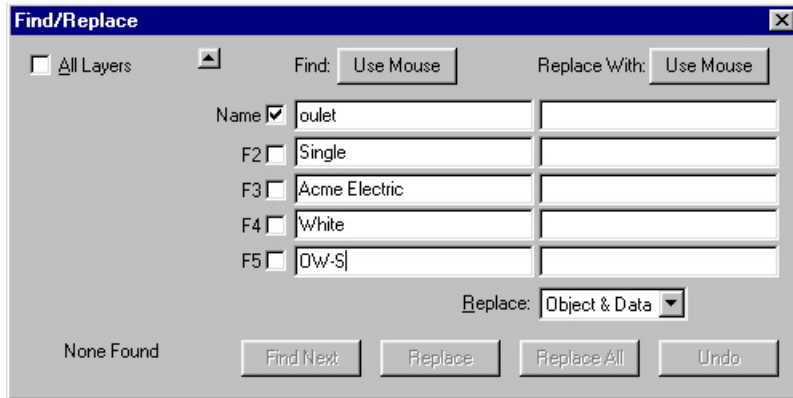
NOTE: In drawings with many items that have object information, temporarily de-checking the Find fields’ checkboxes can speed the typing of Find criteria.



The Find/Replace dialog box will temporarily disappear, and the “?” cursor will appear on the drawing.

4. Click on a sample of the object or group with the desired object information.

The Find/Replace dialog box will reappear, with all the object’s information displayed in the fields and the total number of items found displayed at the lower left.



5. If you want to search on every layer of the drawing, check the All Layers box.

NOTE: The default is to search in the active layer only.

6. If you don't want to search on every object-information field, de-check the fields you want ignored.

NOTE: It's possible to find objects or groups that share some object information data, but are not identical. For example, two items might have the same name but different part numbers, and both would be found if "Name" was checked and "Part Number" was not.

7. Click the Find Next button.

The first matching object will be selected, and the Find/Replace dialog box will display the remaining number of objects or groups that meet the criteria checked (that is, the count will be reduced by one).

You can continue to find matching objects by clicking the Find Next button again. If the dialog box is obscuring too much of the drawing, you can shrink it using the arrow check:

- Click the arrow check.



The Find/Replace dialog box will shrink to its reduced mode.



Continue clicking Find Next as long as you need to. You can return the Find/Replace dialog box to full size at any time by clicking the arrow check again.

- **When you are done finding or replacing objects, click the close box at the upper right of the dialog box.**

Replacing Objects

When you use the Find feature, often you will want to replace the objects or groups you find with different items. The Replace options in the Find/Replace dialog box will replace some or all of the found items with copies of whatever object or group you specify.

As with the Find feature, you can only replace using an object or group that has object information assigned to it.

TECHNICAL NOTE: The replacement object must be unique; that is, it must have a unique set of data in its object information fields. When an object is replaced, the datum of the replacement object will occupy the same location as the datum of the original object.

You can replace objects either one at a time (bypassing some if desired with the “Find Next” button), or all at once with the “Replace All” button. If you replace objects one at a time, the Undo button will reverse the replacement of the last single object or group.

The best way to select the replacement object is with the “Replace: Use Mouse” button.

To find and replace objects or groups:

1. **Choose Find/Replace from the Data menu.**

The Find/Replace dialog box will appear, with no information entered.

2. **Specify the objects or groups to be found (either with the Find: Use Mouse button or by typing field data directly).**
3. **Make sure the fields you want to use as criteria are checked.**
4. **If you want to find and replace on every layer of the drawing, check the All Layers box.**
5. **Click the Replace: Use Mouse button.**

The Find/Replace dialog box will temporarily disappear, and the “?” cursor will appear on the drawing.

6. **Click the object or group you want to use for replacement.**

The Find/Replace dialog box will reappear, with all the object information displayed in the Replace fields. Because replacement selections must be unique, PC Draft always uses all object information fields to define a replacement. (Although PC Draft uses all fields as criteria for the replacement, some fields can be empty. For example, an object can have all its fields blank except for “Name” and still be used as a replacement.)

Field	Find	Replace With
Name <input checked="" type="checkbox"/>	Outlet	Outlet
F2 <input type="checkbox"/>	Single	Duplex
F3 <input checked="" type="checkbox"/>	Acme Electric	Acme Electric
F4 <input type="checkbox"/>	White	White
F5 <input checked="" type="checkbox"/>	OW-S	OW-D

Replace: Object & Data

None Found

Find Next Replace Replace All Undo

7. **Click the Find Next button.**

The Find/Replace dialog box will display the number of objects or groups that match the checked “Find” fields, and the first matching object will be selected.

8. If you want to replace this particular found object, click the Replace button.

The selected object will be replaced with a copy of the object you defined as the replacement.

9. Click the Find Next button.

The next object that matches the Find criteria will be selected. You can replace it, click Find Next again to move to the next matching object, or click Undo to reverse the replacement.

To replace all matching objects or groups:

10. Click Replace All.

All objects that match the Find criteria will be replaced.

11. When you are done finding and replacing objects, click the close box at the upper right of the dialog box.

Chapter 6

Using Drawing Aids

Using Drawing Aids

PC Draft offers several useful features that make your drawing tasks much easier. This chapter discusses these **Drawing Aids** in detail.

Show Size

PC Draft is a precision drawing application program designed to help you create detailed drawings. The **Show Size** function makes it easier to draw objects precisely because it can display the size of each object on your drawing. Show Size gives you a continuous display of an object's size as you draw or resize it. It also displays the degree of rotation as you rotate objects (angles of rotation range from zero to 360 degrees, moving counterclockwise from a rightward-pointing — “due East” — orientation).

The units displayed in the Show Size window are determined by the current options chosen in the Document Scale & Units dialog box. For more information, see the section in this chapter titled “Setting the Size Units.”

To display the Show Size window:

1. **Select Show Size from the Palettes submenu in the View menu, or**
2. **Select Show Size from the Window menu, or**
3. **Select Show Size from the popup menu at the bottom left of the document window.**

The Show Size window will appear.

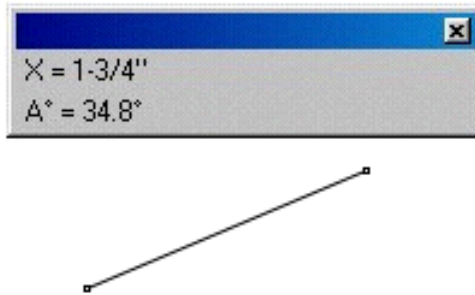
Using Show Size With Drawing Tools

Text Tool

The Show Size window displays the length (“X=”) and height (“Y=”) of the rectangle you use to define the block for paragraph text.

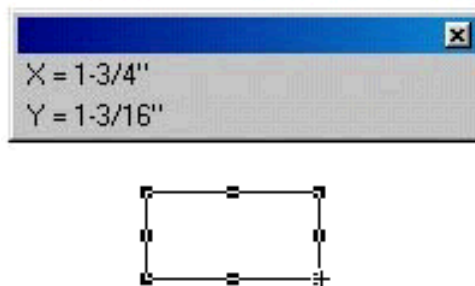
Line Tools

The Show Size window for the line tools (including the Perpendicular, Tangent, Parallel, and Extrude tools) displays the length of the line and the angle at which the line is drawn. (“X=” represents the length; “A°=” represents the angle.)



Square-Corner Rectangles

The palette displays the “X” and “Y” values for a square-corner rectangle. The X value represents the width of the rectangle, and the Y value represents its height.



Rounded-Corner and Elliptical-Corner Rectangles

When you draw a rounded-corner rectangle, the palette shows you the radius (“R=”) of the corners, the height (“Y=”), and the length (“X=”) of the rectangle. The palette shows the major and minor radii of the arcs on the corners of Elliptical-Corner Rectangles.

Circles by Diameter and by Radius

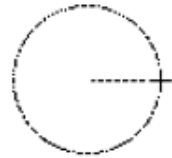
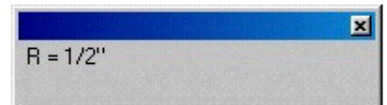
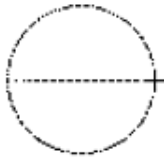
PC Draft allows you to draw circles three ways: by their diameter, by their radius, and by three points.

BY DIAMETER

When you draw a circle by its diameter, the Show Size window displays “D=” to represent the size of the circle’s diameter.

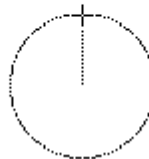
BY RADIUS

When you draw a circle by its radius, the palette displays “R=” to represent the size of the circle’s radius.



Arcs by Radius

As you drag to create the radius of an arc, the Show Size window displays both the length of the radius (“R=”) and the starting angle (“A°=”). The starting angle is the angle between the line attached to the cursor and the X-axis.

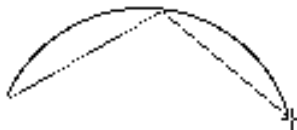


Once you release the left mouse button and move the mouse to create the arc, the Show Size window changes to display two different readings: the delta angle (“ΔA°=”) and the angle (“A°=”). The delta angle is the difference

between the starting angle and the ending angle of the arc. The delta angle is the actual number of degrees through which the arc passes. The angle reading represents the angle between the ending angle (shown on-screen by the line attached to the cursor) and the X-axis.



Arcs by Three Points As you create an arc by three points, the Show Size window will not become active until you are moving from the second to the third point in the arc. At that time, it will become active and display the entire arc angle.

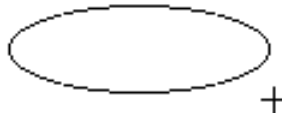
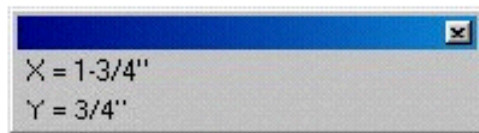


Elliptical Arcs When you start drawing an elliptical arc, the palette shows you the height (“Y=”) and width (“X=”) of the ellipse used to define the size of the arc. It also shows you the starting angle (“ A° =”), which is the angle between the

line attached to the cursor and the X-axis. When you finish defining the size and the starting angle of the arc, the palette shows you the delta angle (“ $\Delta A^\circ =$ ”) and the angle. The delta angle is the difference between the starting angle and the ending angle. The delta angle is the actual number of degrees through which the arc passes. The angle (“ $A^\circ =$ ”) represents the angle between the ending angle (shown on-screen by the line attached to the cursor) and the X-axis.

Ellipses

The Show Size window for ellipses displays both the “X” and “Y” diameters of the ellipse. The “X” represents the width of the ellipse, and the “Y” represents the height of the ellipse.



Polygons

The Show Size window for polygons functions in the same way as the Show Size indicator for lines. The palette displays the length of the line (“X”) and the angle (“ $A^\circ =$ ”). The palette displays this information for each side of the polygon as it is drawn.

Using Show Size With Rotation

During rotation, the Show Size function shows you how much you have rotated an object. You can rotate objects in degrees, minutes, and seconds or in degrees and decimal fractions. See the section titled “Using the Rotate Function” in Chapter 5 for information about rotating objects.

Hiding the Show Size palette

To remove the Show Size window from the screen:

1. Click on the window's close box, or

2. **Choose Show Size from the Palettes submenu in the View menu, or**
3. **Choose Show Size from the Window menu, or**
4. **Choose Show Size from the popup menu at the bottom left of the document window.**

The Show Size window will be removed from the screen, and there will no longer be a checkmark against its name in the Palettes submenu etc.

Rulers

Rulers are used as drawing aids to help you position objects in precise locations on your drawing. Rulers appear along the top and on the left side of the drawing window. The displayed rulers reflect the current position of the window during scrolling, and their scale reflects the current magnification level. PC Draft offers two types of rulers: standard and scale.

To display PC Draft's rulers:

- **Open the Layout menu and choose Show Rulers.**

The rulers will be displayed, and a check mark will appear by the Show Rulers command in the Layout menu.

Standard Rulers

Standard Rulers are the type of rulers with which you are probably familiar.

To display standard rulers:

- **Open the Layout menu and choose Standard Rulers.**

Scale Rulers

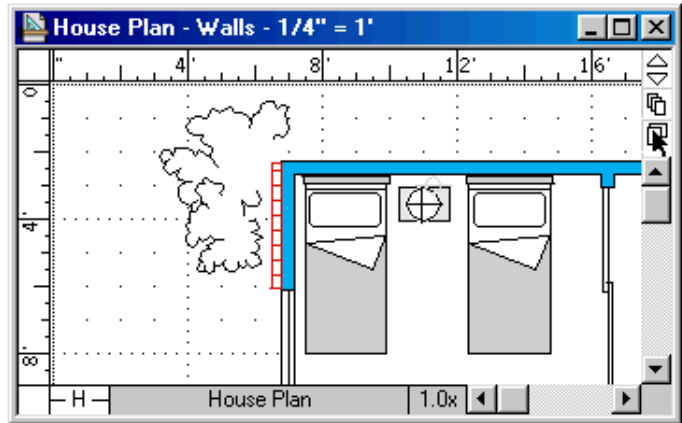
Scale Rulers reflect the current drawing scale of your document. For example, on a $1/8" = 1'$ scale, the major ruler divisions will be in increments of eight (8 ft., 16 ft., and so on). Scale rulers display measurement divisions according to the current size unit settings. For instance, if "decimal feet" is the current setting, the scale rulers will be displayed in decimal feet, matching to the current drawing scale.

For more information about size units, refer to the section titled “Setting the Size Units” in this chapter.

To display scale rulers (if Show Rulers is checked):

- **Open the Layout menu and choose Scale Rulers.**

Below is an example of scale rulers with a scale of $1/8" = 1'$ and size units set at fractional feet and inches.



Setting the Rulers' Zero Points

There may be occasions when you want to change the zero point of the rulers from the upper left corner of your drawing to some other convenient point on your drawing. For instance, you may want to set the zero point of the rulers to one edge of an object so that you can position other objects relative to that particular point. For this reason, PC Draft allows you to change the zero point of the ruler.

When you change the zero point of one or both of the rulers, the positioning of the new zero point is dependent upon the grid snap. You can change the zero point of either the top or left ruler independently, or change the zero points of both rulers at the same time.

Setting the Zero Points of the Rulers Independently

To change the zero point of either the top or the left edge ruler independently of the other:

1. **Position the tip of the pointer on the ruler where you want the new zero point to appear.**



2. Click the left mouse button.

This method of changing the zero point works the same for both the top and the left rulers.

Resetting the Zero Points of the Rulers Independently

To change the zero point of either the top or the left edge ruler back to the upper left corner:

- 1. Hold down the Control key.**
- 2. Position the tip of the pointer on the ruler.**
- 3. Click the left mouse button.**

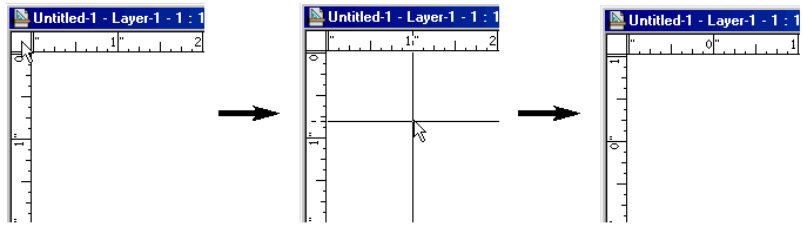
The zero point for that ruler will revert to the upper left corner, while the other ruler's zero point will be unchanged. This method of resetting the zero point works the same for both the top and the left rulers.

Setting the Zero Points of Both Rulers Simultaneously

You can change the zero points of both rulers simultaneously by using the cursor. In this way, you can easily align the zero points of both rulers to a point on your drawing.

To set the zero points for both rulers at the same point:

- 1. Position the tip of the pointer in the box where the two rulers cross at the upper left corner of the drawing window.**
- 2. Press down the left mouse button.**
- 3. Holding down the left mouse button, drag diagonally downward and to the right until the cursor is positioned on the new zero point you want for both rulers.**
- 4. Release the mouse button.**



Resetting the Zero Point of Both Rulers Simultaneously

To reset the zero point to the upper left corner of your drawing:

- **Click in the small box where the two rulers cross at the upper left corner of the drawing window.**

Cursor Position Indicator

The Cursor Position Indicator is designed to inform you of the position of the cursor (that is, the crosshair cursor, the arrow pointer, and the various other pointers) on your drawing. This allows you to accurately determine the starting and ending points of an object, and also gives you the ability to make inquiries about the position of any point on your drawing.

Like all of PC Draft's automatic features, the Cursor Position Indicator conforms to the environment of your drawing. The X/Y display of the cursor's position is displayed to the scale of the drawing and in the size units that are currently selected.

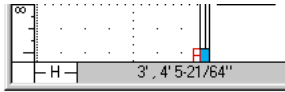
The Cursor Position Indicator shows the absolute position of the cursor in regards to the zero origin. The zero origin of the cursor position ($X=0$, $Y=0$) is determined by the zero points on the rulers. Therefore, if you move the zero points on the rulers, the zero origin of the Cursor Position Indicator will also change. This feature is very useful, especially when you want to make measurements relative to a specific point on your drawing.

Activating the Cursor Position Indicator

To activate the Cursor Position Indicator:

- **Open the View menu and choose Show Cursor Position.**

Once you have made your choice, the X/Y position of the cursor will be displayed on the bottom left edge of the document window as shown in the following figure.



Now as you move the cursor around on your drawing, the display will inform you of the cursor's X/Y position relative to the zero points of the rulers.

The default zero origin on the rulers is always the upper left corner of your drawing. To change the zero origin of the Cursor Position Indicator, you must change the zero points on the rulers.

Hiding the Cursor Position Indicator

If you do not want the cursor position displayed, follow this step:

- **Open the View menu and choose Show Cursor Position.**

The cursor position will disappear, and the check mark will be removed from the Show Cursor Position command.

Grid Snap and Grid Lines

The **grid snap** feature (accessed from the Set Grid command in the Layout menu) lets you superimpose an invisible grid over your drawing so that objects can be drawn, moved, or resized precisely with little effort. Whereas grid lines provide visual guidelines that assist you in drawing, the grid snap is an invisible network of “magnets” that affects the drawing and placement of objects.

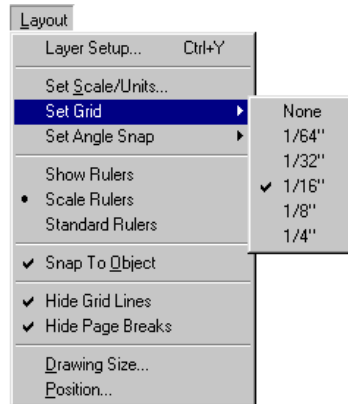
You should set the grid snap to the smallest length you need in or between objects in your drawing. For example, if you wanted to draw a line that is 5-3/4 inches long, you should set the grid snap to one-quarter inch. With the grid snap set this way, the cursor will snap to every quarter-inch increment as you draw the line.

Values displayed in the Set Grid submenu will always be expressed in the current scale and unit system. For more information, see the section in this chapter titled “Setting the Size Units.”

Choosing a New Grid Snap

Before you set the grid snap, you should choose a scale to be used for your drawing. The grid snap setting should be appropriate for that scale. (See the section in this chapter titled “Using the Scale Function” for information about setting scales.)

To choose a new grid snap:



1. Open the Layout menu and drag until Set Grid is highlighted.

The Set Grid submenu will appear.

The Set Grid submenu shows the grid spacing choices for the current scale. Each scale has its own set of possible grid spacings. For example, a scale of 1:1 (1"=1") in fractional units will have increments as small as 1/64th of an inch and as large as 1/4 of an inch.

2. Drag through the submenu until the grid snap you want is highlighted.

3. Click the left mouse button.

If you open the Set Grid submenu again, you will see that a check mark appears beside the chosen grid snap. The check mark indicates the document's current grid snap.

Using the Grid Snap Function

When a grid snap other than "None" is chosen, any object you draw or move will automatically be positioned to the nearest grid position. You will not be able to begin or end a draw or move action between the grid snap positions.

For example, if you were moving an object with the grid spacing set at 1/4 inch, the object would move in quarter-inch increments.

You can activate or deactivate the grid snap to suit your needs at the time.

To Deactivate the Grid Snap

At times you may want to turn off the grid snap when you draw or move objects. To turn off the grid snap:

1. **Open the Layout menu and drag until Set Grid is highlighted.**

The Set Grid submenu will appear.

2. **Drag until None is highlighted.**
3. **Click the left mouse button.**

To Activate the Grid Snap

1. **Open the Layout menu and drag until Set Grid is highlighted.**

The Set Grid submenu will appear.

2. **Drag until the grid spacing you want is highlighted.**
3. **Click the left mouse button.**

Releasing Objects From the Grid Snap

You can temporarily suspend the grid snap function by holding down the Control key as you move or draw an object. This technique allows you to position an object on a location that does not happen to fall at a grid point.

For example, if you press and hold down the left mouse button as you are drawing the side of a polygon, the line will be released from the grid snap.

WARNING: Be advised that if you deactivate the grid snap while drawing or moving an object, that object will be removed from the grid. This means that it will be difficult for you to draw lines or borders tangent to the object, or align the object with other objects. In order to place the object back on the grid, you will have to use the Align to Grid function, which is described below.

Snapping Edges and Lines Along Their Lengths

If you draw an object with the grid snap on, its edges will get longer by small increments or jerks. You can apply the current grid snap to a line by holding down the Alt key as you draw. For example, if the current grid snap is 1/4" and you draw a 30° line while holding the Alt key, the line will grow in quarter-inch increments.

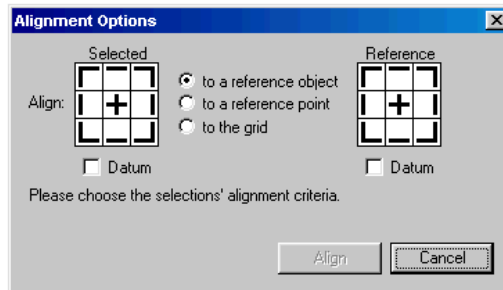
Align to Grid

There will be times when you might create, move, or paste into a PC Draft document objects that are not on the current grid.

To align the objects to the current grid:

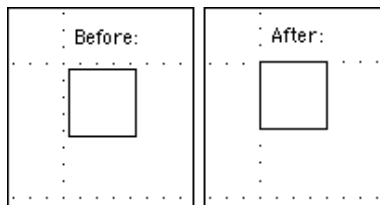
1. **Select the objects to be aligned.**
2. **Open the Arrange menu and choose Alignment Options...**

The Alignment Options dialog box will be displayed.



3. **Click "to the grid" radio button.**
4. **On the grid, representing the selected object(s), click on the grid squares to specify which parts of the object(s) are to be aligned, or check the "Datum" checkbox below the grid.**
5. **Click on the Align button.**

Once you have made your choice, the selected objects will be aligned to the closest grid snap in the manner that you have chosen.



Angle Snap

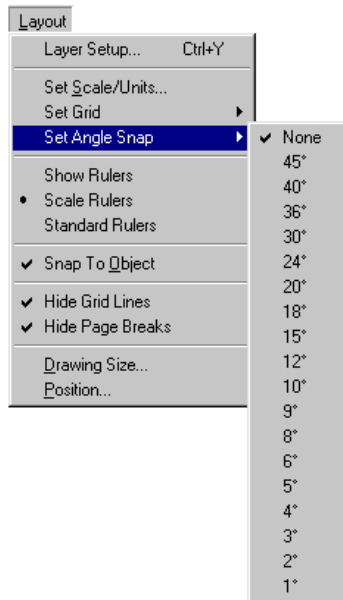
You should set the angle snap to the angle you need in or between objects in your drawing. For example, if you wanted to draw a line at an angle of 14°, you should set the angle snap to 2°. With the angle snap set this way, the cursor will snap to two degree increment as you draw the line.

Setting the angle snap

To choose a new angle snap:

1. **Open the Layout menu and drag until Set Angle Snap is highlighted.**

The Set Angle Snap submenu will appear. A check mark indicates the document's current angle snap.



The Set Angle Snap submenu shows the possible angle choices.

2. **Hold down the mouse button, drag through the submenu until the angle snap you want is highlighted, and release the mouse button.**

The angle snap remains as set until it is changed again.

Using the angle snap function

When an angle snap other than None is chosen, objects you draw (to which angle is relevant) will automatically be positioned to the nearest angle snap position. You will not be able to draw lines between the angle snap positions.

You can activate or deactivate the angle snap to suit your needs at the time.

Turning the angle snap off and on

At times you may want to turn off the angle snap when you draw objects.
To turn off angle snap:

- 1. Open the Layout menu and drag until Set Angle Snap is highlighted.**

The Set Angle Snap submenu will appear.

- 2. Hold down the mouse button, drag until None is highlighted, then release the mouse button.**

To turn on angle snap:

- 1. Open the Layout menu and drag until Set Angle Snap is highlighted.**

The Set Angle Snap submenu will appear.

- 2. Hold down the mouse button, drag until the angle snap you want is highlighted, then release the mouse button.**

Releasing objects from the angle snap

You can temporarily suspend the angle snap function by holding down the Shift key as you draw an object. This technique allows you to draw an object at an angle that is not an angle snap line.

Snap to Object

You can choose to make one object snap to another object in the drawing. When Snap to Object is on, the cursor will snap to the vertices of existing objects. For example, you could draw a line and make one of its end points coincide precisely with a corner of a rectangle.

By default, the Snap to Object function is active when you open a new PC Draft document.

To turn off the Snap to Object feature:

- **Open the Layout menu and choose Snap to Object On.**

The check mark will be removed from the command, and the feature will be deactivated.

To turn on the Snap to Object feature:

- **Open the Layout menu and choose Snap to Object On.**

The check mark will be added the command, and the feature will be activated.

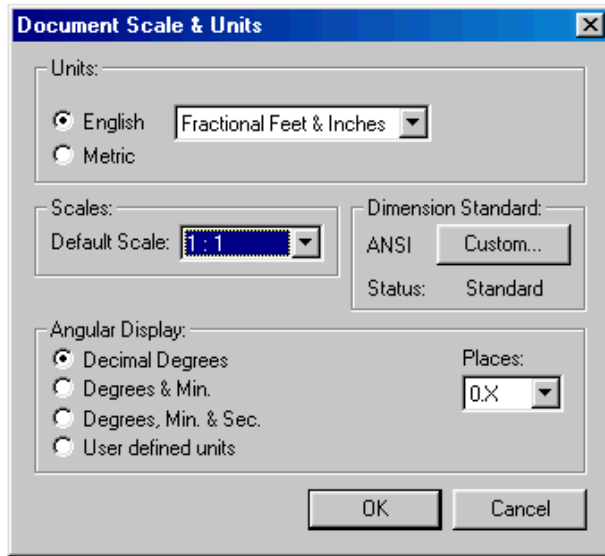
Setting the Size Units

The **Size Units** function lets you determine the units in which you want to work. The specification of units affects the Show Size window, the grid snap spacing, the scale options, the units of rotation, and the display of the scale rulers. The unit size options are accessed from the Layout menu.

To specify the units:

1. **Open the Layout menu and choose Set Scale/Units.**

The Document Scale & Units dialog box will appear.



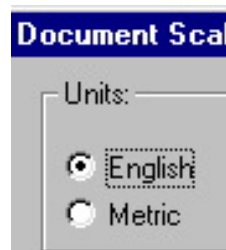
2. Click on the button beside English or Metric, depending on the type of units you want to use in the document.

Using English Units

To use English units in your drawing:

1. Open the Layout menu and choose Set Scale/Units.

Once you've done so, the Document Scale & Units dialog box will be displayed.



2. Click on the button beside the title, English.

If you use English units, you can choose from the following units options:

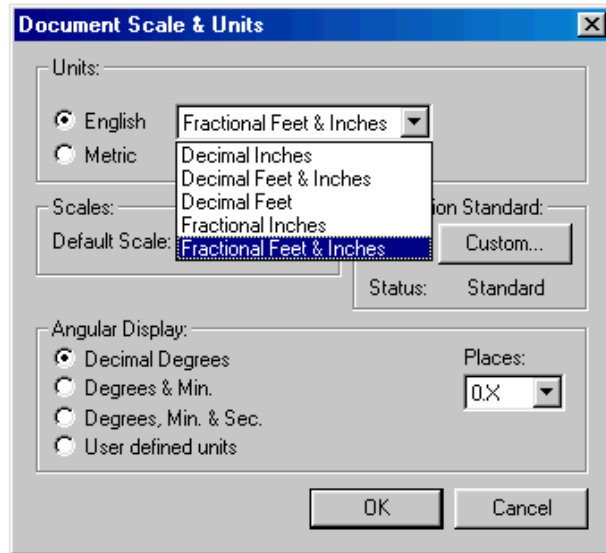
Decimal Inches
 Decimal Feet & Inches
 Decimal Feet
 Fractional Inches

Fractional Feet & Inches

To make your units choice:

3. Click the Unit Size combo box located beside the English and Metric buttons.

The Unit Size pop-up menu will appear.



The pop-up menu shows you the various unit size options that are available when you are working in English units. For instance, if you were to choose “decimal feet,” the Show Size window, the grid lines and snaps, the numerical values of the scale rulers, and the dimension and area calculations would all be presented in decimal feet.

4. Drag until the type of size units you want is highlighted.

5. Click the left mouse button.

Choosing the Number of Decimal Places for Calculation

PC Draft provides you with the capability of selecting the number of decimal places that you desire in numerical displays. You can choose either one, two, three, or four places behind the decimal point, as well “None” (no places) to display integers only. The values will be rounded off to the selected number of decimal places. The default number of places behind the decimal is two.

In larger scales, the number of decimal places allowed for display may be reduced automatically.

The decimal places option is only available when you are working in Metric units or decimal English units.

To change the number of decimal places, follow these steps:

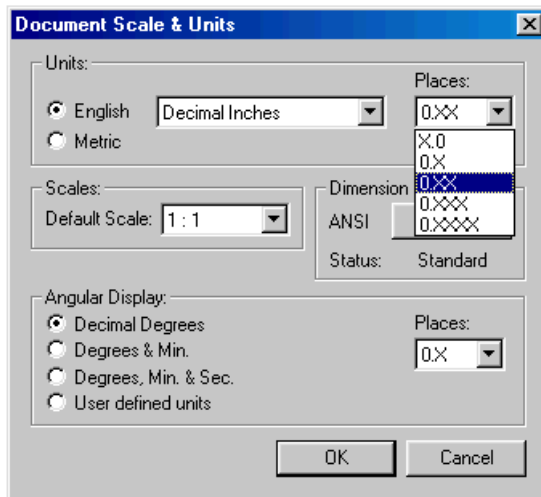
1. Open the Layout menu and choose Set Scale/Units.

Once you have done so, the Document Scale & Units dialog box will be displayed.

2. Point on the Places combo box.

3. Click the left mouse button.

The decimal places pop-up menu will appear.



4. Drag through the pop-up menu until the desired number of decimal places is highlighted.

5. Click the left mouse button.

When you are done making your choices from the dialog box:

- **Click on the OK button to close the dialog box and apply the changes.**

Once you have made your choice, all numerical displays, including dimension lines and area calculation displays, will be rounded off to the selected number of decimal places. All new displays of values will also reflect your choice.

Using Metric Units

When you want to work in metric units:

1. Open the Layout menu and choose Set Scale/Units.

The Document Scale & Units dialog box will be displayed.

2. Click the Metric radio button.

If you use Metric units, you can choose from the following units options:

Millimeters
Centimeters
Decimeters
Meters

To make your choice:

1. Click the places combo box.

The Metric Unit Size pop-up menu will appear.

If you were to choose “Centimeters,” the Show Size window, the grid lines and snaps, the numerical values of the scale rulers, and dimension and area calculations would ALL be presented in centimeters.

2. Drag until the type of units you want is highlighted.

3. Click the left mouse button.

4. Click on the OK button.

Once you've made your choice, all objects will be converted to the new units, and the numerical values for any objects drawn afterwards will display the new units (unless the Hide Metric Units feature is active — see below).

Hiding Metric Units

In many metric drawings, displaying the units is unnecessary. PC Draft allows you to hide the unit names so that areas and dimensions are shown in numerals only.

To hide metric units:

1. Open the Layout menu and choose Set Scale/Units.

The Document Scale & Units dialog box will be displayed.

2. Click the Metric radio button.

3. Click the Hide Metric Units checkbox.

The box will be checked, and the units will not be displayed with the drawing's dimension line and area values.

Setting the Rotation Units

The **Angular Display** choice lets you decide the units in which you want rotation and angular dimensions displayed and calculated. You can choose whether rotation appears in decimal degrees (for example, 63.58°) or in degrees, minutes, and seconds (for example, 47° 22' 30").

To specify the rotation units:

1. Open the Layout menu and choose Set Scale/Units.

The Document Scale & Units dialog box will appear.

2. Click the Decimal Degrees or Degrees, Min. & Secs. radio button, depending on the type of units you want to use in the document.

See Chapter 5 for information on rotating objects, and Chapter 4 for information on using angular dimensions.

Using the Scale Function

Before starting a drawing, you need to determine the sizes of the objects and the paper you are going to use. For large drawings it is impractical to draw objects at their actual sizes; it is necessary to reduce them, yet still maintain their proper proportions.

A scale accomplishes this. A scale is the ratio of the object's size on the drawing to its size in the real world. For example, if you choose a scale ratio of one inch equals ten feet (1" = 10'), a line drawn ten inches long on a drawing would represent a 100-foot line in the real world. (To save yourself the trouble of calculating the size of each object to the scale of the drawing, you should use the Show Size function.)

PC Draft offers 25 different Feet & Inches scales and 20 Metric scales for your use. This versatility allows you to create a drawing at one scale, and then have it automatically converted to a different scale.

You can also have up to four drawings, all at different scales, displayed on the screen at the same time. This makes it easy for you to copy and paste between drawings. When you paste an object into a drawing with a different scale, the object will automatically adjust in size to conform to the scale of the new drawing.

NOTE: The scale you choose is used as the default scale for the document. You can assign a different scale to each layer on your drawing if you wish. (See the section titled "Assigning a Different Scale to a Layer" in Chapter 7 for more information.) The default scale you specify in the Document Scale & Units dialog box will be assigned to new layers. If you change the default scale in the Document Scale & Units dialog box, the layers using the default will be rescaled.

Setting the Scale

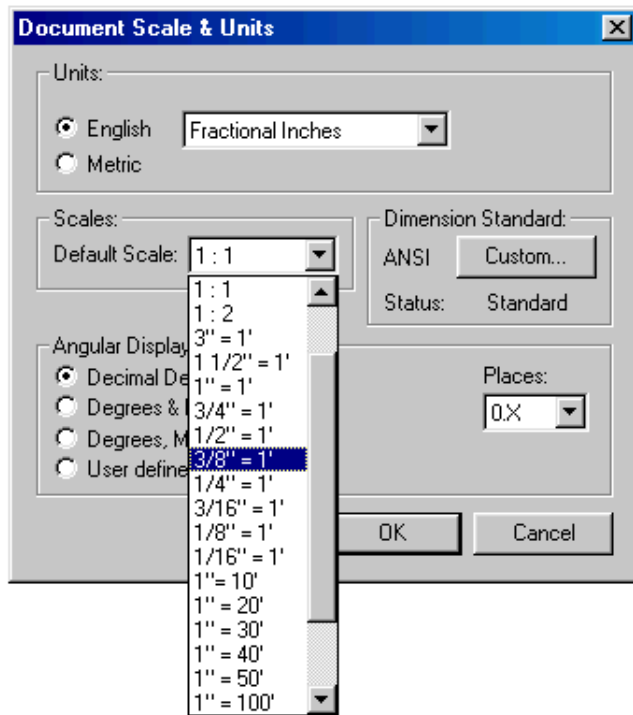
To specify the default scale:

1. **Open the Layout menu and choose Set Scale/Units.**

The Document Scale & Units dialog box will appear.

2. **Click the radio button beside English or Metric, depending on the type of units you want to use in the document.**

3. Click the Default Scale combo box.



The Scale pop-up menu will appear.

4. Drag the mouse cursor, drag until the scale you want is highlighted.

5. Click the left mouse button.

The new scale will be displayed in the Default Scale pop-up menu.

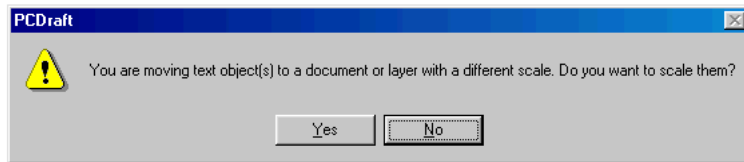
6. Click on the OK button to close the dialog box and apply the changes.

The dialog box will disappear and your drawing will now reflect the new scale. If you create a drawing at one scale, and then decide later to change to a new scale, simply follow the steps outlined above to choose a new scale. The appearance of the objects on the drawing will either grow or shrink, depending on the new scale chosen.

NOTE: Scale can also be changed in any layer via the Layer Setup window. See Chapter 7, “Symbol Libraries and Layers.”

Scaling text

If you change the scale of a document that contains text, an alert displays asking if you want to scale the text or not.



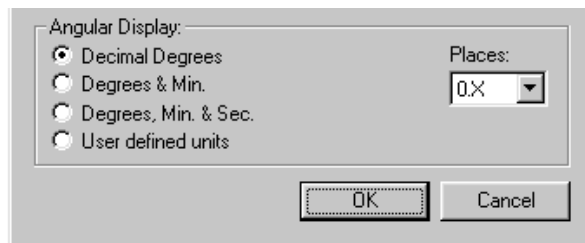
- **Click Yes if you want the text to be resized according to the new scale, or**
- **Click No if you wish the text to continue to display at the size it currently is on screen.**

NOTE: Scale can also be changed in any layer via the Layer Setup window.

Angular display

The Angular Display choices let you specify the units in which you want rotation and angular dimensions to be displayed and calculated.

You can choose to display the rotation units in decimal degrees (e.g. 63.58°), in degrees and minutes (e.g. 51° 14'), in degrees, minutes and seconds (e.g. 47° 22' 30"), or in user defined units.



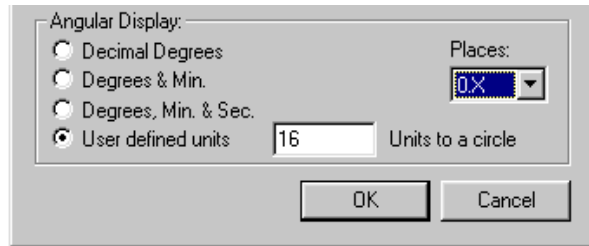
To specify the rotation units:

- **In the Document Scale & Units dialog, click on one of the radio buttons in the Angular Display section, depending on the type of units you want to use in the document.**

Setting the Rotation Units

User defined units

If you click on User defined units, you can specify the number of units to a circle by typing a value in the Units to a circle field.



With a value of 16 units to a circle, at one decimal place, 90° will be displayed as 4.0.

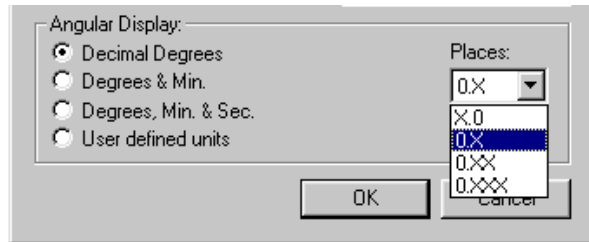
Decimal places

If you choose decimal degrees or user defined units for the units of angular display, you can also select the number of decimal places you would like to display for angular values.

To change the number of decimal places:

1. Click on the Places button.

The decimal places popup menu will appear.



2. Holding down the mouse button, drag through the popup menu until the desired number of decimal places is highlighted, then release the mouse button.

Once you have made your choice and closed the dialog, all angular displays will be rounded off to the selected number of decimal places.

Chapter 7

Symbol Libraries and Layers

Using Symbol Libraries

Symbol libraries give you the ability to save, catalog, and reuse standard images, or symbols. You can take previously created symbols out of symbol libraries and put them directly onto your drawing. With on-line symbol libraries you can create electrical and architectural symbols, or commonly used images, like logos, notices, and figures. You can then store them in an easy-to-access library document, and insert the symbols into various drawings. The symbols in the libraries retain all their drawing attributes, such as their scale, rotation, and object information fields.

Creating a New Symbol Library

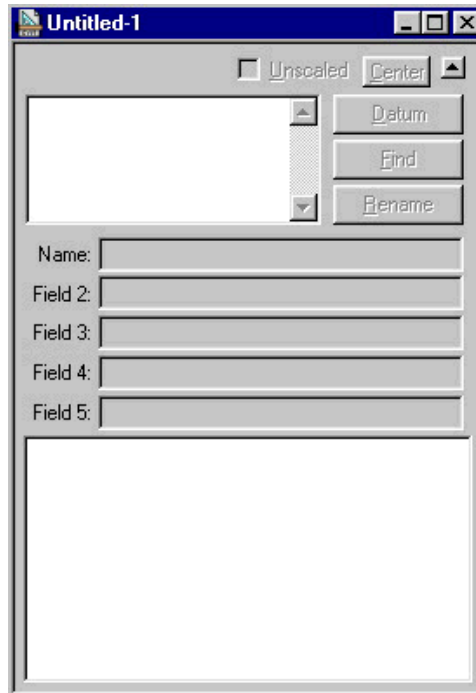
To create a new symbol library:

1. **Open the File menu and drag until New is highlighted.**

The New submenu will appear.

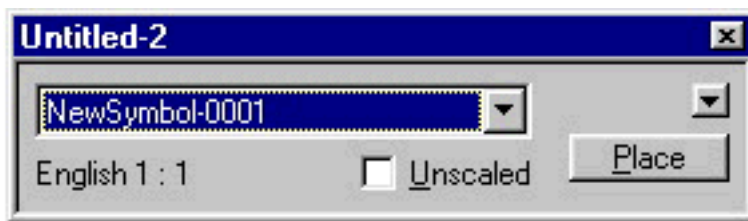
2. **Drag the mouse cursor until Symbol Library is highlighted.**
3. **Click the left mouse button.**

A new symbol library window will appear.



Shrinking the Library Window

You can shrink the symbol library window down to palette size by clicking the arrow check box at the right-hand end of the title bar.



With the palette version, you can quickly place symbols into a drawing.

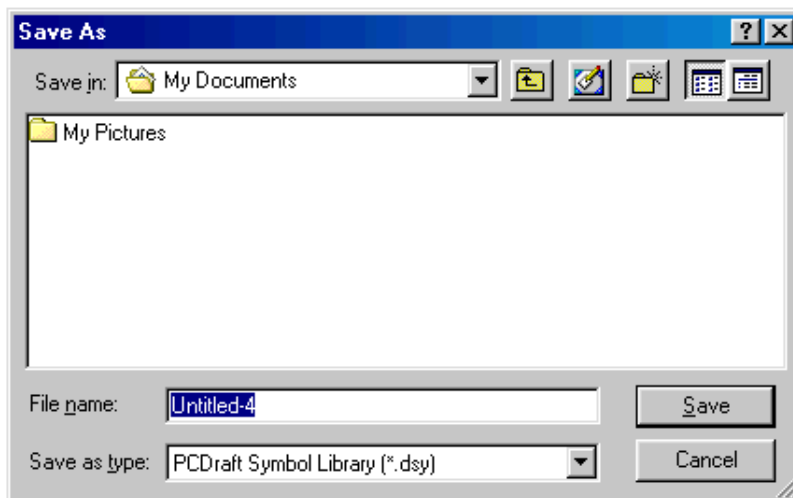
Saving a Symbol Library

You can assign a name to a symbol library to help organize your collection of symbols. For example, an architect might maintain a separate library for architectural symbols, or a desktop publisher might maintain libraries for logos and figures.

To save a symbol library under a certain name:

1. **Open the File menu and choose Save As.**

A dialog box will appear.



2. **Type in a name.**
3. **Use the directory list to specify the folder in which you want to save the library, if appropriate.**
4. **Click on the Save button.**

The symbol library will be saved under the specified name in the specified folder or on the specified disk.

Opening an Existing Symbol Library

You use the Open command in the File menu to open symbol libraries stored on disk. Once a symbol library is open, you can paste objects into it from your drawing, or copy symbols in the library and paste them into your drawing.

To open a symbol library stored on disk:

- 1. Choose the Open command from the File menu.**

A dialog box will appear.

- 2. Choose Symbol Library from the Files of type pop-up menu.**

The list box will display the available symbol libraries in the current directory.

If the symbol library you want is stored in another folder or on another disk:

- 3. Select the folder or drive as necessary to view the contents of the folder that contains the symbol library you want.**

- 4. Select the name of the symbol library.**

- 5. Click on the Open button.**

The symbol library window will appear on the screen.

You can open symbol libraries created with PC Draft only.

NOTE: The new PC Draft supports the symbol libraries created using this version 4.3 or later. You will recognize these by the suffix* .dsy.

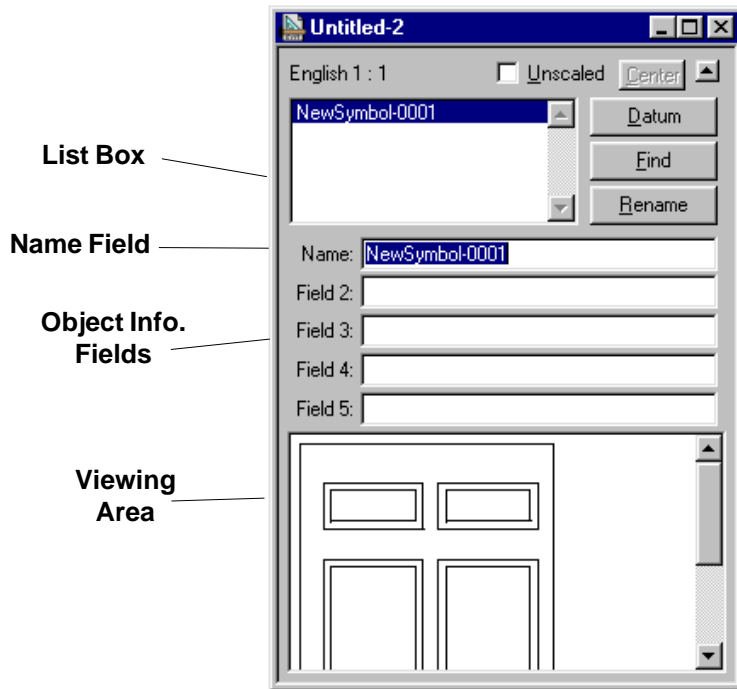
Inserting Objects Into a Symbol Library

You can use PC Draft's drawing tools to create objects and then insert them into a symbol library:

- 1. Cut or copy the object on your drawing that you want to insert into a library.**

2. **Open a symbol library.**
3. **Paste the object into the library.**

When you insert a new symbol into a library, the default name “NewSymbol-#” (where “#” is a number that increases as new symbols are added to the library) is assigned to the symbol. You can change the default name. The symbol names appear in a list box, and the current symbol is displayed in a viewing area at the bottom of the symbol library window.



The following text provides in-depth instructions on how to insert an object into a library:

1. **Select the objects you want on the drawing.**

If several objects are selected, they will be pasted as one symbol into a library.

2. Open the Edit menu and choose Cut or Copy.

3. Open a symbol library.

If an existing symbol library is open, click on its window to make it active.
If no library is open, create a new library or open an existing library.

When the symbol library you want is open and active,

4. Open the Edit menu and choose Paste.

The symbol you cut or copied in PC Draft will appear in the symbol library.
The name “New-Symbol-#” (where “#” is a number that increases as new symbols are added) will appear in the name box and the list box. Both entries will be highlighted.

Naming Symbols

To change the name for a symbol in the library:

- 1. Use the scroll controls beside the list box to display the name you want to change, if necessary.**
- 2. Click on the symbol name you want to change.**
- 3. Type a new name in the name box.**
- 4. Click on the Rename button.**

NOTE: Pressing Enter after typing the new name will not preserve the name; you must click the Rename button.

The new name will appear in the symbol library’s list box in alphabetical order.

NOTE: The name assigned to a symbol in a library file is preserved as part of its object information when it’s pasted into a drawing.

Searching for Symbols by Their Names

If you have a large number of symbols in a library, you might find it convenient to search for symbols by name.

To search for a symbol by name:

1. **Type in the name of the symbol you want to find.**

NOTE: You do not have to enter the complete name. If you enter part of the name, PC Draft will try to match what you enter with the appropriate symbol name.

2. **Click on the Find button.**

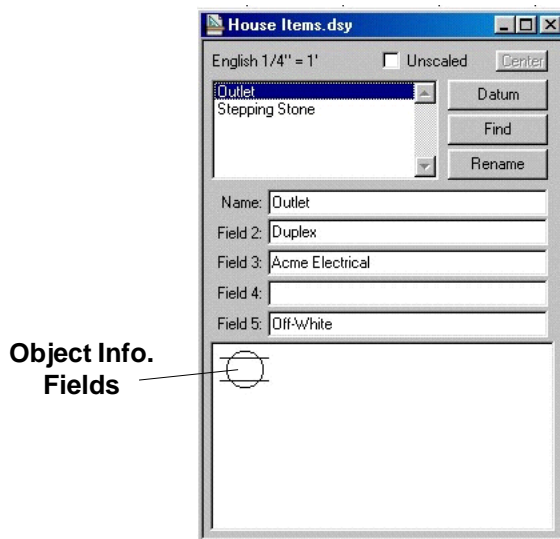
PC Draft will attempt to locate the name you specified. If a name that matches is found, PC Draft will highlight the symbol's name in the list box and display the symbol in the viewing area.

Editing Symbols

When a symbol is in a library, you cannot change its appearance directly (though you can paste it into a drawing at any time and resize, ungroup, or otherwise edit it, then paste it back into the library). You can, however, change a symbol's object information and datum point.

Changing a Symbol's Object Information

In addition to the symbol's name, the symbol library window includes text boxes for the other five fields of object information allowed in PC Draft. You can add or edit object information with the symbol library window open.



NOTE: In a symbol library, the field names always retain their generic numbering (“Field 2” through “Field 5”), rather than using whatever field names you might have assigned in a particular drawing. That’s because symbol libraries are, themselves, separate files. When you paste a symbol that has object information into a drawing, its object information will automatically be assigned to the respective fields, no matter what the field names are in that drawing.

To add object information to a symbol:

- 1. Use the scroll controls beside the list box to display the symbol you want to add object information to, if necessary.**
- 2. Click on the name of the symbol you want to add object information to.**
- 3. Click in one of the object information fields and type the object information.**

NOTE: As in a drawing, the maximum length for object information is 25 typed characters.

- 4. Click on the Rename button.**

NOTE: Pressing Enter after typing the new object information will not preserve it; you must click the Rename button.

- 5. Repeat steps 3 and 4 as needed with the other object information fields.**

To change a symbol’s object information:

- 1. Use the scroll controls beside the list box to display the symbol you want to change, if necessary.**
- 2. Click on the name of the symbol you want to change.**
- 3. Click in one of the object information fields and edit the object information.**
- 4. Click on the Rename button.**

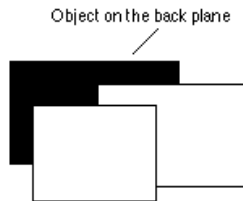
NOTE: Pressing Enter after editing the object information will not preserve the changes; you must click the Rename button.

- 5. Repeat steps 3 and 4 with the other object information fields, if necessary.**

NOTE: If you paste a group or object that already has object information into a library, the object information is pasted along with the item and will appear in the library window's object information fields; it can then be edited if necessary. In any case, a symbol's object information will stay with the symbol if you paste it into another drawing.

Assigning a New Datum Point to a Symbol

PC Draft lets you change the location of the datum point for each symbol. A datum point is a reference point on an object. The datum point is important because you can use it as a reference point when you paste symbols into a drawing.

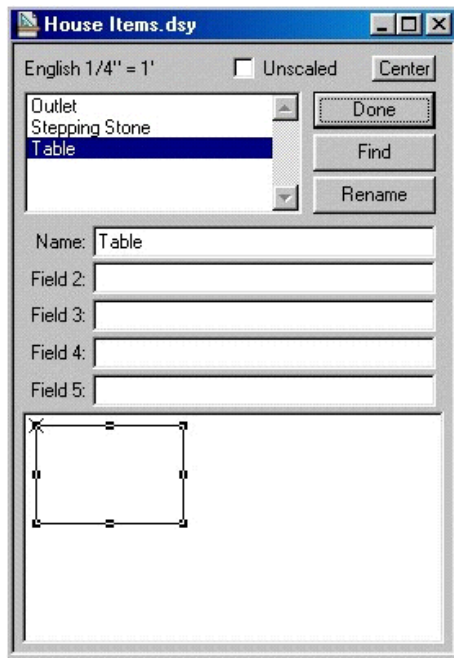


Each type of object has a default datum point. For example, the default datum point for rectangles is the upper left vertex. The default datum point for a grouped object (most symbols are grouped before pasting into a library) is the default datum point of the object at the back of the group.

To assign a new datum point to a symbol:

- 1. Open the symbol library that contains the symbol whose datum point you want to change.**
- 2. Click on the name of the symbol you want in the symbol library list box.**
- 3. Click on the Datum button. (You can also accomplish steps 2 and 3 by double-clicking on the symbol's name.)**

The edit handles associated with the symbol will appear. The datum point is represented by an “X” marker on the symbol.



4. If necessary, use the size box to display the entire symbol.
5. Click inside the bounding box (represented by the edit handles) to define the new datum point.

The “X” marker will appear where you clicked to mark the new datum point.

To place the datum point in the center of the symbol:

- Click on the Center button.

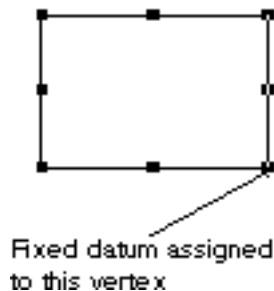
NOTE: The symbol’s center is defined as the center of the symbol’s “extent.” The extent is the overall size of the symbol.

To apply the datum point change to the symbol:

- Click on the Done button.

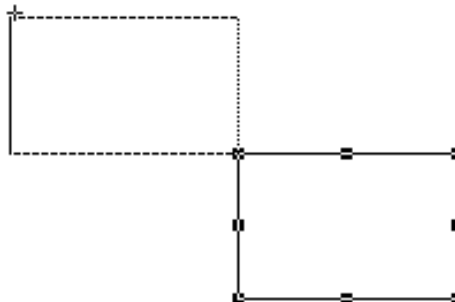
You can also finish editing the symbol's datum point by clicking on the name of another symbol.

Technical Notes: If you click near a vertex point (that is, a point where two edges meet, shown on screen by a major edit handle), the datum point marker will snap to that vertex. You can place the datum point anywhere within the bounding box. (The bounding box is the overall extent of the symbol or group.) However, a datum point located at the center of the object, or on a vertex point, has some special attributes of which you should be aware. This type of datum point, called a “fixed datum point,” retains the same relative position on the symbol even if you reshape or resize the symbol after you have pasted it onto a drawing. However, if you resize a symbol that has a “free datum point” (a datum point that doesn't appear on a vertex point or the center of a symbol) in such a way that you make the datum point appear outside the symbol's bounding box, the datum point will revert to the default datum point position that applies to the object or the group. This change only applies to the symbol on the drawing. The original symbol in the library will not be affected.



As an example, suppose you assigned a fixed datum point to the lower right vertex on a rectangle, copied the symbol, and then pasted it into a drawing.

You then reshaped the rectangle by dragging the handle associated with the lower right vertex toward the upper left corner of the drawing, as shown in the following figure.



Inserting Symbols Into Drawings

Since a fixed datum point was assigned to the lower right vertex, the datum point will still appear on the lower right vertex.

However, suppose you had assigned a free datum point that appeared in the lower right corner of the rectangle, but not on a vertex point. In this case, if you reshaped the rectangle in the same way as in the above example, the datum point on the symbol on the drawing would revert to the default datum point for rectangles, which is the upper left vertex. This would occur because the reshape operation moved the free datum point outside the symbol's bounding box.

When you want to insert a symbol into a drawing, you select the symbol you want from a list containing the names of the symbols in the current library. PC Draft lets you preview a symbol before you paste it into your drawing. The symbol you choose from the list of symbols appears in a viewing area at the bottom of the symbol library window. You can get symbol into a drawing by pasting it or placing it.

To paste a symbol into a drawing:

- 1. Open the symbol library that contains the symbol you want to paste into your drawing.**
- 2. Click on the symbol name. (If necessary, use the scroll controls to display the name of the symbol you want in the list box.)**

The chosen symbol will appear in the viewing area.

- 3. Open the Edit menu and choose Copy.**
- 4. Activate the drawing you want by clicking on it.**
- 5. Click on the drawing where you want the symbol to appear.**
- 6. Open the Edit menu and choose Paste.**

The chosen symbol will appear where you clicked on the drawing. The symbol's datum point will be used as the reference point for the paste operation. This means that the object's datum point will appear where you clicked.

NOTE: If the symbol you have selected is too large to fit in a drawing, you won't be able to paste it in. In such cases, you might try re-scaling the drawing to make room for the symbol.

Placing Symbols from the Library Palette

If you need to insert many symbols, or many copies of one symbol into a drawing, it may be easiest to put the library window into its “palette” mode. When library is in palette mode, you can rapidly place symbols directly into the drawing.

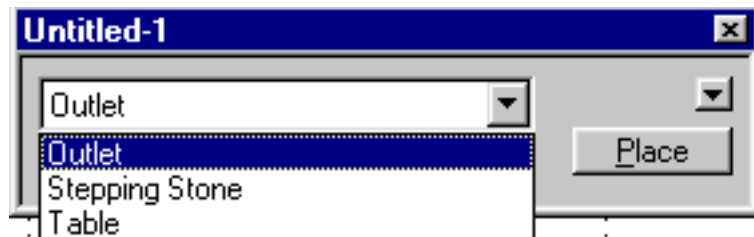
To shrink the symbol library window to palette mode:

- **Click the arrow check box at the upper right of the window.**

The library window will shrink to palette size. The list of symbols will appear as a popout menu.

To place a symbol in a drawing:

1. **Use the library's popout menu to choose a symbol by name.**



2. **Click the Place button.**

The pointer will change to an “X-shaped” cursor.

3. **Move the cursor over the drawing.**
4. **Click where you want the symbol to appear.**

A copy of the symbol will appear at each point you click on the drawing (the symbol's datum point will be aligned under the cursor at each click).

To exit from the Place mode:

- **Click on the Pointer icon.**

WARNING: When the library appears as a palette, you cannot use the usual Cut, Copy, or Paste commands with it. To use those commands with a library, or to edit symbols' datum points, names, or object information, you must click the arrow check box at the upper right of the palette to put it back in "full window" mode.

Using the Repeated Paste Function

You can use the Repeated Paste function, accessed from the Edit menu, to paste multiple copies of the same symbol onto various locations on a drawing.

To use the Repeated Paste function with symbols:

1. **Copy the symbol you want.**
2. **Activate a drawing window by clicking on it.**
3. **Open the Edit menu and choose Repeated Paste.**

When you choose Repeated Paste, you enter a special mode. In this mode, an object on the Clipboard (in this case the symbol you copied) is pasted onto the drawing at each point on which you click. While in this mode, you can scroll the window and even activate different layers and continue to paste symbols.

4. **Click where you want the symbol to appear.**

A copy of the symbol will appear at each point you click on the drawing (the symbol's datum point will be aligned under the cursor at each click).

To exit from the Repeated Paste mode:

- **Click on the Pointer icon.**

Using Scaled and Unscaled Symbols

When you insert an object into a symbol library, PC Draft lists the units and scale in which the symbol was created at the top of the list box. This information is stored with each symbol. (You can find out the scale and units that are associated with a particular symbol by clicking on the symbol's name and then reading the information at the top of the list box.) If you put a symbol into a drawing whose scale is different from the symbol's, the symbol will seem to grow or shrink to match the scale of the drawing. However, you can choose to paste an **unscaled** symbol into drawings. When you paste an unscaled symbol into a drawing, the symbol appears the same physical size on the drawing as in the library.

To paste unscaled symbols onto a drawing:

1. **Click on the name of the symbol you want to paste.**
2. **Click on the check box beside "Unscaled."**
3. **Copy and Paste or Place the symbol into a drawing.**

The symbol will appear in its original size on the drawing. The "Unscaled" check box acts as a toggle. When it is checked, all symbols you copy and paste onto drawings will be unscaled until you uncheck it.

Deleting Symbols From Symbol Libraries

To delete a symbol:

1. **Open the symbol library that contains the symbol you want to delete.**
2. **Click on the symbol name.**
3. **Open the Edit menu and choose Clear or Cut.**

The symbol will be deleted from the library.

Closing a Symbol Library

To close a symbol library:

- **Click in the symbol library's close box.**
- or,
- **Open the File menu and choose Close.**

If you insert any objects into a new symbol library and then close the library, a dialog box will appear asking if you want to save the changes.

To save the library and its contents:

- **Click on the Yes button.**

When you click on the Yes button, a dialog box will appear. (See the section titled “Saving a Symbol Library” in this chapter for more information.)

To close the library without saving the library or its contents:

- **Click on the No button.**

Using Layers

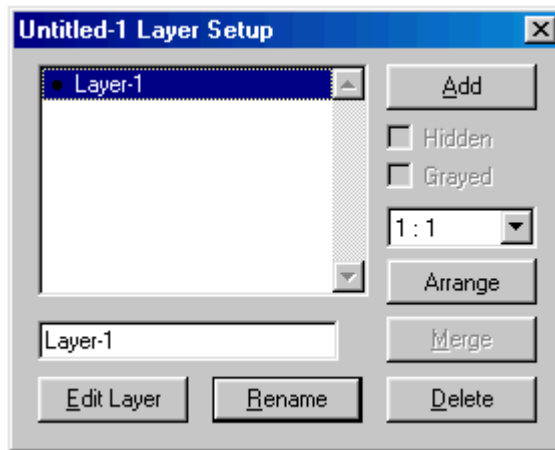
PC Draft allows you to use multiple layers on a drawing. However, only one layer can be active at a time, which means that you can draw and edit objects on only one layer at a time. The name and scale of the active layer appear beside the document name in the title bar. The number of layers you can use in a document is only restricted by the amount of memory you have.

You can also display or print layers individually using PC Draft’s Slide Show feature, described later in this chapter. Normally, all layers are printed, not just the currently active layer.

You can assign a distinct name to each layer and change the order of layers. Each layer can have a different scale. You can choose to hide specific layers (which makes them both invisible and non-printing), and you can make objects on inactive layers either appear dimmed (gray) or display their fills and line attributes (including colors). Layers are controlled through the Layer Setup dialog box.

To display the Layer Setup dialog box:

Displaying the Layer Setup Dialog Box



- **Choose Layer Setup from the Layout menu.**

The Layer Setup dialog box will appear.

When you open a new PC Draft document, you start out working on Layer-1. The names of existing layers appear in the list box on the left side of the dialog box.

Active, Inactive, Visible, and Hidden Layers

Only one layer can be active at a time. The active layer is the only layer you can edit. In the Layer Setup dialog box, a bullet symbol appears beside the name of the active layer.

Inactive layers can be hidden or visible. Only the objects on visible layers appear on the screen and on printed output. A check mark appears beside the names of visible layers. When a layer is hidden (see the section titled “Hiding Layers” in this chapter for information on hiding layers), the check mark is removed.

Selecting Layers

You can select a single layer or a number of layers in the Layer Setup list box.

Selecting a Single Layer

To select a single layer:

1. **Point on the layer’s name in the list box.**
2. **Click the left mouse button.**

The name of the selected layer will be highlighted in the list box and the text box.

Selecting Multiple Layers

To select layers listed in consecutive order:

- 1. Point on the name of the first layer in the range of layers you want to select.**
- 2. Press down the left mouse button.**
- 3. Holding down the left mouse button, drag the cursor through the names of all the layers that you want to select.**

As you drag, the names you drag through will be highlighted.

- 4. When you have highlighted the names of all the layers you want to select, release the left mouse button.**

To select multiple layers that are not listed in consecutive order:

- 1. Click on the name of the first layer you want to select.**
- 2. Press down the Control key.**
- 3. Holding down the Control key, click on all of the other layers you want to select.**

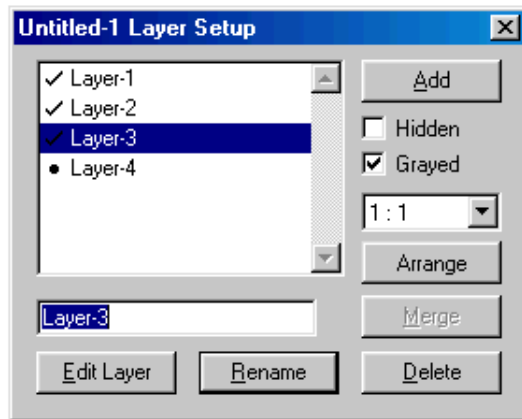
Renaming Layers

You can easily rename layers, assigning descriptive names that reflect the contents of individual layers.

To rename a layer:

- 1. Click on the name you want to change in the Layer Setup list box.**

The selected name will be highlighted in the list box and the text box below the list box.



2. Type in a name for the layer.
3. Click on the Rename button, or press Return.

The new name will appear in the list box and the text box.

Creating New Layers

To create a new layer:

- Click on the Add button in the Layer Setup dialog box.

The name of the new layer will appear at the bottom of the layers listed in the list box. PC Draft assigns the default name “Layer-#” to new layers, where “#” is a number that reflects the total number of layers in the document. For example, if you had ten existing layers in a document, the next layer you added would be named “Layer-11.”

Selecting the Active Layer

Because only one layer can be active, you must select the layer you want to edit. When a layer is active, you can select and modify the objects on it.

To select the active layer (that is, the layer you want to edit):

1. Click on the name of the layer in the list box.
- 2a. Click on the Edit Layer button.

or,

2b. Double-click on the name in the list box.

To close the Layer Setup dialog box:

3. Click on the close box.

The Layer Setup dialog box will close and the selected layer will be activated.

You can also select the active layer by using the up/down arrows on the right side of the drawing window. The arrows reflect the layer stacking order shown in the Layer Setup dialog box.

By clicking on the up or down arrow, you can scroll through the defined, visible layers without having to open the Layer Setup dialog box.

To activate layers that are stacked on top of the base layer:

- **Click on the up arrow until the layer you want to edit is activated.**

To activate layers toward the bottom of the layers stack:

- **Click on the down arrow until the layer you want to edit is activated.**

Selecting the Active Layer Using the Layer Button

You can also select the active layer by using the Layer Button on the right side of the drawing window. By clicking on the button, you can open a pop-up menu listing visible layers near the active layer.

To switch layers using the Layer Button:

1. Click the layer button.

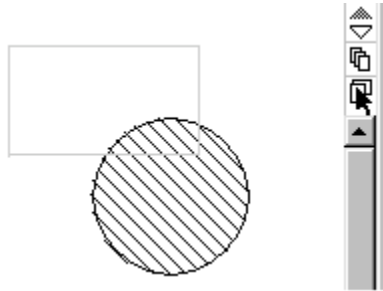
The menu of layer names will appear.

2. Choose the name of the layer you want to switch to, and click on it.

Selecting the Active Layer Using the Layer Tool

Sometimes you can see the object you want to edit, but you can't remember which layer it's on. The Layer Tool, below the Layer Button, is the best way to get to a visible layer quickly. Once selected, the Layer Tool's cursor enables you to click an object in another layer, automatically activating that layer.

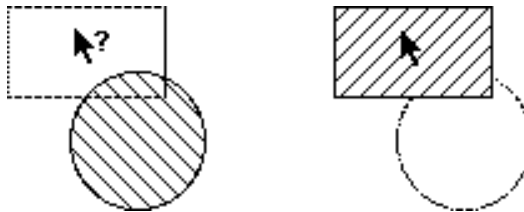
To switch layers using the Layer Tool:



1. Click on the layer tool.

The layer selection cursor will appear.

2. Click on an object in a different layer.



The new layer will be activated, and you will be able to work with objects in that layer.

Hiding Layers

At times, you may find it convenient to hide the inactive layers on the drawing.

The contents of hidden layers are not only removed from the screen, they are also omitted from printed output. This allows you to print only the contents of the layers you want. You cannot hide the active layer.

To hide inactive layers:

1. **Select the inactive layers you want to hide.**
2. **Click on the Hidden check box.**

The check mark will be removed from the names of the layers you have hidden.

Specifying How the Objects on Inactive Layers Are Displayed

The layers will be redisplayed when you uncheck the Hidden check box. The preset choice for objects on inactive layers is to be displayed without fills and with their borders dimmed. This avoids confusion as to which objects are on the active layer.

However, you can choose to have the objects on inactive layers appear with their fills and border attributes, including colors and patterns. This allows you to preview your drawing before you print it.

To make the objects on inactive layers retain their normal appearance:

1. **Select the grayed out layers you want to appear with their normal fills and colors.**
2. **Uncheck the Grayed box.**

The Grayed check box will be cleared, and the objects on the selected layers will appear with their normal fill and line attributes when their layers are inactive.

Arranging Layers

As you add layers, new layers are placed on top of the existing layers on the drawing, in a process analogous to placing transparent sheets of plastic on top of each other. The layer at the top of the list in the list box is at the rear of the drawing, and the layer at the bottom of the list in the list box is at the front of the drawing.

Objects on an upper layer will appear on top of objects on a lower layer. If objects are opaque (that is, filled), and overlap objects on a lower layer, they naturally cover portions of the objects beneath them. Sometimes, you might want to move objects on a lower layer in front of an upper layer. To do this, you need to rearrange the layers.

There are four commands you can use to rearrange layers:

Bring To Front
Send To Back
Move Forward One
Move Back One

These choices are discussed in the following pages.

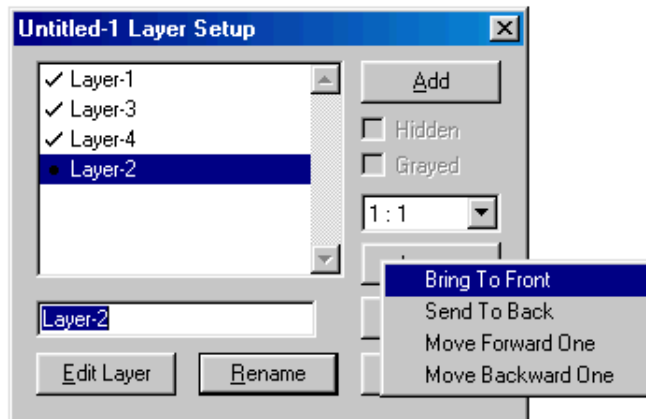
Bringing a Layer to the Front

To bring a layer to the front, thereby making the objects on it appear on top of all other objects on the drawing, you can use the Bring To Front command.

To bring a layer to the front:

1. **Choose Layer Setup from the Layout menu.**
2. **Select the layer you want to bring to the front.**
3. **Point on the Arrange button.**
4. **Press down the left mouse button.**

The Arrange Layers submenu will appear.



5. Drag the mouse cursor until Bring To Front is highlighted.

6. Click the left mouse button.

When you release the left mouse button the objects on the selected layer will appear on top of all other layers on the drawing. Also, the name of the selected layer will move down to the bottom of the list in the Layer Setup dialog box. You can also move multiple layers to the front. If you select more than one layer and then choose Bring To Front, all the selected layers will be moved towards the top of the drawing, and the layers' names will be moved towards the bottom of the list in the list box.

Sending a Layer to the Back

When you want objects on a layer to appear behind all other objects, you can send the layer to the back.

To send a layer to the back:

- 1. Choose Layer Setup from the Layout menu.**
- 2. Select the layer you want to send to the back.**
- 3. Press down on the Arrange button.**
- 4. Drag the mouse cursor until Send To Back is highlighted.**
- 5. Click the left mouse button.**

When you release the left mouse button, the selected layer's name will be moved to the top of the list. Also, the objects on that layer will appear behind the objects on all the other layers.

You can send more than one layer at a time to the back. To do so, simply select the layers you want to send to the back, then choose Send To Back.

Moving Layers Forward One Level

You can move layers up one at a time by using the Move Forward One command.

To move layers up one level:

1. **Choose Layer Setup from the Layout menu.**
2. **Select the layers you want to move up.**
3. **Press down on the Arrange Layers button.**
4. **Drag the mouse cursor until Move Forward One is highlighted.**
5. **Release the left mouse button.**

When you release the left mouse button, the selected layers will be moved forward one level on the drawing. The layers' names will be moved down one position in the list.

You can repeat the above steps to continue to move layers forward one level at a time.

Moving Layers Backward One Level

You can also move layers toward the back of a drawing one level at a time.

To move layers backward one level:

1. **Choose Layer Setup from the Layout menu.**
2. **Select the layers you want to move backward.**
3. **Press down on the Arrange button.**
4. **Drag the mouse cursor until Move Backward One is highlighted.**
5. **Click the left mouse button.**

When you release the left mouse button, the selected layers will be moved back one level on the drawing, and their names will be moved up one place in the list.

Assigning a Different Scale to a Layer

You can assign different scales to the various layers in your document. This allows you to include details with an overall floor plan drawing, or details of a part of a machine within the drawing of the entire machine.

The default scale for each layer is the scale that was defined in the Document Scale & Units dialog box. When you start out with a new document, the default scale is 1:1; therefore, unless you change the default scale for the document using the Document Scale & Units dialog box, the default scale for each new layer will be 1:1.

To define a new scale for a layer:

- 1. Select the layer you want.**
- 2. Point on the button that shows the current scale of the layer (The button below the check box titled “Grayed”).**
- 3. Press down the left mouse button.**

The Layer Scale pop-up menu will appear.

- 4. Drag the mouse cursor until the scale you want to apply to the selected layer is highlighted.**
- 5. Click the left mouse button.**

The scale you chose will appear on the button. When an individual layer is selected in the list box, the scale for that layer appears on the button.

The scale for the active layer appears on the title bar beside the document and layer names.

NOTE: The scale you choose in the Document Scale & Units dialog box is the default scale for the document. When you add a new layer, the new layer assumes the default scale. However, you can assign a different scale to each layer on your drawing if you wish. You should be aware that if you change the default scale in the Document Scale & Units dialog box, the layers that use the default scale will be changed to the new scale. The layers that you’ve given custom scales will be unaffected by changes made to the default scale.

Merging Layers

PC Draft allows you to merge the objects on two or more layers into one layer. All the layers to be merged must have the same scale.

WARNING: You cannot undo the merging of layers.

To merge layers:

- 1. Select the layers you want to consolidate into one layer.**
- 2. Click on the Merge button.**

A box will appear to confirm that you want to proceed.

- 3a. Click on the OK button to merge the selected layers.**

Or,

- 3b. Click on the Cancel button to void the operation.**

If you choose “OK”, a new layer named “Merged Layer-#,” will be created, where “#” is the number of merged layers in the drawing.

Deleting Layers

You can delete specific layers, along with all their contents. All but the last layer in the document can be deleted.

WARNING: You cannot undo the deletion of layers.

To delete layers:

- 1. Select the layers you want to delete.**
- 2. Click on the Delete button.**

If the layers contain any objects, a dialog box will appear to confirm that you want to proceed.

- 3a. Click on the OK button to delete the layers.**

or,

- 3b. Click on the Cancel button to cancel the deletion.**

Slide Shows

PC Draft's layer feature enables you to use different layers as presentation slides. With the View menu's Slide Show command, you can display a drawing's layers as slides one after another, without menu bars or other tools, advancing either automatically or manually. You can also designate one layer as a "master slide," which will appear as a background for all the other slides.

In Slide Show mode, any layer that exceeds the screen size is reduced to fit on the screen.

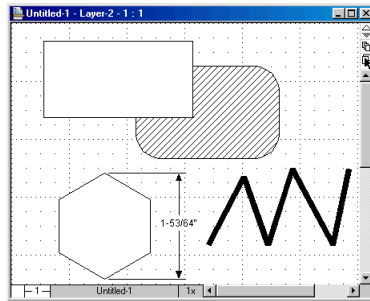


Image in
Drawing Window

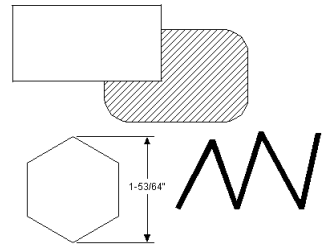


Image in
Slide Show Mode

In addition, the File menu's Print Special command will print layers separately, either at their full sizes or reduced to fit each layer on a page. You can also use Print Special to print the currently displayed layer by itself.

The order of slide presentation is determined by the order of layers. The layer that appears first in the Layer Setup dialog box's list of layers will appear first in the slide show; if the Master Slide option is active, the layer listed first will act as the master (or background) slide.

Layers that are hidden will not be displayed in Slide Show mode or printed. Layers can be displayed in a slide show that advances when you change the slide manually or when an interval you determine has passed.

To display a drawing's layers as a slide show with manual control:

1. **Open the View menu and choose the Slide Show command.**

The Slide Show dialog box will appear.



2. **If necessary, click the radio button next to Display Slides: Manually, and then click the Play button.**

The first slide will appear.

3. **When you want to see the next slide, press the Right Arrow key on the keyboard or press the left mouse button.**

The next slide will appear.

4. **If you want to move back to the previous slide, press the Left Arrow key on the keyboard.**

The previous slide will appear.

5. **When you are done with the slide show, press the Esc key.**

PC Draft will revert to normal drawing mode.

The following table details the controls for manual slide show mode:

Move forward one slide:	Mouse button or Right Arrow key
Move backward one slide:	Left Arrow key
Leave Slide Show mode:	Esc key

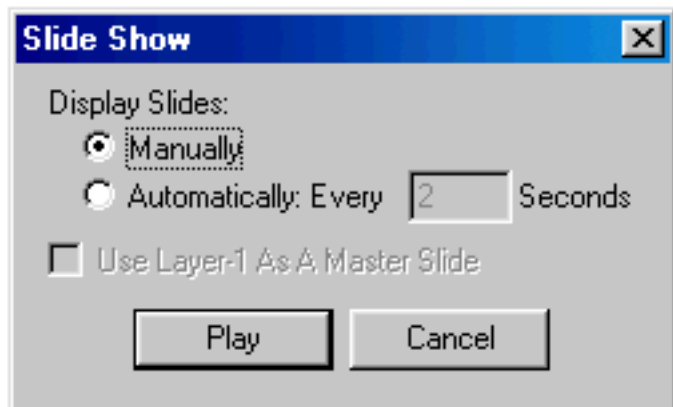
You can set the slide show to advance from slide to slide automatically after a set interval. You control how long the preset interval is (it can range from one second to 999 seconds, which is 16 minutes and 39 seconds).

In automatic Slide Show mode, PC Draft will repeat the sequence of slides indefinitely. Pressing the Esc Key will put PC Draft back into regular drawing mode.

To display a drawing's layers as a slide show with automatic advance:

- 1. Open the View menu and choose the Slide Show command.**

The Slide Show dialog box will appear.



- 2. If necessary, click the Display Slides: Automatically radio button.**

3. **Double click in the Seconds field, if necessary, then type the number of seconds for each slide to be displayed.**
4. **Click the Play button.**

The first slide will appear. After the number of seconds you specified, the next slide will appear. When all the slides have been displayed, the slide show will start over.

5. **When you want the slide show to stop, press the "Esc" key.**

PC Draft will revert to normal drawing mode.

NOTE: You can use the automatic slide advance feature to create primitive “animated” sequences. Set the interval to one second and move or edit objects on different layers so that they appear to “jump” or change as the slides advance.

Master Slides

You can use one layer as a “master slide,” forming a single background for all the other slides in a slide show.

PC Draft treats the first layer listed in the Layer Setup dialog box as the master slide. To move a different layer to that position, you can use the Layer Setup dialog box’s Send to Back command.

The Master Slide option works with both manually and automatically advanced slide shows.

To display a drawing’s layers as a slide show with a single background:

1. **Open the View menu and choose the Slide Show command.**

The Slide Show dialog box will appear.



2. **If necessary, click the Display Slides: Manually, or Display Slides: Automatically radio button, and set any necessary time interval.**
3. **Click the Master Slide check box.**
4. **Click the Play button.**

The first slide will appear, consisting of the first and second layers combined into one image.

5. **If necessary, advance to the next slide.**

When the show is advanced (either manually or automatically), the second slide, combining the first and **third** layers, will appear. As the show advances, each succeeding layer will be displayed over the first layer.

6. **When you want the slide show to stop, press the "Esc" key.**

PC Draft will revert to normal drawing mode.

Printing Slides

PC Draft's Print Special command (found in the File menu) will print slides sequentially, either reduced to fit the current printer's pages or at their full size, and with or without the first layer appearing as a "master" background for the other slides. The Print Special command can also print the

currently active layer alone, without any other layers appearing on the resulting hardcopy.

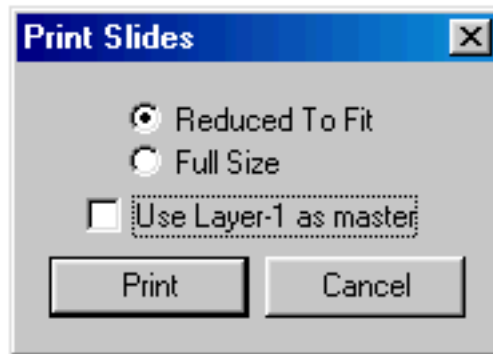
Layers that have been marked “hidden” using the controls in the Layer Setup dialog box will not be printed.

To print a drawing’s layers separately as sequential slides:

1. **In the File menu, open the Print Special... submenu and choose the Slides... command.**

The Print Slides dialog box will appear.

2. **Click either the Reduced to Fit or Full Size radio button.**



The Reduced to Fit option will shrink any layers that are larger than the current printer’s paper size so that they each appear on a single page. The Full Size option will leave all layers at their actual sizes, so that larger layers may print on several pages.

3. **If you want to print the slides with the first (bottom) layer as a master background, make sure the Use Layer-1 As Master checkbox is checked.**
4. **Click the Print button.**

The layers or slides will print out in sequential order.

Chapter 8

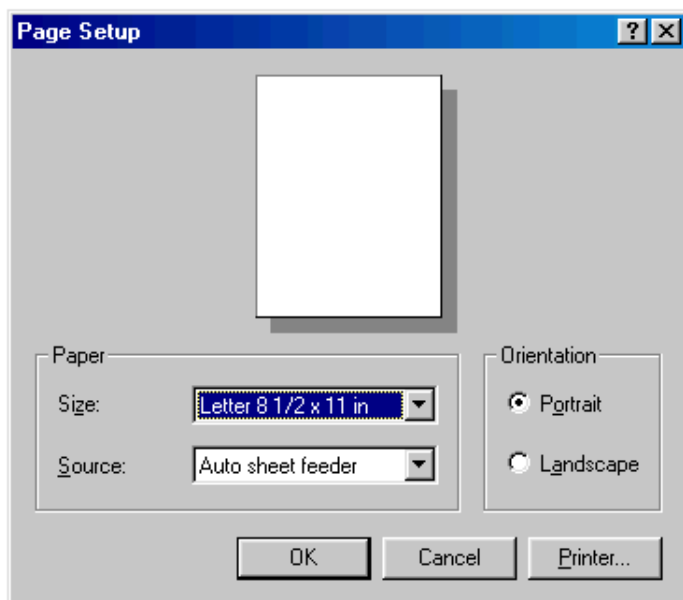
Drawing Layout and Printing

Drawing Layout and Printing

Using PC Draft, you can create drawings of up to 56.88 inches high by 56.88 inches wide. You can define the desired drawing size by using the Page Setup choices in conjunction with the Drawing Size feature. The Page Setup dialog box, accessed through the Page Setup command in the File menu, determines the size of the individual pages that make up the overall drawing area. The Drawing Size feature, accessed from the Layout menu, has a graphical interface that lets you select the number of pages needed to achieve the desired overall size of the drawing.

Before you define the overall size of your drawing using the Drawing Size feature, you should specify the type of output device you will use, and the Page Setup dialog box to specify information about the page setup.

You can configure your Printer Driver directly from the Page Setup dialog box.



To do so, click the Printer button and choose the printer from the pop up menu beside Name.

Defining Your Page Setup

The Page Setup command allows you to choose how you want your document to appear on the printed page. The page setup depends on the type of printer you select. (See “Printing a Document” in this chapter for information about choosing printers.)

Properties

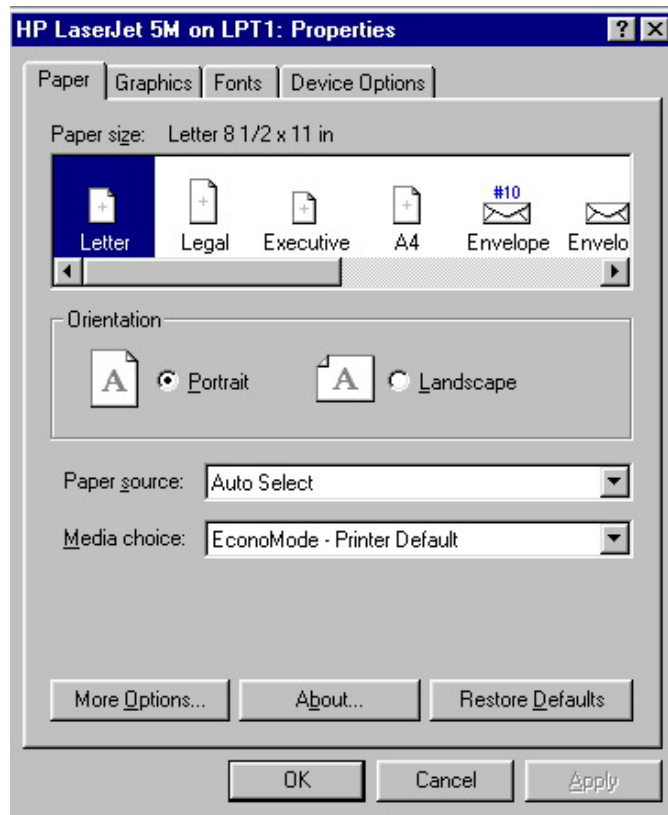
Normally, the choices of properties include Paper, Graphics and Device Options.

Your properties options are dependent on the particular printer you will use, such as HP®, Xerox®, or Epson®. The type of printer is also very important in defining the maximum size and the type of media that you will be able to use (for example Inkjet, Laser, Dot Matrix, etc.).

To select your Paper Option:

- **Open the File menu and choose Page Setup**
- **Click the Printer button from the Page Setup dialog box**
- **Choose your printer and click Properties button**

The following dialog box will be displayed so that you can choose your various paper size.



Paper Size

You will notice that there are a variety of paper types offered in the dialog box. Each paper type has its own block size. The block size refers to the physical page size of the pages in the PC Draft drawing area.

Normally the printer drivers offer the standard sizes of papers. Below are the most common paper sizes for desktop printers:

- Click the icon to choose the paper size.

Letter	8.5” x 11”
Legal	8.5” x 14”
Executive	7.25” x 10.50”
A4	8.26 x 11.69”
A5	5.83 x 8.26”
B5	7.17” x 10.13”

Some printers include Envelope and Custom sizes.

Orientation

The Printer Drivers offer a number of special printing features. These features allow you to set the orientation of the pages on the drawing area and control the way a drawing can be printed.

The available page orientations are Portrait and Landscape. Select Portrait orientation to print objects vertically on the page, or Landscape orientation to print objects horizontally on the page.

NOTE: PC Draft will get the page orientation from the printer driver. We recommend setting up your printer driver as the default printer, even if PC Draft allows you to change your printer on the fly.

Graphics Options

Resolution:

Under Resolution, you will find different options for setting up the print quality. Some drivers display the Resolution options as pop up menus expressed in dots per inch (dpi), others offer different Quality options that

indicate the resolution (for example maximum or minimum resolution). The number of dpi will depend on the printer.

Dithering:

The printer driver can offer Dithering options to print bitmap, vectors, or to get good quality output for different types of media.

Some drivers will give an intensity option enabling you to make the image either darker or lighter.

You may also have the option, depending on your driver, to set up the number of copies desired.

Device Option

This option is part of some printer drivers. If your driver has this option, it will allow you to setup the Printer features.

NOTE: You may find an option giving you a choice to either print in Postscript or not. We recommend to not use the Postscript options with PC Draft.

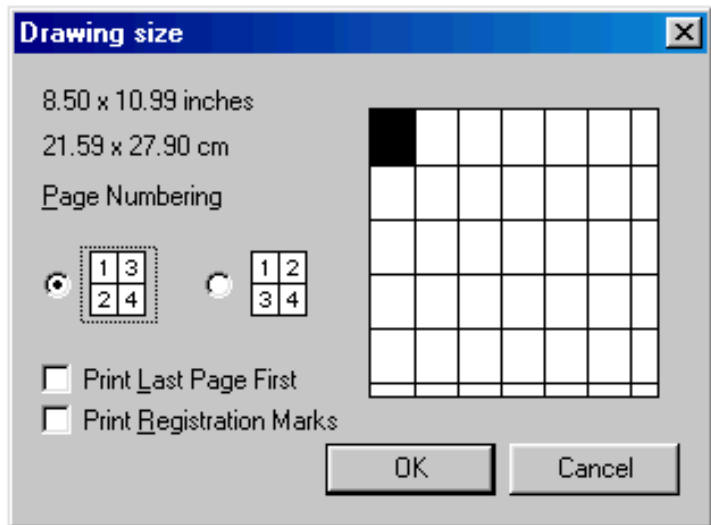
Defining Your Drawing Size

Once your page setup is complete, you are ready to define the overall size of the drawing.

To set the size of your drawing:

- **Open the Layout menu and choose Drawing Size.**

A dialog box will appear, displaying the current total drawing size in the form of a block diagram.



You can see the diagram is divided into blocks. This diagram represents the maximum drawing size available, and each of the blocks represents a single page. The blocks that are darkened indicate the current drawing size.

To change the drawing size:

1. **Position the tip of the pointer on one of the activated page blocks.**
2. **Press down the left mouse button.**
3. **Holding down the left mouse button, drag until you have activated the number of page blocks required to make up the drawing size you want.**
4. **Release the left mouse button.**
5. **Click on the OK button.**

As you know, the PC Draft drawing window generally shows only a portion of the overall drawing. Therefore, when you change the drawing size it won't be noticeable until you zoom out or scroll to another area of the drawing.

PC Draft Printing Options

PC Draft lets you make choices that affect how pages are printed out. For example, you can specify the way pages in a document are numbered, and the order in which they are printed.

Specifying How Pages Are Numbered

You can choose to number pages by column or by row. In either case, page one will appear in the upper left corner of the document.

To number pages by column, in ascending order from top to bottom, or by row (from left to right):

- 1. Open the Layout menu and choose Drawing Size.**

The Drawing Size dialog box will appear.

- 2. Click on the button to the left of the page numbering option you want.**

Printing in Reverse Order

To print the pages in the document from the last page to the first page (for printers that produce pages face up):

- Click on the check box beside Print Last Page first in the Drawing Size dialog box.**

After your drawing is complete, you can print it on any printer.

Printing a Document

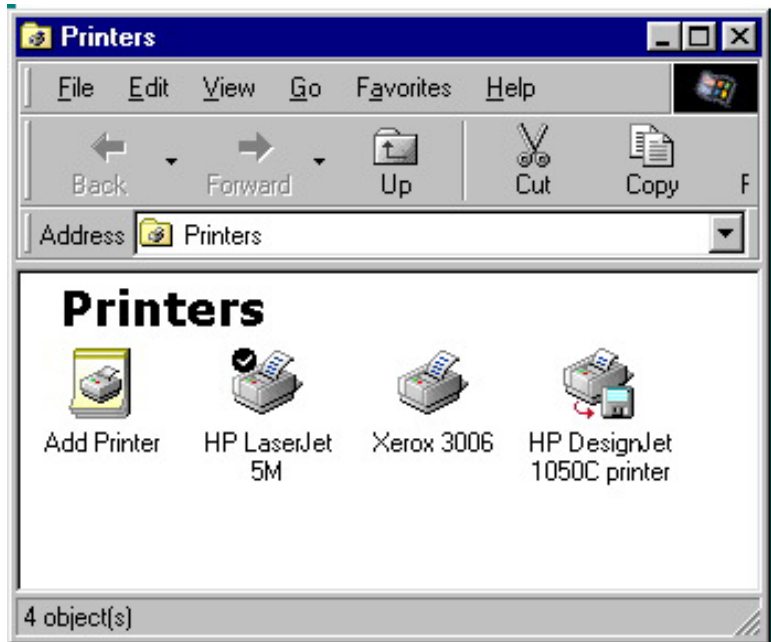
Before you print, make sure that you have chosen the printer you want to use.

Choosing Your Printer

To choose a printer:

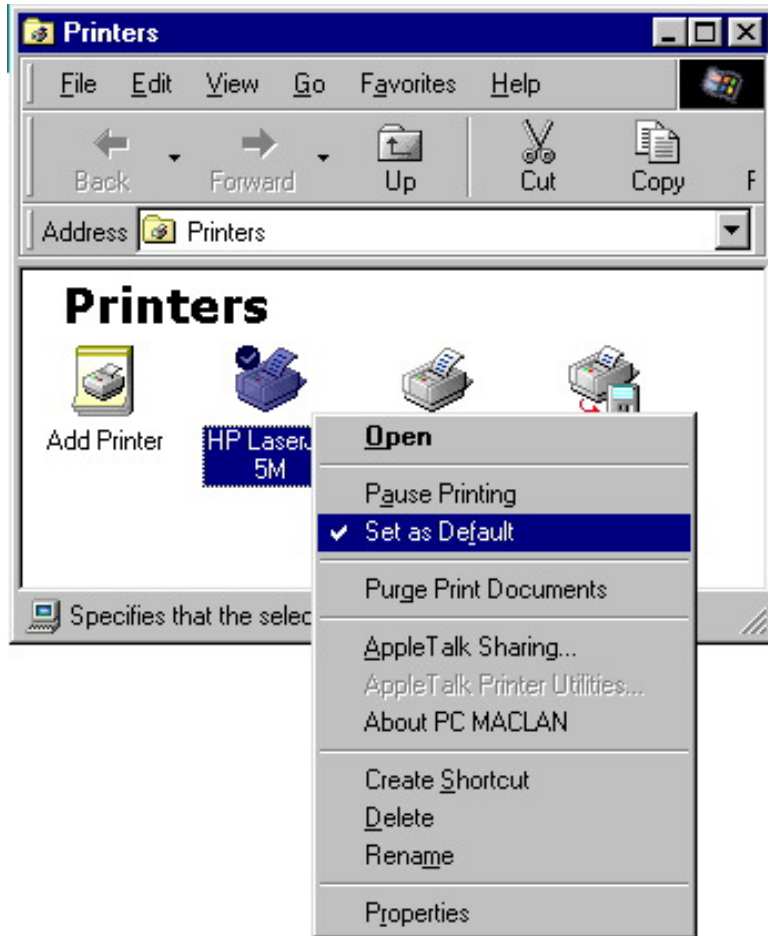
- Open the Start menu and choose Printers from the Settings submenu.**

A dialog box will appear displaying the available printers.



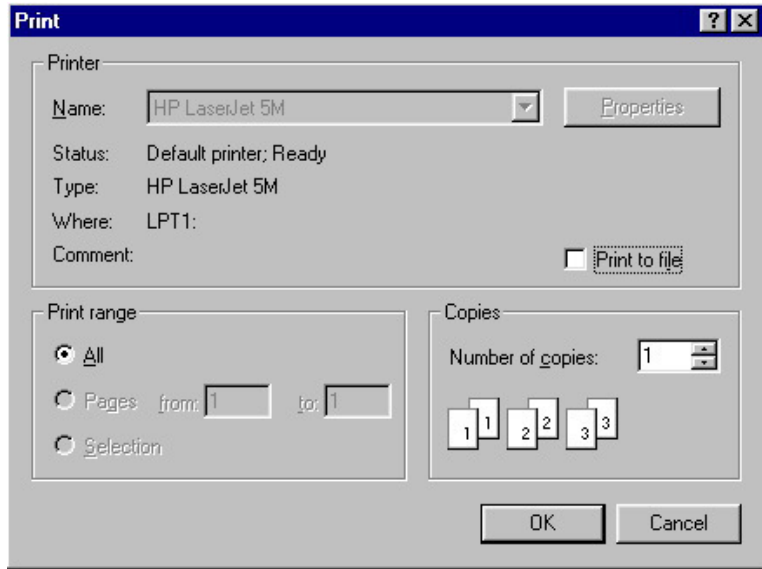
To Setup your default printer:

- **Right click the printer icon**
- **Holding down the left mouse button, drag until the "Set as Default" is highlighted and release the button.**



Number of Copies

The Print dialog box for the laser printers provides you with a number of printing options. You can specify the number of copies you want to print, the range of pages, the source for the paper, and whether or not you want to print out information about the print job.



Page Range

If you want to print only some of the pages in the document, you can specify the range of pages you want to print by doing the following:

1. Click in the box beside **Pages From**, then type the number of the first page in the range you want to print.
2. Click in the text box beside **To**, then type the number of the last page in the range.

To Transfer Objects to Other Applications Using BMP

1. **Select the object or objects you want to move.**
2. **Open the Edit menu and choose Copy.**
3. **Switch to another application, which accepts graphics.**

Once you leave PC Draft, all graphic objects on the Clipboard will be converted to the BMP format.

4. **Open the Edit menu and choose Paste.**

The objects in the Clipboard will appear as a BMP image in the application's window.

Opening BMP Files with Other Applications

Many applications, including some word processors and page layout programs, can open BMP files directly, treating them as graphics inserted in text documents.

(To learn about saving documents in the BMP format, see Chapter 1.)

In many word processing and page layout programs, you can manipulate BMP images (by cropping, resizing, or panning) just as you can any other imported graphics.

Resizing Bitmap Images

There may be occasions when you want to enlarge, reduce, or even distort the shape of a bitmap image produced from a program such as Paint®. PC Draft allows you to enlarge or reduce the size of a bitmap image without distorting the image. PC Draft also allows you to change the size of a bitmap image in one direction at a time.

Resizing in One Direction

To resize a bitmap image in one direction only:

1. **Select the bitmap image you want to resize.**
2. **Position the tip of the pointer on one of the edit handles in the middle of the bitmap's bounding box, (that is, the handles on the top, bottom, left and right sides).**
3. **Press down the left mouse button.**

Constrained Resizing

4. **Drag until the bitmap image is the size you want.**
5. **Release the left mouse button.**

If you stretch a bitmap from one of its corner edit handles, you will be able to resize the bitmap image's size in a proportional manner, (that is, the height-to-width ratio will be maintained).

To resize a bitmap image while maintaining its proportions:

1. **Select the bitmap image you want to resize.**
2. **Choose Group from the Arrange menu.**
3. **Point on one of the edit handles on the corners.**
4. **Press down the left mouse button.**
5. **Drag until the bitmap image is the size you want.**
6. **Release the left mouse button.**

Resizing the Height and Width Separately

You can use the handles on the corners with the Alt key to change the bitmap image's horizontal and vertical size independently. This method allows you to change the image's proportions while resizing it. (This means that the height-to-width ratio of the image will not be maintained.)

To resize a bitmap image while changing its proportions:

1. **Select the bitmap image you want to resize.**
2. **Point on one of the corner edit handles.**
3. **Press down the left mouse button.**
4. **Press down the Alt key.**
5. **Holding down the left mouse button and the Alt key, drag until the bitmap image is the size you want.**
6. **Release the left mouse button and the Alt key.**

Printing Slides

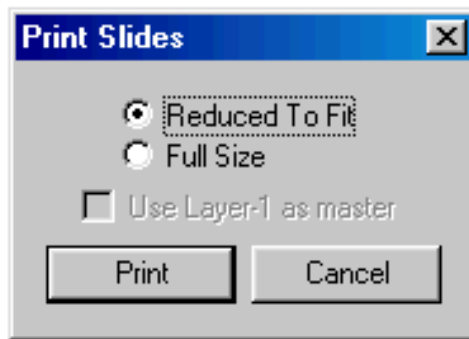
PC Draft's Print Special command (found in the File menu) will print slides sequentially, either reduced to fit the current printer's pages or at their full size. The Print Special command can also print the currently active layer alone, without any other layers appearing on the resulting hardcopy.

Layers that have been marked "hidden" using the controls in the Layer Setup dialog box (see Chapter 7) will not be printed.

To print a drawing's layers separately as sequential slides:

1. **In the File menu, open the Print Special... submenu and choose the Slides... command.**

The Print Slides dialog box will appear.



2. **Click either the Reduced to Fit or Full Size radio button.**

The Reduced to Fit option will shrink any layers that are larger than the current printer's paper size so that they each appear on a single page. The Full Size option will leave all layers at their actual sizes, so that larger layers may print on several pages.

3. **Click the Print button.**

The layers or slides will print out in sequential order.

Chapter 9

The Report Feature

The Report
Feature

Often, you may want to extract information from your drawing in the form of a report (a Bill of Materials, for example). Or you may need a report detailing the properties of objects in your drawing, such as perimeter, area, length, or other measurements.

	BILL OF MATERIALS					
The Conc	The Elkgrove Building Concord, California					
ELE Desc	ELECTRICAL:					
Outl	Description:	Type:	Part Number:	Total:		
Outl	Outlet	Duplex	123-456-00	87		
FLO F	Outlet	Duplex/GRD	123-456-00	10		
Living	FLOOR COVERING:					
Bedr	Room:	Floor Type:	Supplier:	Color:	Model No.:	SQ. Footage:
Bedr	Living Room	Carpet	Dupont	Lt. Brown	BVG 123-5	225.5 ft2
Kitch	Bedroom-1	Carpet	Dupont	Lt. Brown	BVG 123-5	144.0 ft2
Entr	Bedroom-2	Carpet	Dupont	Lt. Brown	BVG 123-5	175.5 ft2
	Kitchen	Tile	ABC Tile Co	Spanish	A34SP23	110.0 ft2
CON	Entry	Tile	ABC Tile Co	Spanish	A34SP23	58.0 ft2
Desc	CONCRETE					
Found	Description:					QTY:
Walk	Foundation					386' 6"
Sup	Walkway					412.0 ft2
	Supports	Floor				45

Reports can be very useful for such things as determining the cost of a project or counting items in a drawing (such as furniture in an office layout or components in a mechanical drawing). Just about any drawing can be made more meaningful using PC Draft's report functions.

Any change made to your drawing will be reflected in your reports. Once you create a report, you don't have to remember if you've changed the length of a wall or added furniture or fixtures to a layout. PC Draft's automatic updating of any data you've designated for a report can save you hours of work and prevent many mistakes.

PC Draft reports can include data about any objects to which you've assigned object information, such as names. In the Report Format window, you designate which items of object information you want included as criteria, which functions (Count, Height, Length, Width, X Dimension, Y Dimension, Area, or Perimeter) you want performed on the data, label the items if necessary, then print or display the report results.

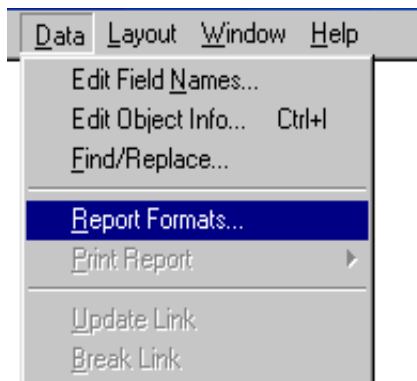
Clone...				
BILL OF MATERIALS				
The Elkgrove Building				
Concord, California				
CRITERIA	Name	Type	PN	Undefined
ELECTRICAL				
Description:		Type:	Part Number	
COUNT	Outlet	Duplex	123-456-000	
COUNT	Outlet	Duplex/GRD	123-456-100	
Obj Info.				

You can also link a report to the Microsoft® Excel® worksheet, and then use Excel's powerful calculation and formatting features on the report's data (to generate cost estimates, for example).

Creating a Report

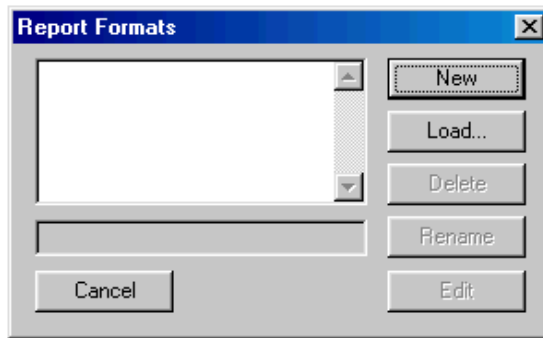
Most report actions, including creation of a new report, begin with the Report Formats dialog box. The dialog box displays the names of all of a drawing's reports, and its buttons initiate creating, editing, renaming, and deleting reports, as well as loading reports in from other drawings.

To create a report:



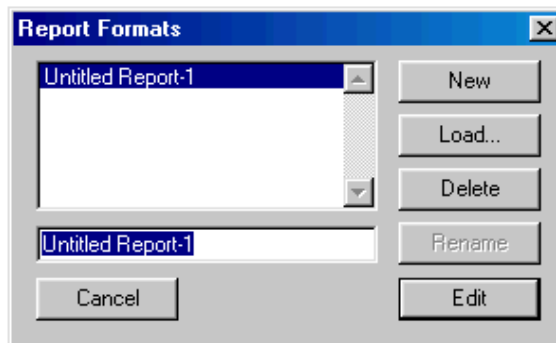
1. Choose the Data Menu's Report Formats... command.

The Report Formats dialog box will appear.



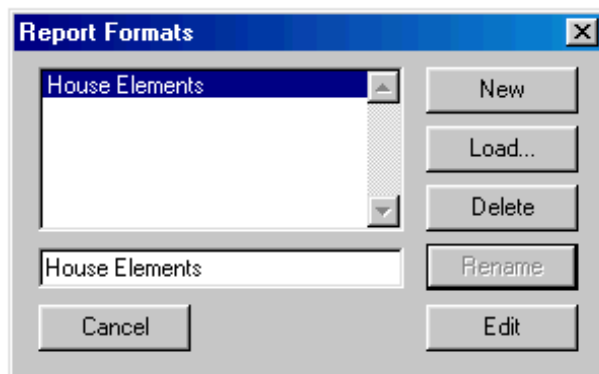
2. Click the New button.

A default name for the report will appear in the list box and the text field.



3. If you want a more descriptive name for the report, type it in the text field, then click Rename.

The report's name will change in the list box.

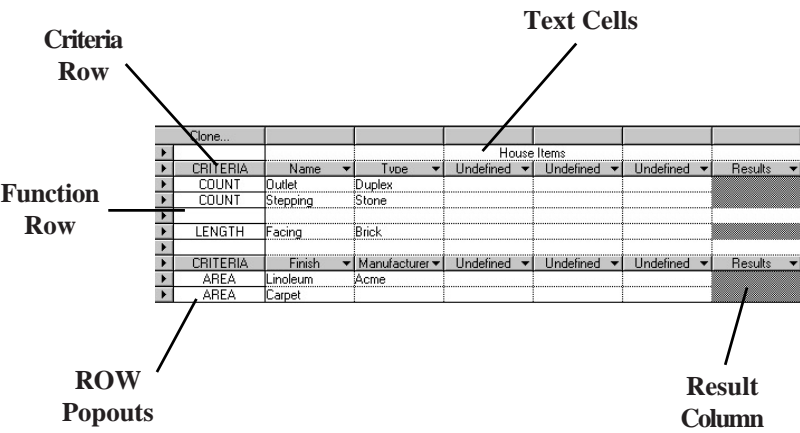


You can now edit the report, setting it up to display the data you want.

Setting up a Report

PC Draft’s report formats can display the individual or total lengths, widths, heights, areas, and perimeters of objects or sets of objects chosen by the object information you specify. The reports can also display the count or (the total number) of objects that match your criteria.

Report formats include three basic elements: **Functions**, such as COUNT; **Criteria** for the functions (for example, you can COUNT all objects with Name = “Desk” and Type = “Wood”); and **Text** for headings and notes.

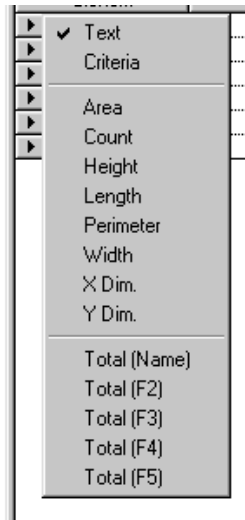


When the report is printed, not all the parts will appear on paper.

House Items		
Outlet	Duplex	17
Stepping Stone	Aggregate	49
Facing	Brick	26'3-3/4
Linoleum	Acme	103.72 ft
Carpet		559.32 ft

You set up a report mainly by using the **row pop-out menus**. These let you quickly define whether a row will contain text, criteria, or a function. All you need to do is mouse down at the end of the row and make your choice.

The default condition for rows is **text**; any row not marked in the leftmost



column is a text row. You can enter text in the row's cells just by clicking and typing. You can also choose Text from the row menu to define a text row.

Choosing Criteria from the row menu makes that row a **criteria bar**. Each column in the criteria bar will have a menu containing the list of object field names you can use for criteria. You can choose a field name for a column or leave it Undefined.

Adding a **function** to your report is as easy as choosing it from the menu. Once you've done so, the name of the function will be displayed at the beginning of the row. To set

the criteria for the function, you enter the desired Object Info into the column under the appropriate field name.

You can either type an object's information manually to establish criteria or point and click the appropriate object after clicking the "Obj. Info" button in the Report Format window. This allows you to choose a function like COUNT, then click on a sample of the object you want to count. Its Object Info will automatically be inserted into the appropriate criteria fields.

You can continue to define additional rows of functions using the same field names, or insert a new criteria bar to change the field names used in the functions that follow. (Each function row is controlled by the closest criteria bar above it.) Inserting criteria bars and adding functions below them allows you to create comprehensive reports that may extend over multiple pages if needed.

You can establish the parts of a report in any order, and add or delete rows as needed.

To set up a report's text:

1. Choose the Data Menu's Report Formats... command.

The Report Formats dialog box will appear.

2. **In the list of reports, select the report you want to edit.**
3. **Click the Edit button.**

The Report Format window will appear.

4. **Decide on a row you want to use for text.**

In a new report, each row will be blank in all columns, showing that it is a text row.

5. **Click in the first cell where you want to have text, then type the text.**
6. **Move to the next cell, if necessary, by pressing the Tab key.**

NOTE: Text can be wider than a single column, if the next cell in the row is empty.

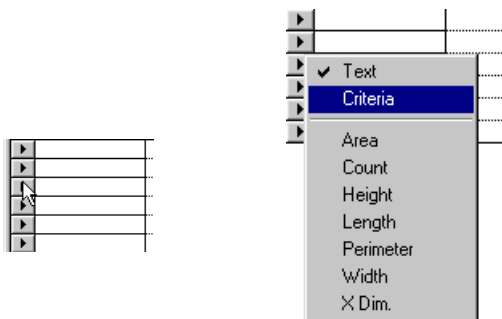
7. **Repeat steps 4 through 6 until all the text is in place.**

To set up a report's criteria bars:

1. **Open the report, if necessary.**

The Report Format window will appear.

2. **Decide on a row you want to use for criteria.**



3. **Open the Row Popout menu at the left end of the row and choose Criteria.**

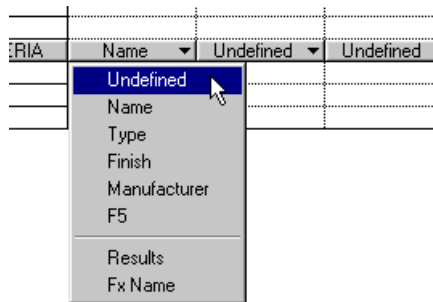
The row will read “CRITERIA” in the first column, showing that it is a criteria bar. All the cells in the bar will read “Undefined.”

	CRITERIA	Undefined ▾	Undefined ▾	Undefined ▾	Undefined ▾	Unde... ▾	Results ▾
--	----------	-------------	-------------	-------------	-------------	-----------	-----------

4. **Move the cursor to a cell where you want a criterion, then press the left mouse button.**

A popout menu listing the drawing’s field names will appear.

NOTE: The field names will be either the default field names or the field names you’ve defined for the drawing.



5. **Choose the field name you want for the criterion in this column.**

The field name will appear in the criteria bar.

6. **Repeat steps 4 and 5 till you have established all the criteria for this criteria bar.**
7. **If you want more than one criteria bar in the report, repeat steps 2 through 6 as needed.**

Once you’ve established the criteria bars, you can set up the function rows and fill them with object information.

Functions

PC Draft's reports extract different types of information from different types of PC Draft objects. All the functions except Count give results measured according to the scale and units of the layers containing the objects.

Area displays the area of an object, or the sum of the areas of multiple items or items in a group. (This function does not return a value for text objects and dimension objects.)

Count displays the total number of objects and groups that meet the criteria of the function row.

Height displays the unrotated vertical size of an object or group, or the sum of vertical sizes of multiple items. For example, if a one-inch square has been rotated 45 degrees, this function will still show its height as one inch. (This function does not return a value for text objects and dimension objects.)

Length displays the longest measurement of an object or group, or the total of the longest measurements of multiple items. For lines, linear dimension objects, and radial dimension objects, that is the distance between the two ends or reference points. For most other objects, the length is the longer of the horizontal or vertical (X or Y) extents of the object; if the object has been rotated, the value is determined as if the object had not been rotated. (This function does not return a value for text objects and angular dimension objects.)

Perimeter displays the length of a line, the perimeter of any other object or group, or the total of those measurements of multiple items. (This function does not return a value for text objects and dimension objects.)

Width displays the unrotated horizontal size of an object or group, or the sum of horizontal sizes of multiple items. For example, if a one-inch square has been rotated 45 degrees, this function will still show its width as one inch. (This function does not return a value for text objects and dimension objects.)

X-Dimension displays the horizontal size, measured along the horizontal axis, of an object or group, or the sum of horizontal sizes of multiple items. For example, if a one-inch square has been rotated 45 degrees, this function will show its X-Dimension as about 1.4 inches. (This function does not return a value for text objects and dimension objects.)

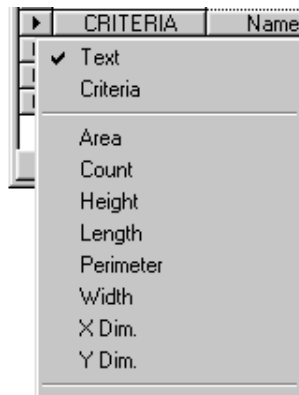
Y-Dimension displays the vertical size, measured along the vertical axis, of an object or group, or the sum of vertical sizes of multiple items. For example, if a one-inch square has been rotated 45 degrees, this function will show its Y-Dimension as about 1.4 inches. (This function does not return a value for text objects and dimension objects.)

Function Rows

To set up a report's function rows:

1. Open the report, if necessary.

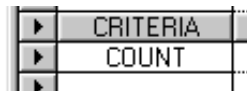
The Report Format window will appear.



2. Decide on a row you want to use for a function.

3. Open the Row Popout menu at the left end of the row and choose a function.

The row will display the name of the function in the first column, showing that it is a function row.



4. If you want more than one function row in the report, repeat steps 2 through 3 as needed.

Object Information

The report's criteria bars cause PC Draft to search for objects or groups that match the object information entered in the function rows, then display the results in the Results column.

You need to enter the object information in each function row. If you remember the precise object information needed (and its precise spelling),

you can type it into the function's cells under the appropriate field names (listed in the criteria bar above). However, you can also use the **Obj Info** button to point and click an example of the object directly, so PC Draft can enter the object's information in the function row automatically, under the correct field name.

To enter the object information for an item:

- 1. Open the report, if necessary.**

The Report Format window will appear.

- 2. Click in the function row.**

A flashing text-insertion cursor will appear in the cell you clicked.



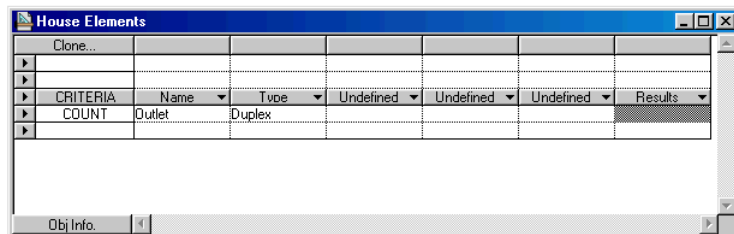
- 3. Click the Obj Info button at the lower left of the report window.**

- 4. Click the object you want to use for the function's criteria.**

The Report Window will disappear from over the drawing window, and the cursor will have a question mark attached.



The Report Window will reappear, and the selected row will display the object's information in the appropriate columns.



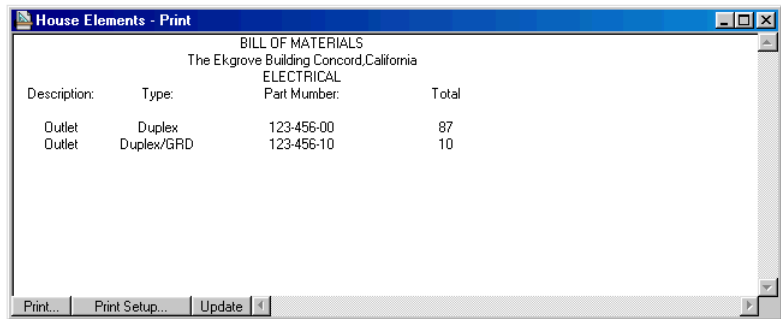
- 5. If you want object information in more than one function row in the report, repeat steps 2 through 4 as needed.**

NOTE: If an object's data is in a column that is "Undefined" in the criteria bar, it will be treated as a text label and ignored by the function's criteria.

Running the Report

When all the criteria bars, text labels, function rows, and object information are in place, you're ready to run the report by printing it (either to the screen or to a printer). That will put the results of the functions in the Results column for each function.

Printing to the screen creates a Print Report window that shows you the results of all the functions and gives you a preview of how the report will look on paper.



The screenshot shows a window titled "House Elements - Print". Inside, the report is titled "BILL OF MATERIALS" and "The Ekgrove Building Concord, California". It lists electrical parts with columns for Description, Type, Part Number, and Total. The data shows two types of outlets: Duplex (123-456-00) with a total of 87, and Duplex/GRD (123-456-10) with a total of 10. At the bottom, there are buttons for "Print...", "Print Setup...", and "Update".

Description:	Type:	Part Number:	Total
Outlet	Duplex	123-456-00	87
Outlet	Duplex/GRD	123-456-10	10

You can also print to the screen if you just want to see the results of the report, but don't need a copy on paper.

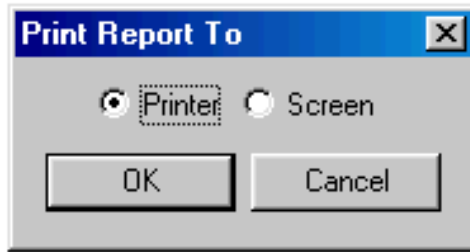
To print the report to a printer:

1. **If you want to adjust the printed report's page setup, choose Page Setup... from the File menu.**

The Page Setup dialog box for your active printer will appear. You can make various changes to the printed report's page setup (depending on the printer model). For example, you may need to print the report in horizontal mode (sometimes called "Landscape" mode).

2. **Make any desired selections in the Page Setup dialog box, then click OK.**
3. **Open the Data menu's Print Report submenu, then choose the report you want to print.**

The Print Report To dialog box will appear.



4. **Select the Printer button, then click OK.**

The Print dialog box for your active printer will appear.

5. **Make any desired selections in the Print dialog box, then click Print.**

The report will be printed.

To print the report to the screen:

1. **Open the Data menu's Print Report submenu, then choose the report you want.**

The Print Report To dialog box will appear.

2. **Select the Screen button, then click OK.**

The Print Report window will appear.

You can scroll around to examine the report's appearance and results. If you want to revise the report before printing it, you can.

To edit the report before printing:

1. **Click on the Report Format window.**

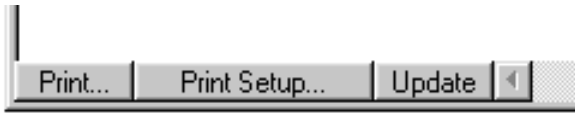
The Report Format window will become active.

2. **Make any needed changes to the report.**

3. **Click on the Print Report window.**

The Print Report window will become active.

4. **Click the Update button.**



The Print Report window will be updated to reflect your changes.

Once you've determined that the report appears properly, you can print it, making any necessary page setup changes.

NOTE: You can also continue to work and make changes to the drawing. If you want to see the results of the changes you've made in the drawing, you can activate the Print Report window and click its Update button. PC Draft will then recalculate all the report's functions and display the new results in the window.

To print the report:

- 1. If you want to adjust the page settings before sending the report to the printer, click the Page Setup... button.**

The Page Setup dialog box for your active printer will appear.

- 2. Make any desired selections in the Page Setup dialog box, then click OK.**

The Print Report window will reappear, reflecting your Page Setup changes.

- 3. Click the Print... button.**

The Print dialog box for your active printer will appear.

- 4. Make any desired selections in the Print dialog box, then click Print.**

The report will be printed.

Formatting a Report's Appearance

You can make various changes to a report's appearance, depending on how you want it printed. A report can have a particular font, size, and text style. Cells, columns, or rows can have their text justified right, left, or centered. Rows can be inserted or deleted, and the width of columns can be changed.

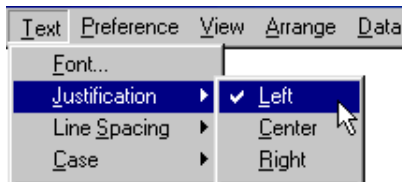
For example, certain text labels or object information items might take up more space than the default column width allows. Or you may need to add more rows to make room for more functions.

To change the text font or size used in a report, you open the Text menu and make the appropriate selections. Your choices will be applied to the whole report.

You can apply different text justifications to different cells, rows, or columns, by using the Text menu's Justification submenu:

To change the justification of a cell:

1. Click in the cell.



2. Open the Text menu's Justification submenu.

3. Choose the desired justification.

The cell will be justified in the manner you chose.

To change the justification of a row:

1a. Click the first cell in a row (next to the row control button).

or,

1b. Hold down the Shift key and click the row control button.

The row will be selected.

2. Open the Text menu's Justification submenu.

3. Choose the desired justification.

The row will be justified in the manner you chose.

To change the justification of several rows:

1a. Click the first cell in a row (next to the row control button).

or,

1b. Hold down the Shift key and click the row control button.

The row will be selected.

2. Press the Shift key.

3. While holding down the Shift key, click the next row's first cell.

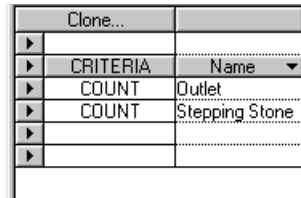
4. Repeat step 3 until all needed rows are selected.

5. Open the Text menu's Justification submenu.

6. Choose the desired justification.

The rows will be justified in the manner you chose.

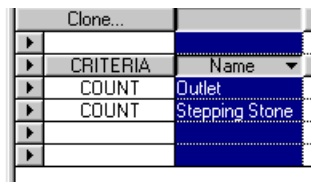
To change the justification of a column:



A screenshot of a table interface. The table has two columns. The first column contains row control buttons (arrows) and labels: 'Clone...', 'CRITERIA', 'COUNT', 'COUNT', and two empty rows. The second column contains labels: 'Name', 'Outlet', 'Stepping Stone', and two empty rows. The 'Name' cell has a dropdown arrow.

Clone...	
▶	
▶ CRITERIA	Name ▼
▶ COUNT	Outlet
▶ COUNT	Stepping Stone
▶	
▶	

1. Click the column control.



A screenshot of the same table interface as above, but the second column is highlighted in blue, indicating it is selected.

Clone...	
▶	
▶ CRITERIA	Name ▼
▶ COUNT	Outlet
▶ COUNT	Stepping Stone
▶	
▶	

The column will be selected

2. Open the Text menu's Justification submenu.

3. Choose the desired justification.

The column will be justified in the manner you chose.

To change the justification of several columns:

1. **Click the column control.**

The column will be selected.

2. **Press the Shift key.**

3. **While holding down the Shift key, click the next column's control.**

4. **Repeat step 3 until all needed columns are selected.**

5. **Open the Text menu's Justification submenu.**

6. **Choose the desired justification.**

The column will be justified in the manner you chose.

To change the width of a column:

1. **Move the pointer to the right-hand edge of a column control.**

The cursor will change to the column adjustment cursor.



2. **Hold down the left mouse button and drag left or right to define the new column width.**

A reference line will appear as you move the cursor.

3. **When you've defined the width you want, release the left mouse button.**

The column will assume the width you specified.

To insert a row:

1a. Click the first cell in a row (next to the row control button).

or,

1b. Hold down the Shift key and click the row control button.

▶	CRITERIA	Finish ▼	Manufacturer ▼	Undefined ▼	Undefined ▼	Undefined ▼	Results ▼
▶	AREA	Carpet					
▶							

The row will be selected.

2. Choose the Edit menu's Insert Row command.

A new row will appear above the selected row.

▶	CRITERIA	Finish ▼	Manufacturer ▼	Undefined ▼	Undefined ▼	Undefined ▼	Results ▼
▶							
▶	AREA	Carpet					

NOTE: If you select several rows and choose Insert Row, the same number of rows will be inserted above the selected rows. If you choose Insert Row with no rows selected, a new row will be added to the bottom of the report.

To remove a row:

1a. Click the first cell in a row (next to the row control button).

or,

1b. Hold down the Shift key and click the row control button.

The row will be selected.

2. Choose the Edit menu's Delete Row command.

The row will be deleted, and the rows below will move up.

Renaming a Report

Sometimes you may need to change the name of an existing report. The Report Formats dialog box's Rename button makes that easy.

To rename a report:

- 1. Choose the Data Menu's Report Formats... command.**

The Report Formats dialog box will appear.

- 2. In the list of reports, select the report name that you want to change.**

The report's name will appear in the text field.

- 3. Type the report's new name in the text field, then click the Rename button.**

The new name will appear in the list box.

Loading a Report from Another Drawing

Each PC Draft report format is stored as part of a drawing file. After you have created reports for several drawings, you may find that a report format created for one drawing would be useful in another drawing. The Report Formats dialog box's Load feature lets you "copy" report formats into the current drawing file.

Once a report is loaded into a drawing, it uses the field names defined for that drawing, no matter what the field names were in its source file. However, it retains the order of the fields, and any text-display attributes that were already defined.

To load a report from another drawing:

- 1. Choose the Data Menu's Report Formats... command.**

The Report Formats dialog box will appear.

- 2. Click the Load button.**

A dialog box listing the PC Draft drawings in the current directory will appear.

- 3. Use the directory list to display the drawing containing the report you want to load.**

4. Click on the drawing's name.



5. Click on the Open button.

A dialog box listing the report formats in the selected PC Draft document will appear.

6. Click on the name of the report format you want.

7. Click on the Load button.

The Report Formats dialog box will appear again, with the report you chose displayed in the list of the current drawing's report formats. You will be able to edit, rename, or print that report from the current drawing.

Deleting a Report

You can delete specific reports, along with all their contents.

WARNING: You cannot undo the deletion of reports.

To delete a report:

1. Choose the Data Menu's Report Formats... command.

The Report Formats dialog box will appear.

2. In the list of reports, select the report that you want to delete.
3. Click on the Delete button.

A dialog box will appear to confirm that you want to proceed.

4. Click OK to delete the report, or click the Cancel button to cancel the deletion.

NOTE: If the report has been cloned and linked, the deletion will automatically break the link; see the next section for more about cloning and linking reports.

Cloning and Linking Reports

You can copy or “clone” PC Draft’s report formats into worksheet document files created with Excel®, a popular application program sold by the Microsoft® Corporation. The advantage of cloning a report is that you can use Excel’s powerful mathematical functions to calculate useful information from the data in the PC Draft report.

For example, if you’ve created a report that shows the total number of times a particular part is used in a technical drawing, you can use the cloned worksheet version to learn the total cost of using those parts. Likewise, you could calculate the total cost of using a certain type of carpet, if your original report shows the total area of a floor.

If you choose to link a cloned report, you can make changes in the original drawing, re-run the report, and then automatically update the report’s Excel clone. That means you can quickly get new cost estimates (for example) when you add, change, or remove items in your plans or drawings.

In addition, you can use Excel’s advanced page-formatting features to modify a report’s presentation.

To clone a report into an Excel spreadsheet:

1. Choose Report Formats...

The Report Formats dialog box will appear.

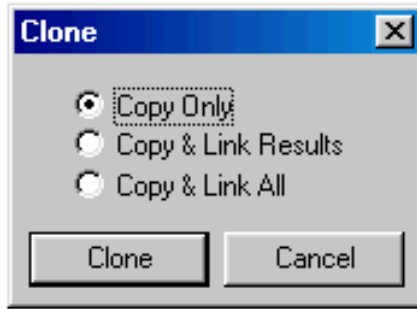
2. Select the report you want cloned, then click Edit.

The Report Format window will appear.



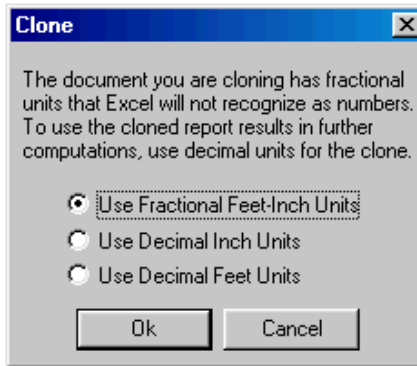
3. Click the Clone button.

The Clone dialog box will appear.



4. Choose **Copy Only**, **Copy & Link Results**, or **Copy & Link All**.

5. Click the **Clone** button.



Because Excel cannot recognize most English-unit measurements (such as 4' 10") as numerals, PC Draft may display a dialog box letting you decide whether to convert fractional English units to decimal numerals.

6. Select a unit choice, then click **OK**.

PC Draft will launch Excel, and the report will be entered in an Excel worksheet. Its format will be the same as if printed from PC Draft.

After the report is cloned, you can edit it, calculate from its data, or reformat it in Excel just as you would any other Excel worksheet.

About Links

If you choose **Copy Only** in the Clone dialog box, the report will be editable in Excel, but any changes made to the report in PC Draft will only appear in a worksheet if you clone it again.

If you choose **Copy & Link Results**, the report will appear in Excel with the Results column linked to PC Draft. If you change the drawing or report in PC Draft, the changed results will appear automatically in the worksheet after you choose Update Link in the Data menu. However, any changes to the report's text and criteria made in PC Draft will not appear in the worksheet unless you create another clone.

If you choose **Copy & Link All**, the report will appear in Excel with all the report cells linked to PC Draft. If you change the elements of the drawing,

or the text, criteria, or results of the report in PC Draft, the changes will appear automatically in the worksheet after you choose Update Link in the Data menu.

Updating and Breaking Links

When you make changes to a report that you've linked, you'll generally want to make sure that the revised data is reflected in the corresponding worksheet. The Update Link feature enables you to accomplish that quickly and easily.

In other cases, you may want to remove links that you've established. The Break Links command severs any report link you no longer need or want.

To update a link after changing a drawing or a report:

1. Open the Data menu's Update Link submenu.

The Update Link submenu will appear, listing any linked reports. (Reports without links will not appear in this submenu.)

2. Choose the report you want updated.

Once you release the left mouse button, PC Draft will update the report's links to the worksheet file.

To break a link:

1. Open the Data menu's Break Link submenu.

The Break Link submenu will appear, listing any linked reports. (Reports without links will not appear in this submenu.)

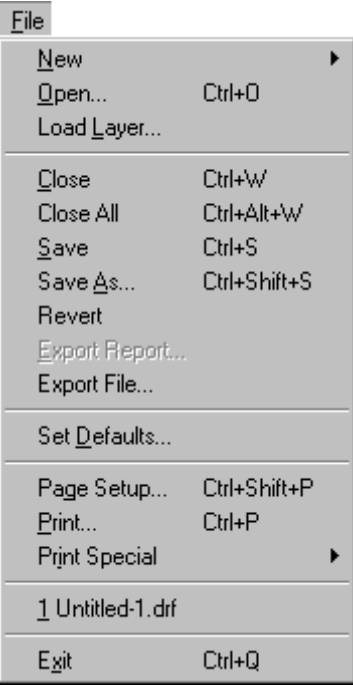
2. Choose the report you want unlinked.

PC Draft will break the report's links to the worksheet file.

NOTE: If you delete a report that has been cloned and linked, the deletion will automatically break the link.

Appendix

APPENDIX A



Menus and Dialog Boxes

FILE MENU

New	Creates a new untitled document or symbol library. The document’s size will be one page. The dimension of the drawing area is determined by the paper type (U.S. Letter, U.S. Legal, and so forth).
Open	Opens the directory of existing PC Draft documents on the disk. This command also gives you the option of opening other disks that contain PC Draft documents.
Load Layer	Loads a layer into a document.
Close	Closes and puts away a document. Prior to closing, a dialog box will ask if you want to save the changes made to the document.
Close All	Closes and puts away all documents. Prior to closing each one, a dialog box will ask you to save the changes made to the document.
Save	Saves the contents of your drawing to the disk and leaves the drawing open.
Save As	Saves a copy of the current drawing. You will be asked to name the document, and then a copy of the drawing with its new name will be saved onto the disk.
Revert	Reverts to the last saved version of the document.
Export Report	Exports the current report as a text file.

Export File	Exports PC Draft document as a graphic image.
Set Defaults	Saves the settings that affect the drawing environment, such as scale, grid snap, size units, and so on.
Page Setup	Determines the print format, such as paper size, page orientation, pagination, and reduction factor.
Print	Prints out the drawing in a specified quality mode (on some printers). The print dialog box enables you to set the page range, the number of copies of the print-out, and whether the drawing will be printed on continuous or cut sheet paper.
Print Special	This submenu either prints the active (current) layer or separately prints each layer of a drawing.
Exit	Exits from the application.

EDIT MENU

Undo/Redo	Undo reverses the last operation performed. Redo performs the operation that was reversed by Undo.
Cut	Removes a selected object from the drawing and places it on the Clipboard.
Copy	Copies a selected object on the drawing and places it on the Clipboard.
Paste	Pastes an object from the Clipboard onto the drawing at the point where you click the left mouse button.

Edit	
Undo Move	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Paste Unscaled	Ctrl+Shift+V
Clear	
Repeated Paste	
Copy Attributes	
Apply Attributes	
Attributes Options...	
Duplicate	Ctrl+D
Duplication	▶
Select All	Ctrl+A
Select None	Ctrl+Shift+A
Select Special...	Ctrl+Alt+A
Move...	Ctrl+M
Expand...	
Contract...	
Reshape	▶
Edit Datum	Ctrl+E

Paste Unscale	Pastes an object without scale.
Clear	Deletes a selected object from the drawing.
Repeated Paste	Enables you to repeatedly paste an object onto a drawing.
Copy Attributes	Copies the item's object information and graphic attributes.
Apply attributes	Applies the attributes to one object.
Attributes Option	Displays the attribute options dialog box.
Duplicate, Duplication	Enables you to duplicate selected objects on the drawing, either one at a time or in linear and circular arrays.
Select All	Selects all the objects on the active layer.
Select None	Deselects all objects in a document.
Select Special	Displays the Select Special Dialog Box to setup the information about the object(s) that you will select.
Move	Displays a dialog box that enables you to move or copy selected items to precise locations on the drawing.
Expand	Displays a dialog box that enables you to increase the size of selected object by multiplying the object's dimensions by specified values.

Contract	Displays a dialog box that enables you to reduce the size of selected object by dividing the object's dimensions by specified values.
Reshape	Displays a submenu that lets you smooth and unsmooth several types of objects.
Edit Datum	Enables you to define a new datum point for a selected object.



TEXT MENU

The Text menu contains various choices for defining text attributes, such as text font, size, style, line spacing, case, and so on.

Font	Lists the font sizes and styles installed on your system.
Justification	Justifies text horizontally and vertically inside the text block.
Line Spacing	Displays a submenu that lists the following line spacing options for text.
Case	Controls the case (UPPERCASE, lowercase, or Title Text) of text.
Select All Text	Selects every text object in the current layer.
Hide Text	Hides text on the drawing. When this item is checked, text is omitted from hardcopy output as well.



PREFERENCE MENU

Border Position	Displays a submenu that lists the following options for border position.
Border Inside	Includes all the object's border in the measurement of its overall extent.
Border Centered	Includes only the center of the object's border in the measurement of its overall extent.
Border Outside	Excludes the object's border from the measurement of its overall extent.
Pen Style	Allows to change a pen style of the selected object.
Zoom Line Weights Off/On	When Zoom Line Weights is active, lines and borders are magnified in proportion to the current zoom factor. (Normally, line widths are displayed as they would appear at a normal view, regardless of zoom factor.)
Hide Line Styles	When Hide Line Styles is active, solid lines will appear on lines and objects instead of line styles.
Edit Colors	Displays the available colors. After you choose the color you want to edit, a dialog box used to modify the chosen color is displayed. (Edit Color is only active when you run the program on a color system.)
Edit Patterns	Displays the available patterns. After you choose the pattern you want to edit, a dialog box used to edit the chosen pattern is displayed.

Hide Fills Hides all the fills (patterns and washes) on the drawing.

Cross Cursor Activates and deactivates the large, crosshair-style drawing cursor.

Tool Options Displays dialog boxes with options to set up the Parallel Line Tool and the Regular Polygon Tool.



VIEW MENU

Zoom This submenu's commands increase or decrease the current magnification by a factor of two or four.

Restore Prev. Zoom Changes the view back to the most recent level of magnification.

Home View Changes view to upper left corner of drawing, with no magnification.

Palettes Displays or hides the Tool palette, Attribute palette, Accessory palette, Dimension palette, Show Size palette, and Resize palette.

Show Cursor Position Displays the X and Y coordinate position of the cursor. The preset (0,0) position is the upper left corner of the document.

Show Area, Hide Area Calculates and displays or hides the area values of selected objects.

Slide Show Displays the dialog box used to control the Slide Show feature.

Delete View Displays the dialog box used to name and save specific views of the drawing.

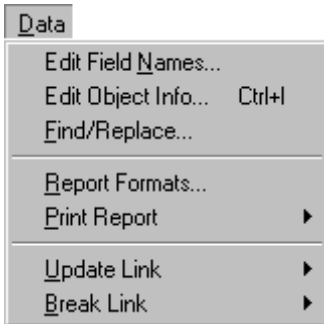
- Save View** Displays a submenu that lets you delete views that were previously saved.
- Delete All Views** Deletes all views that were previously saved.
- [View Names]** Enables you to quickly choose and display a previously saved view.

Arrange	
Bring To Front	Ctrl+F
Send To Back	Ctrl+B
Move Forward One	Ctrl+Shift+F
Move Back One	Ctrl+Shift+B
Group	Ctrl+G
Ungroup	Ctrl+U
Rotate	Ctrl+R
Rotate To Zero	Ctrl+Shift+R
Rotate Options...	Ctrl+Alt+R
Flip Horizontal	
Flip Vertical	
Align Again	Ctrl+T
Alignment Options...	Ctrl+Alt+T
Distribute On Line	Ctrl+Shift+T
Lock	Ctrl+L
Unlock	Ctrl+Shift+L

ARRANGE MENU

- Bring to Front** Moves selected objects to the front of the active layer.
- Send to Back** Moves selected objects to the back of the active layer.
- Move Forward One** Moves selected objects forward one level on the active layer.
- Move Back One** Moves selected objects back one level on the active layer.
- Group** Combines two or more objects so that they can be treated as a single object with a single set of edit handles.
- Ungroup** Converts grouped objects to their original state with their own individual set of edit handles.
- Rotate** Lets you rotate a selected object or group.
- Rotate to Zero** Lets you return rotated objects or groups to their original orientations.

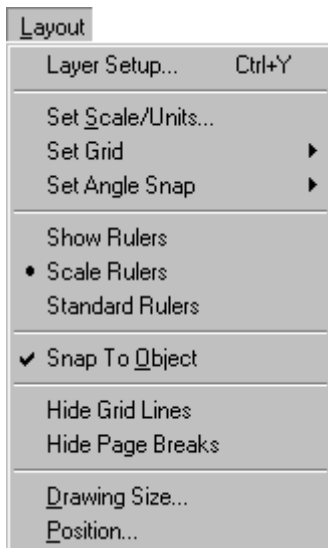
Alignment Options	Displays a dialog box that lets you specify rotation for a selected object or group by entering precise units of rotation.
Flip Horizontal	Flips selected objects horizontally on the drawing.
Flip Vertical	Flips selected objects vertically.
Align Again	Repeats the last alignment.
Rotate Options	Displays a dialog box showing the various alignment options.
Distribute on Line	Distributes selected objects along a straight line, and spaces them equally about their centers or datum points.
Lock	Restricts objects on the drawing so they cannot be changed by any of PC Draft's functions such as move, edit, fill, and so on.
Unlock	Returns locked objects to their original condition so they can be moved, edited, and so on.



DATA MENU

Edit Field Names	Displays the names of object information fields, enabling you to edit them.
Edit Object Info	Displays the object information for a selected object or group, enabling you to edit it.
Find/Replace	Displays the Find/Replace dialog box, which allows you to find and replace items according to their object information.

Report Formats	Displays the Report Formats dialog box, enabling you to create, load, delete, rename, and edit report formats.
Print Report	Enables you to print report formats to a printer or to the screen.
Update Link	Updates links from report formats to Excel files.
Break Link	Breaks links between report formats and Excel files.



LAYOUT MENU

Layer Setup	Displays the dialog box that lets you add, delete, hide, display, merge, and rearrange layers on your drawing.
Set Scale/Units	Displays the dialog box that lets you choose the units, default scale, and dimension standards for a drawing.
Set Grid Snap	Displays a submenu that enables you to choose from the various grid snaps available in English or metric scales. The grids will reflect the current scale and size units chosen.
Set Angle Snap	Displays submenu with options to choose angle snaps available in English or Metric scales.
Show Rulers	Displays the rulers on the top and left sides of the drawing.
Scale Rulers	Displays rulers based on the current scale of the drawing. The scale rulers also reflect the current size units.

Standard Rulers	Displays the standard rulers in which the major ruler divisions are spaced one inch apart.
Snap to Object On/Off	When Snap to Object is active, objects you draw or move will snap to the vertices of nearby objects on the drawing.
Hide Grid Lines	Turns grid lines off.
Hide Page Breaks	Turns page boundary lines on or off.
Drawing Size	Displays a dialog box that enables you to set the size of the drawing.
Position	Moves all objects on all layers of a drawing at the same time.



WINDOW MENU

Show/Hide All Palettes	Shows/hides all the palettes
Tool	Shows/hides the Tool palette.
Attribute	Shows/hides the Attribute palette.
Accessory	Shows/hides the Accessory palette.
Dimension	Shows/hides the Dimension palette.
Show Size	Shows/hides the Show Size palette.
Resize	Shows/hides the Resize palette.
Alignment	Shows/hides the Alignment palette.

Status Bar

Shows/hides the Status Bar

Cascade

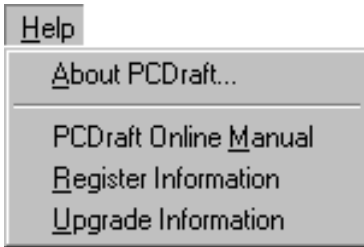
Arranges multiple opened windows in a overlapped fashion.

Tile

Vertically arranges multiple opened windows in a non-overlapped fashion.

Arrange Icons

Arranges icons for minimized windows at the bottom on the main window.

**HELP MENU****Help Topics**

Displays the Online Help Application with brief information about the most important issues.

Register Information

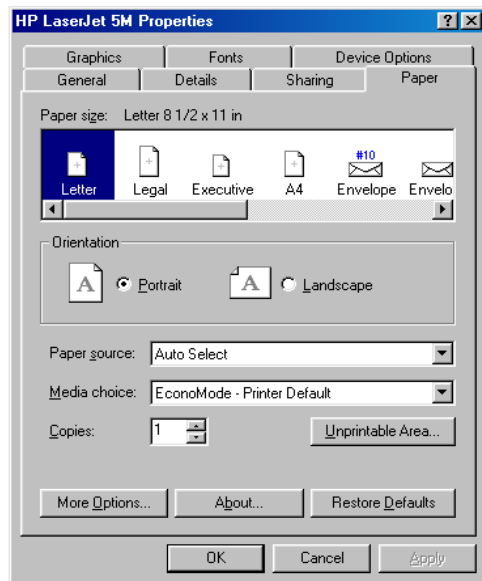
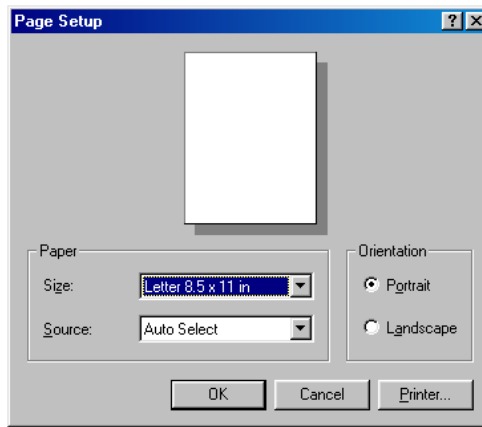
This option connects you to the Online Registration page.

Update Information

This option connects you to the Microspot Web site.

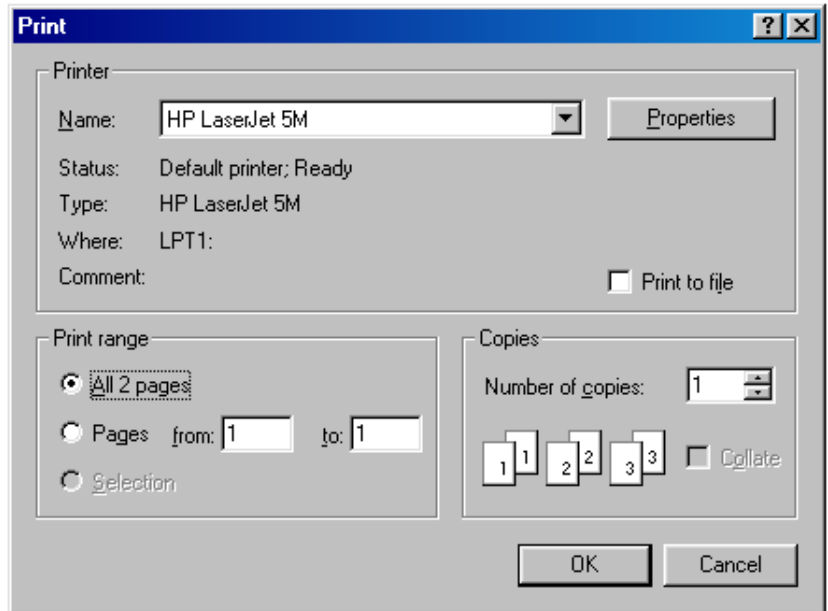
Dialog Boxes

Page Setup/ Printer Properties



The Page Setup dialog boxes allow you to choose options for the different paper types. There is a different Page Setup dialog box for the various types of available printers. Each paper type corresponds to a particular page size. The Page Setup dialog box allows you to specify how the pages on the drawing are oriented. Page orientation allows you to print your document with the drawing oriented either horizontally or vertically on the page.

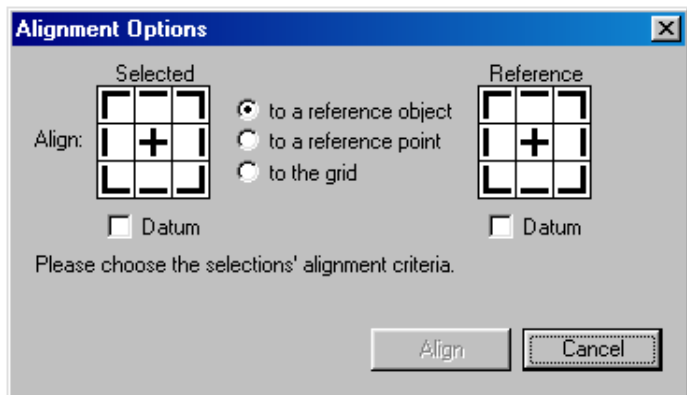
Print



The print dialog boxes let you make choices about the printout of your drawing. You can select the number of copies of the document to be printed from this dialog box, and in some Printer Drivers you can specify whether the paper feed is continuous (Automatic) or on individual sheets (Hand Feed). You can also specify a paper cassette or manual feed as the paper source.

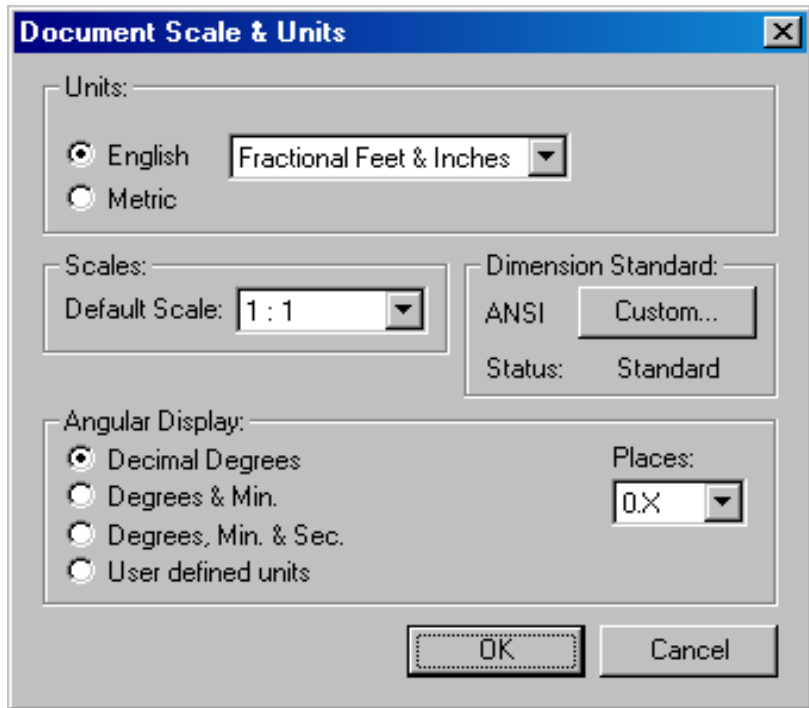
The Properties button allows you to set up options for the printer.

Align Options



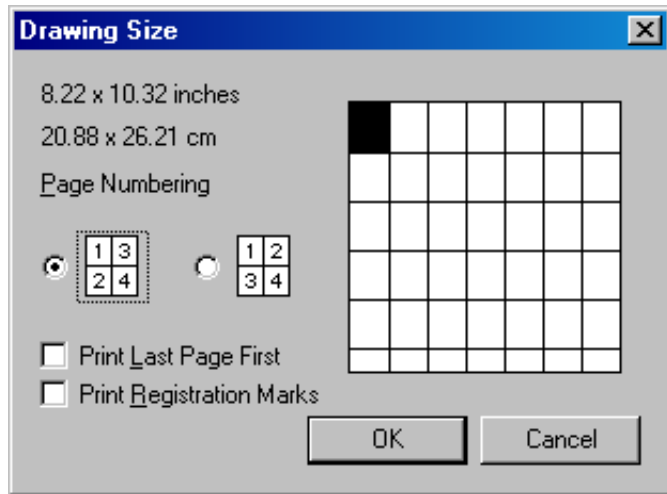
The alignment option allows objects to be horizontally aligned by their tops, centers, or bottoms. Objects can be vertically aligned by their left, middle, or right sides. Objects can be centered on top of each other, aligned with a specified part of the selected object(s) or to a specified part of a reference object, aligned to a reference point, or aligned to a datum point. You can align objects using either the alignment icon or the labeled buttons. This dialog box also allows you to align objects to the grid.

Document Scale & Units



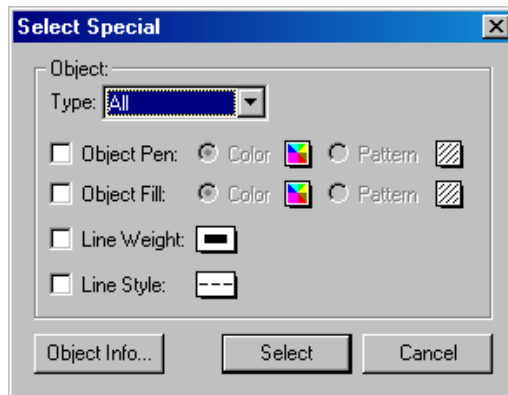
The Document Scale & Units dialog box, accessed using the Set Scale/Units item in the Layout menu, sets up your drawing environment. Through this dialog box, you can define the drawing scale, the size and angular units, and in the case of metric and decimal English units, the number of places behind the decimal for size values.

Drawing Size



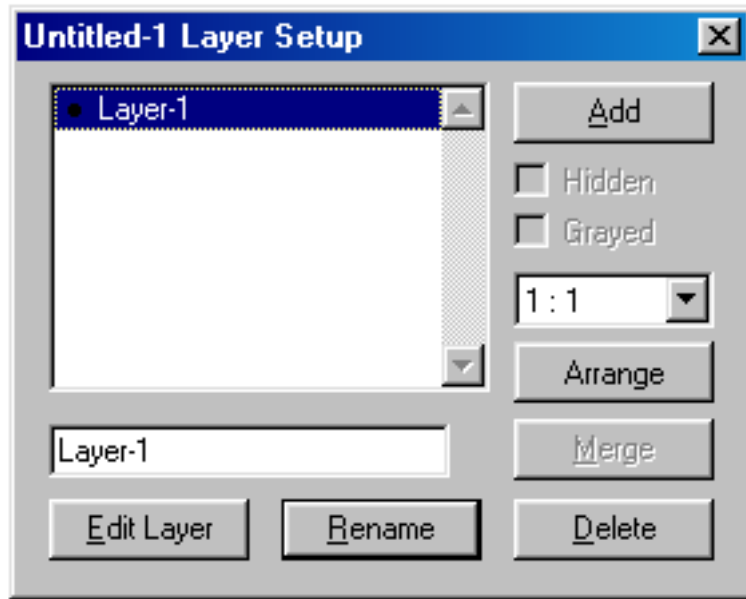
This dialog box is used to add or remove the page blocks that make up the overall drawing size. Clicking on the unfilled blocks adds additional sheets of paper to the drawing area. Clicking on the filled blocks close to the upper left corner of the block diagram removes sheets from the drawing area. As the number of sheets of paper is increased, the total drawing size is calculated and displayed to the left of the diagram. You can also use this dialog box to specify the order in which pages are printed.

Select Special



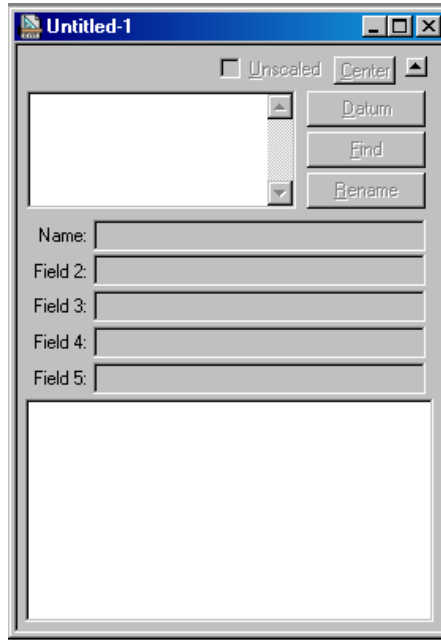
The Select Special dialog box, opened via the Edit menu's Select Special command, enables you to select objects in a drawing according to their graphic type, attributes, or object information.

Layer Setup



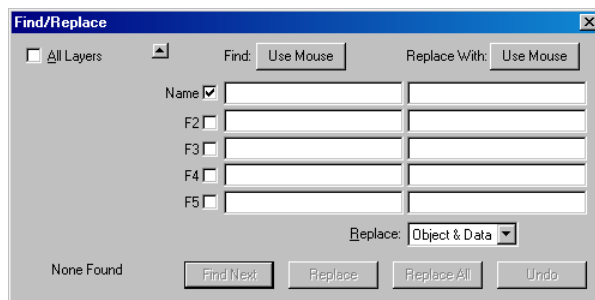
This dialog box is used to control the layers on the drawing. Clicking on a layer name in the list box (on the left side of the dialog box) selects the layer. Double-clicking on the layer name makes it the active layer. By first selecting certain layers, and then clicking on a check box or using a button, you can change the attributes for layers. When the box beside Hidden is checked, PC Draft hides the objects on the selected layers; when the box beside Grayed is checked, the objects on the selected layers appear without their normal fills. You can change the order of layers by selecting layers, pressing on the Arrange button, and choosing an arrangement option. Clicking on the Delete button erases the objects on selected layers. Clicking on the Merge button combines the objects on selected layers onto one layer (the selected layers must have the same scale). Clicking on the Add button adds a new layer to the drawing.

Symbol Library



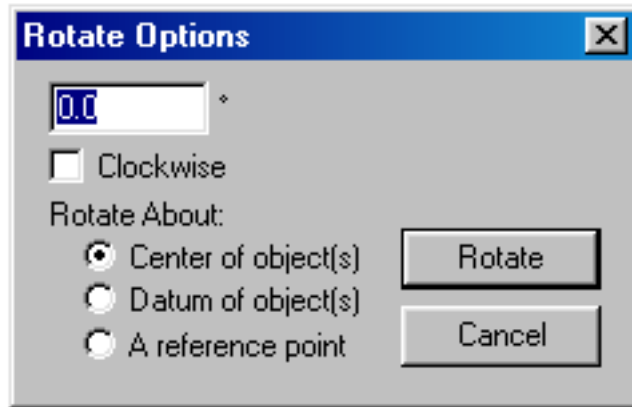
The Symbol Library dialog box lets you store and retrieve commonly used objects. To locate a symbol in a library, type in the name of the symbol you want, and then click on the Find button. To select a symbol, click on its name. The symbol will appear in the viewing area at the bottom of the window. To rename a symbol, select the symbol, type in a new name, and then click on the Rename button. To paste symbols into a scaled drawing at the same physical size as they appear in the library, click on the box beside Unscaled before you copy the symbol. You can also use this dialog box to edit the datum points and object information of selected symbols.

Find/Replace



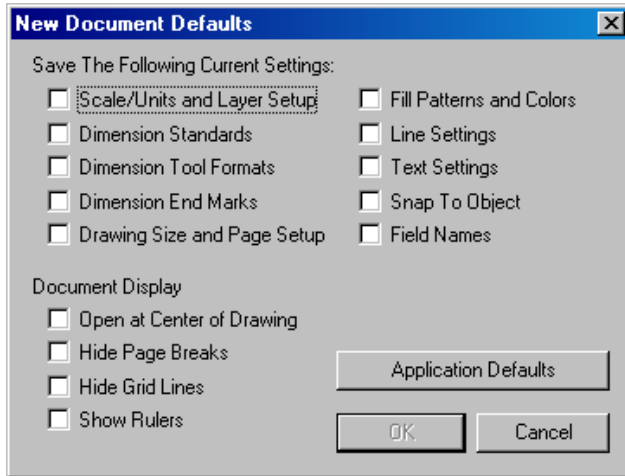
The Find/Replace dialog box, accessed using the Find/Replace command in the Data menu, enables you to find and replace items you specify according to their object information, in one or all layers of the current drawing.

Rotate Options



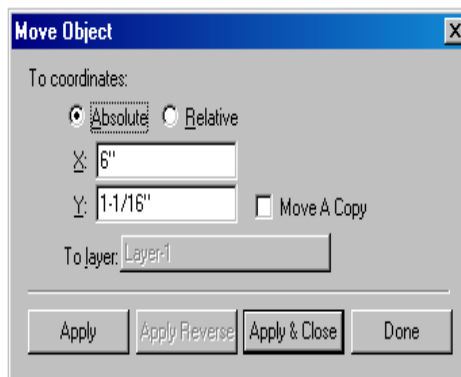
The Rotate Options dialog box lets you specify the number of degrees and decimal fractions of a degree (or degrees, minutes, and seconds) you want to rotate selected objects. To open the Rotate Options dialog box, choose Rotate Options in the Arrange menu. To specify the desired amount of rotation, double-click in the appropriate text box and type in a value. To specify clockwise rotation, click on the button beside clockwise. To rotate around the datum point of the object, click on the check box beside "Datum of Object(s)". After you have made your choices, click on the Rotate button. To rotate objects around a certain point on the drawing, click on the button beside "A reference point," click on the Rotate button, then click on the desired reference point on the drawing.

Set Defaults



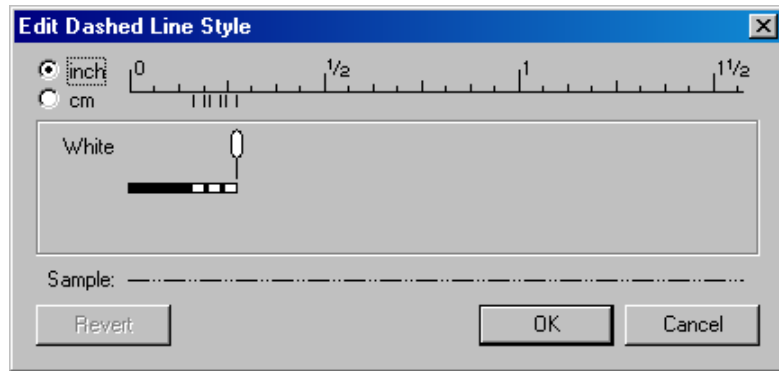
The Set Defaults dialog box lets you save certain settings for documents. The saved settings will be present in new documents you create. To open the Set Defaults dialog box, choose Set Defaults from the File menu. To choose the settings you want to save, click on the check boxes beside the desired settings. To save defaults that affect how new documents are opened, and the status of the Cursor Position Indicator and the Show Size palette, click on the Application Defaults button. Click on the OK button to save the defaults.

Move Object



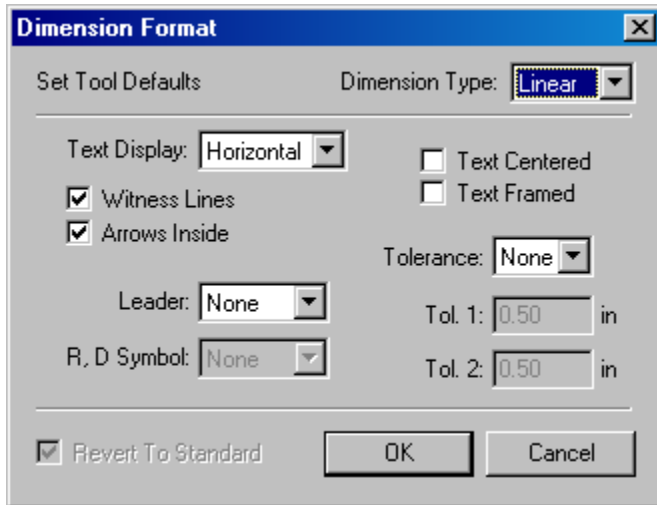
The Move Object dialog box, accessed using the Move item in the Edit menu, enables you to move selected objects or groups to a location you type in. Through this dialog box, you can move or copy the selected object to any location in any layer of the current drawing.

Edit Line Styles



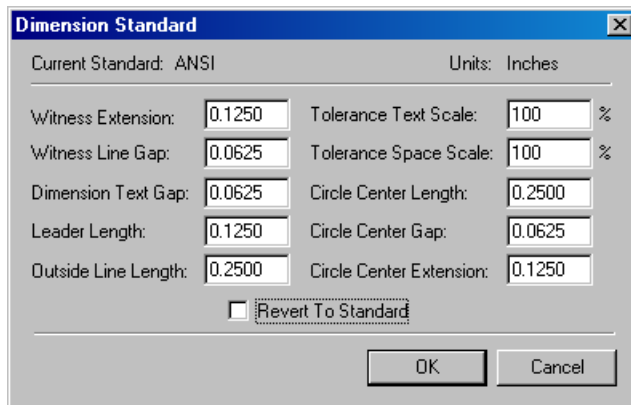
The Edit Line Styles dialog box lets you create custom line styles. You create the line styles by defining the length of the gaps and dashes in the line. To edit a line style, choose a line style from the Edit Line Style submenu, which is accessed from the Line menu. Click on the button beside inch to use inches for the units of measure; click on the button beside cm to use centimeters. To define the line style, move the pointer to the field in the center of the dialog box. If you position the pointer above the line a white flag will appear; if you position the pointer below the line a black flag will appear. The white flag is used to add gaps; the black flag is used to add dashes. To add a gap or dash, point where you want to add a gap or dash, press down the left mouse button, holding down the left mouse button, drag until the gap or dash is the length you want. Then release the left mouse button.

Dimension Formats



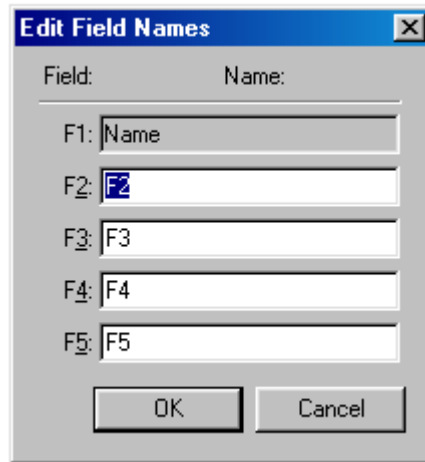
The Dimension Formats dialog box, opened by using the Format button in the drawing tools palette, enables you to control the appearance of dimension objects, including settings such as how dimension text is displayed, the position of leader lines and dimension end marks, the use of tolerance values, and whether to replace a calculated dimension value with a text string of your choice. Default settings can be changed separately for Linear, Radial, and Angular dimensions.

Dimension Standards



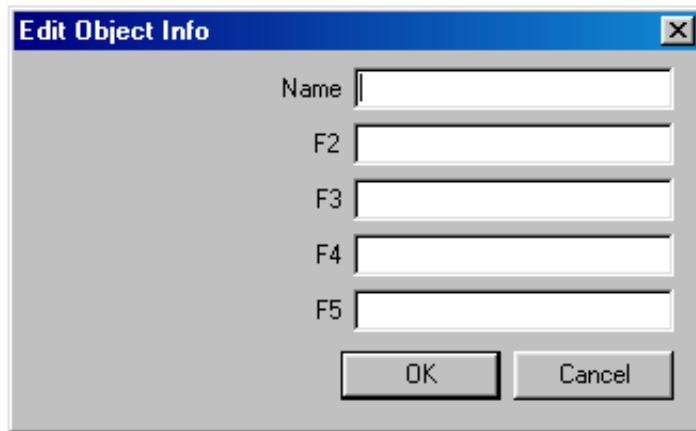
The Dimension Standards dialog box, opened via the Dimension Formats dialog box (for existing objects) or the Document Scale & Units dialog box (for setting document defaults), enables you to alter the dimension settings defined according to ANSI or international metric standards.

Edit Field Names



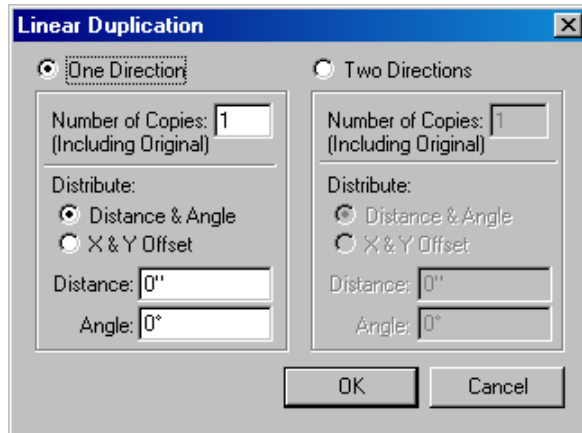
The Edit Field Names dialog box, opened via the Data menu's Edit Field Names command, enables you to edit the object information field names for the current drawing.

Edit Object Information



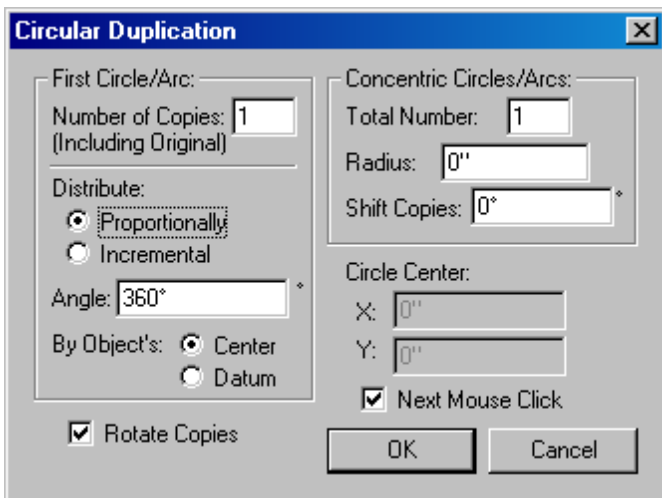
The Edit Object Information dialog box, opened via the Data menu's Edit Object Info command, enables you to edit the object information for a selected object or group.

Linear Duplication



The Linear Duplication dialog box, accessed using the Linear command in the Edit menu's Duplication submenu, enables you to duplicate selected items as many times as you specify, in one or two directions according to distance and angle or vertical and horizontal displacement.

Circular Duplication



The Circular Duplication dialog box, accessed using the Circular command in the Edit menu's Duplication submenu, enables you to duplicate selected items in single or concentric circles or circular arcs. You can define the sweep or increment of the circle and the angular offset and radii of concentric circles.

APPENDIX B Special Usage of Keys

Hold down the appropriate key to achieve the following results.

Shift Key	(Normally constrains an action)
Line tool:	Constrains lines to snap at 45-degree increments.
Rectangle tool:	Constrains the shape to a square. (Applies to rounded-corner, square-corner, and elliptical-corner rectangles.)
Circle tool:	(by Radius or by Diameter) Constrains the line used to define the radius or diameter to snap at 45-degree increments.
Arc tool:	<p>Arcs by Radius: Constrains the line used to define the radius to snap at 45-degree increments.</p> <p>Elliptical Arcs: Constrains the size of the ellipse that is used to define the arc and allows you to change the starting angle of the arc without changing its size.</p>
Polygon tool:	Constrains the line segments to snap at 45-degree increments during creation.
Freehand tool:	Activates the eraser, allowing you to delete part of the freehand shape during creation.
Rotation:	Changes the rotation units. The first press of the Shift key activates rotation in minutes; the second press activates rotation in seconds.
Moving objects:	When held down after dragging begins, constrains movement of objects to a horizontal or vertical direction. With multiple objects, pressing Shift before dragging moves one object independently of other selected objects.
Selecting objects:	Extends the selection to include non-selected objects you click on. Also deselects the selected objects you click on.
Distribute On Line:	Constrains the line used to define the distribution of objects to snap at 45-degree increments.

Pattern Editor dialog box:	Constrains the movement of the pointer and the Finger-Painting tool to a 90-degree angle.
Pointer tool:	Activates the alternate Zoom cursor (magnifying glass).
Control Key	(Normally releases a constraint)
Rotation:	Allows rotation in one-degree increments. Also returns to the previous rotation units; takes you from rotation-in-seconds to rotation-in-minutes, and from minutes to degrees. Also, returns you to the pointer mode when you click on the drawing.
Zoom:	Returns you to the pointer mode when you click on the drawing.
Dimension/ Area Calculation values:	Allows you to move point-to-point dimension line and area calculation values away from dimension lines and objects.
Alt Key	(Normally activates an optional mode of operation)
Distribute On Line:	When you choose Distribute On Line from the Arrange menu, objects are distributed on a line according to their datum points.
Finger-Painting tool:	(in Pattern Editor dialog box) resets the Finger-Painting tool color to the color you click on.
Zoom:	Activates the Zoom Out mode.
Add/Delete Handle:	Activates the Delete Handle mode.
Selection rectangle:	Selects all the objects that are inside or touching the rectangle.
Align Objects:	Aligns selected objects to one element in a group, rather than to the group as a whole.

Tool Icons:	Opens the optional dialog boxes for certain drawing tool icons: Parallel lines, Fillets, Chamfers, Extend.
Line, Polygon, Parallel, Offset, and Perpendicular tools:	While drawing, snaps the length of lines, polygon segments, polyline segments, parallel lines, parallel polygon segments, parallel polyline segments, and perpendicular lines, and the offset distance of offset lines, to the currently active grid snap increment.
Space Bar	
Pointer tool:	Activates the Pan feature when you drag while in the pointer mode. This allows you to scroll horizontally and vertically at the same time.
Key Combinations	
Pan feature:	Shift-space bar constrains panning to 90-degree movement when pointer tool is selected.
Bezier curves:	Shift-Alt constrains Bezier handle pairs to move in tandem.
Deselect All:	Shift-Control-A deselects any selected objects.
Select All Text (In Open Text):	Within a text block, Control-A selects all text characters.
Cropping:	Shift-Alt permits cropping of a bitmap or pixel map by dragging a corner edit handle.

APPENDIX C Importing and Exporting Files with PC Draft

File Import and Export in PC Draft

PC Draft can import image document files from the formats listed below. This appendix details the conversion issues involved in retrieving each type of image with PC Draft.

- TIFF format files, such as scanned images
- DXF files (PC Draft will also export DXF&DWG)
- MacDraft files

TIFF File Loading

TIFF stands for “Tag Image File Format.” It’s a standard format for high-resolution images, and is often used to save images stored with scanning devices.

PC Draft will load certain TIFF images (from files compatible with the TIFF 5.0 format) into drawings via the Load Layer command. To be compatible with PC Draft, the file must have a file type of “TIFF.”

Each TIFF file’s images will be placed in a separate layer (with the same name as the original file). The images will appear as pixel-map objects. You can move such objects to other layers using the Cut or Copy and Paste commands, or you can (for larger images) use the Layer Setup command’s Merge Layers option to combine them into layers with other parts of the drawing.

To load a TIFF file into PC Draft:

1. Choose Load Layer... from the File menu.

The Load Layer dialog box will appear.

2. If necessary, open the Format pop-up menu and choose All or TIFF.

Both the All and TIFF format choices will list TIFF documents.

3. Use the directory list to display the TIFF file you want to open.

4. Double-click on the title of the file.

The image or images will be loaded into a new layer with the same name as the original TIFF file.

TIFF images, like other pixel-map objects, can be resized by dragging handles. Unlike bitmaps, some pixel maps do not resize proportionally. However, you can get around this by selecting a pixel map and choosing Group from the Arrange menu. That will group the object to itself (put it in a “group of one”). It can then be resized proportionally like other PC Draft groups (see Chapter 5 of the PC Draft Reference section for more information about resizing groups).

PC Draft can export files in the following formats: BMP, JPEG, MaxPaint, PhotoShop, PICT, PNG, QuickTime Image, SGI Image, TGA, TIFF. See Apple, QuickTime documentation for details.

DXF File Exchange

DXF is a standard file type for exchanging images among different graphics and drawing programs. PC Draft lets you save PC Draft drawings as DXF files and open DXF files created with other programs. (The DXF file format was developed by AutoDesk®, Inc., the manufacturer of AutoCAD®.

To save a document as a DXF file:

- 1. First save the drawing as an ordinary PC Draft drawing.**

NOTE: Because PC Draft creates a DXF file by converting a PC Draft drawing from the disk, rather than straight from RAM, you must save the drawing as a PC Draft file first.

- 2. Open the File menu and choose Save As.**

A dialog box will appear.

- 3. Type in a name.**

- 4. In the file format popout menu, choose DXF, then click the Save button.**

To open a DXF file:

- 1. Choose the File menu's Open command.**

A dialog box will appear.

- 2. In the file format popout menu, choose DXF.**

- 3. Highlight the name of the desired file in the list box, then click the Open button.**

The Set Scale/Units dialog box will appear.

4. Set the desired scale and units and click OK.

NOTE: The Set Scale/Units dialog box that precedes the DXF import **does not** re-calculate the DXF file into a new scale or onscreen size. It only determines what scale will be applied to the drawing. The onscreen size of the drawing must be determined in the source program.

DXF Export Issues

The DXF image will appear in a new untitled PC Draft drawing.

Because the DXF format does not handle as many kinds of shapes and attributes as PC Draft's own file format, certain attributes in a PC Draft drawing are changed in the resulting DXF file. These changes are defined below:

- The image moves to the upper left corner of the drawing window.
- Circles, arcs, and straight lines become one pixel thick. Other object outlines retain their line weights.
- All shapes lose their fills.
- Custom line styles are limited to eleven segments (dashes or blanks).
- Rectangles (including squares) become polygons.
- Rounded-corner rectangles become polygons (with many sides emulating the corner arcs).
- All three types of circles (radial, diametric, and three-point) become radial circles.
- Ovals (ellipses) become polygons with many sides.
- Radial and three-point arcs become radial arcs. Elliptical arcs expand to polygons emulating full ellipses.
- Parallel objects become sets of line segments (one segment per side or end cap).
- Freehand shapes become polygons (mid-segment edit handles added).

- Bezier curves become many-sided polylines (open polygons).
- Splines become many-sided polylines.
- Smoothed freehands and polygons or polylines become many-sided polygons or polylines.
- Dimension objects become simple lines or arcs, with circles, polygons, or lines emulating the end marks; witness lines become simple lines and value text blocks become independent text objects.
- Area calculation text becomes an independent text object.
- Bitmap objects, including high-resolution pixel maps, are omitted.
- Text assumes the default application font, preserving the upper-left position of the original text object.
- Each line of a multi-line text object becomes at least one separate text object. Each point at which the text style changes within a line begins a new text object. For example, a line ending with one bold-faced word would become two text objects; a line containing one bold-faced word in the middle would become three text objects.
- Each line of a rotated multi-line text object becomes a separate text object, rotated about its own center. (To line these objects up properly after conversion to DXF, rotate them back to the horizontal, group them, then rotate the group to the desired angle.)

DXF Import Issues

PC Draft can open DXF files created using other programs, subject to various limitations. Before opening a DXF file with PC Draft, or if you are having trouble opening a DXF file, read over the following list of issues.

- **Scale and Units:** The Set Scale/Units dialog box that precedes the DXF import does not re-calculate the DXF file into a new scale or onscreen size. It only determines what scale will be applied to the drawing. The onscreen size of the drawing must be determined in the source program.
- These DXF items are not supported by PC Draft: X-Refs (External References); 3-D objects or entities; solid objects or entities; block attributes.

- If a DXF file created using AutoCAD does not open in PC Draft, check to see that all unused items (blocks, layers, and so on) have been purged from the source file. If there is resident information from deleted blocks, the DXF files will not open. Also, before creating the DXF file, it's best to explode and purge nested blocks, which increase the complexity of files, sometimes making them non-openable.
- When generating a DXF file select a text DXF export format in your source program. (Some programs offer a binary DXF output, which is not supported in PC Draft.)
- If a drawing comes in, but some or all of it is off of the page, use the Layout menu's Position command to properly position the drawing onto the page. (Different CAD programs use different X / Y origin points, as well as handling curves differently. The result of these translations can cause the drawing to import partially or entirely off of the page.)
- If some or all of the drawing entities are not visible in the imported file, choose the Edit menu's Select All command, then use the Attribute palette's Pen Color or Pen Pattern popout menu to assign the objects a new pen color (you may need to repeat this for each layer). When importing a DXF file, PC Draft matches the objects' original colors to its active color table. Sometimes the result of a color match can be a hard-to-see color (white ink on a white background, for example). Assigning a new pen color remedies this.

DWG format documents

PC Draft includes a DWG File Exchange Library, so PC Draft is able to read and write files in DWG format.

Reading DWG files

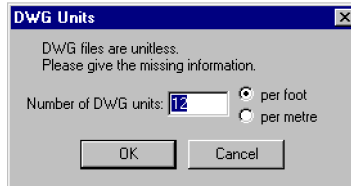
To read files in DWG format, launch PC Draft and choose Open from the File menu. In the standard Open dialog, choose DWG from the Files of Type list, then choose the file to open.

To open a document saved in DWG format

- 1. Open the File menu and choose Open.**
- 2. Choose DWG from the Files of Type list in the standard Open dialog.**
- 3. Locate and click the name of the document that you want to open.**
- 4. Click the Open button.**

The Set Scale/Units dialog appears.

5. **Set the desired units. The default scale in this dialog is set to Automatic (which will select a scale for you that PC Draft believes is correct), but you can choose to set it manually. Now click OK.**



6. **DWG files use nonspecific units of measurement. Enter a value to specify how many DWG units there should be per foot or per metre in the PC Draft document.**

The DWG image will be displayed in a new untitled PC Draft drawing.

DWG import issues

Currently PC Draft does not support objects in DWG documents that contain hatches or BMP. The first time such an object is encountered during the read process, a dialog appears informing you that the type of object is not supported. These objects will not be read into the PC Draft document.

Writing DWG files

To save documents in DWG format

1. **Choose Save As from the File menu.**

The standard Save dialog appears.

2. **Enter a name for the document.**
3. **Specify the location to save the document.**
4. **Choose DWG from the Save as type list.**

The DWG extension will automatically be added to the file name.

5. **Click the Save button.**

The document will be saved in DWG format, with the name and at the location specified.

Opening old MacDraft files

PC Draft also supports files created with PC Draft 1.5, WinDraft 1.2 and MacDraft for Windows. The suffix for these files is .dft.

Using MacDraft 4.2.1 or later you will be able to save your files as PC Draft 1.5, WinDraft or MacDraft for Windows format.

To open the .dft files just place the files into your PC computer, open your File menu from PC Draft, select the Open option and choose PC Draft 1.5 Drawing (.dft) from type of file. Select the file from the list and click the Open button.

NOTE: If you do not have MacDraft 4.2.1 or a later version, please contact Microspot for information about the conversion kit options.

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