MECCA™ 2000

INTEGRATED ELECTRONIC PUBLISHING SYSTEM

Getting Started

AMGRAF, INC.

MECCA™ 2000 Version 5.05

These specifications are subject to change without notice.

1501 Oak Street • Kansas City, MO 64108-1424
Phone: (816) 474-4797 • Fax: (816) 842-4477
E-Mail: info@amgraf.com • Internet: www.amgraf.com

Contents

Overview of MECCA 2000

Chapter 1: Starting the MECCA 2000 System

Chapter 2: Working with Graphics

Chapter 3: MECCA 2000 Pop-Up Menus and Dialog Boxes

Chapter 4: Business Forms Composition

Chapter 5: Scanning

Chapter 6: Label Composition

Chapter 7: Using NEdit Text Editor

Chapter 8: Security Document Composition

Chapter 9: The PostScript Interpreter

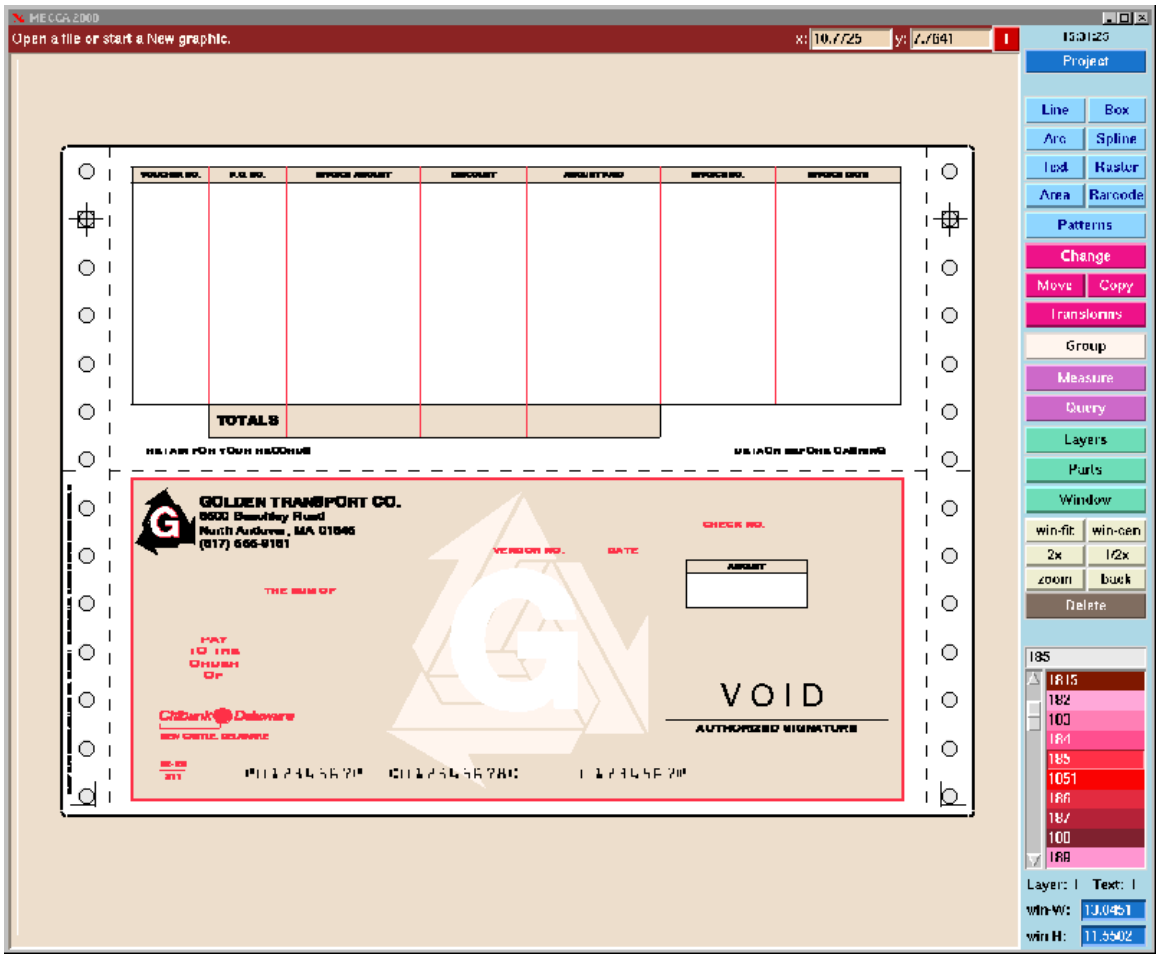
Overview of MECCA 2000

Welcome to Amgraf's MECCA 2000 System

MECCA 2000 is *the world's premier business forms composition system.*
The software offers designers a comprehensive suite of tools to create multi-color, multi-part forms with graduated screens, borders and pantographs, scanned logos, barcodes, and fine typography. For label manufacturing, the software includes trapping, flexographic distortion, and a unique step-and-repeat feature. To add security to any document, MECCA 2000 provides functions for superimposed hidden "Void" messages, a relief line generator, microprint composer, prismatic color mixer, guilloche patterns and custom geometric patterns for lacey backgrounds. With batch pagination, forms production from order-entry to plate can be entirely automated.

Finished designs are output via PostScript as flawless color-separated negatives or printing plates, or they may be transmitted to digital color printing presses for high-speed variable-imaging applications.

The Colorful Graphical Interface



The MECCA 2000 Screen

A colorful point-and-click graphical interface assists the forms designer. The elegant arrangement of the status readouts, menu buttons, and drawing window allows the operator to control the MECCA 2000 software with confidence.

For each drawing tool, option windows "pop-up" by clicking the right mouse button. For every step, "next action prompts" appear at the top of the screen to guide the user. An on-line help feature is also available whenever a question arises.

Pop-up menus and dialog boxes for each function are conditionally displayed as the operator clicks on a menu.

The MECCA 2000 system is a form designer's dream-come-true. From producing fine typography for the dedicated professional, to creating text-intensive backers, contracts, and books, MECCA 2000 simplifies the typesetting process. Graphical elements such as rules, rounded-corner boxes, graduated screens, check borders, and pantographs are drawn with precision by the point-and-click options. Customer logos can easily be scanned, cleaned-up, and color separated. Color proofs and plate-ready films can be output in minutes.

Add Security to Every Printed Document

Graphical effects can be used to add security to almost any document. Unlike special papers, coatings and inks, graphical effects in general do not add to the overall production cost of a document. Given two documents that have the same value, a forger will most likely try to counterfeit the one with the least number of security features.

The MECCA 2000 System allows very complex composition and has a wide variety of security design features that can be incorporated into your artwork. The use of fine-line relief printing, superimposing hidden messages, original fine-line detailed borders, unique geometrical designs, spot color blending, and also micro-text create an effective counterfeiting deterrent when used in conjunction with specialty papers, inks and other treatments.

Through the MECCA 2000 comprehensive set of design tools you can add copy-resistant graphical safeguards to certificates, coupons, titles, tickets, monetary or legal documents, and other valuable forms, labels, and tags. Our fine-line relief backgrounds with microtext, phantom images, and PixeLace™ moiré patterns are easy to create and virtually impossible to duplicate. "Void" pantograph technologies using public domain and proprietary methods are also available.

INTENTIONALLY LEFT BLANK

Chapter 1: Starting the MECCA 2000 System

Before a computer can do anything else, it first has to "boot" an operating system. Follow these steps:

First, **check floppy drives for diskettes.** If you find any **take them out** or the system will try to boot from the diskette.

Second, **power on all components of the system,** the monitor will clear and begin to display messages indicating that your PC is going through its self-diagnostic procedures.

If you see the following message on the screen and the diagnostics stop, just press enter.

boot
: _

The computer will connect to the server and prompt you with a startup message showing your *computer_name!login:*

Your MECCA 2000 System has alternate screens. You must start MECCA 2000 through alternate two... do this by simultaneously pressing the keys **[Alt]-[F2].**

Starting local daemons...
Fri Jan 07 15:05:07 2011

FreeBSD (COMP1.rbf.com) (ttyv0)

login: _

At this point, you type in whatever *login_name* you've been assigned, using all lowercase letters, and *[Enter]*. Instantly you're asked for your password.

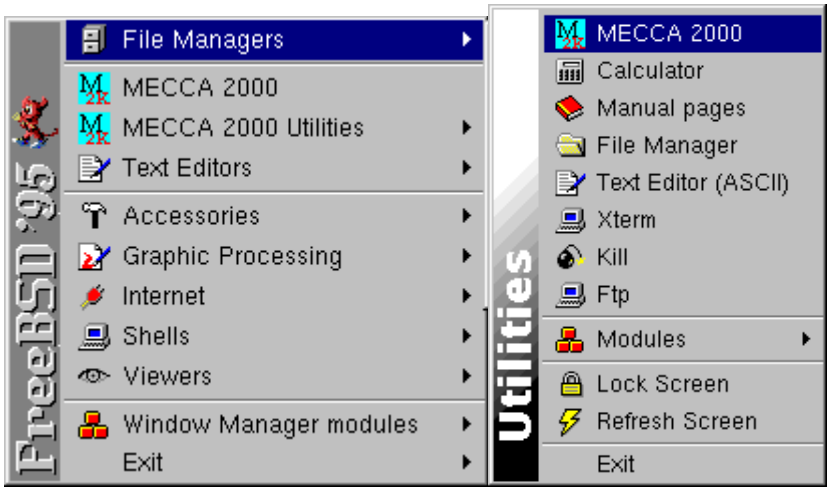
Password: _
(This will not display.)

Type your *password [Enter]*. For example, your entries would be something like **"amgraf [Enter] amgraf [Enter]".** Once this has been accomplished, your MECCA Startup screen will appear.

The MECCA 2000 Screen

The MECCA 2000 Startup screen is your desktop. Starting the MECCA 2000 is as easy as clicking [Start] and **[MECCA 2000].**

Now go to **[Start]** and notice that you have other choices. This will give you access to the basic file management functions. There is also a pop-up menu with other utilities; accessed by clicking your left mouse button anywhere in the window.



Accessing Applications From the [Start] button and the "Left" mouse button

Alternate Screens

Your UNIX operating system allows alternate screens, this means that you can login more than once, but there are some restrictions:

The [Alt] key is used to access other working areas. Alone it doesn't do anything, but in combination with the [F1] through [F12] keys, it becomes very powerful. It allows you to access other working areas, either in the same login or other logins.

[Alt]-[F1] is reserved for system reporting and shutting down.

[Alt]-[F2] when logged in as **amgraf** initiates the MECCA 2000 Startup Screen on Alternate 11. If you alternate out of the MECCA 2000 screen and need to go back to it, press [Alt]-[F11].

[Alt]-[F3] when logged in as **amgraf** initiates a $-prompt, the standard Unix command line.

You can actually login under each function key, but that is not practical.

Switching from one screen to another is accomplished by pressing the [Alt]-[F#] simultaneously. This will always work unless you are in MECCA 2000. At this point the **[Ctrl]-[Alt]-[F#]** must be used simultaneously to switch screens out of MECCA 2000.

Logging Out

Logout means to sign out of a login and close it. You will notice that a login message appears, but it is not enough for shutting the power off.

[Alt]-[F2] is used for MECCA 2000 graphics. Logging out will take you to this alternate's prompt. You cannot shutdown in Alternate F2. You must go to Alternate F1 to go through the shutdown procedures.

Shutting Down the System

We can't overemphasize how important it is to "close" the operating system before you power down the computer at the end of the day. An important part of this process consists of "saving" all files that are currently "open". If a file has not been saved, it will be lost when you power off the computer.

Always "shutdown" First

Using the steps below will always halt the Unix operating system properly. Failing to do so will require you to "clean" your hard disk after powering on again. *Cleaning* is a scan of the files and programs on the hard disk to locate any bad file structures, which may have been damaged during the improper power down.

The shutdown procedure will do two things: 1) successfully close the operating system, and 2) successfully disable the system from the server.

Press **[Alt]-[F1]** first. The *shutdown* can only be executed from the root login on Alternate F1, so go to [Alt]-[F1] and type in: **root [Enter],** password: **Mecca2K [Enter].**

At the #-prompt type in: **shutdown -h now [Enter].**

Do not power off until you see the "Operating System has Halted, " message.

Power Off Computer

Some computers automatically reboot themselves after a few seconds. If you've gotten up to get a cup of coffee and the operating system has rebooted while you were gone, you must go through the power off process all over again. Sorry. If it has not passed the "boot" message, then you can safely power down. Anything past that point and you must log back into "root" and halt the system again.

What if Accidentally Powered Off

If you ever actually have a power failure that stops the program, you should not panic. It is not particularly good for it, but should not cause any problems. Turn off the power switch on the main unit so that the system will not reboot itself when the power comes back on again. Try to find the power problem (checking cables, etc.). Wait a few minutes and turn the system back on again as usual.

The operating system will automatically check itself and clean up any corrupted files when the system is turned on.

The system was not shut down properly, and the root file system should be cleaned.

Proceed with cleaning (y/n)? **y [Enter]**

If a text file is lost, you will get a mail message telling you how to recover it. If a graphic file is lost, there is one area that may be worth your time to look at, */lost+found.* This directory holds files that have lost their filename. If your file is there, you can move it back to its proper location.

After cleaning, if your system does not respond properly, call the Amgraf Help Line at (816) 474-4797. Hours are from 6 a.m. to 6 p.m. Central Standard Time, Monday through Friday.

INTENTIONALLY LEFT BLANK

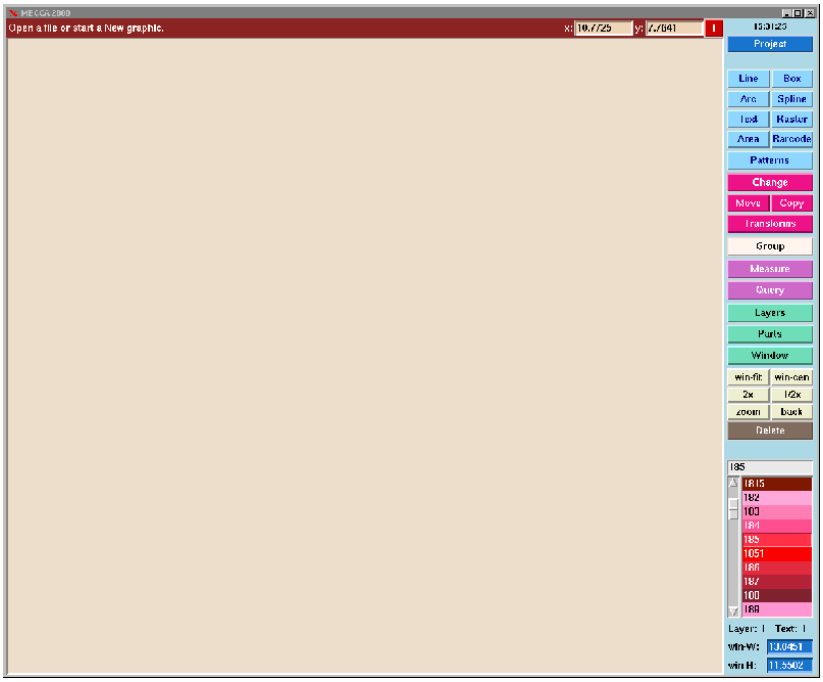
Chapter 2: Working with Graphics

In this chapter and the next, we'll explore some of the basic techniques for using MECCA 2000 to create simple and moderate graphics. Details on using each of the options are in *Volume 2: Illustrating and Drawing.*

Starting Up MECCA 2000

Start MECCA 2000 by clicking the **[MECCA 2000]** menu on the startup window. You'll then see a display that looks like the one below.

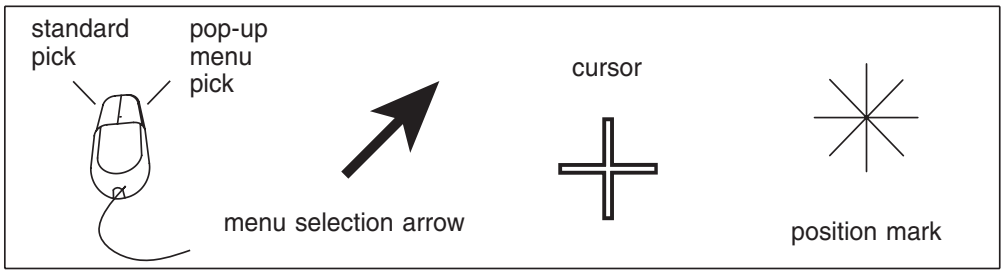
The large square brown box taking up most of the screen is the working **Window.** It can show the entire graphic or a blown up portion of a graphic using the [Zoom] option. As you can see there are buttons on the right-hand side. Each one represents different types of functions.



The Opening Screen of MECCA 2000

The Mouse, Cursor, and Position Mark

The figure below shows the mouse with its two buttons, as well as close-ups of two items you'll often see on your screen: the crossed-shaped cursor and the position/pick mark.



The Mouse, Arrow/Crosshair Cursors, & Pick/Position Mark

The *crossed-shaped cursor* indicates the active position of the mouse on the screen. It follows the mouse around as it is moved.

You'll notice that you can move the cursor everywhere on the screen, and that when you place it over one of the button options, the cursor changes to an arrow while the background shifts to white instead of its previous color. This is showing you which option is currently being seen.

To actually select the function button click the **left** mouse button. Then immediately move to the Window and click the **right** mouse button. This will then show a "Pop-Up" menu full of sub options for that function.

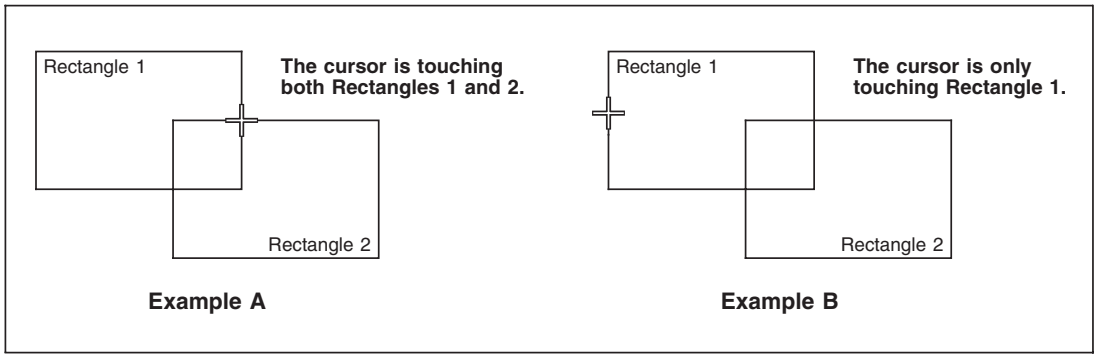
When using a mouse, hold it in your regular drawing hand and place your index finger gently on the left button. The mouse sits on the mouse-pad and glides smoothly around the drawing area. Pressing the *left* button causes MECCA 2000 to pick a point or choose an option, according to where the cursor is located. The cursor when in the window area is represented by crosshairs and its coordinates are tracked at the top right-hand of the window. When you move the cursor over a button function or menu option it then turns to an arrow.

The *position or pick* mark is made on the screen when the *left* "mouse button" is pressed down to indicate what you have chosen. This can also be a position marker held in memory by MECCA 2000 as you continue to indicate other necessary information for movement.

Choosing and Picking

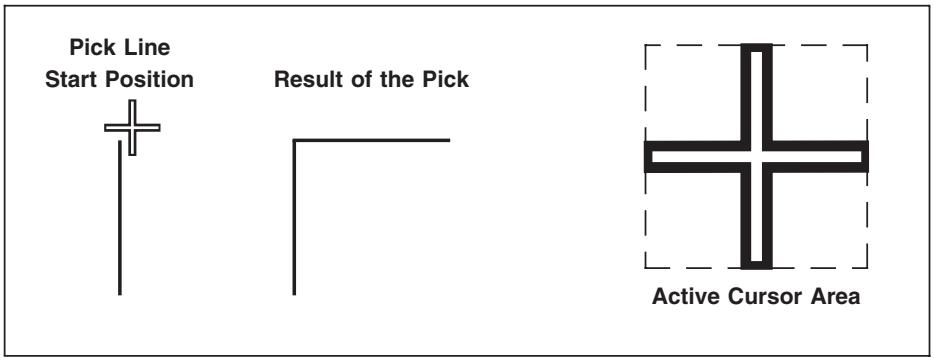
As used in these books, "choosing" refers to moving the cursor over the various buttons and options listed in the pop-up menus, and pressing the *left* mouse button down to indicate what option you want MECCA 2000 to do next. Throughout the rest of this chapter, we'll be using **boldfaced** type to tell you what options to choose, in what order, to accomplish your goals. "Picking" refers to using the cursor in the Window Area to indicate items to be affected by the options or a position in the window.

When picking items to move, copy, or delete, it is always better to select away from where two items overlap. In *the drawing below,* Rectangle 1 needs to be deleted. If picked like *Example A* the operator cannot be sure which rectangle the system will delete. If picked like *Example B* the only component that the cursor is touching is Rectangle 1.



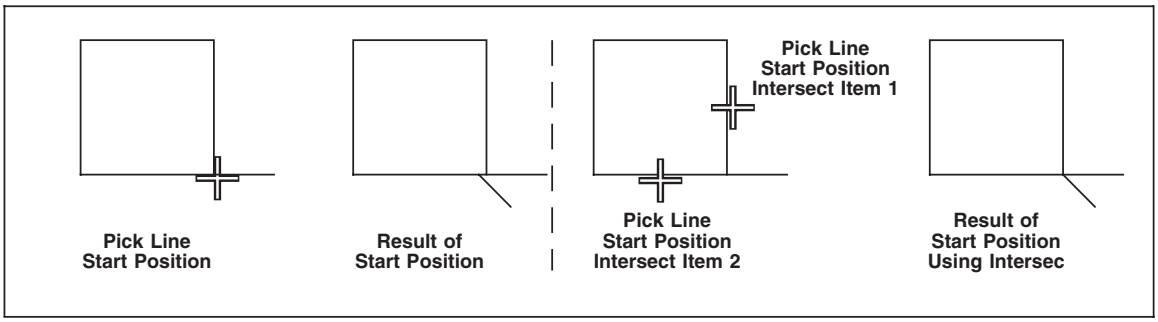
Picking Rectangles to Delete

While drawing, the cursor will snap to the end of a line when the crosshair is touching the endpoint of that line. It will also snap to the corner of a rectangle or box component. The cursor does not have to be positioned exactly on the end of the line. As long as the active area of the cursor is touching the endpoint the cursor will snap onto the endpoint. This is only if there are no other components at the same location. Below we see how the snap to endpoint works and also the active cursor area.



Picking Line Endpoints and the Active Cursor

If the exact corner of a rectangle overlaid with a line needs to be picked, just selecting the corner will not work. This is because the line can be selected anywhere. To find the exact corner use the **Intersect** option in the **Position Assistant** menu.

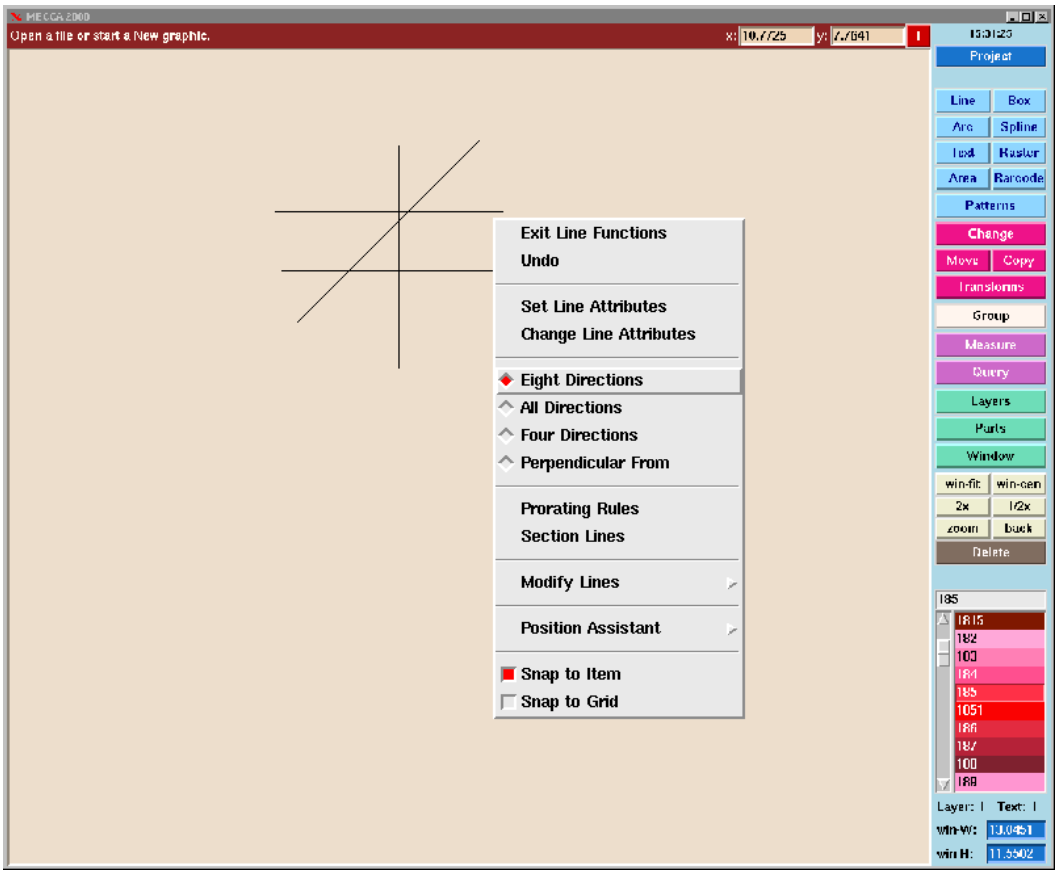


Picking the Corner of a Rectangle Covered by a Line

Choose Options through Pop-Up Menus

Throughout this chapter and the next, we'll be talking about choosing options with the mouse. When you move your cursor over an option it will turn white. To select the option click the **left** mouse button. Notice that the prompt line gives you a hint of what is needed by that function to operate.

Each function though has many other options. Bring your cursor over into the Window Area and then click the **right** mouse button. Clicking the *right* mouse button will bring up a "pop-up" menu of the sub options for that function. Notice that the cursor has changed to an arrow for selecting menus.



Eight Direction is a sub option of Line

Slide the mouse up and down the menu, as your cursor touches each option it turns white to highlight it. Click your *left* mouse button to select one of these sub options and make it active.

You'll also notice that if your arrow cursor comes off of the "pop-up" menu, the menu will close. If this happens before you have had a chance to select your sub option, just click the *right* mouse button again and the menu will open reappear.

The MECCA 2000 Window and Menus

Let's look at the MECCA 2000 window and menus. The **Prompt Area** is located at the top left of your screen. This is there to help you know what information MECCA 2000 needs to do the functions. The **User Input Area** for typing in coordinates is located at the top right of your screen represented by the "x" and "y" data boxes. Next to the "x" and "y" is the **Unit of Measure** indicator and button.

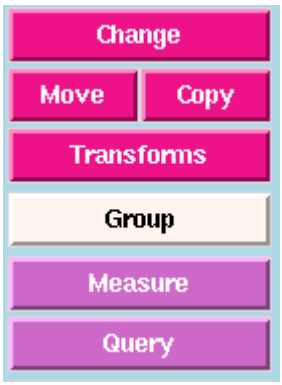
Naturally, the right-hand side holds the buttons for our main different types of functions. Let's quickly review their actions.

The blue [Project] button holds the sub options for loading, starting new, saving or printing files. The next nine buttons are the drawing tools: [Line], [Box], [Arc], [Spline], [Text] each creating a component type as you draw.

The Project and Active Drawing Buttons

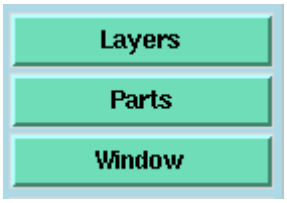
Each of these tools includes a pop-up menu with access to the {Position Assistant} tools. These are used to allow precise positioning of the cursor when needed.

The magenta buttons are your altering tools: [Change], [Move], [Copy], and [Transform]. Followed by three assistant tools [Group], [Measure], and [Query].



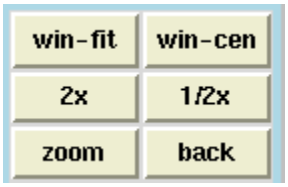
Altering and Assistant Tools

The green buttons [Layer], [Parts], and [Window] allow complete control for Multi-Color and Multi-Part jobs for display and printing.



Controls for Display and Printing

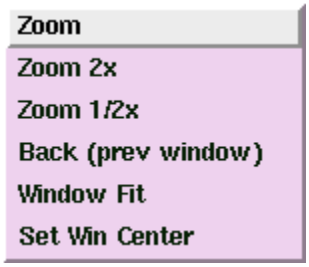
The tan Zoom Functions control how large components will be displayed in the Window Area of your screen.



Zooming Buttons

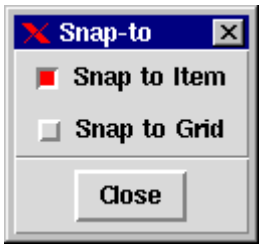
Hot Key Shortcuts

[Ctrl]-Left Mouse (Button1**)** in the drawing window brings up a "quick zoom" menu:

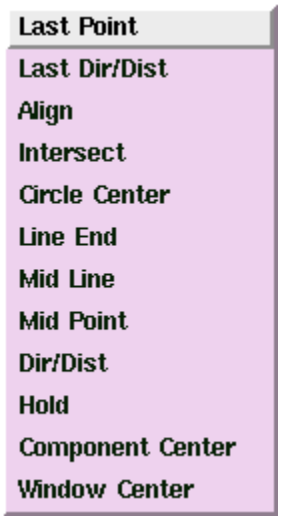


[Shift]- Left Mouse (Button1**)** brings up a "quick function select" menu:

[Ctrl]-Right Mouse (Button3**)** in the drawing window brings up a "quick component snap, grid snap" dialog:



[Shift]-Right Mouse (Button3**)** in the drawing window brings up the "position assistant" menu:



Also, the following short-cut keys have been added:

[Ctrl]-z & [Ctrl]-/ is Zoom 1/2x
[Ctrl]-Z & [Ctrl]-? is Zoom 2x
[Ctrl]-f & [Ctrl]-k is Window-Fit
[Ctrl]-a & [Ctrl]-; is equivalent to a mouse right-click
[Ctrl]-g means invoke group function

All of these are set in */usr/bin/amgraf/m2k.*

If a pop-up menu is already on the screen, another right-button click (or [Ctrl]-a) will un-post it.

Types of Drawing Components

Listed below are the different types of drawing components that are created by the MECCA 2000 System.

VECTOR

This includes any lines drawn, prorated rules, and line sectioning.

SPLINES

A Bezier spline is an irregular smooth curve.

VECTOR CHAIN

These components cannot be created in MECCA 2000, but may appear in files that were created on MECCA III or imported. Convert them to Splines to make any modifications.

BOXES

The box is a specialized component that can have rounded corners, inside filled areas, screened bars (odd, even or both), individual line weights on edges all as one component. It also includes the library of borders and pantographs.

ARC/CIRCLE/ELLIPSE

This includes a circle, arc (semi-circle), or ellipse.

TEXT

Text is recognized through a unique mnemonic for each font. Text is created by the two functions Input Text and Place Text Into Boxes.

RASTERS

Rasters are images. This includes black and white logos, halftone and color scanned photographs. Common image types such as BMP, JPEG, TIFF, PNG, DCS and PCX files can be imported from other software packages using the Combine option.

AREAS

Areas include screened or solid filled areas that are placed inside of the following components: lines, circles, splines, and free hand sketches. They do require an outside path first and boxes can be part of that path.

BAR CODES

There are many different types of bar codes that can be generated. Codabar, Code 3 of 9, Postal FIM and Zip, UPC- A and E, Interleaved 2 of 5, Code 128, EAN-13, EAN-8, USPS IMB, and the Data Matrix 2D Bar Code.

Starting from Scratch

Begin by moving the cursor over the drawing buttons. Notice how the display shifts from color to white, each time the cursor passes over an option. We are going to start with a fresh screen by choosing **[Project], {New Graphic}.** This has cleared any previous drawing and opened a fresh window.

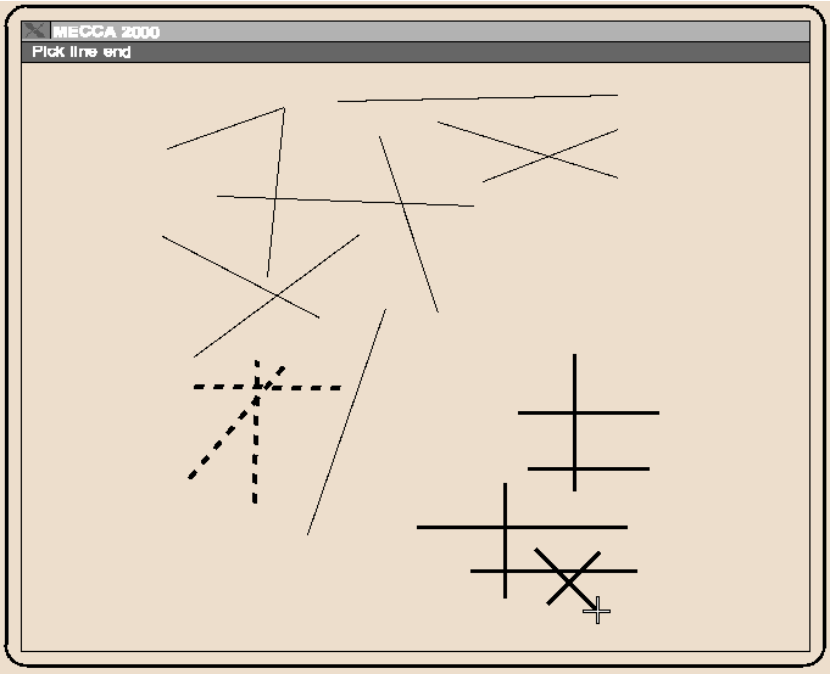
We are now ready to start drawing.

Drawing Lines

Choose the **[Line]** option by moving your cursor over the option until it turns white, then click with your **left** mouse button. Immediately bring the cursor out into the Window Area and click the **right** mouse button. A "pop-up" menu now shows a list of *Line* options with the {Eight Directions} option selected. In the Prompt Area, the words "Pick line start" will appear.

Move the cursor over to the left of the Window Area and **click the left** mouse button. You have just picked your line starting point. Do not hold down the button for a drag effect. MECCA 2000 uses single picks for all selections.

The Prompt Area now says "Pick line end." Now **move your cursor away** a few inches and you'll **notice a construction line** following the cursor on the screen. This line will shorten or lengthen depending on how far away you move from the original starting point. The line will follow your cursor in eight, 45 degree, directions from the starting point. As soon as you **click the left mouse button again,** the line freezes on the screen.



Using the {Eight Direction} Mode

At the top of the Line sub options menu, is the option for setting the line attributes. Choose the **{Set Line Attributes}** option. This will immediately bring up a "dialog window" where you can fill out all physical characteristics at one time.

Lines have six attributes; let's only look at the weight and style at this time.

Drawing Defaults

Line Weight - 1-Point
Line Style - Solid
Line Layer - 1
Color - 700 for 100% Black
Screen Lineage - 133
Screen Angle - 45

In the input field provided for *Weight,* you can either type in a value or choose from the drop-down list. Here you'll see a choice of sizes for lines, with associated colors for the window display of type color.

5 (0.5 pt) Cyan
10 (1.0 pt) Green
15 (1.5 pt) Blue ... etc.

Choose the half-point line weight **{0.5 pt Cyan}.** To accept your choice, select **[Okay].** The prompt "Pick line start" is back and your ready to draw some more lines. Practice

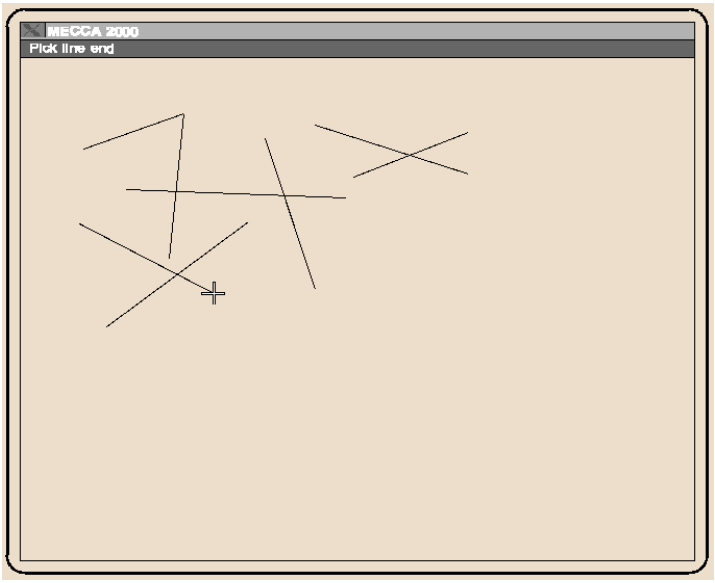
using {Set Line Attributes}; set the *Weight* to something different. Be sure to [Okay] to save the setting before drawing again.

Next, lets choose the **{Set Line Attributes}** *Style* option and look at the variety of line styles you have available:

Solid
Solid Rounded Ends ... etc.

Solid lines are the default setting. Dotted or dashed lines naturally have a variety of uses. Choose a different line style, [Okay] it and draw a few more lines.

Choose the **{All Directions}** option. In this mode you can draw lines at any angle. To get back your previous flexibility, choose the **{Eight Directions}** option.



Drawing Lines Using {All Directions}

Exiting Out of a Function

To leave one function to go to another, for the most part you simply click on the next function you want to do. However, there are certain options and suboptions that require you to do an {Exit Function} before it will let you continue on or go to another function.

Exiting a Function can be accomplished by simply toggling the button off, or by going into the pop-up menu and selecting {Exit Function}.

Deleting and Restoring

After a while, your screen is going to get filled up with drawn lines, so you'll want to get rid of them.

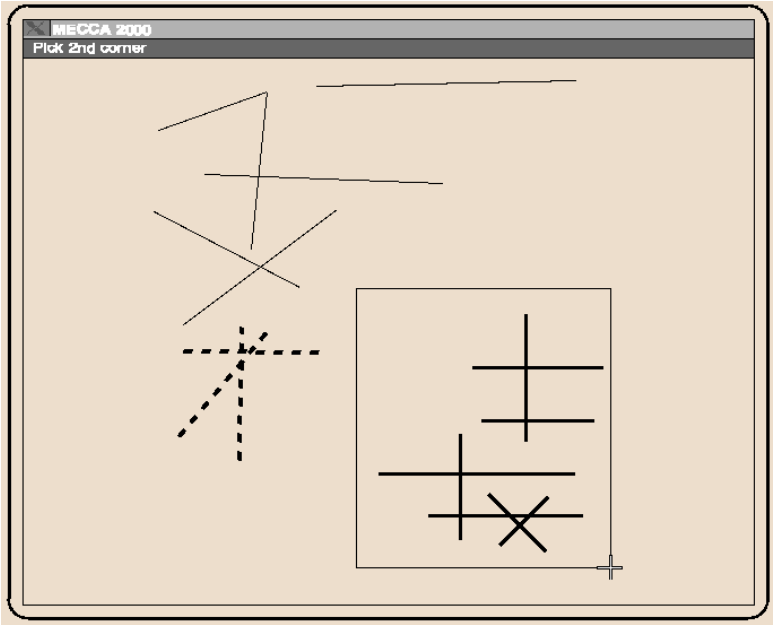
Move your cursor over and select the **[Delete]** button. You'll immediately be out of [Line] mode. You'll be prompted to pick an item to delete, so pick directly on a line you'd like to get rid of. It should vanish instantly. Go ahead and [Delete] several more.

If you click the *right* mouse button you will see Delete's sub option {Restore}. Try choosing **{Restore}** now, while looking at the line you just deleted. The line will reappear. This is a safety feature in case you delete the wrong object. But {Restore} will only recover the very last object deleted. Once you {Exit Delete} and get out of the Delete option, there is no longer an opportunity to recover the last deleted item.

Selecting and Unselecting Items for a Group

If you created a lot of lines on the screen, it could take a while for you to delete them all individually. So try choosing the **[Group]** option now. You'll see eight ways to Group or Ungroup items. Choose **{Pick}** for now, then use your mouse to pick several different lines. Each of them will go white as you pick them (regardless of their original color). The white color distinguishes them as being linked together and grouped. Now choose **[Done Group]** to quit selecting items and to get out of the Group option.

Choose **[Delete]** again, and pick just one of the white lines. They all vanished! This is because by group, picking them, you defined them as all being members of that group. Anything you do to one member of a group, you do to all its members. "All for one, and one for all!"



Using [Group] {Inside}

To try further examples of this, toggle off **[Delete]** and choose **[Group]** again. Go to the pop-up menu and choose group's **{Inside}.**

Move your cursor back over the Window Area and press it down somewhere near some short lines you drew. Move it away slowly in a random direction and you'll see a box appear, with one corner where you started and the other where your cursor is. Expand this box enough to enclose several lines completely, and pick. All the lines that were inside the grouping-box will turn white to indicate that they have been linked. To prove this, **[Done Group], [Delete],** and pick any of the now white lines, and watch them vanish.

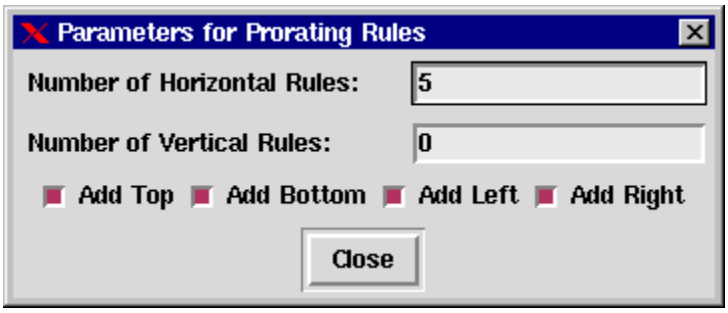
To see a slightly different method for Grouping, exit **[Delete]** and try again. Choose **[Group] and its sub option {Intersect}.** Once more you'll be able to draw a grouping-box, but this time, make sure that some of your random lines are partly in and partly out of the box area. When you finish the box by picking, you'll see that every line that was intersected by the box (or even touching it) has now been grouped. You could delete them again, but that's getting boring. So instead, choose group's **{Unselect Pick}.** Pick a few of the white lines, and they'll go back to their original color. In fact, the Ungroup modes are all the exact opposites of their Group versions, and they can be handy if you've accidentally grouped something you didn't really want included in your group.

But for now, let's get rid of all your previous lines as quickly as possible. Choose group's **{All}** -- and everything in the Window Area will turn white. **[Done Group], pick [Delete],** and pick any white line. The entire Window Area will be empty within seconds! Exit **[Delete]** and we're ready to go onward.

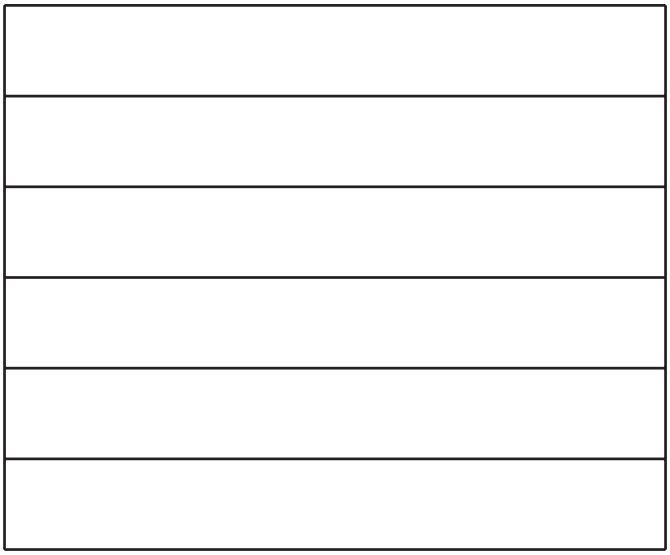
Drawing Multiple Lines

Line's {Prorating Rules} function is designed primarily to draw equally spaced multiple lines. While you are in {Prorating Rules}, if you press the right-mouse button again, you will notice that you are in the Prorating Rules sub options. There you have a {Set Parameters} selection. This will bring up a dialog box that allows you to input how many horizontal and/or vertical lines you would like drawn within your rectangle.

Let's draw 5 horizontal lines.



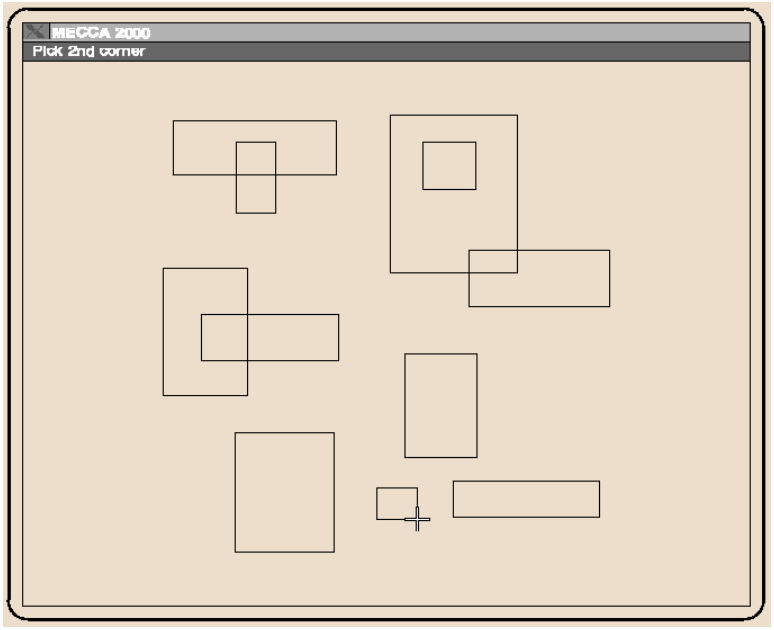
You should use the {Set Line Attributes}, *Style* of *Solid Square Ends* when drawing rectangles to allow for mitered (flush) corners in your rectangles.



Making Rectangles and Squares

When you choose the **[Line]** option, you have a pop-up sub option of {Prorate Rules}. Use this option if you need to make Rectangles or Squares.

Select **{Prorate Rules}, {Set Parameters}.** Set the number for "Horizontal" and "Vertical" to be **0** [Close]. You are immediately put into drawing mode. Place the cursor over in the Window Area and pick, then move it around. A rectangle will appear, in exactly the same way that the grouping-box did. Rectangles require that you pick two diagonal corners. Go ahead and make several rectangles.



Drawing Rectangles

Steps for Drawing Squares

Pick the first corner
Type: 2i
[right arrow]
[down arrow]
[Enter]

With practice you can make some that look like squares, but if you need to be precise, there is another way. Pick a clear area, then instead of moving to another corner, take your hand away from the mouse, and type **2i** and press the **[right arrow]** key. This is stating the width of the square. Now press the **[down arrow]** key to move down 2 inches,

press **[Enter].** You now have a 2-inch square being shown. By using numbers and the [arrow] keys, you can produce precise rectangles and squares.

Making Boxes

The [Box] function is designed primarily for business forms composition. It is picked and drawn exactly like a rectangle, but allows for additional attributes such as rounded corners and screened areas to be included automatically as part of the attributes of the box.

When choosing [Box] you are immediately prompted to "Pick 1st box corner". Move your cursor over into the Window Area and pick. You are then prompted to "Pick 2nd box corner", move your cursor and again you'll see a construction box shrinking and stretching as your cursor moves. Pick again to accept the second corner and the box will become permanent. Just as with drawing rectangles you can specify an exact size of a box by picking the first corner then typing in the width and depth measurements of the box.

The default for [Box] is to have empty insides and square corners. Select {Set Box Attributes} and we can define the details of our box as needed.

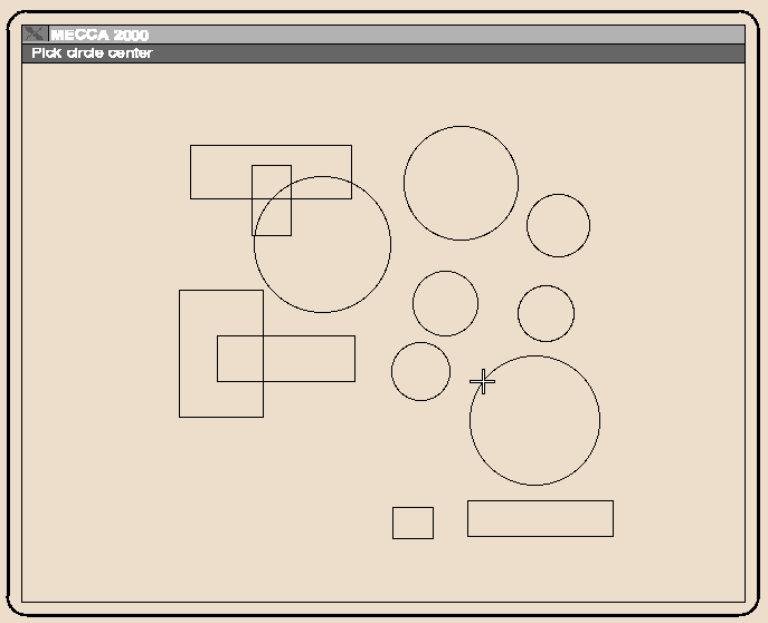
To make a box with 1/4" corners and a solid background we would do the following: Select {Set Box Attributes}, this will bring up the pop-up dialog window. In the input field provided for *Radius* type in **1/4i,** then use the drop-down list for *Corner Type* and select **Rounded.** This will give us four 1/4" rounded corners. Now go down to the *Background* attributes and for *Color Start and End* type in **700.** Color 700 on MECCA 2000 is 100% black. This will fill the entire inside of our box with a solid black area. After you have entered you attributes select [Okay].

You are ready to draw your box by picking two diagonal corners.

Making Circles

Circles also require two picks. **[Delete]** some of your rectangles to make room, then choose the **[Arc]** button and click the **right** mouse button to access Arc's pop-up menu. **{Set Line Attributes}** to the *Style* of **Dashed** and **[Okay].**

Pick wherever you'd like the center of the circle to be, and slowly move the cursor. You'll see a circle appear, which will expand and contract as you move the cursor further from or closer to the chosen center. When you like the size of the circle, just pick again, and the circle will remain. You can then make several more circles in the same fashion.



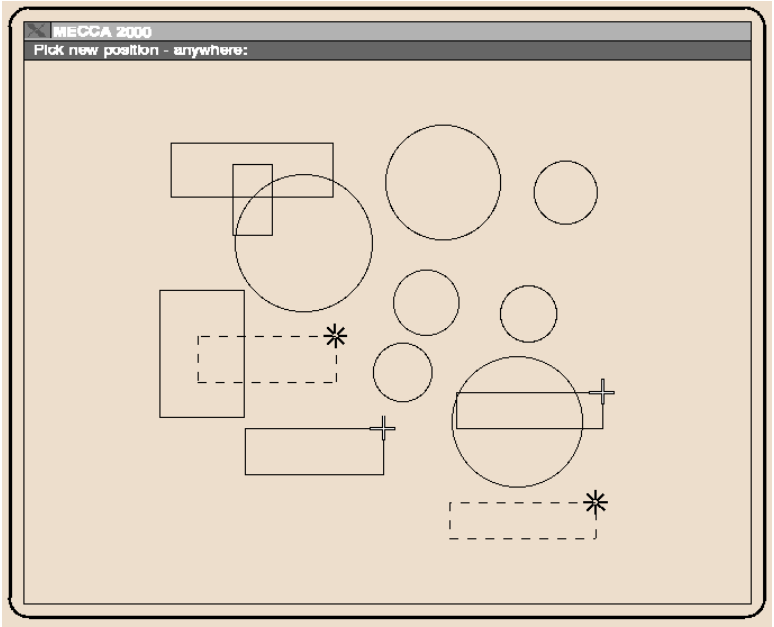
Drawing Circles

As with drawing Boxes and Rectangles, you can get precise with circles as well. Pick a spot to be the center, set the mouse aside and type **15p** and press the **[right-arrow]** key (this defines the *radius* of the circle), then press **[Enter]** and it will appear on screen. Go ahead and make a few more in different sizes and line weights.

Moving Items

Obviously, not every item is going to be created in the perfect position each time, so MECCA 2000 enables you to pick up items and Move them around anywhere you like. Try it now. Choose **[Move]** then slide the cursor over into the window and click the **right** mouse button to get to Move's sub options.

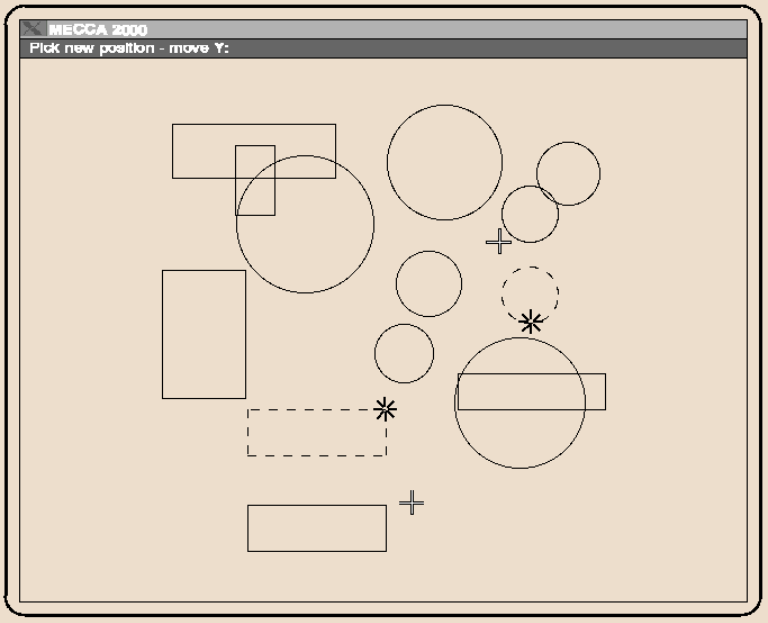
Choose **{Move to Anywhere}** and the menu will close. Pick a corner of one of your rectangles by picking directly on a line (you'll see a pick mark appear), move the cursor away a short distance, and pick again. The rectangle you picked now has that same corner in the new position. Pick something else, say one of the circles, and do it again. Notice that every time you Move something with Move to Anywhere, the picking spot on the original matches the destination spot picked. You are moving cursor-pick to cursor-pick.



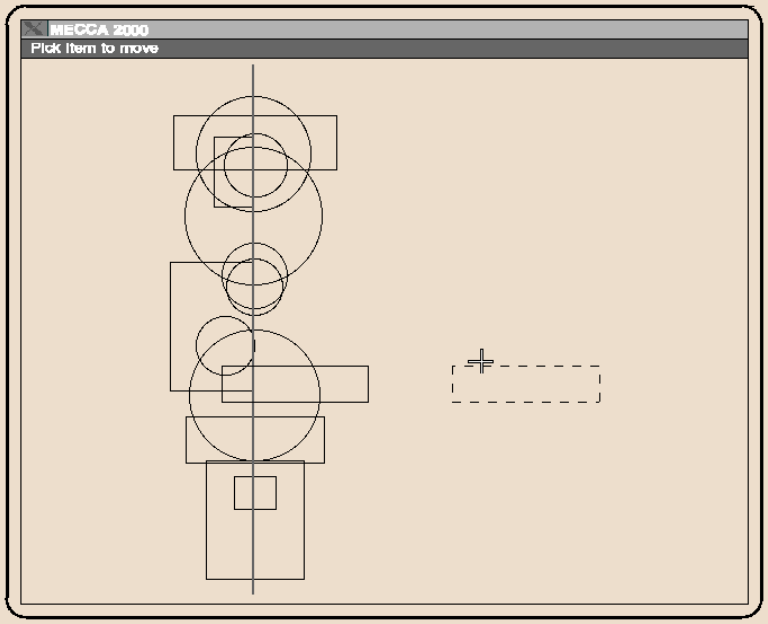
[Moving to Anywhere] in the Window

Now choose the sub option **{Move Y},** which is "move up and down only". Pick an item, then move the cursor directly above or below it, and pick a destination spot. The item will move straight up or down, with the picking spot on it matching the exact vertical position of the destination spot. Think about that a moment, then do it again, this time choosing a destination spot at a wide angle above or below the item's current position. Again the item will move straight up or down, to match the Y-coordinate (the precise vertical position) of the destination spot.

Now try **{Move X}** "move across only". You'll quickly see that it works exactly the same way, only in the horizontal. Try moving things around on the screen for a while.



Using {Move Y} Direction Mode



Using {Move to Plumb} Mode

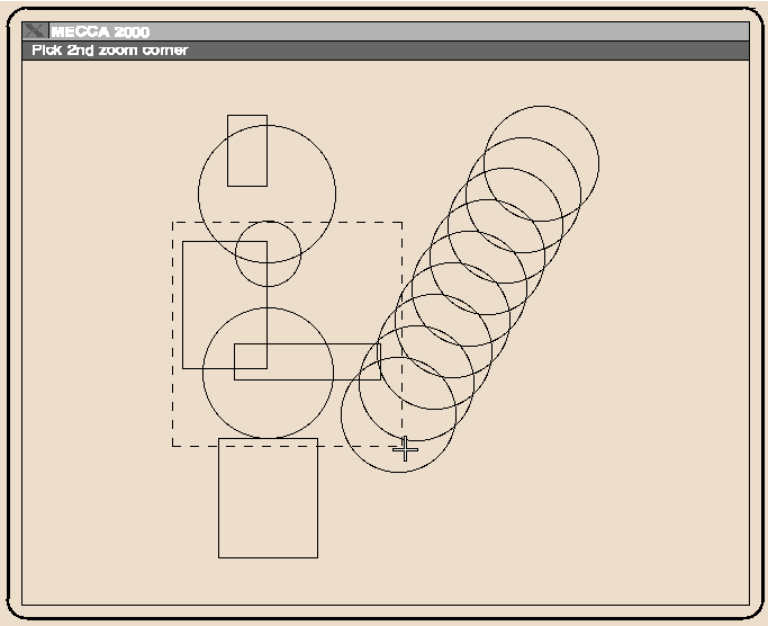
You can also move items to a Plumb or Level Line, so let's see how to do that. Choose the **{Move to Plumb}** option first. You'll see a prompt asking you to "indicate the Plumb Position", so pick a spot somewhere near the middle of the screen. A vertical dashed plumb line will appear. Now pick a few items and watch them move horizontally to place their pick spots on top of the plumb line.

You have something you'd like centered? Just choose the **{Cir Cen}** function in the {Position Assistant} menu, before picking the edge of a circle; or the **{Mid Line}** function before choosing a line, rectangle or square.

Try **{Move to Level}** instead. You'll see it works in exactly the same way, only on the vertical axis. Toggle off the **[Move]** button to exit Move completely.

Copying Items

Choose the **[Copy]** button, then click the **right** mouse button to go to the Copy pop-up menu. Yes, it's just variations on the same commands you were using with Move. Try **{Copy to Anywhere}** first. Pick a spot on an item, then pick a destination spot. Just as with the Move option, you'll suddenly see the item in the new position. But a copy of it has been left behind.



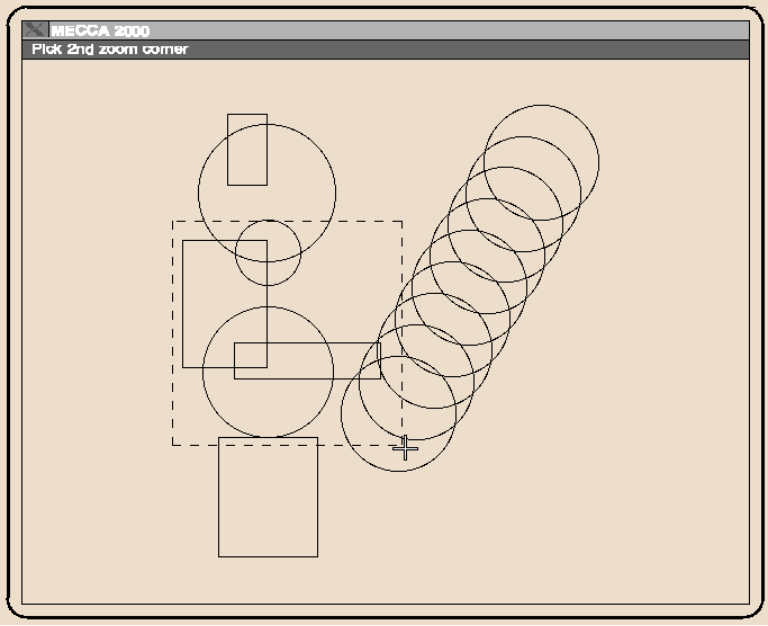
Using {Again}

Choosing the **{Again}** option will cause another copy to appear exactly the same direction/distance from the first copy as it was from the original. And another and another, each time you use the {Again} option.

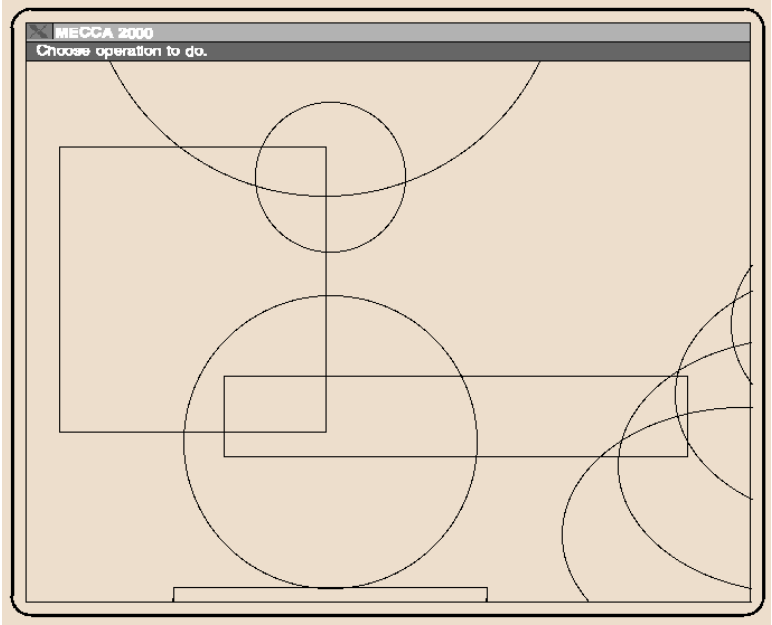
The other Copy options act exactly like their Move counterparts, try experimenting with them.

Windowing and Zooming

There's one last bit of technique to mention before we go about creating a graphic. Many times you will want to see very tiny details of an illustration, and with MECCA 2000 there's practically no limit to how much detail you can see. Choose the **[Zoom]** button and you'll immediately be prompted for a starting spot, so look around at your current collection of items on screen, and find an area where several items closely overlap. Pick a spot off to the side of this and move the cursor slowly. Yes, it's another one of those "rubber band boxes", but watch what happens this time when you pick the second corner: the Window Area is suddenly filled with an expanded version of the area you marked out with the box -- just as if you were using a zoom lens on a camera.



Before Zooming



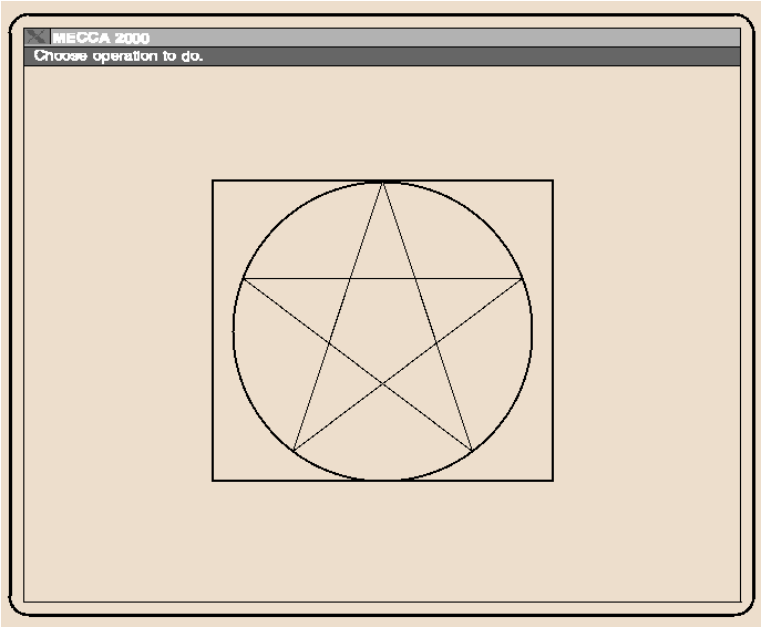
After Zooming

You can even Zoom up again and again, making more and more of the details clear by selecting the **[2x]** button. So even if you had picked an area where the lines were so close together that they originally appeared to be overlapping. Zooming will show them distinctly enough that you can pick one or the other for a Delete, Copy or Move. That's the whole point of the Zoom options!

To get everything back in the window, just choose the **[win-fit]** button. This will take everything in the current drawing and fit it into the regular Window Area boundaries. By the way, it's a good idea to get in the habit of doing a window fit just before saving your graphic. It can be especially important if the drawing is to be used as a merged graphic into batch documents, since it will not merge correctly without a previous fit before saving.

A Simple Drawing Exercise...

You could [Group], {All}, [Done Group], [Delete], {Exit Delete}, but it's probably easier to go to **[Project]** and choose **{New Graphic}.** Here you'll be prompted to choose **Yes.** Our window area is cleared and we are ready to start the drawing.



A Star is a Simple Graphic

First draw the rectangle. Choose **[Line] {Set Line Attributes}** and set the *Style* to be solid-square by choosing **{Solid Square Ends}** and selecting **{Okay}.** Then choose {Prorate Rules}, {Set Parameters} to 0, now pick a spot in the Window Area and draw a square just by hand. It doesn't have to be perfect. **[win-fit]** the rectangle to fill the window. Get out of [Line] mode.

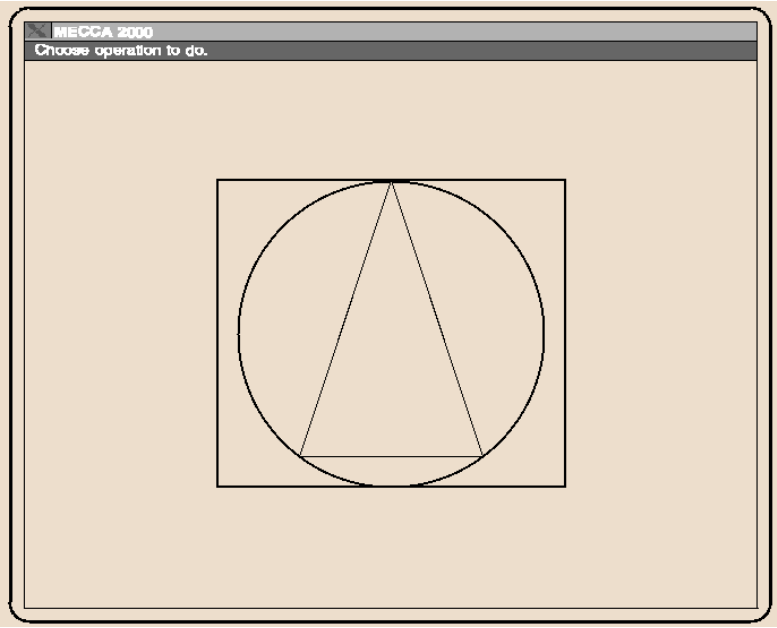
Now draw the circle, since we want the circle to be in the center of the rectangle, we need to use our {Position Assistant} {Comp Cen} function to help us find the middle.

Choose **[Arc]** and when you're prompted to "Pick circle center" choose the **{Comp Cen}** function in Position Assistant. Pick the edge of the rectangle as our component. When you next move the cursor, you will notice that the center of the circle has been selected as being in the middle of the rectangle. Now pick the outside of the circle by selecting a side of the rectangle.

Choose **[Line],** let's make the lines a half-point, solid round end. Do this by choosing **{Set Line Attributes}** and choose **{5 (0.5 pt) Cyan}** from the "pull-down" menu. Then

choose **{Solid Round Ends}** from the *Style* "pull-down" menu. Let the system know you are happy with your selections by choosing **[Okay].**

We are going to work on the top of the star. To pick the exact middle of a line there is the option {Mid Line}. To pick our "line start" select **{Mid Line}** in the {Position Assistant} menu. Now pick the line, which makes up the top of the rectangle.

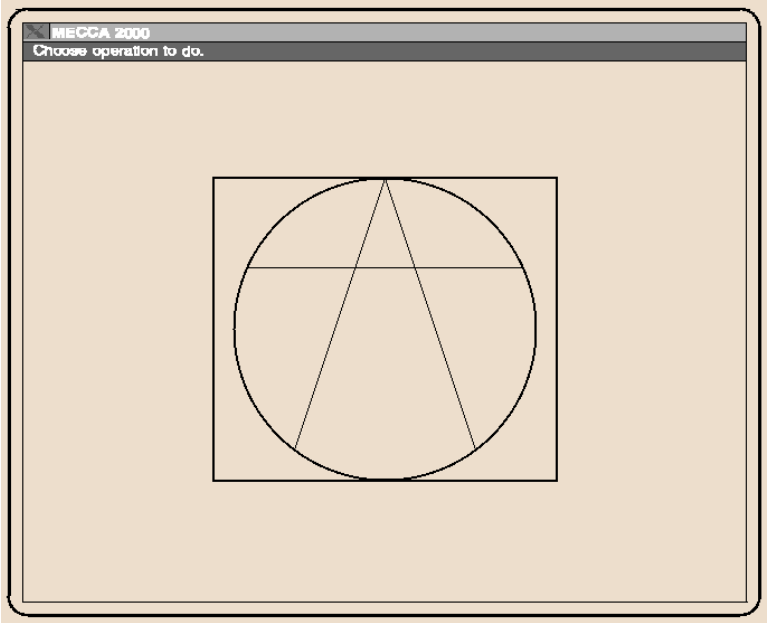


The Top of the Star Starts Out as a Triangle

The beginning of our first line is connected to the middle of the top of the rectangle. If you are not already in **{All Directions}** go choose it, then drag the line down to the bottom (angled slightly) and pick the line end. To get the left hand side to be exactly like the right hand side, we will draw a construction line on the bottom of our circle. Choose **{Eight Directions}** and then draw a line that starts with the end of the first line drawn and is extended until it reaches the left edge of the circle. For the third line, choose **{All Directions}** and draw a line from the top of the first line using **{Mid Line}** again. Pick the end of your line by using **{Intersec}** and picking the left side of the construction line and the circle. You now have a triangle.

{Exit Line Functions} out of **[Line]** and **[Delete]** the bottom of the triangle. We only needed that line to determine where the end point of the left side was to be located. **{Exit Delete}** out of delete and go back to **[Line].**

Draw the top of the arms of your star remembering that this must be a straight line, so go into **{Eight Directions}** mode first. The rest is easy; just draw the other two lines connecting to the ends of the existing lines. Go to **{All Directions}** first, and you may need to **[Zoom]** in closer to see your picks, or use {Line End}.



The {Eight Directions} Mode is Used to Draw the Arm

When you're done, toggle out of [Line] mode and do a **[win-fit].** You should now have a picture that looks like our example on page 36. Congratulations!

Saving Your Graphic

This part is easy. Choose **[Project] {Save As}.** This will take you to the Save "pop-up" window, where you'll have these options: *All* or *Grouped Items Only.* When saving a new file you are presented an area to fill out the file location and filename.

So let's keep whatever default path that shows up on the menu (this is probably /usr/amgraf/untitled.g), and just type in **mystar.g** as the filename. Press the **[Enter]** key**.**

You may have noticed that all the filenames we've been using have only lowercase letters and end in ".g" (like mystar.g). The ".g" is the standard file extension used by MECCA 2000 for graphic files. You could use a different extension, but we suggest you use the ".g" to let you know that this file is a graphic and can be loaded in MECCA using the {Open File} function.

File names are easier remembered if you only use lowercase letters, and remember no punctuation except for the period (.) key.

Save Files Often

If anything can go wrong, it will. Murphy's Law warns us that mistakes happen. Because of this, *we highly recommend* that you pause every 15 or 20 minutes, go to [Project] and {Save/Save As}, then return to your work. For example, if you suddenly realize that you've deleted something you shouldn't have several steps back, you can always recover it from a previously saved version. Just save what you have under a temporary name, and call up the most recently saved version of your graphic to recover the accidentally deleted portion.

Start this habit right now with the exercises in the next chapter, and we promise you won't regret it. Stop and save after every major stage of your drawing, and that way you won't have to go back to the beginning and start over if a mistake occurs.

Printing Your Graphic

This is almost as easy. Choose **[Project]** then select **{Print}.** You'll be presented with a "pop-up" dialog window showing your printer options. Choose your printer and then select **[Okay].** In a minute or two, the file you have in the Window Area will be printed.

Loading in an Existing Drawing

Begin by selecting **[Project], {Open File}.** A "pop-up" window will appear allowing you to locate your file. Once you've located your file, click on it so it appears in the *File name* area, (or if you know the path/file name you can just type it in). Then click on the [Open] button. This will load your drawing on the screen.

Now try clearing the screen using **{New Graphic}** and then draw a few lines. Do not save the lines but go to the {Open File} Menu and load in your mystar.g by placing the cursor over the file name and pressing **[Open].** Your lines are gone and cannot be recovered. They have been replaced with mystar.g. Remember, that each time you {Open File}, it replaces what is on the screen, and that if you need what is on the screen, it must be saved.

INTENTIONALLY LEFT BLANK

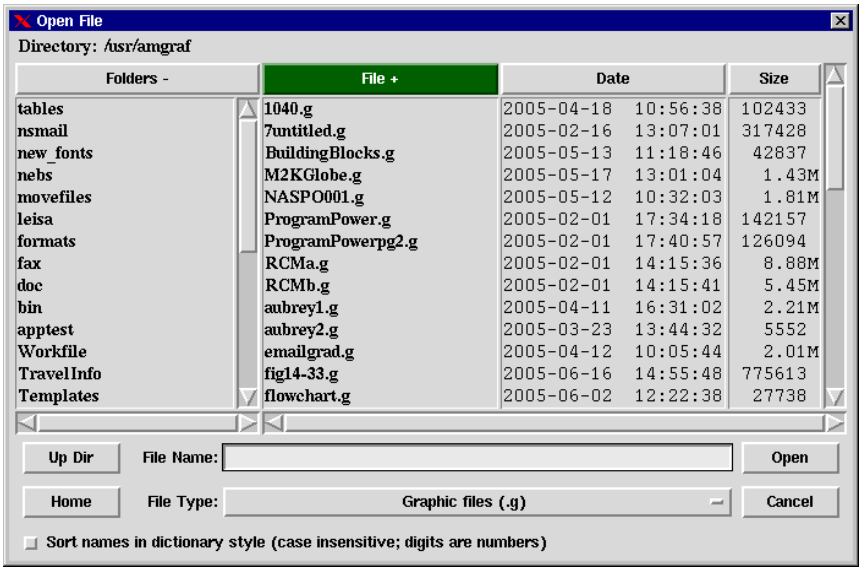
Chapter 3: Pop-Up Menus and Dialog Boxes

Following are all the MECCA 2000 pop-up menus and their dialog boxes.

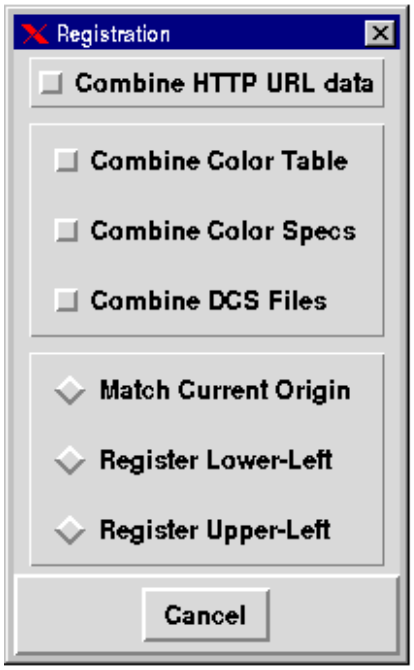
- The Project Menu
  - Combine and Save Dialogs
  - The Print Dialogs
- The Line Menu
  - Prorating Rules
  - Section Lines
- The Box Menu
  - Borders and Pantographs
  - SuperImpose
- Arc
- Spline
- Text
  - Place Text into Boxes
  - Place Text on Circle/Path
  - Micro-Text
  - Vertical Adjust
  - Words From PS Letters
- Raster
- Area
- Barcode
- Patterns
- Change
- Move, Copy, and Group
- Transform
  - Rotate/Scale
  - Point Shaker
  - Shearing
  - Pull/Bending
  - Mirror
- Layer
- Parts
  - Spot Color
  - Process Color
- Window
  - Grid
  - EPS Preview

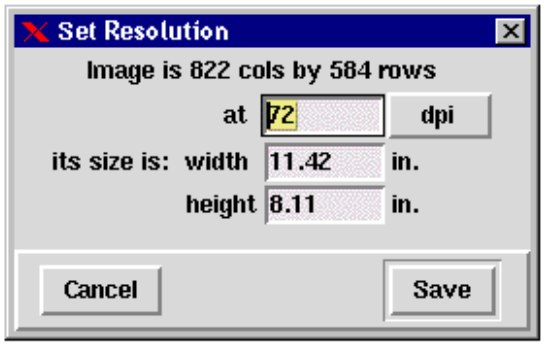
The Project Menu

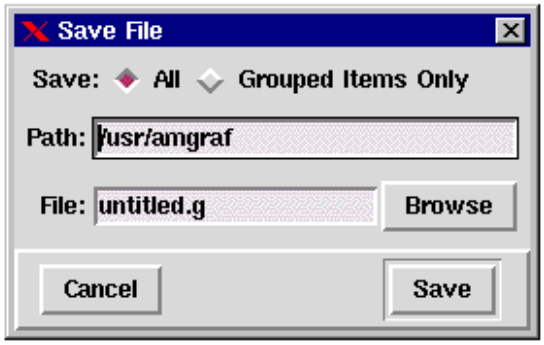
Open File



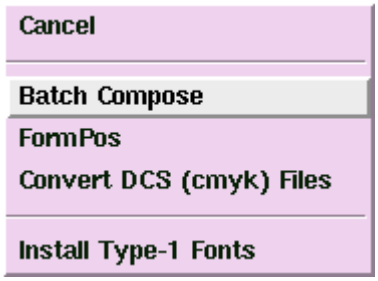
Combine and Save Dialogs

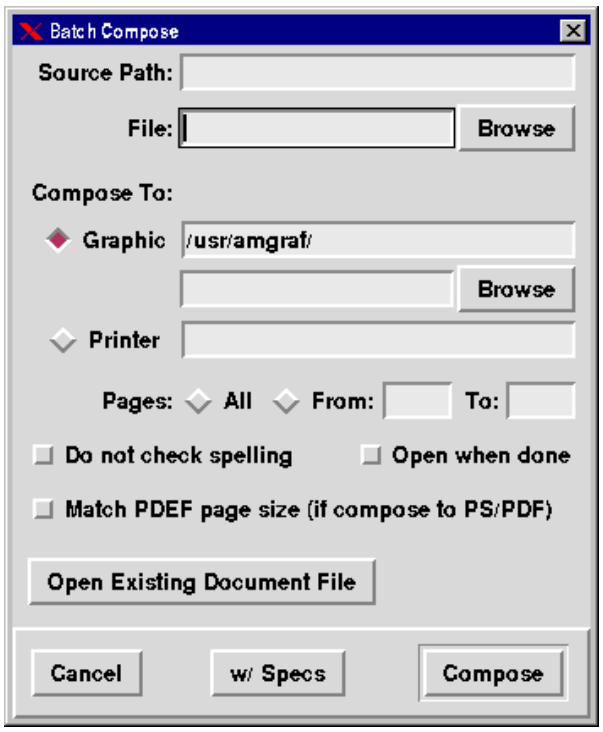


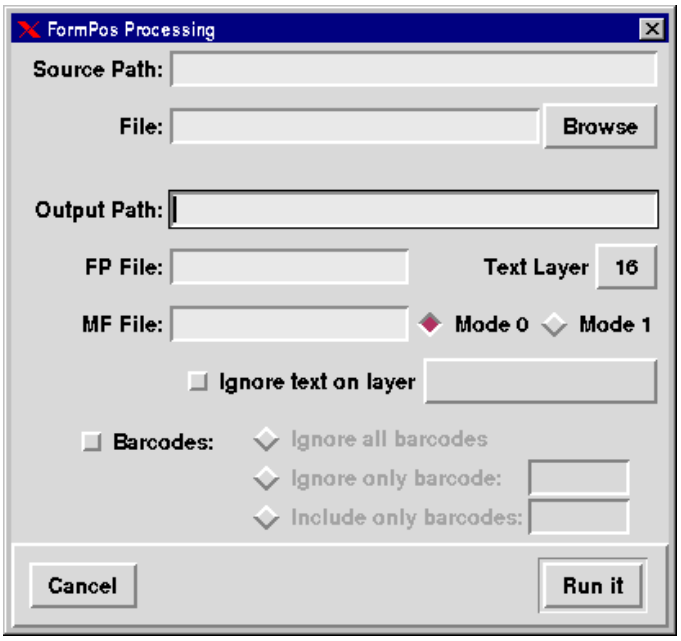




Batch and More

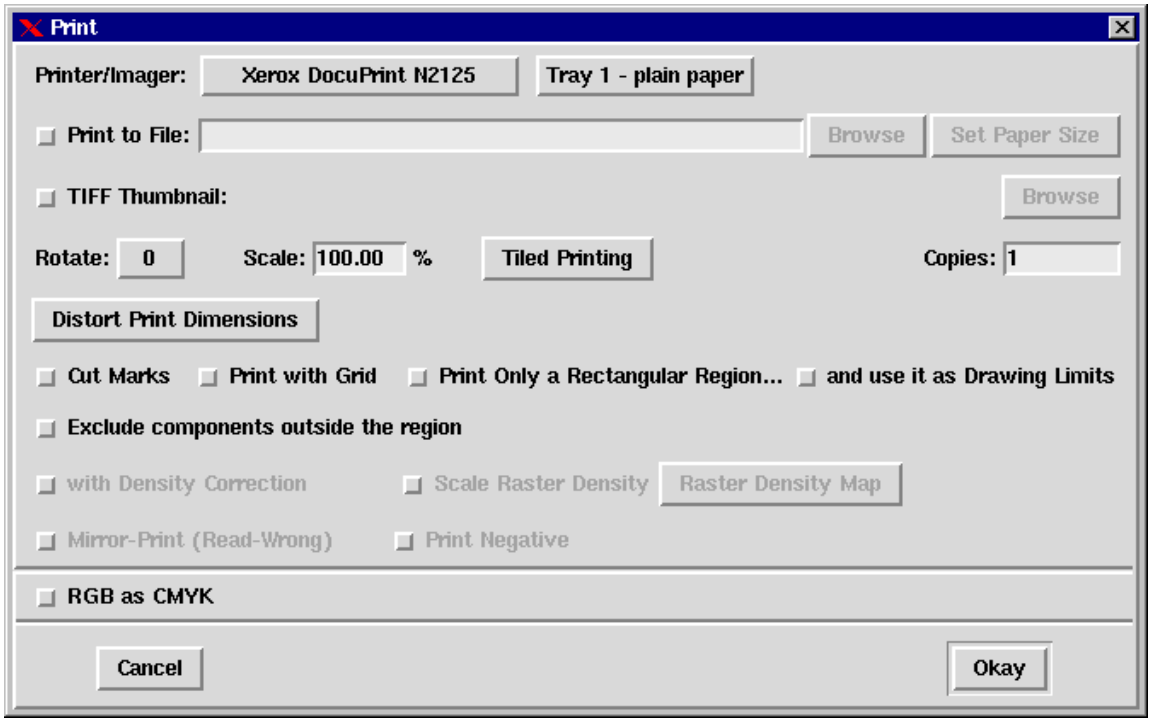




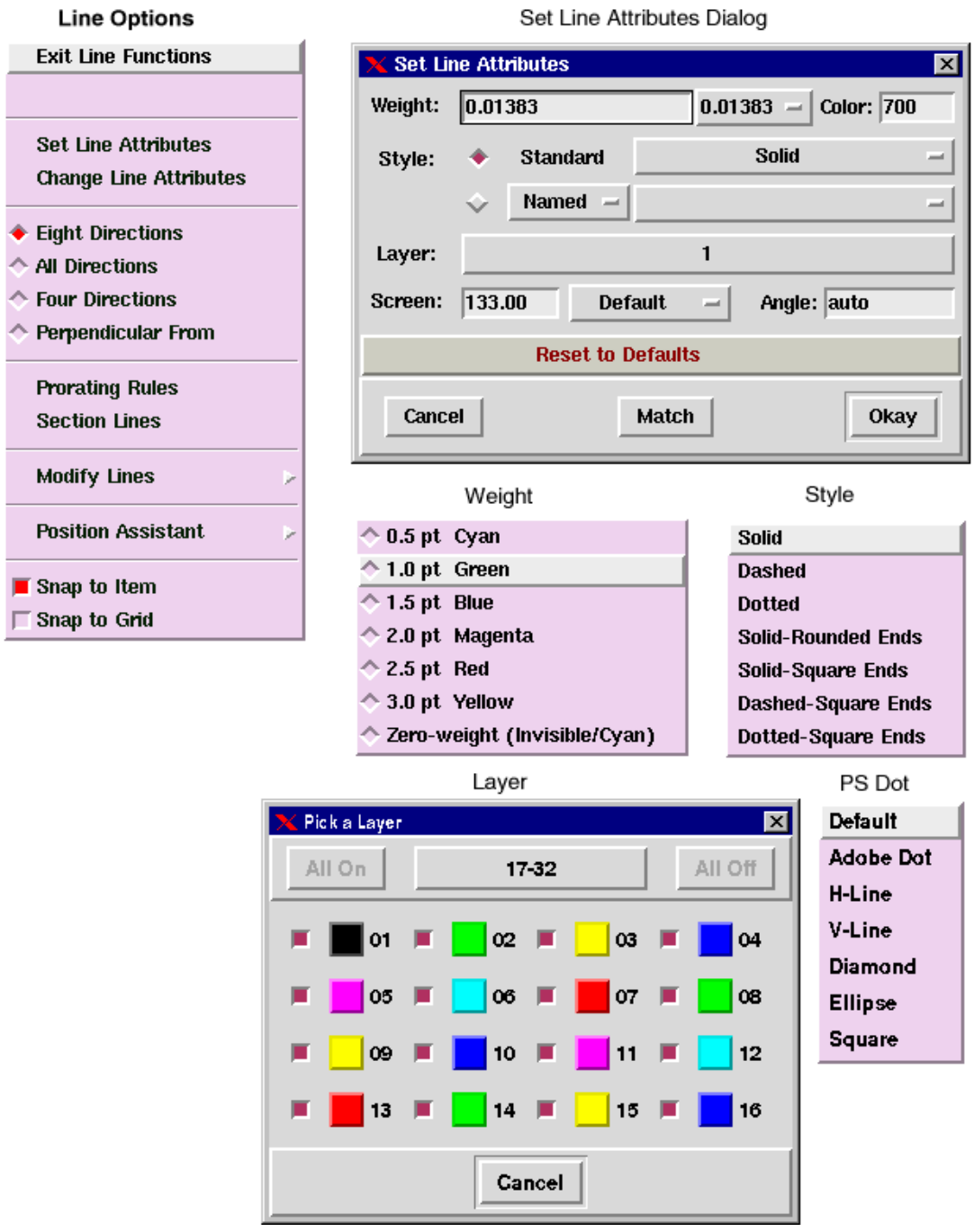


Note: The Convert DCS and Install Type-1 Fonts menus will take you to the Open File option. There you can browse for its needed file types.

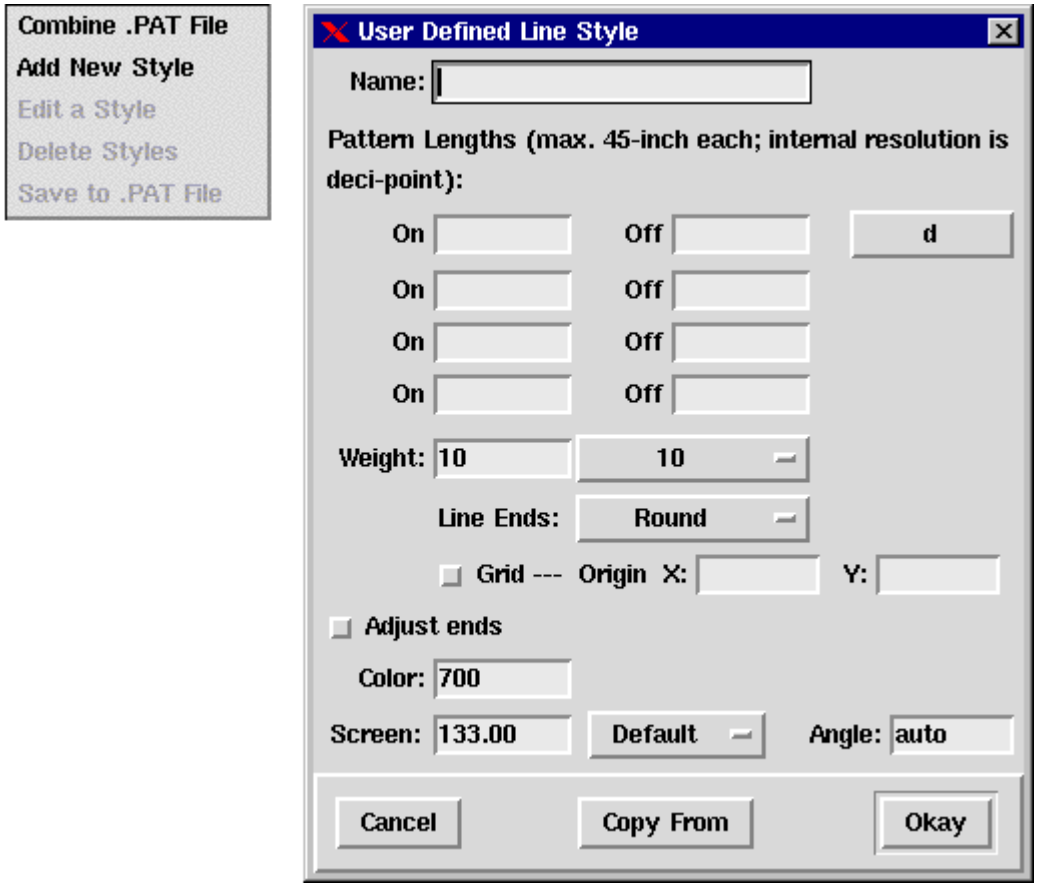
The Print Dialogs



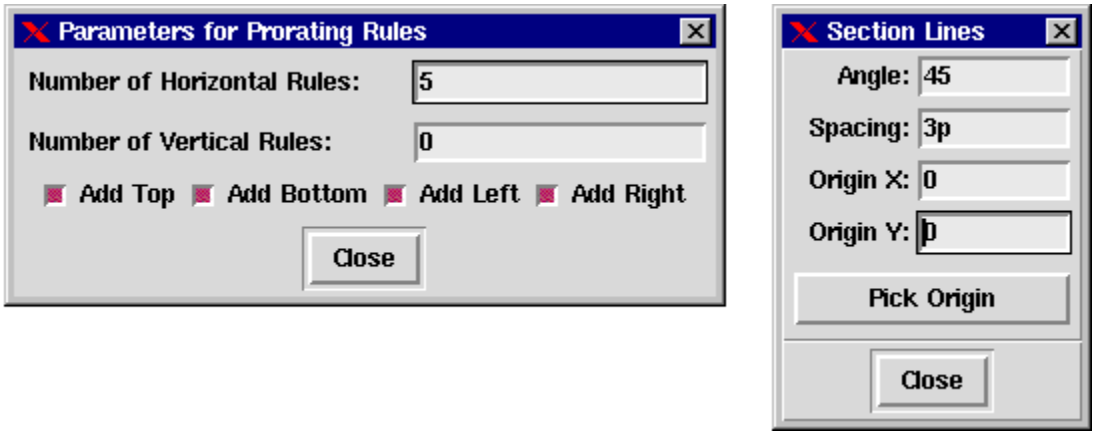
The Line Menu



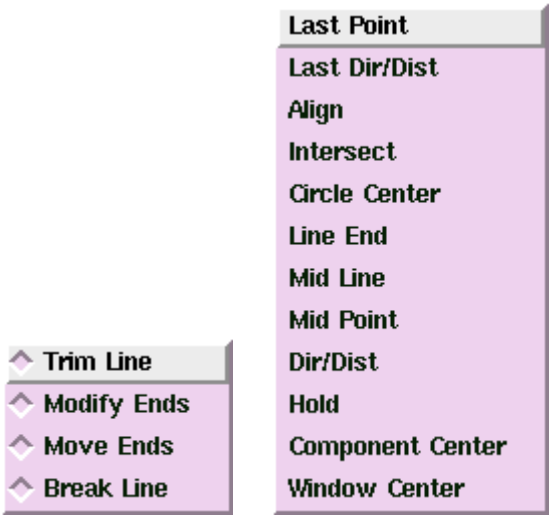
User Defined Line Styles



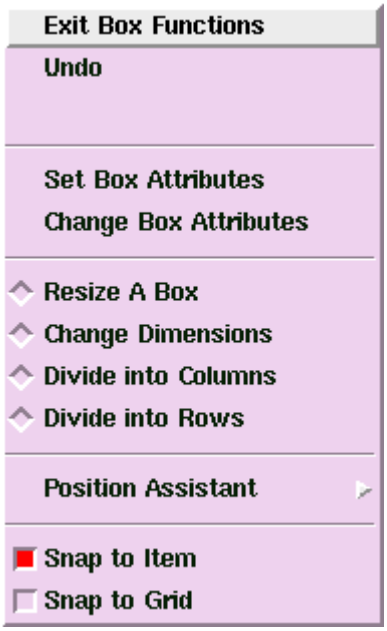
Prorating Rules and Section Lines



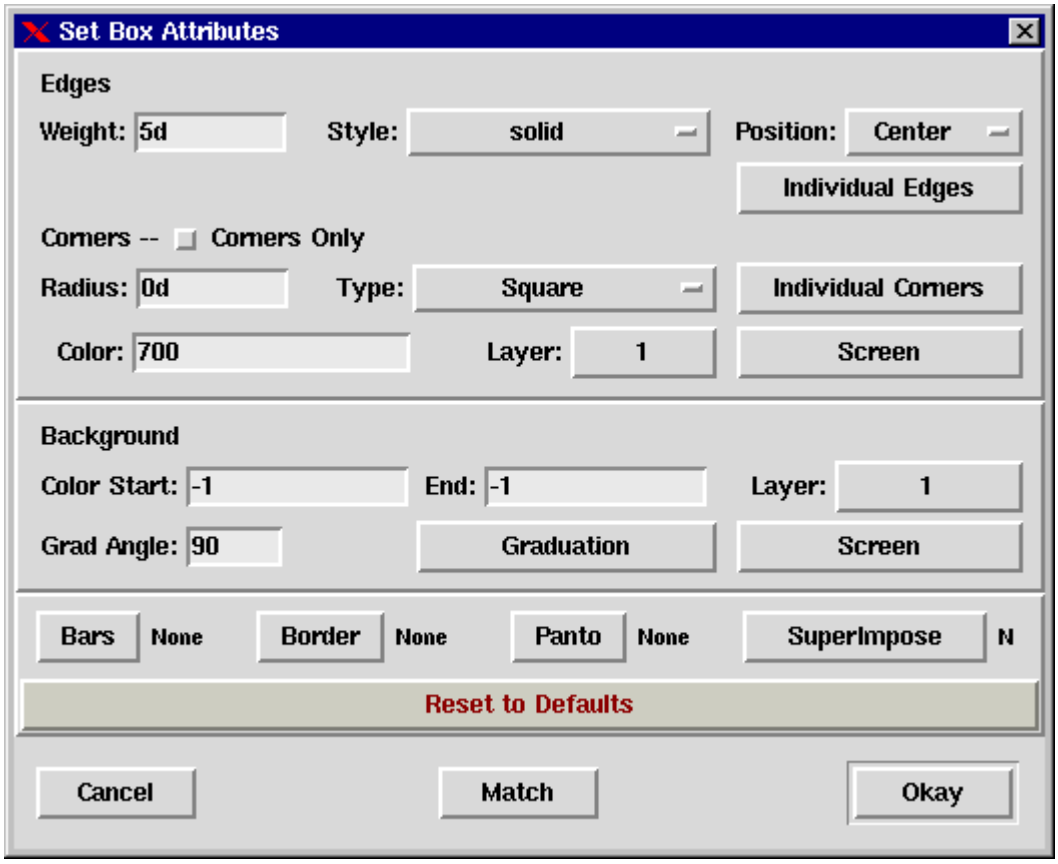
Modify Lines and Position Assistant



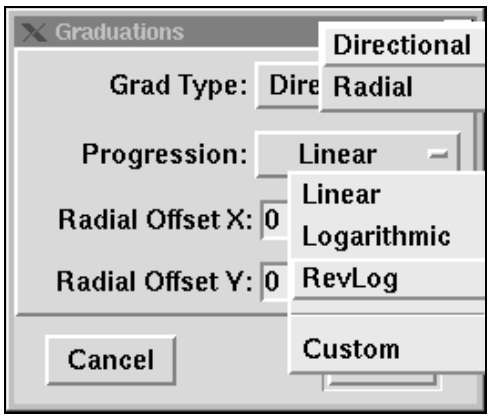
The Box Menu



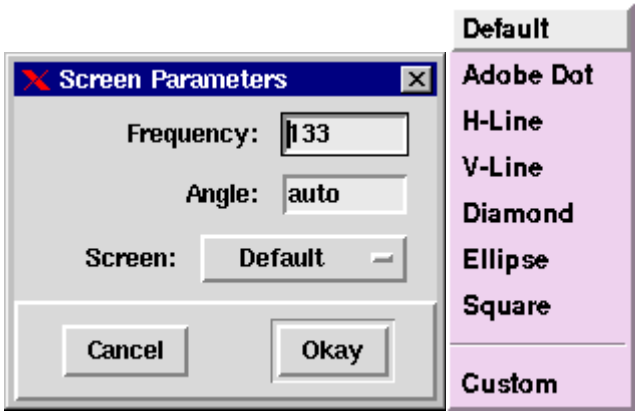
Set Box Attributes



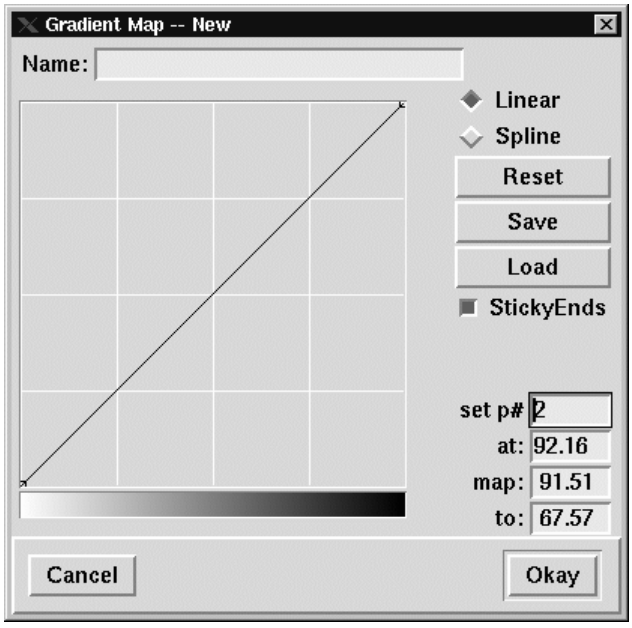
Graduation



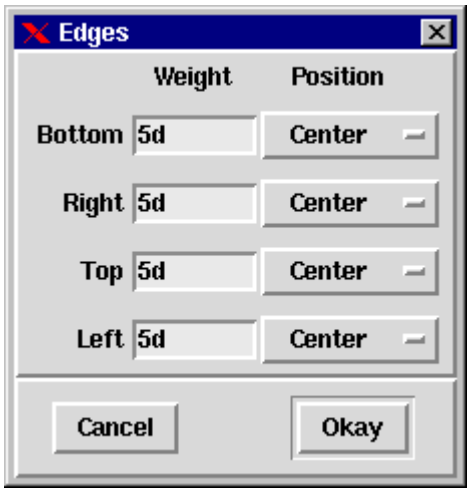
Screen

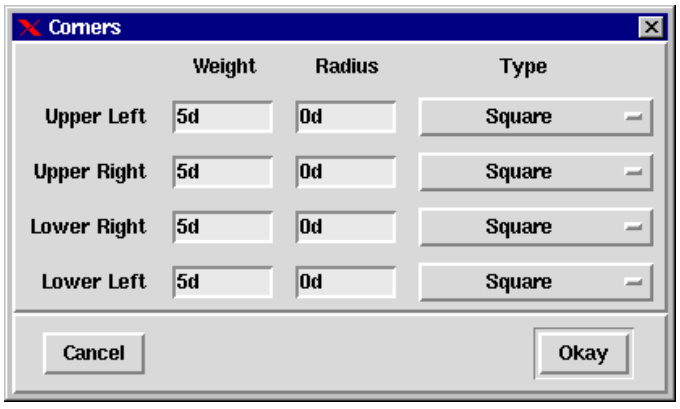


Custom Gradient Map Dialog

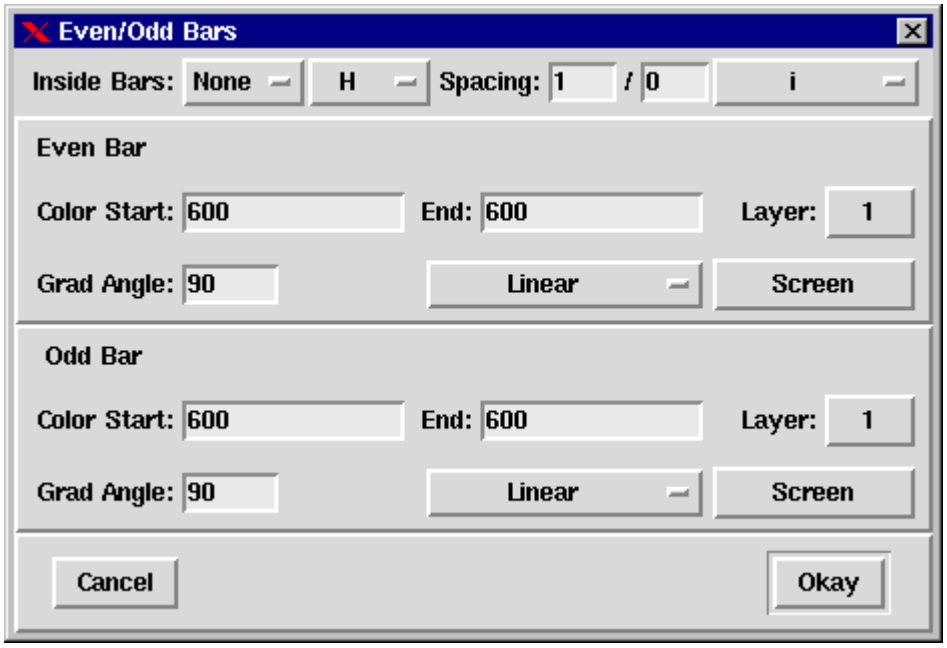


Edges and Corners

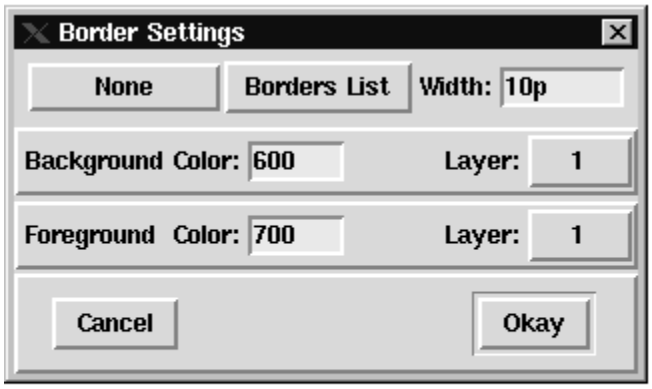


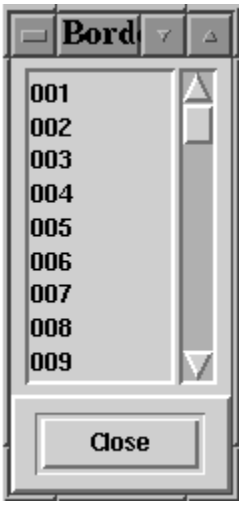


Even and Odd Bars Dialog

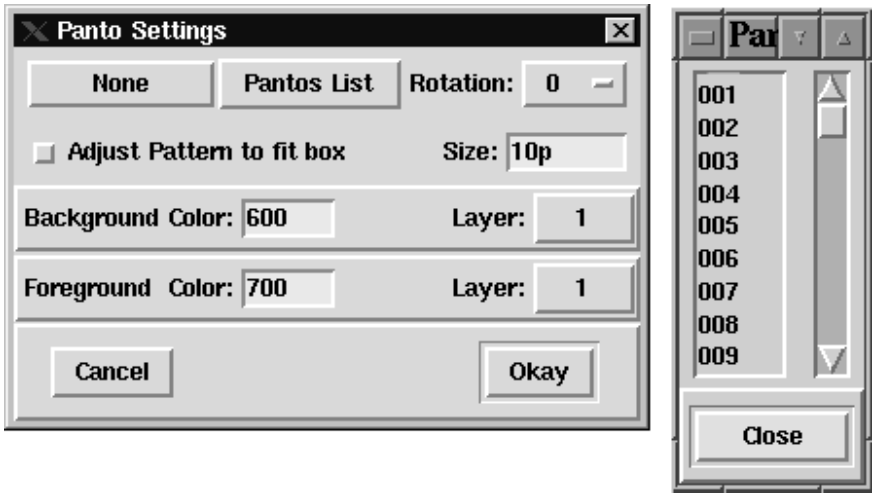


Borders

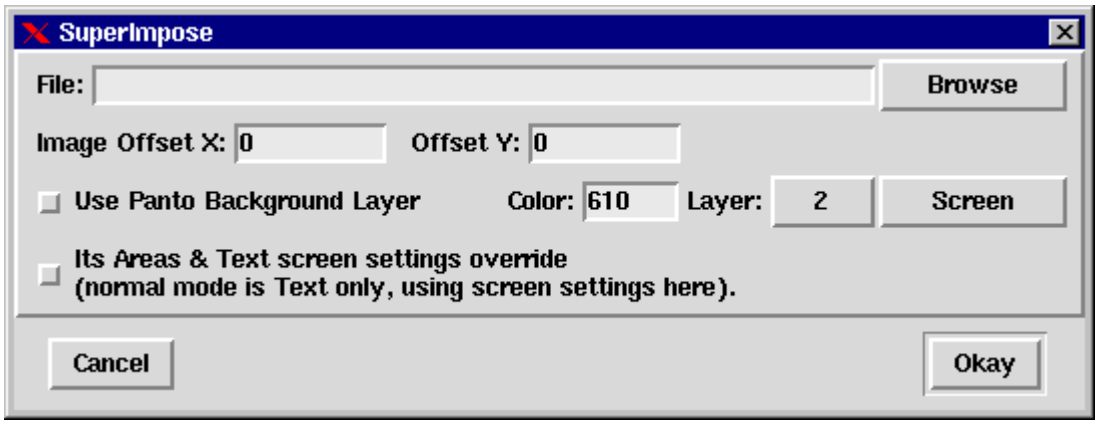




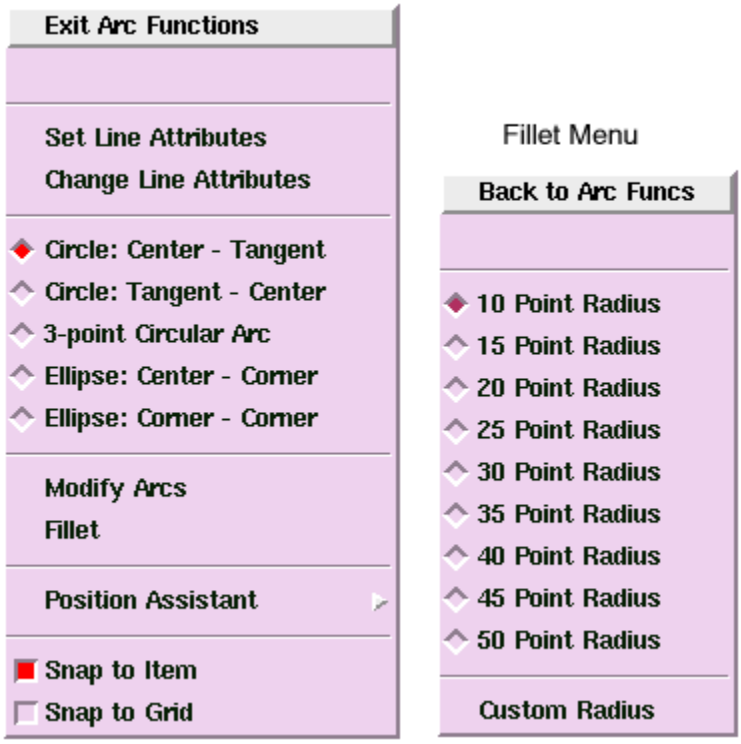
Pantographs



SuperImpose

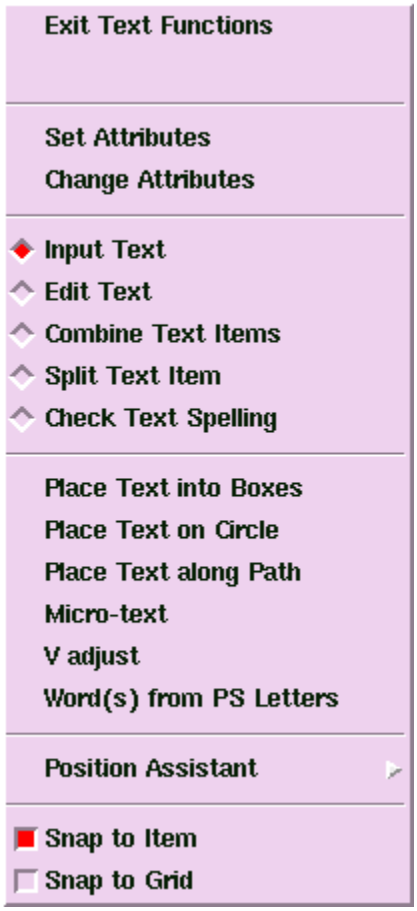


The Arc Menu

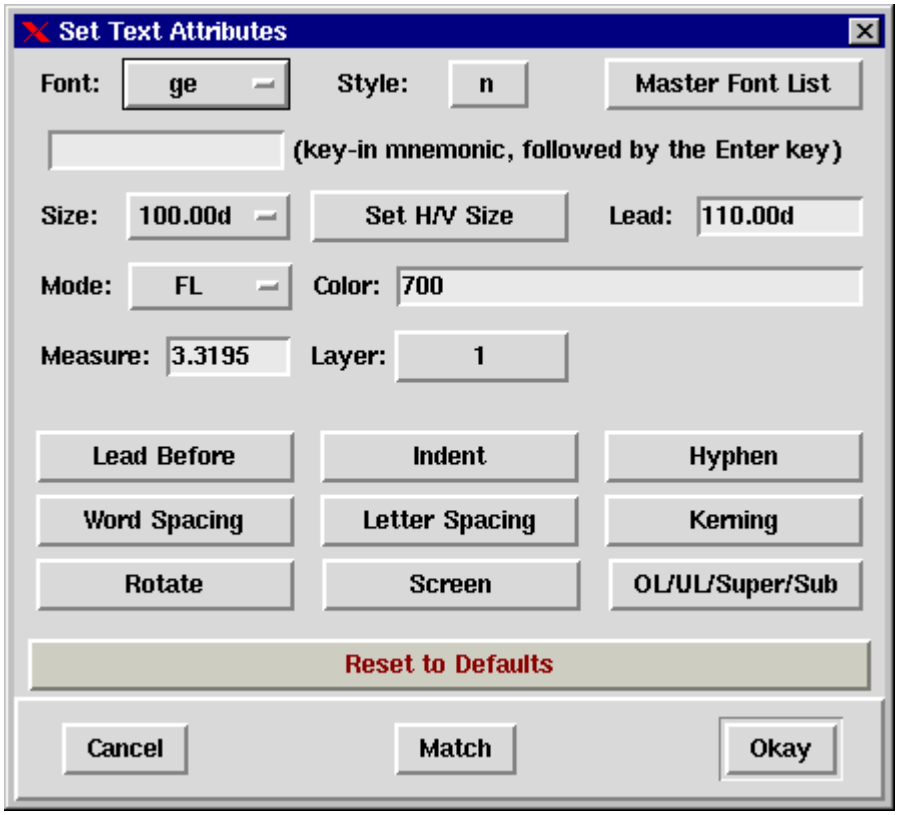

Exit Arc Functions
Set Line Attributes
Change Line Attributes
Circle: Center - Tangent
Circle: Tangent - Center
3-point Circular Arc
Ellipse: Center - Corner
Ellipse: Corner - Corner
Modify Arcs
Fillet
Position Assistant
Snap to Item
Snap to Grid
Fillet Menu
Back to Arc Funcs
10 Point Radius
15 Point Radius
20 Point Radius
25 Point Radius
30 Point Radius
35 Point Radius
40 Point Radius
45 Point Radius
50 Point Radius
Custom Radius

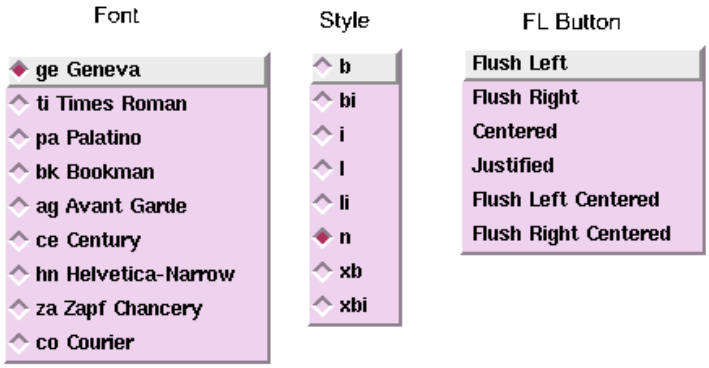
The Spline Menu

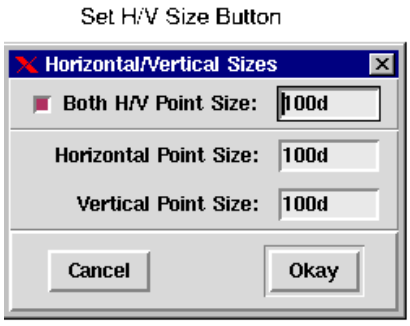
The Text Menu



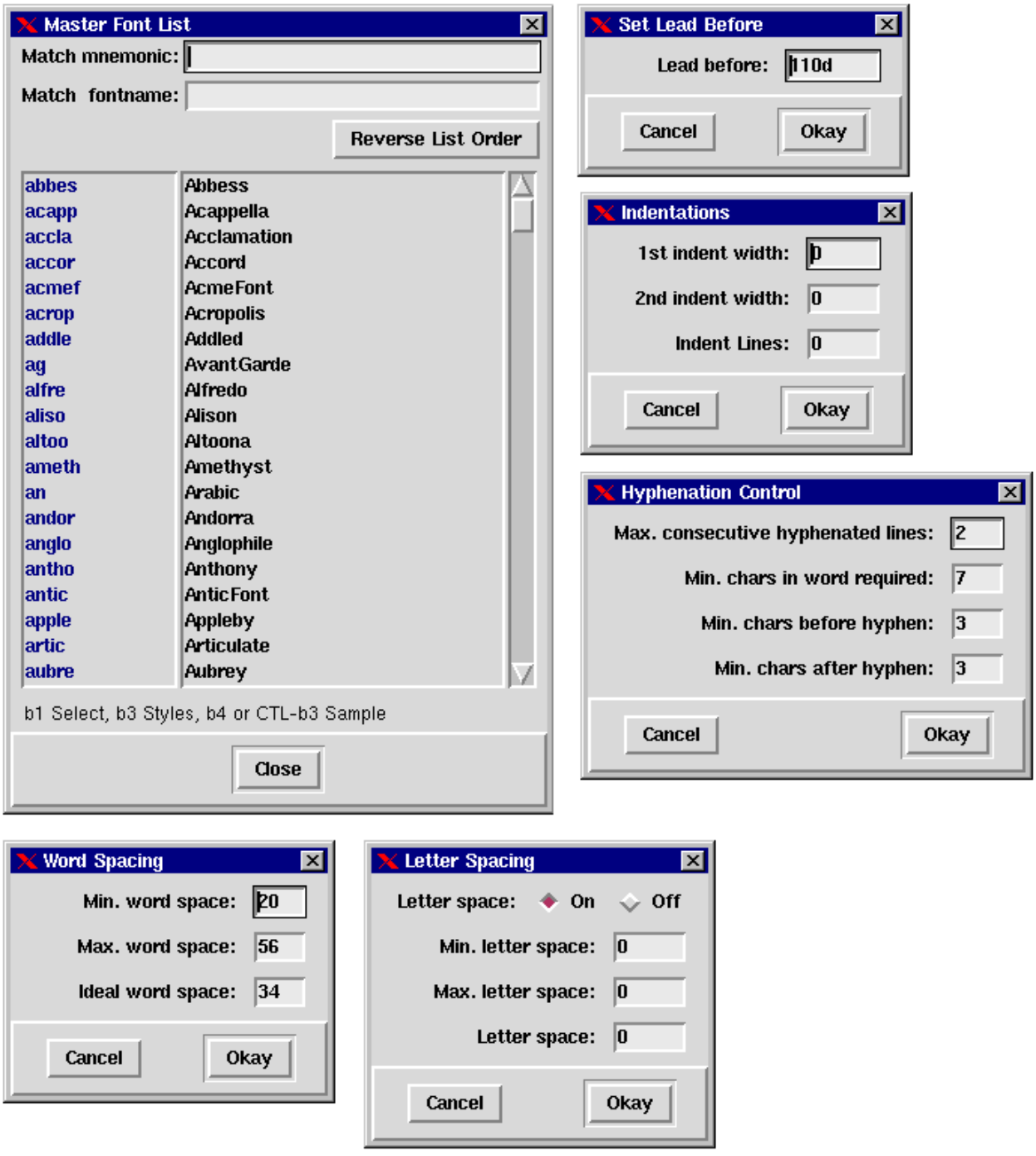
Set Text Attributes

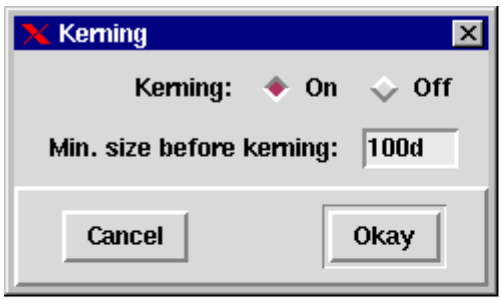


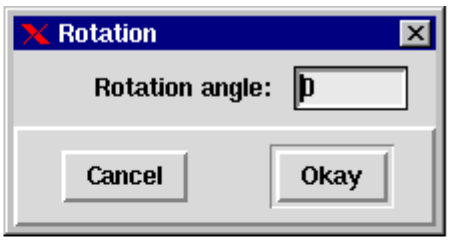


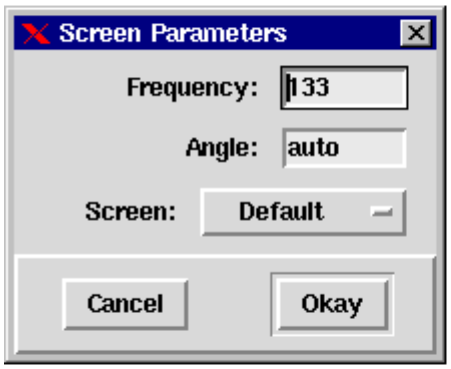


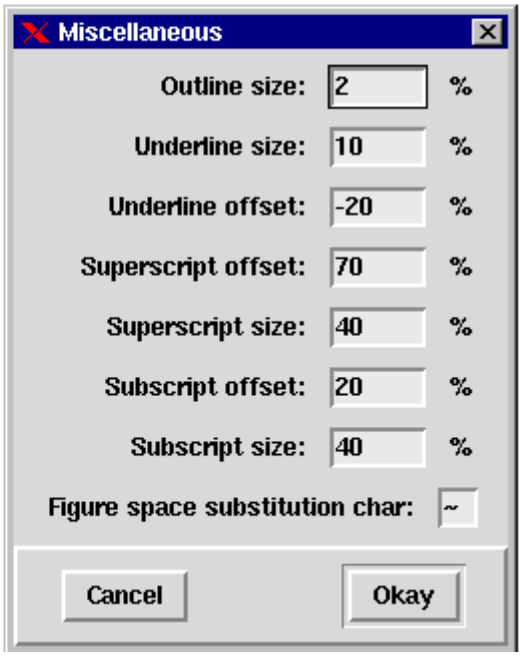
Other Text Attributes



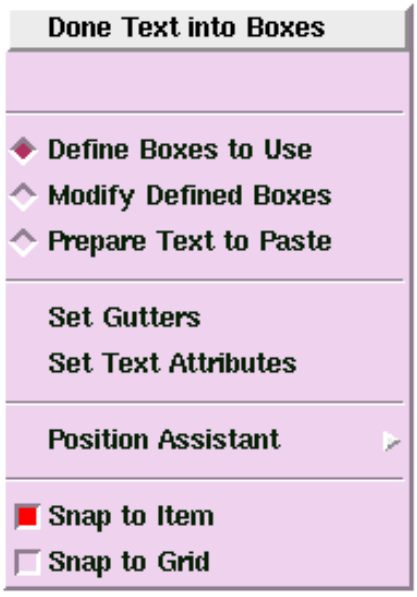




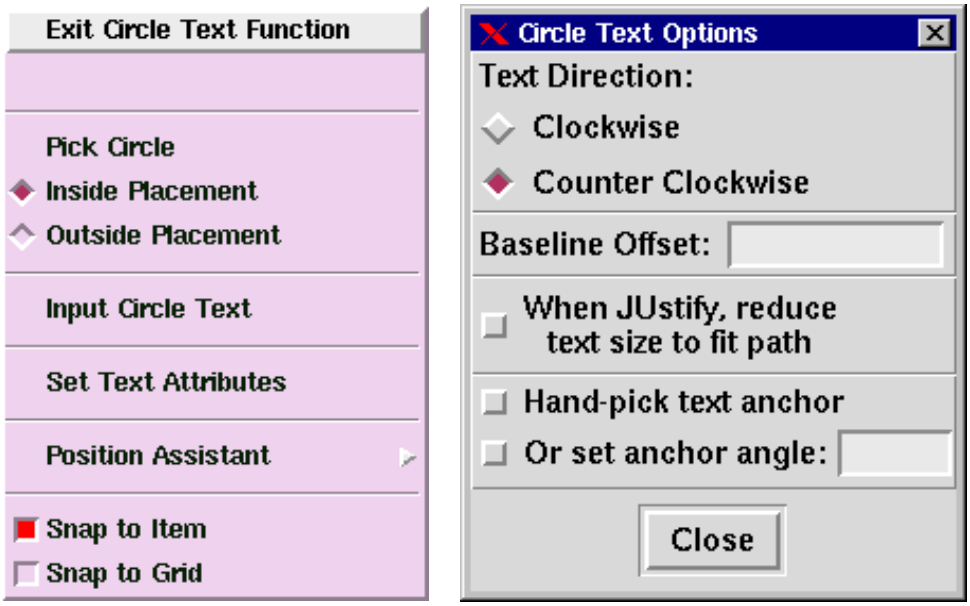




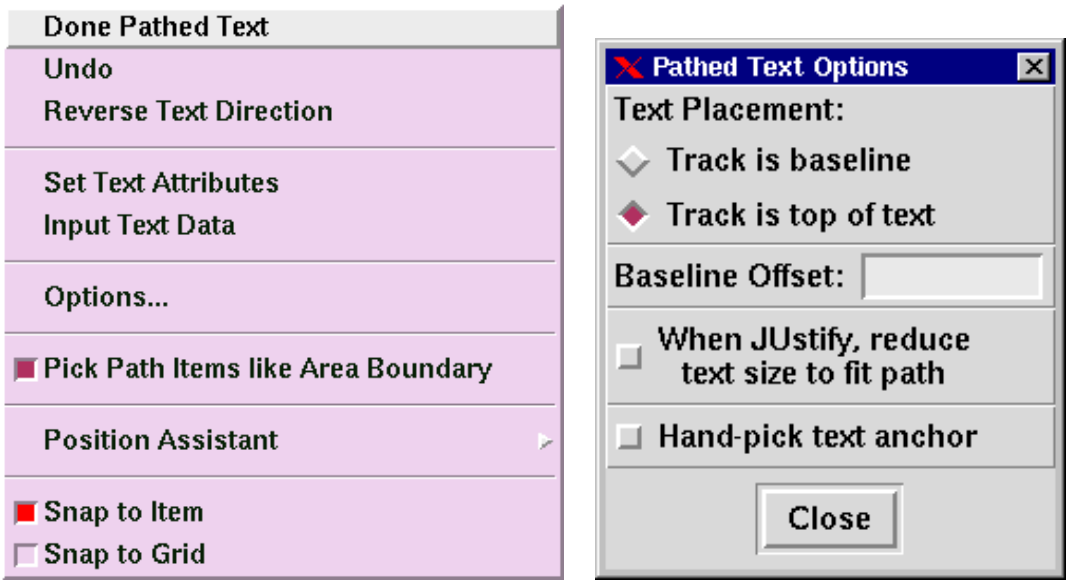
Place Text into Boxes Option



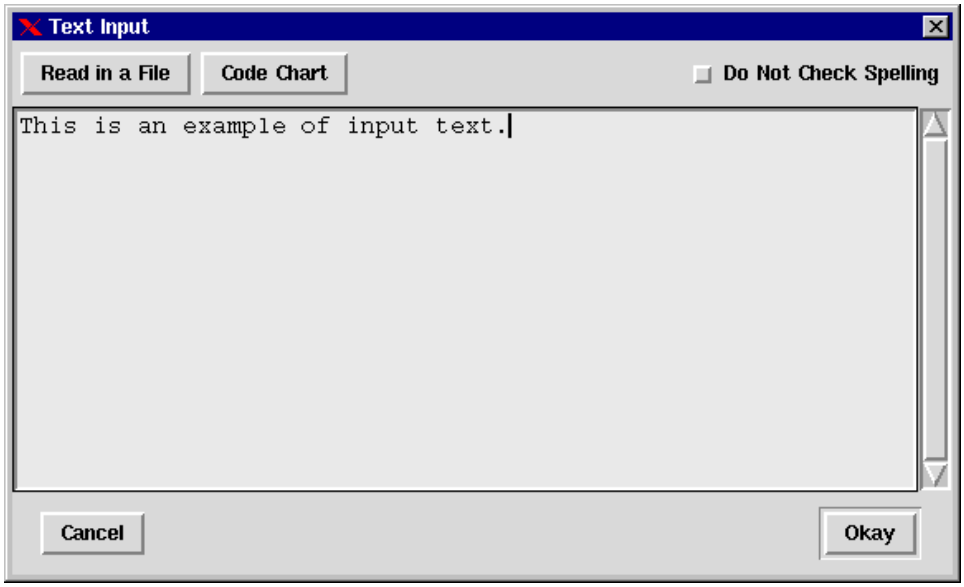
Place Text on Circle Option



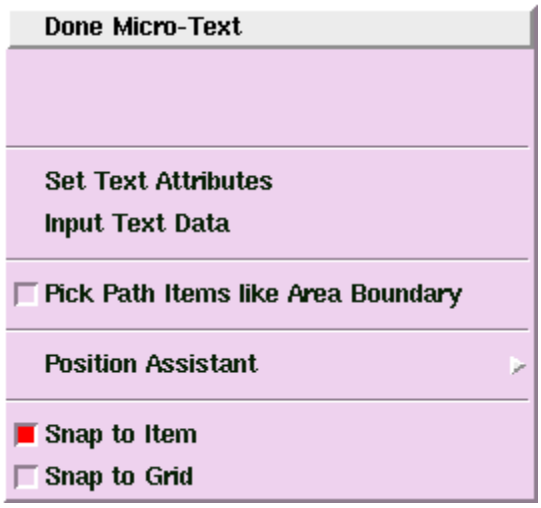
Place Text on Path Option

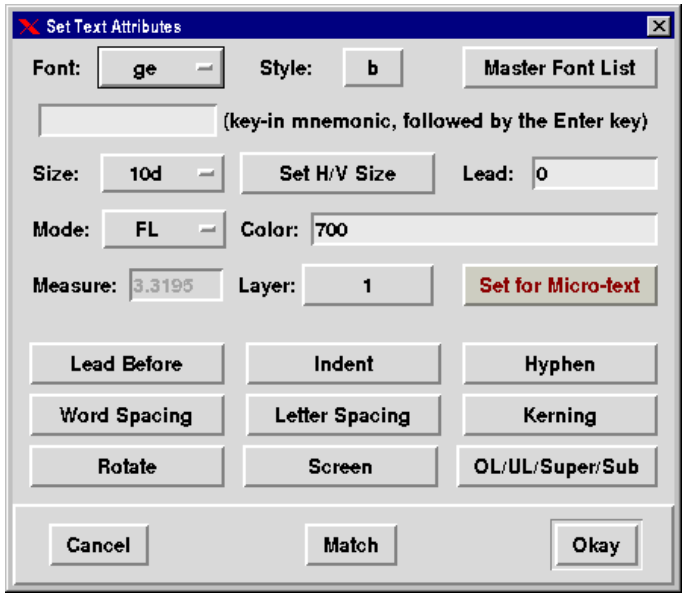


The Text Input Box

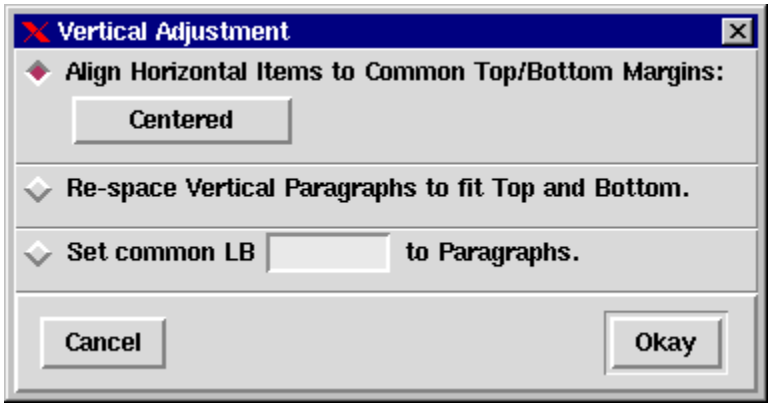


Micro-Text Option

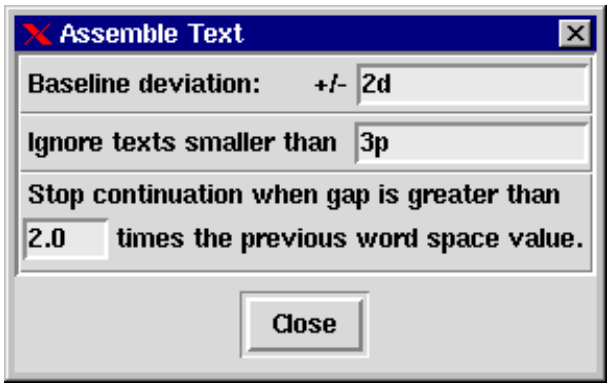




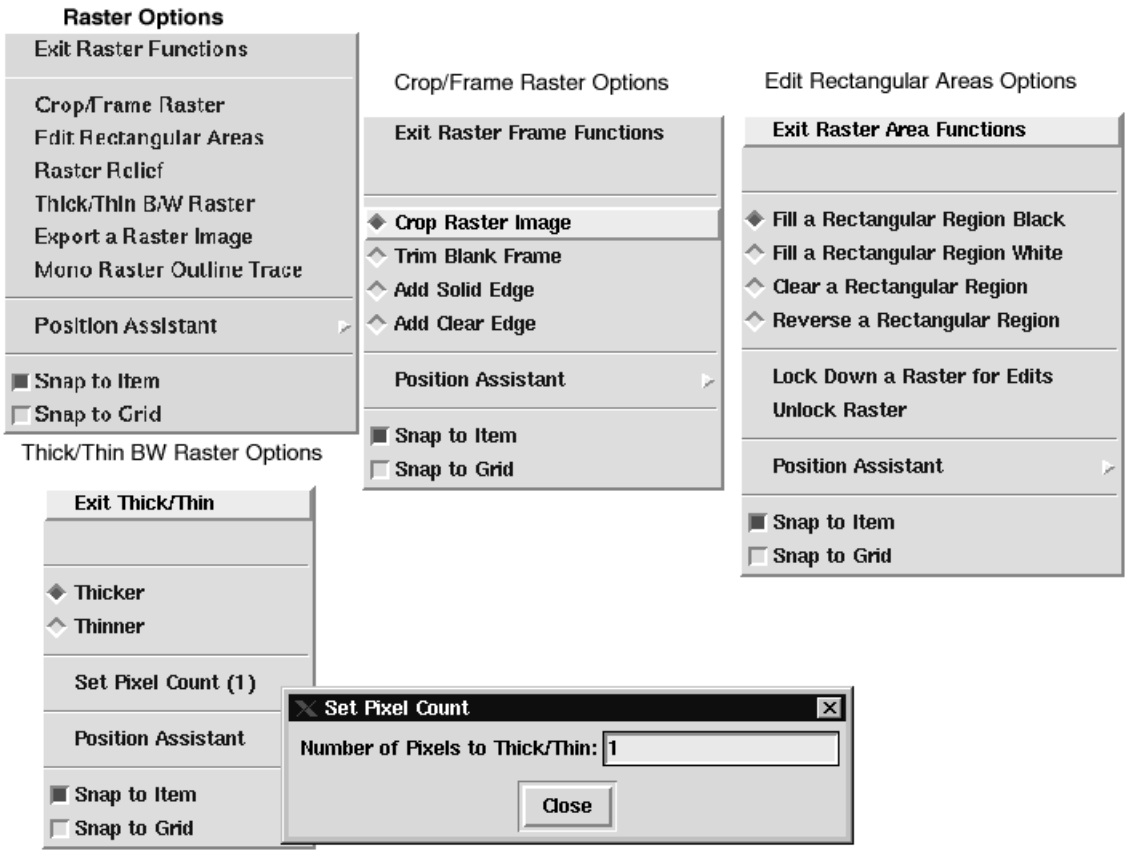
V-Adjust Option



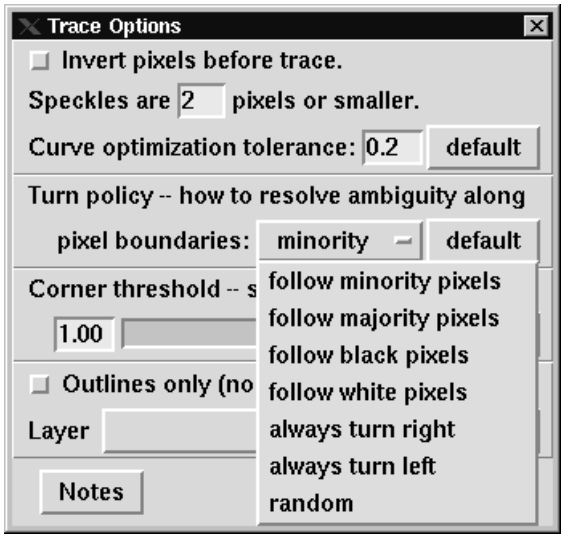
Words from PS Letters



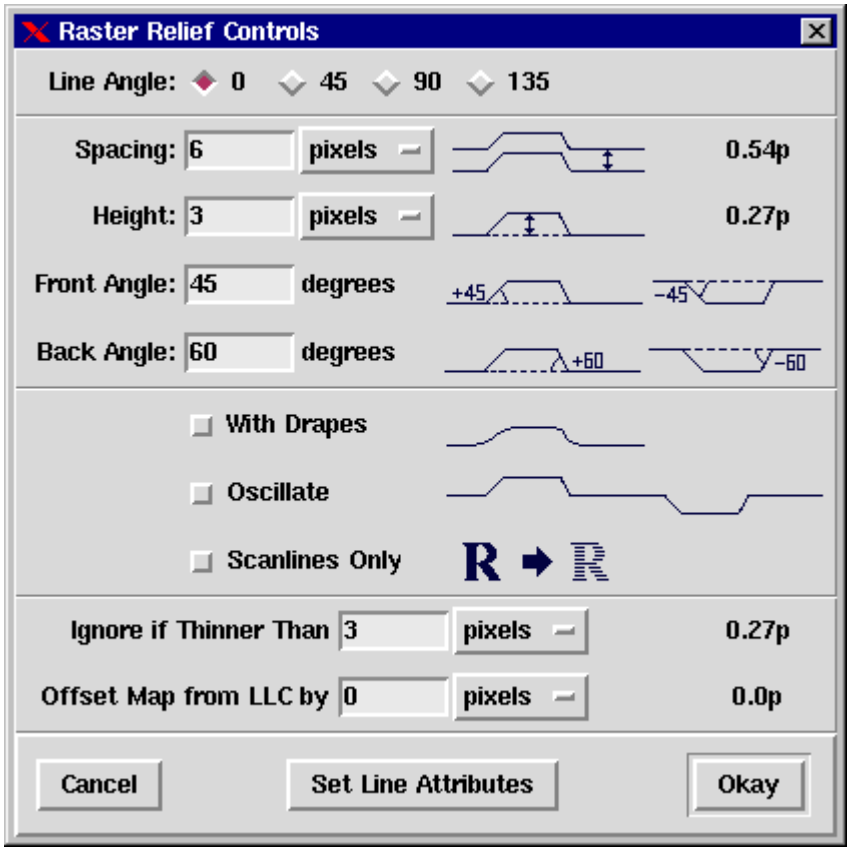
The Raster Menu

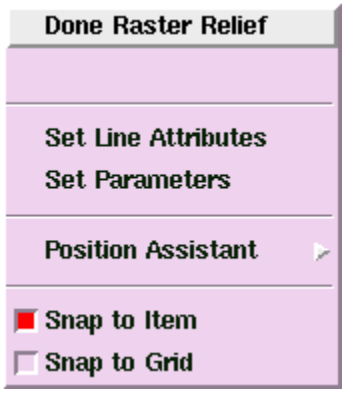


Mono Raster Trace Outline

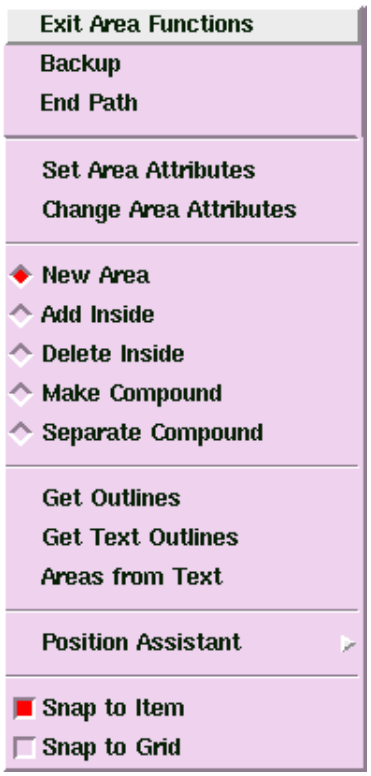


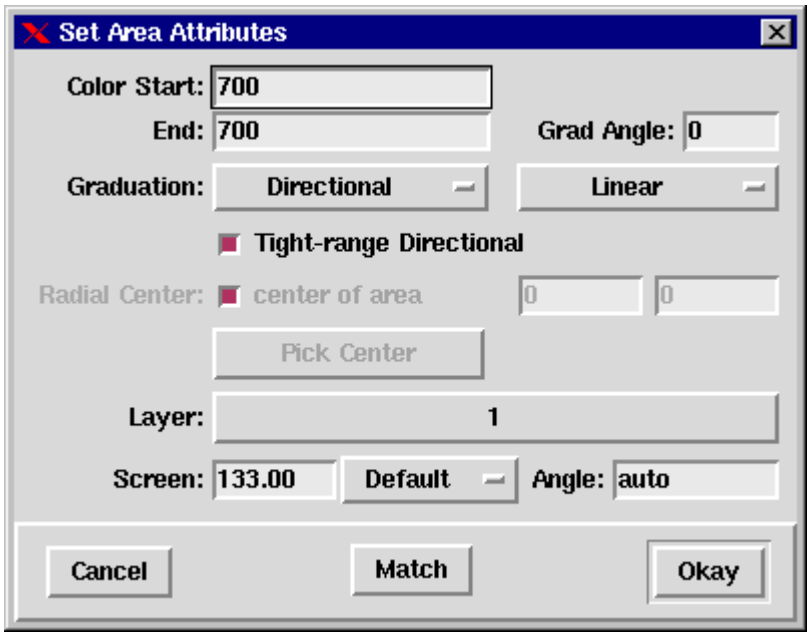
Raster Relief for Black and White Logos



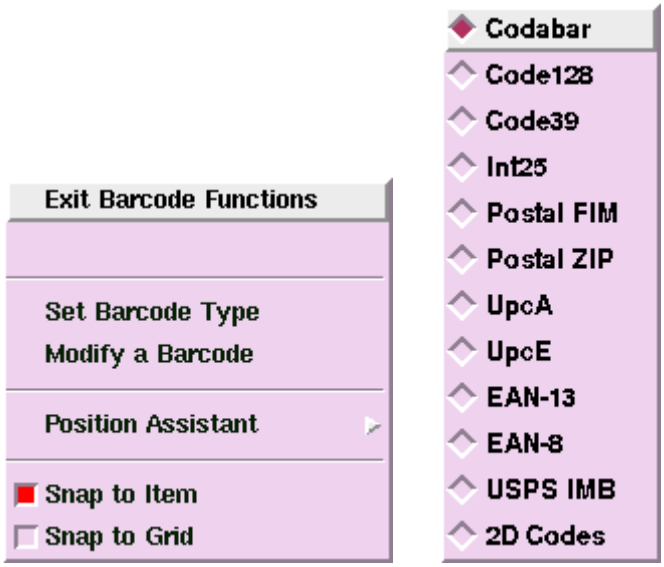


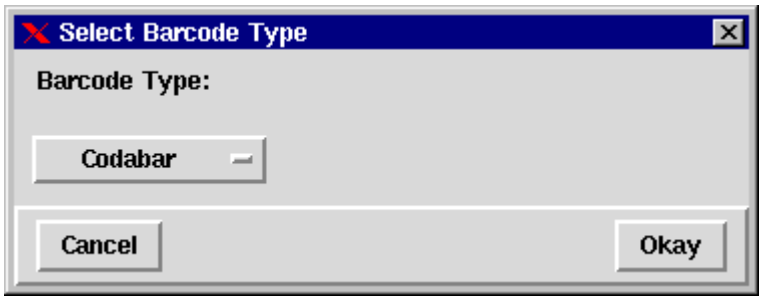
The Area Menu

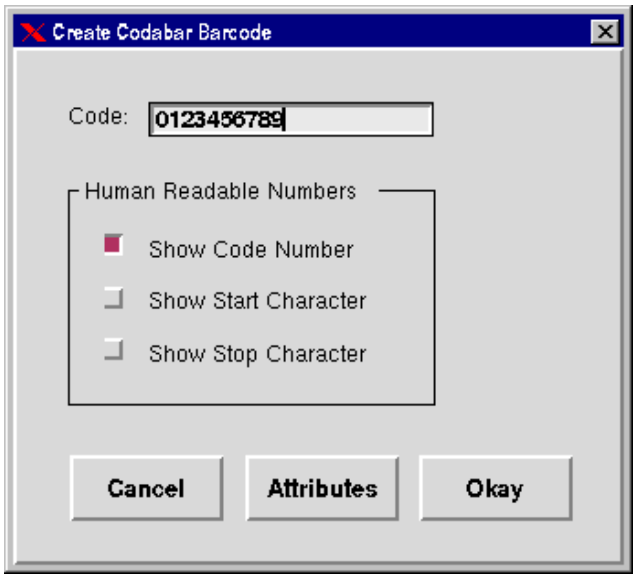




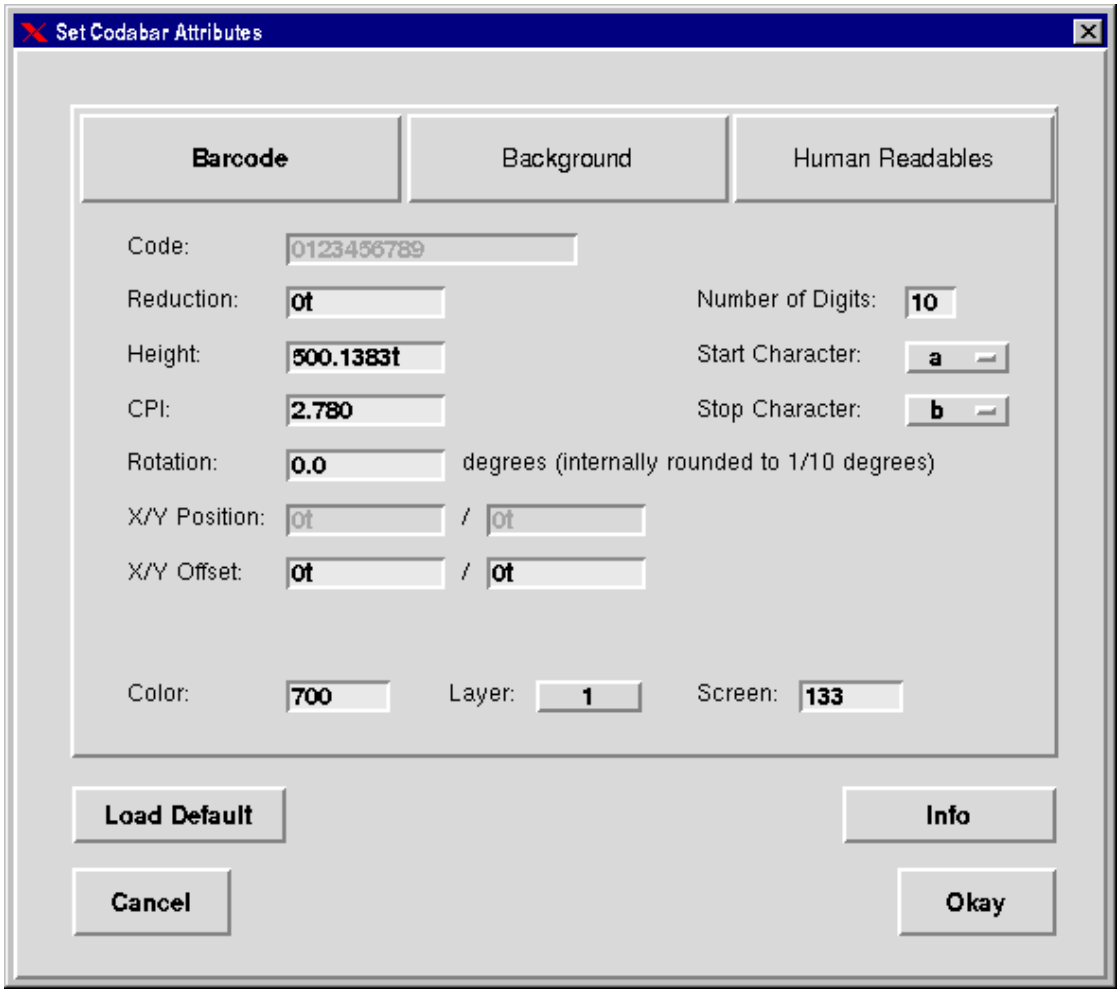
The Barcode Menu



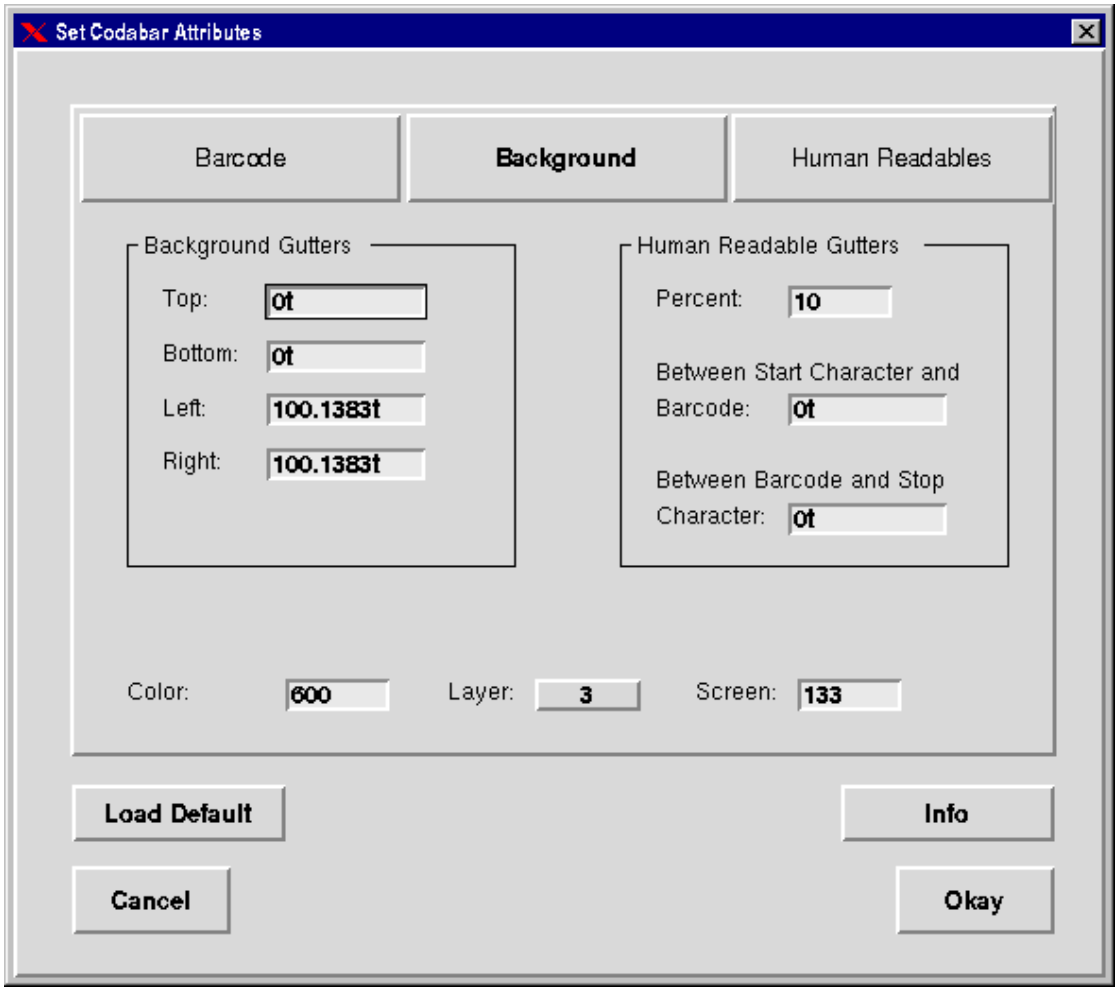




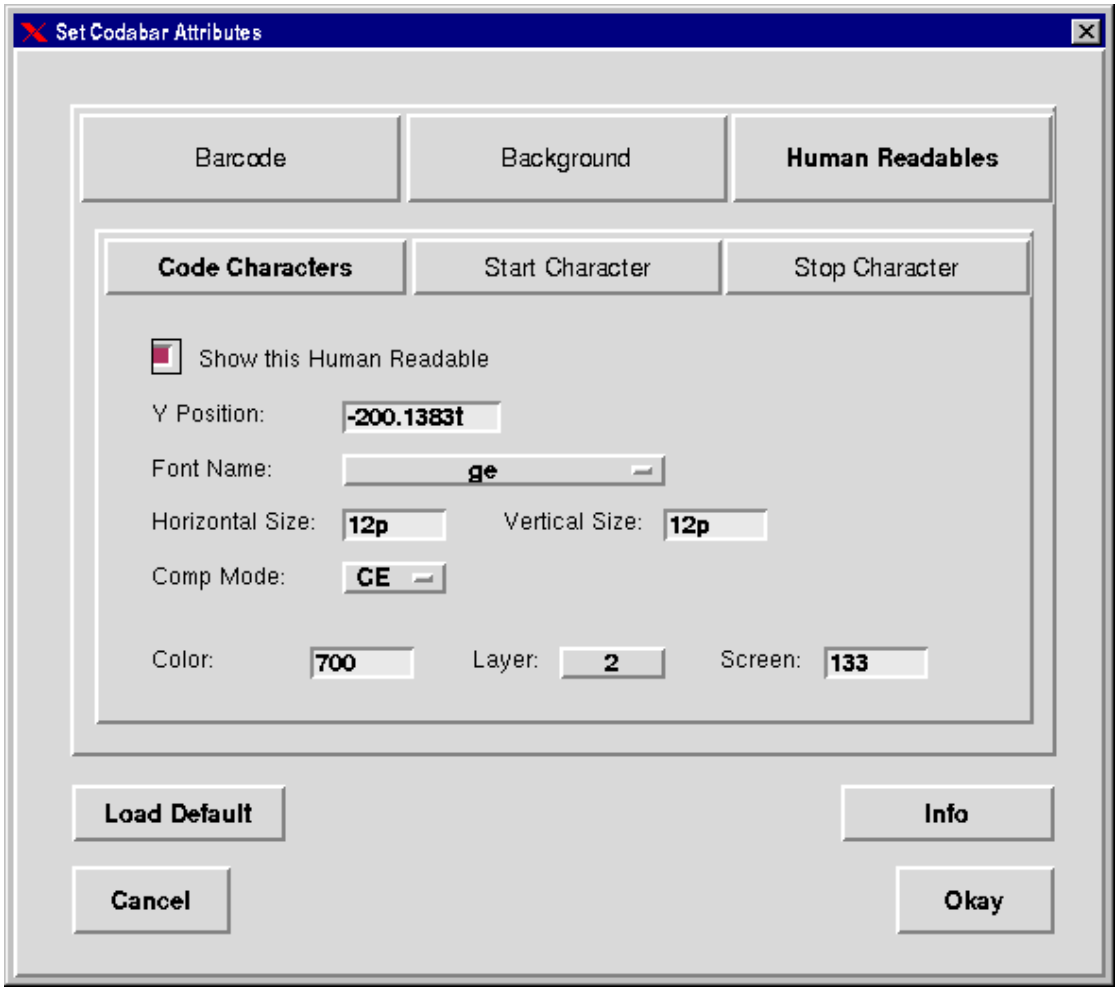
A Barcode Attributes Menu



Barcode Attributes Background Menu

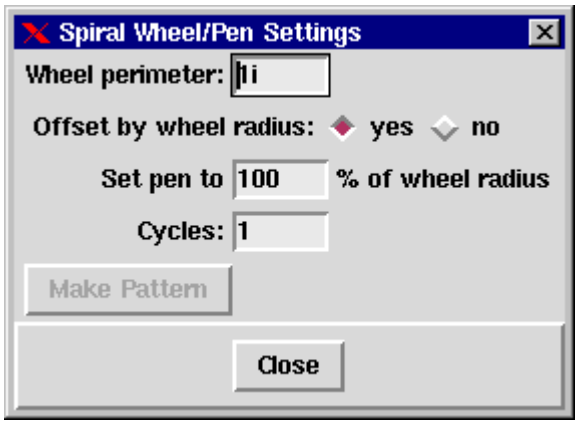


Barcode Attributes Human Readable Menu

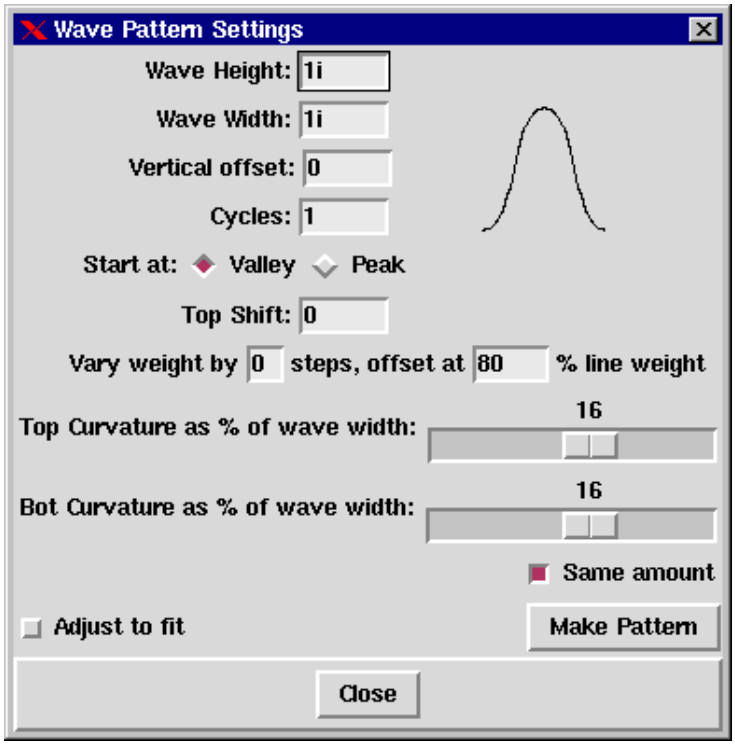


The Patterns Menu

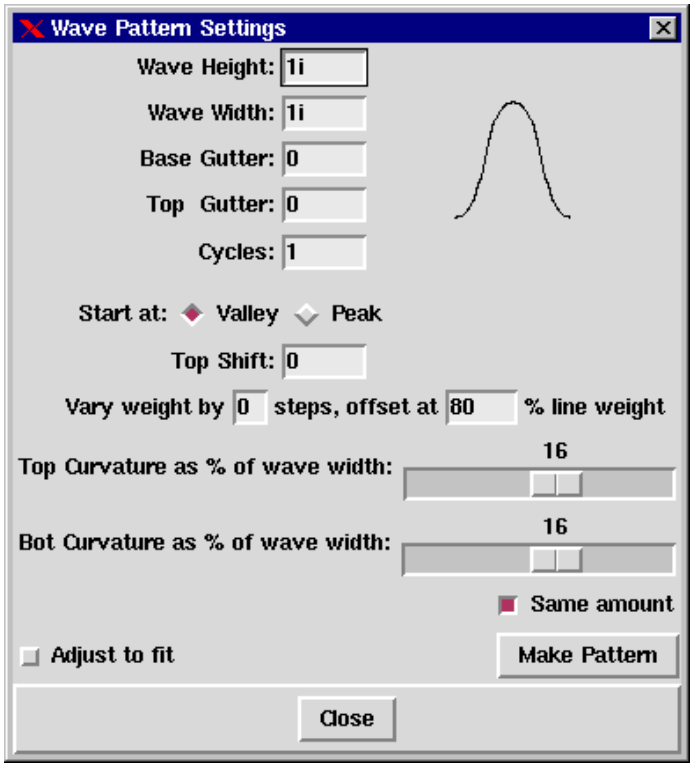
Spirals along Path



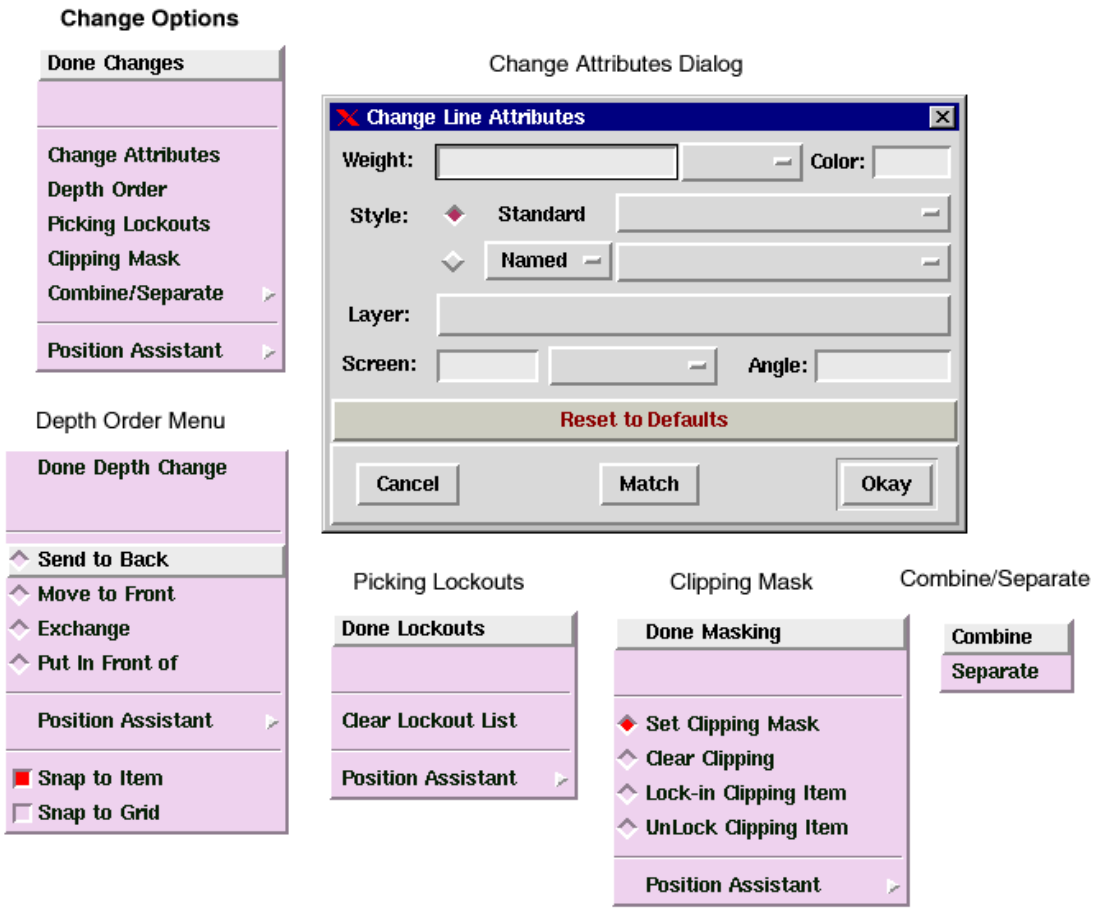
Waves along Path



Waves between Paths

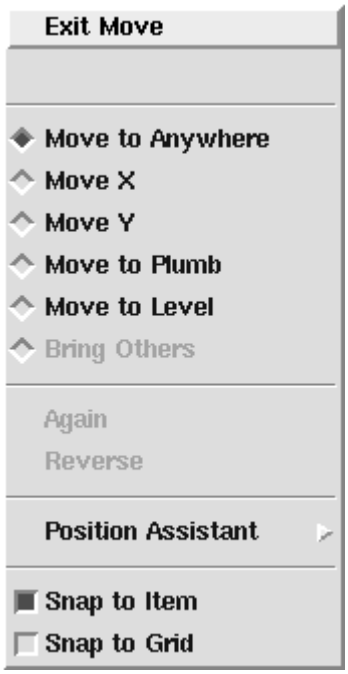


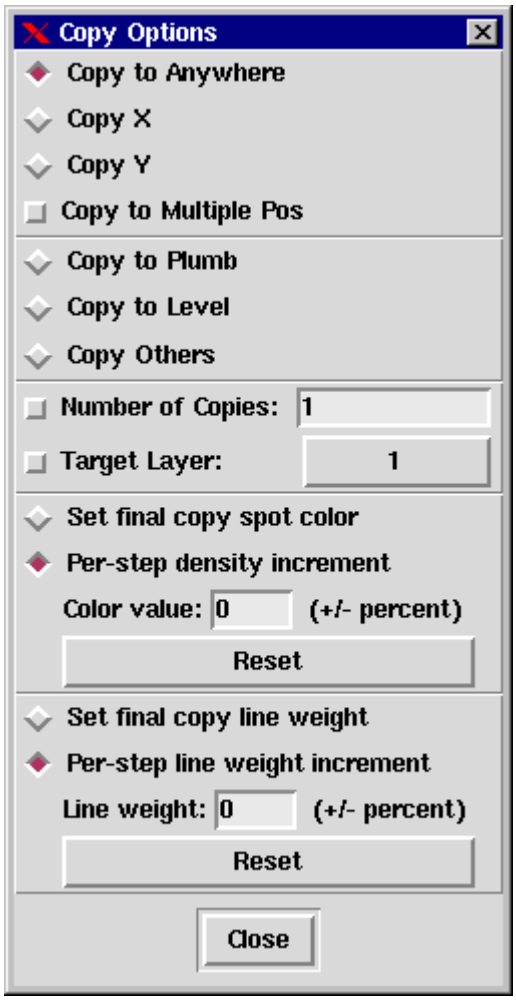
The Change Menu



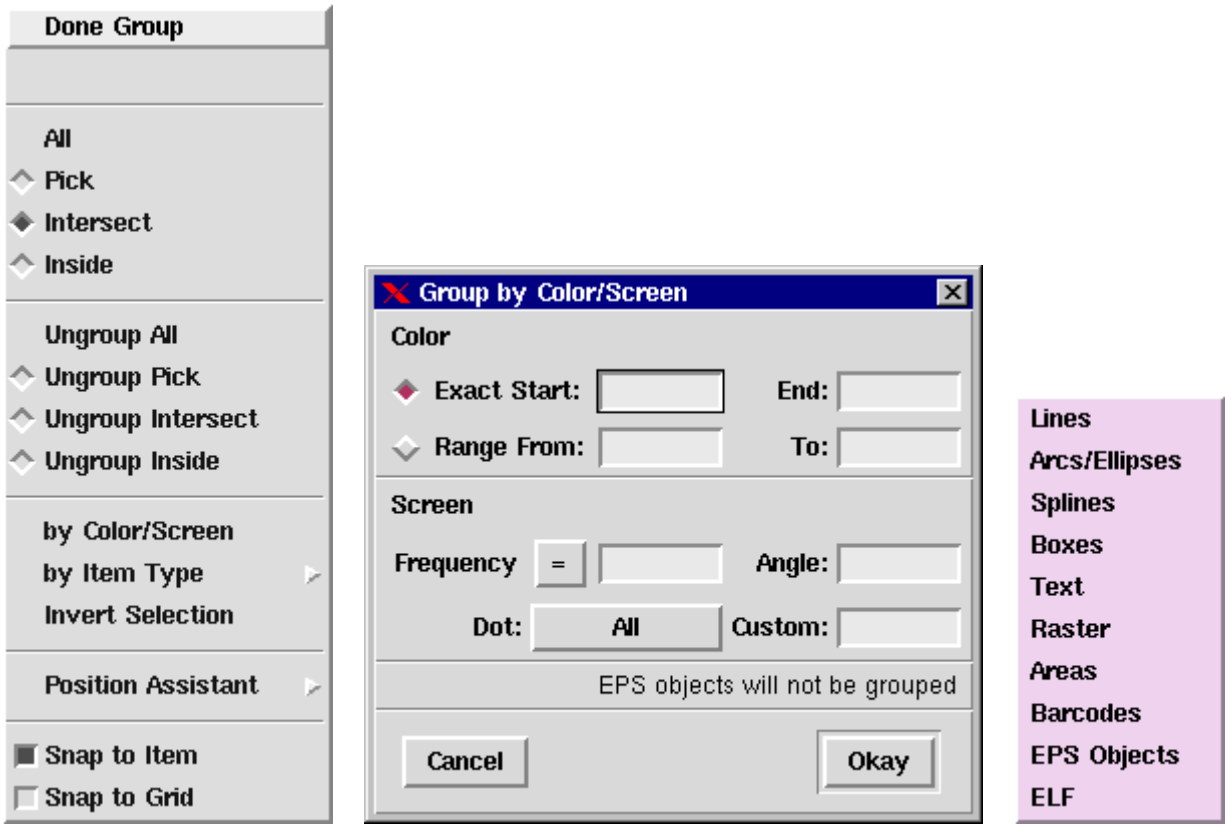
The Move, Copy, and Group Menus

Move and Copy

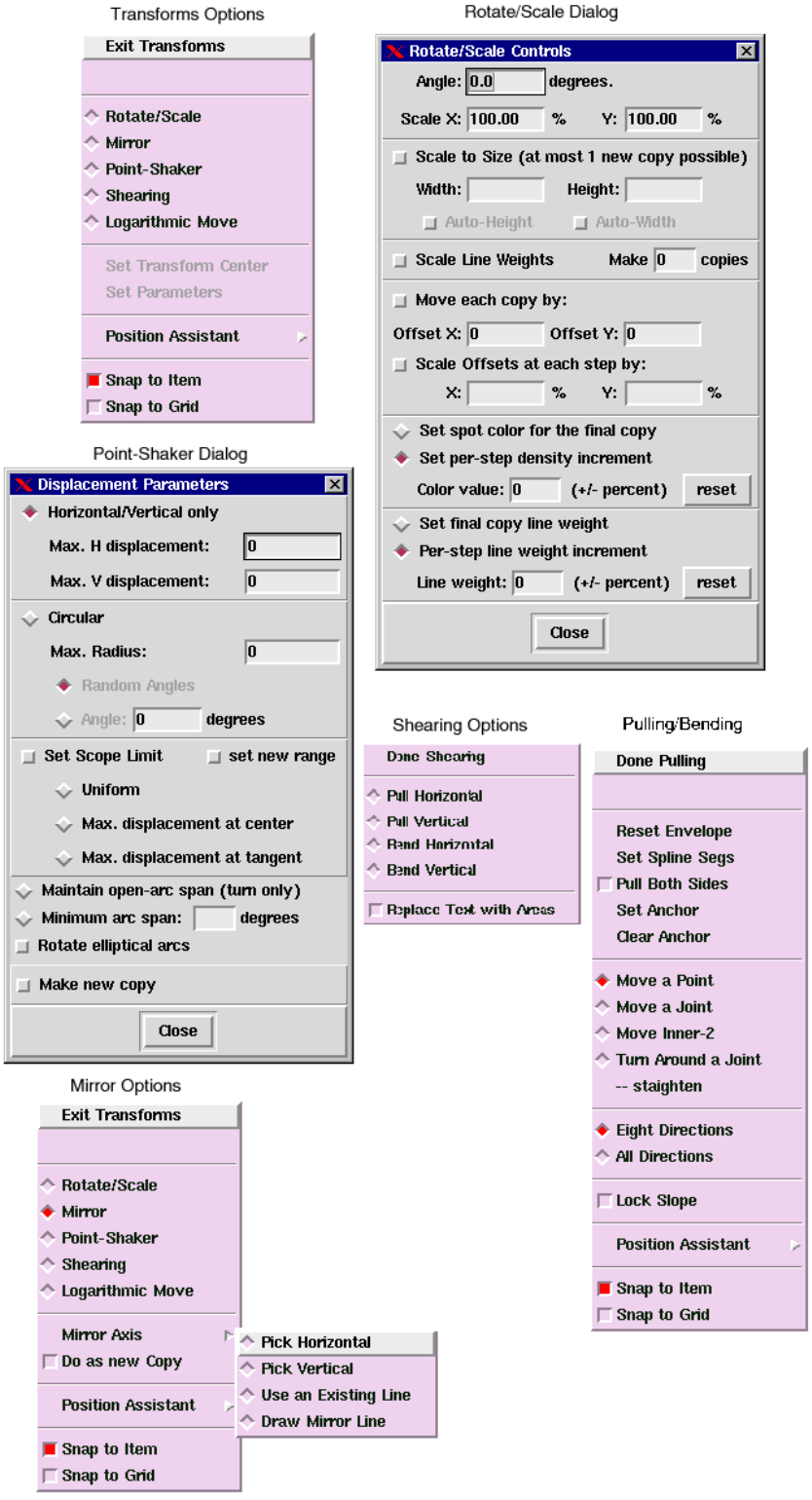




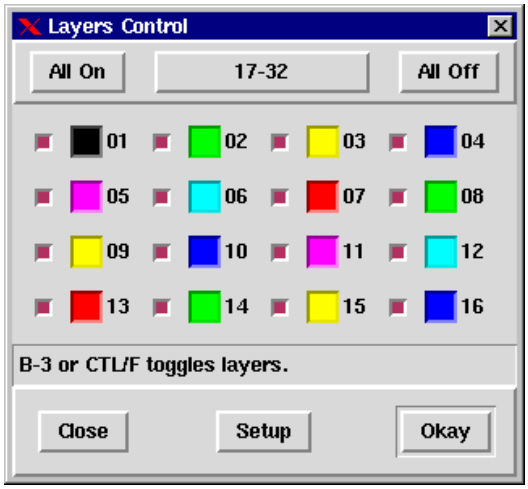
Group Options

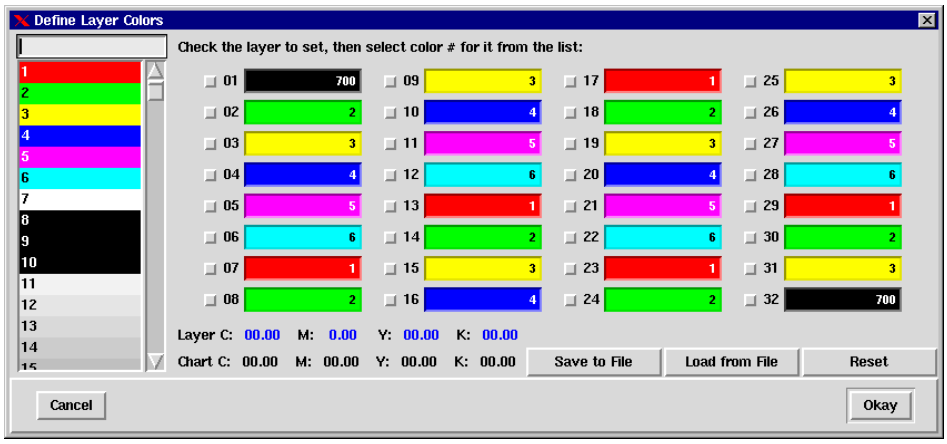


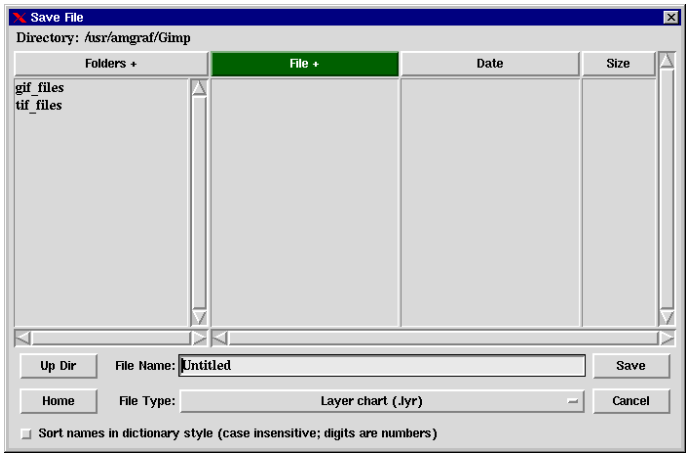
The Transform Options

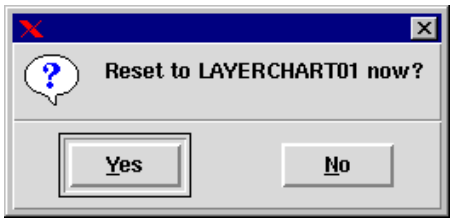


The Layer Menu

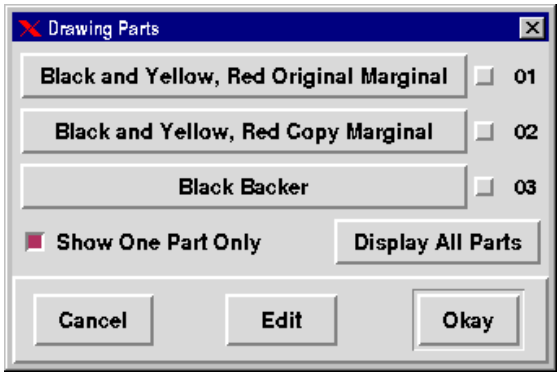


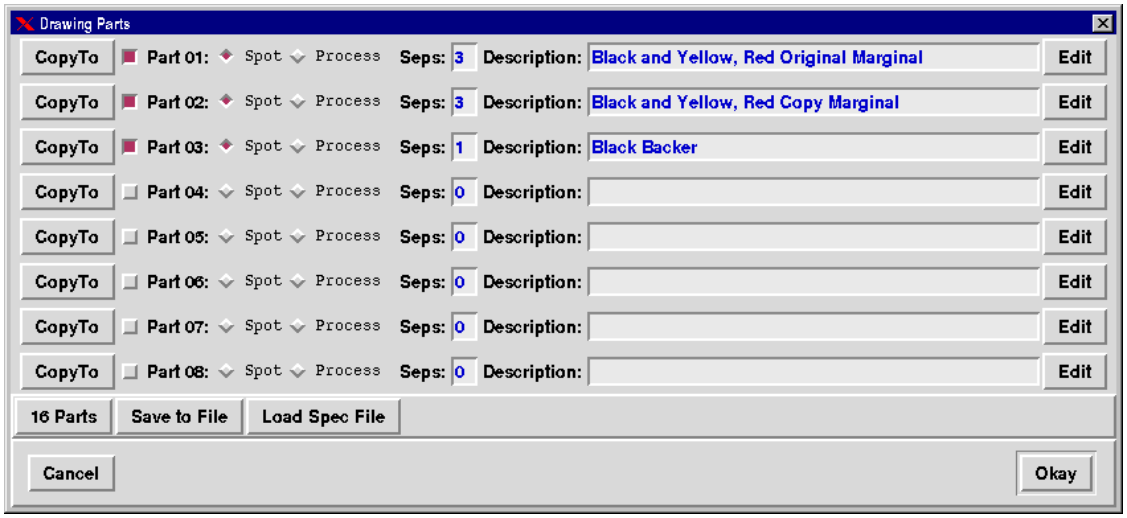




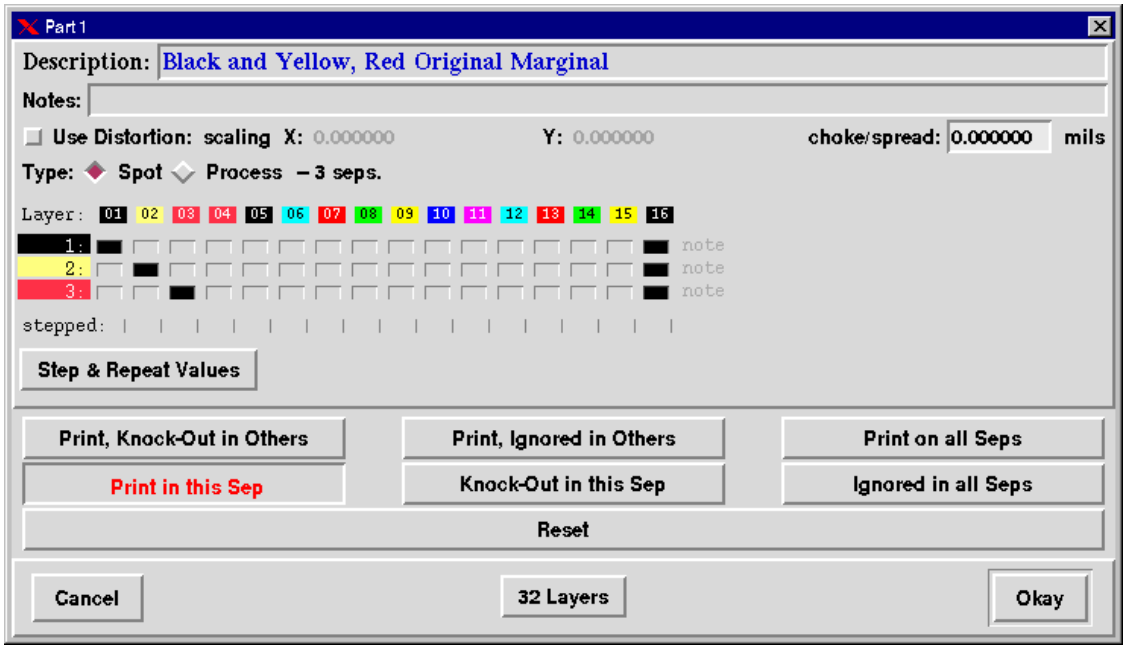


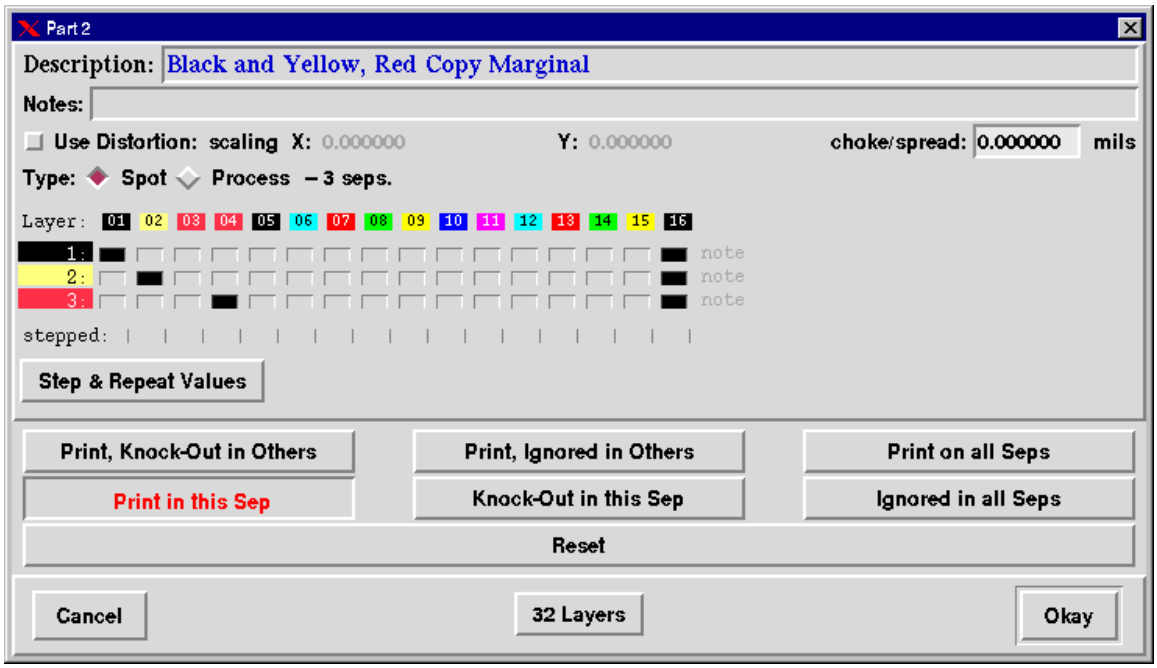
The Parts Menu



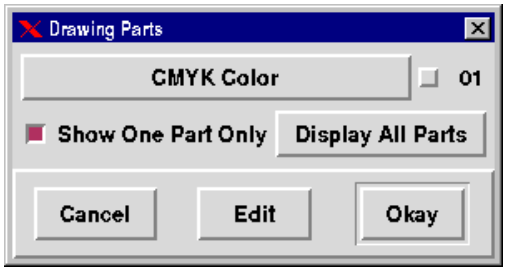


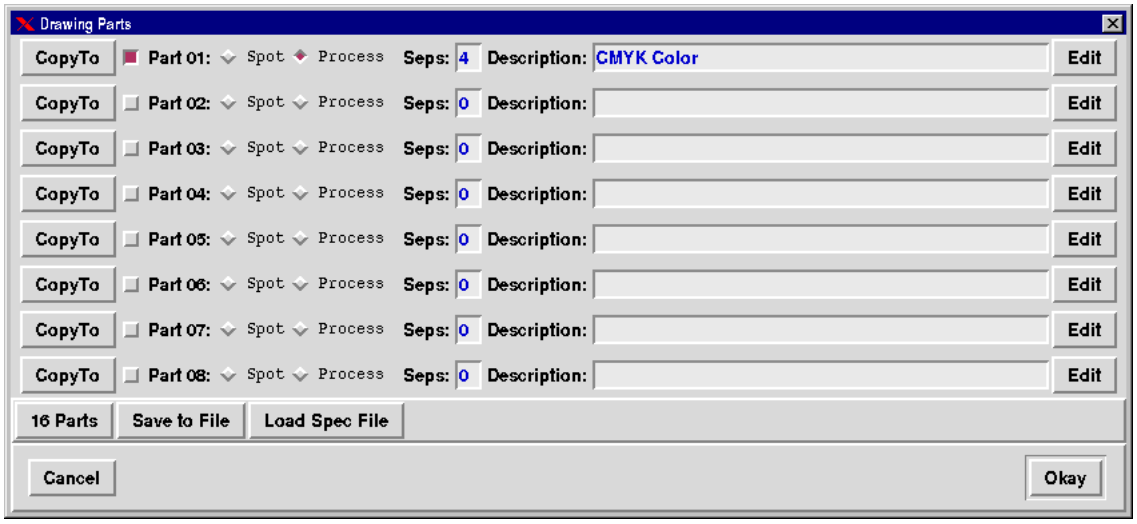
Spot Color Parts

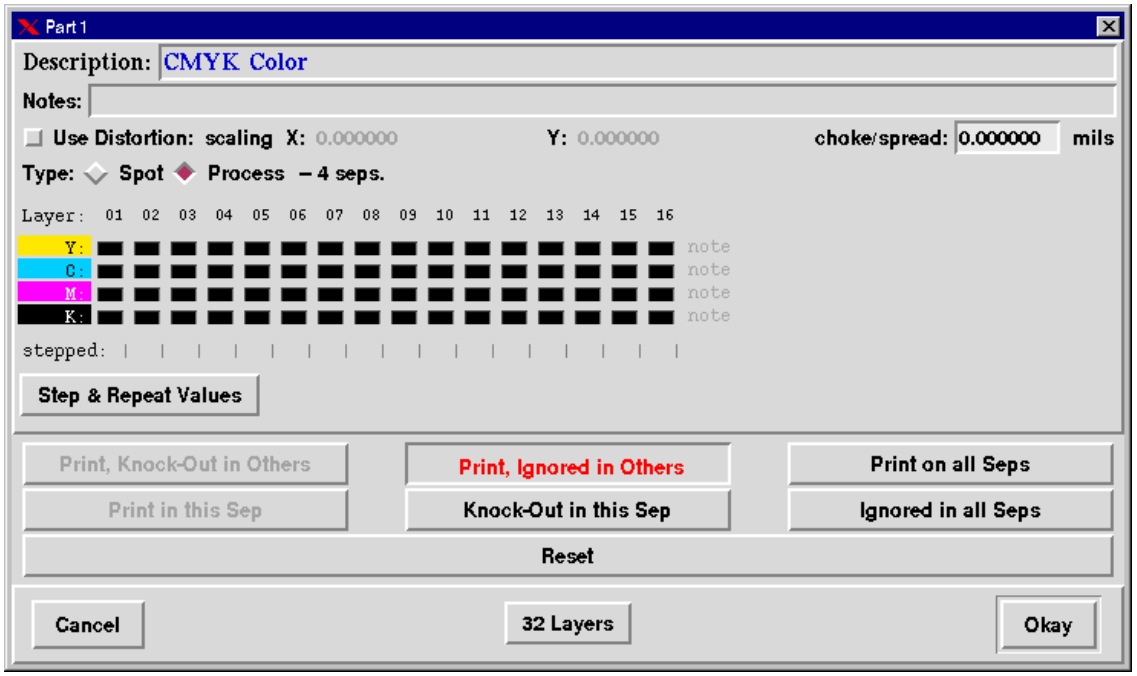




Process Color Parts

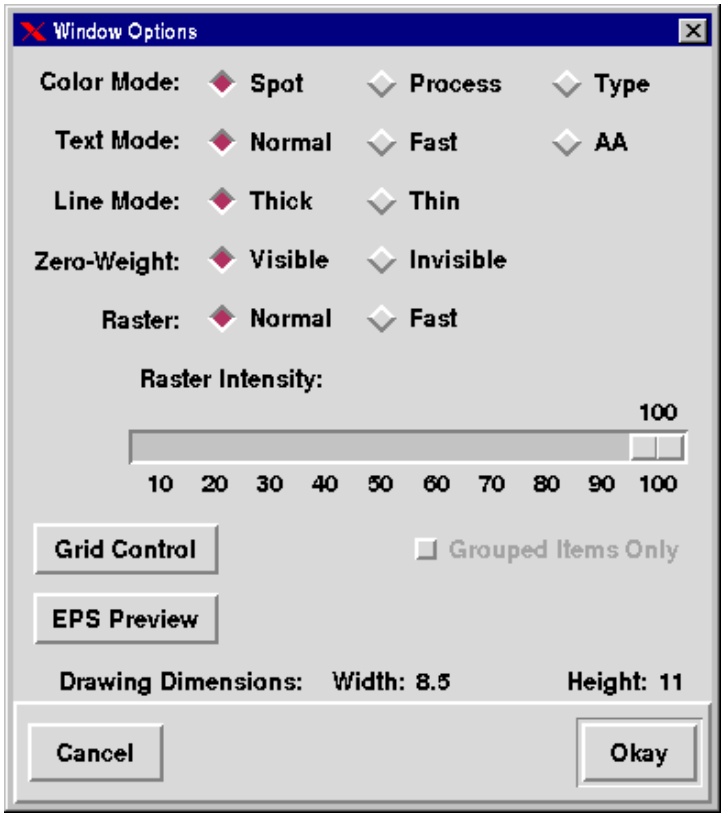




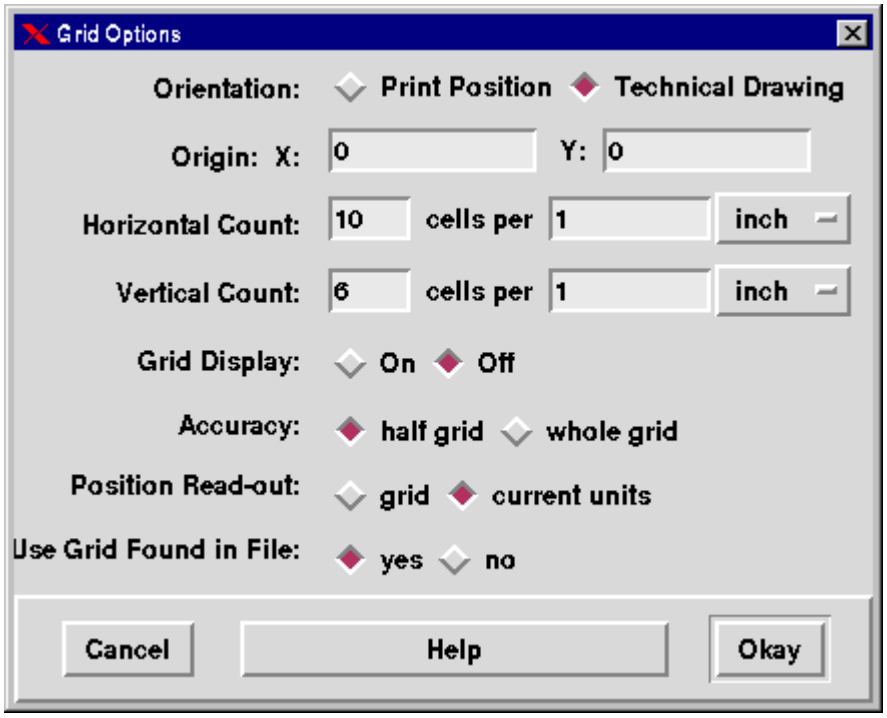


Step and Repeat Values Dialog

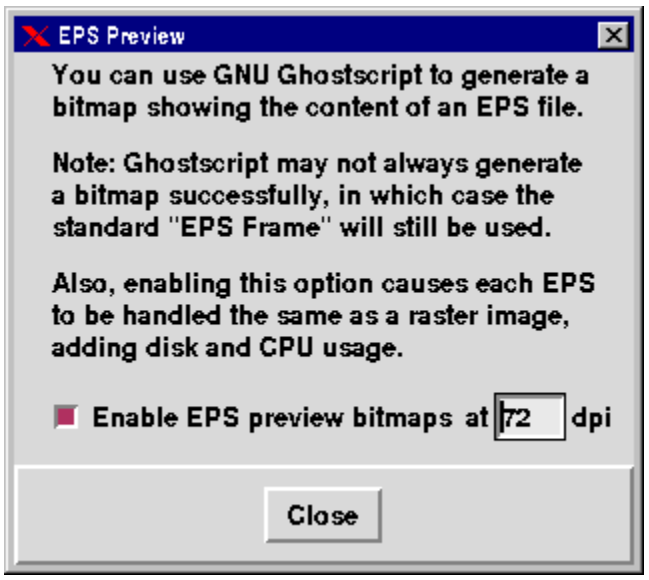
The Window Menu



The Grid Dialog Box



EPS Preview Dialog

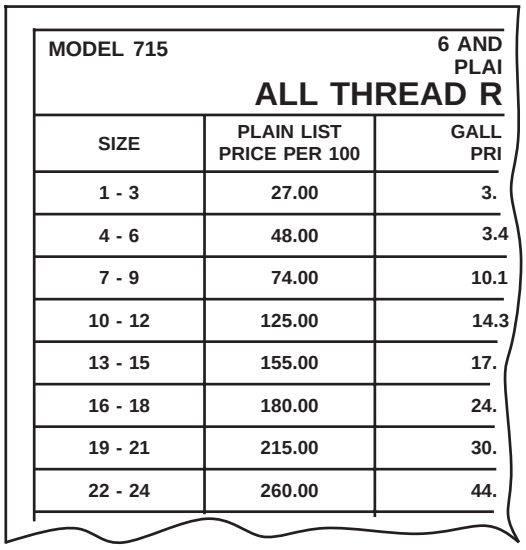


Chapter 4: Business Forms Composition

Professionally composed forms are products of professional forms composition systems operated by skilled forms operators. Forms composition is the process of creating a "master" from which multiple copies can be printed. Before we get into the details of developing this form master, it may be best to define a form.

What is a Form

The generally accepted definition of a form is a piece of paper containing pre-printed data that also has spaces for the entry of additional information after the form is printed. The fact that the additional information will be entered at a later time after the form is printed, determines that the document is a form. A form always has spaces left blank and available for entering of data according to an individual predetermined format.

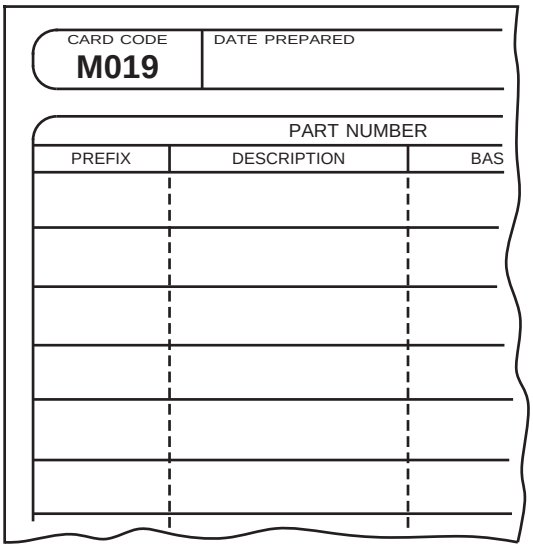


MODEL 715 — 6 AND PLAI

ALL THREAD R

SIZE	PLAIN LIST PRICE PER 100	GALL PRI
1 - 3	27.00	3.
4 - 6	48.00	3.4
7 - 9	74.00	10.1
10 - 12	125.00	14.3
13 - 15	155.00	17.
16 - 18	180.00	24.
19 - 21	215.00	30.
22 - 24	260.00	44.

This is not a form as there are no fill in blanks. Spacing accuracy of rules is not a consideration.



CARD CODE M019 | DATE PREPARED

PART NUMBER

PREFIX	DESCRIPTION	BAS

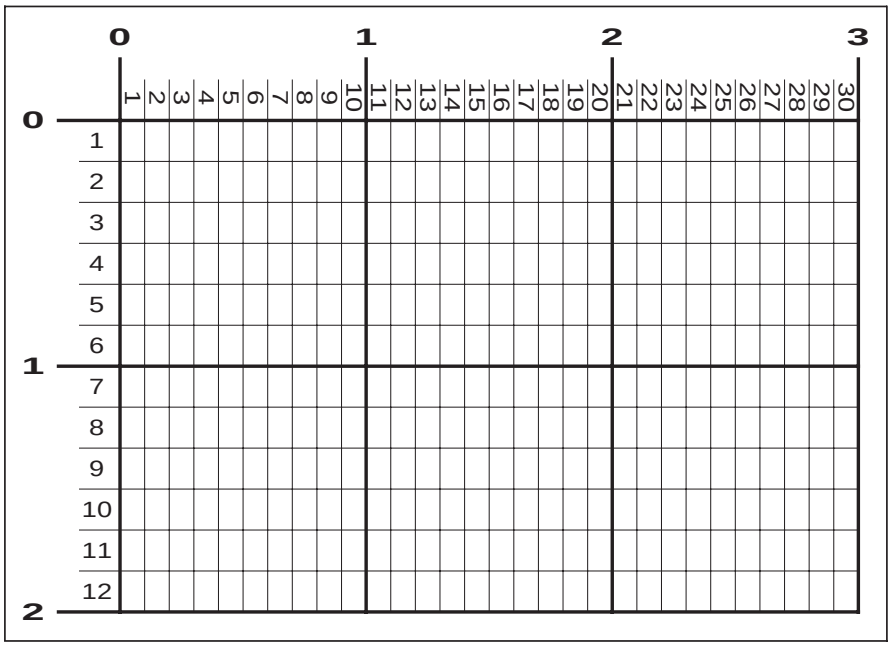
This is definitely a form since data is to be placed inside the rules after printing.

Forms typesetting is different than any other typesetting because of the need of the form to be filled in and processed after it is printed. A form that looks nice but not spaced properly, is as much a disaster in typesetting as an overset. For a form, visual appearance is not enough. All forms are created to do a job. Forms are printed to become clerical

tools. After printing, the blank spaces are filled in by hand, machine, typewriters, computers, or other methods. They are filled in, decollated, rubber stamped, mailed, stapled, read, filed and processed in a variety of ways. Spacing plays a major role in forms creation if the form is to function properly. Knowing how the form is to be filled in (hand, typewriter, etc.) is necessary to match the blanks with the proper spacing. Learning to place items in the proper spacing becomes a major role in forms composition.

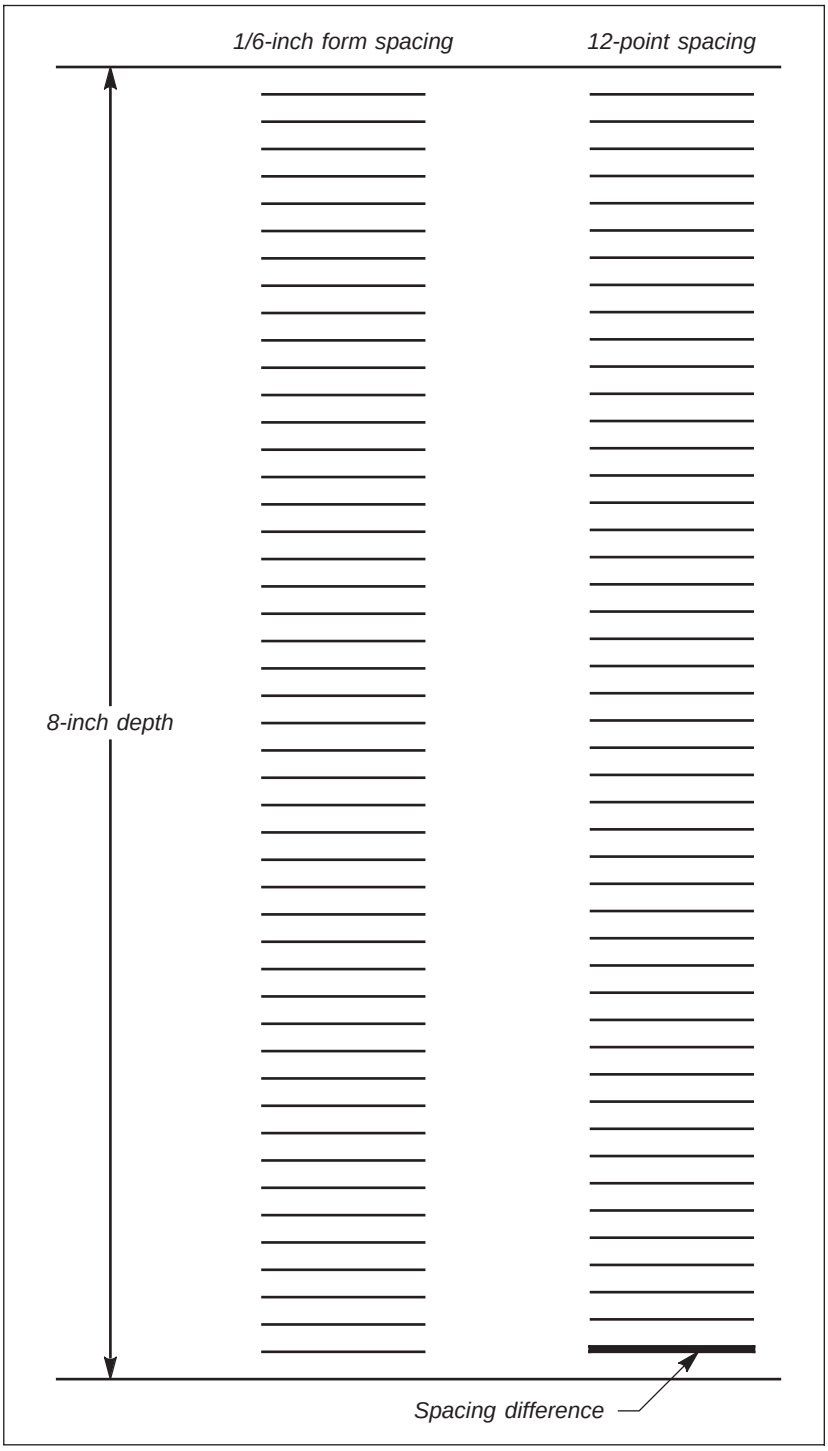
Spacing on Forms

Business machines that fill in forms move horizontally and vertically in increments of inches. Therefore, forms must be drawn using inches as the measurement scale.



Standard Form Spacing is Tenths and Sixths of an Inch

A standard spacing between lines on a form is one-third of an inch. Using two picas or twenty-four points is not the same as one-third of an inch. They are quite close but there is a difference and that difference accumulates as you work your way down the form. Accuracy on a forms master for the continuous form is vital. This is shown in Figure 6-3.



As you can see, after a distance of eight inches, there is a spacing difference of approximately four points, which is more than enough to create difficulties. Almost all business machines space down six lines to the inch. Single spacing is one-sixth of an inch (1/6"), double spacing is one-third of an inch (1/3"), and triple spacing is one-half inch (1/2"). From left to right business machines print ten (10) characters to the inch across. For an elite typewriter the spacing is twelve (12) characters to the inch across.

Forms Design

Forms design occurs before forms composition, but it is imperative that all forms compositors have at least the basic knowledge of forms design. Without this knowledge they are capable of producing visually attractive forms but they are not compatible with the business world, thereby creating processing inefficiencies or worse.

Theoretically, the design of the form should be presented to the compositor as a complete and accurate drawing on forms graph paper with the proper spacing increments shown, but this is not always the case. Therefore, the compositor is forced to design and set forms simultaneously. This is where knowing how the form is to be filled in and used is required.

Getting Ready for the Form

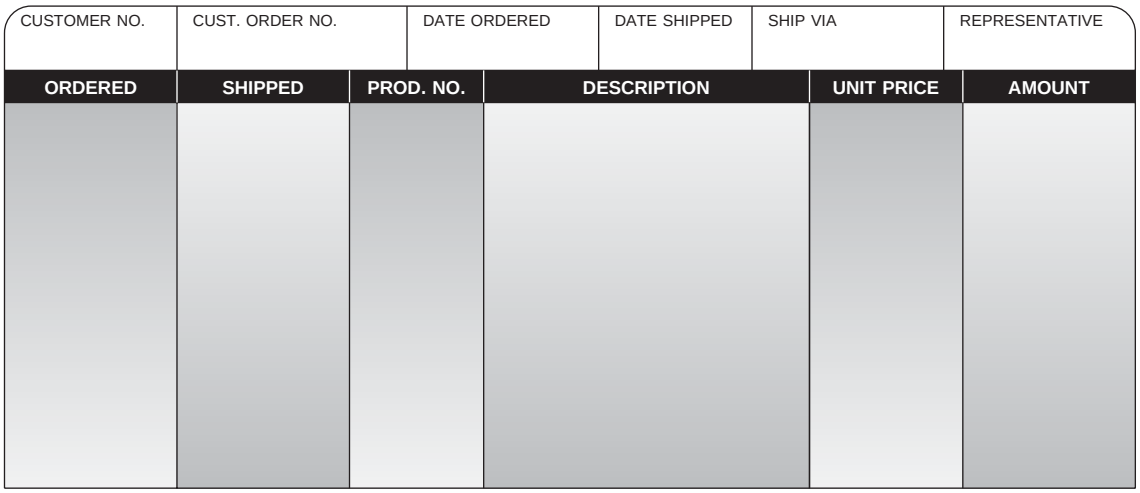
There are several functions that we are going to use in our exercise that is specifically designed for the Business Form world. They are:

> **[Grid Control], {Draw Box} (with its Borders and Pantographs), and {Place Text into Boxes}**

Each of the functions above are explained in detail. It would be advised to read through the material and try their individual exercises before continuing.

What we are attempting to do with this exercise is to explain how to approach a form and combine all of the capabilities of these functions into producing a finished product.

In this exercise we are going to draw the form below.



Setting the Units of Measure

Since we have spent so much time discussing the importance of spacing, the first step is to setup your system to be in inches.

If your system is not setup as inches for the default, then click on the Units of Measure Icon located in the upper right-hand corner of your screen. Then select "Inches" from the "pull-down" menu.

Insuring Accurate Spacing

Setting up a grid will insure accurate picks. It causes the cursor to pick grid points only when you are drawing. The grid has a default of 1/20" and 1/12". It is the most commonly found measurements in forms. The [Grid Control] option is located under the [Window] button.

1. [Window] [Grid Control]
2. Toggle {View Grid} = Grid is Visible,
3. [Okay]
4. [Line] {Snap to}, and select *grid.* Note: This step may need to be repeated to toggle *Item* to off.

Screen will display a grid of one-tenth inch horizontal and one-sixth inch vertical. All of your picks will go exactly in between grids or to grid points only. This allows you to draw all rules in 1/20" and 1/12" spacing.

Changing the Window Display

A gray background is necessary to see White, Black, and Gray on the graphics monitor. Since our form has reversed heads and graduated screens it would be nice to see the component's color as they are drawn.

To do this we are going to setup the Window to meet our needs:

1. [Window]

2. For *Color Mode* select *Process Color*
   This will show us White and Black components as they are drawn.

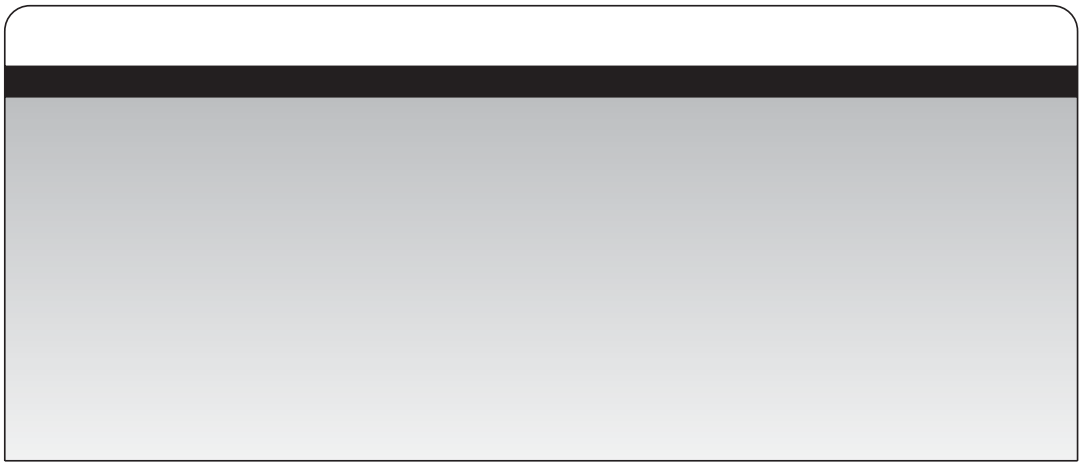
3. For *Line Mode* select *Thick* Line Display. This will show us the thickness of lines to assure proper line weight.

4. [Okay]

Drawing the Three Boxes

In this exercise we are going to draw this form using box construction. Drawing boxes is a little more difficult to learn than rectangles, but is quicker to use because the inside areas are incorporated in the box. And if the box is the wrong size it can be modified to another grid point.

Look at the drawing below. In your mind's eye, see that it is made up of three different types of areas. The first, being the top empty area with two rounded top corners. Secondly, we have a black box that holds the white lines and reverse type. Third is the entire graduated area, ignoring that it is broken into smaller pieces.



Empty Box with Rounded Corners

We are going to use the {Draw Box} function under **[Box].** We are rounding only the two top corners and giving them a radius of one-sixth of an inch. Let's do this in the **{Set Box Attributes}** dialog.

First select Individual Corners. For the upper corners *Weight*, type in **1p** and for their *Radius,* type in **1/6i.** Now select **Round** from the *Type* pull-down menu. For *Background Color Start and End* leave in **-1** meaning **"**empty or transparent". Select **[Okay].**

Now let's draw the box by picking two diagonal corners, similar to drawing a rectangle. As you can see our box is empty and has rounded corners.

Black Box with Square Corners

We need to **{Set Box Attributes}** again to get rid of the rounded corners and put in a black shade. Type in **1p** for the *Weight* under *Edges.* Type in **0** for the Corners *Radius.* Select *Square* from the *Type* pull-down menu.

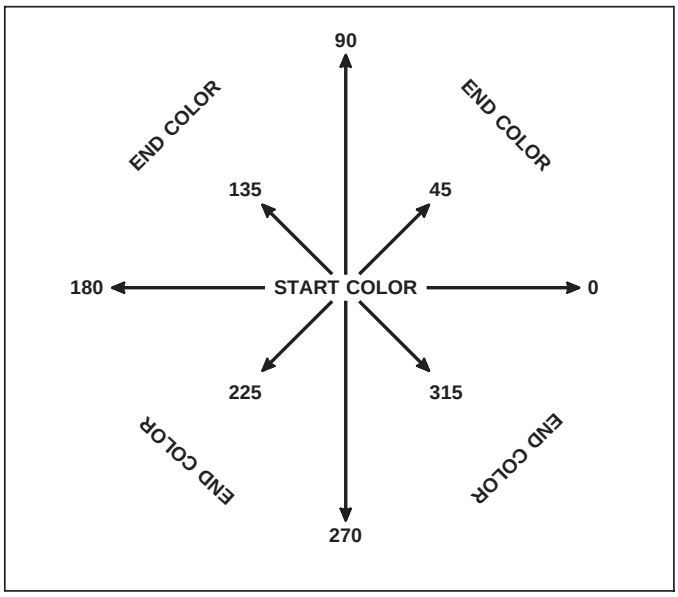
For *Background Color Start and End* type in **700.** Select **[Okay]** to accept the settings.

Draw your box. Be sure to pick the exact corners on your form. Your box has four square corners with an inside of Black.

Graduated Box

Again we need to **{Set Box Attributes},** but before doing so we need to look at our angle of graduation. The Start Color is always in the center of the compass. The End Color is at the end of the direction requested.

Looking at the first graduated piece only, the box will be divided later. The area starts out lighter with a 5-percent screen (number 605), going to a darker screen (possibly 630) or 30-percent. Set the direction of the End Color to 90-degrees.



Select **{Set Box Attributes}** and type in the *Background* parameters. For *Color Start* type **605,** for *Color End* type **630,** and for *Grad Angle* type **90.**

Select **[Okay]** to accept your settings and then pick the two diagonal corners that make up the entire bottom piece. We will split the box next.

Dividing the Boxes into Individual Columns

Boxes are different than rectangles in the sense that they can be broken into smaller box segments. We are going to divide these boxes into columns instead of draw lines. The advantage is that when a revision is made to a column, (making it larger or smaller) the area is modified along with the size.

Lets do the top first.

1. **[Box] {Divide Box in Columns} -** You will be prompted to "pick item to modify". **Pick the top rule of the box.**

2. Using the {Position Assistant}, {Hold} option. {Hold} from the left edge of your box. Now, measuring from the left edge of the box to the place where the box should be divided. Type in that amount, [right arrow], and [Enter]. Click the "right" mouse button and select {Done}. Your box has now been divided into two separate boxes.

3. Repeat step 2 for all lines in the top white box.

4. Skip the Reversed box and move on to the Graduated box. **Pick the bottom of the box** when asked to "Pick item to modify".

5. Do this for each graduated box.

Changing Angle of Graduation

Every other graduated box is graduating at an opposite direction. This is easy to accomplish.

1. **[Group] {Pick}** the second, fourth and sixth boxes, quit out of [Group].

2. **{Change Box Attributes}** This will bring up the dialog window, choose [Match] and then pick the grouped boxes. The attributes of the grouped boxes will appear in the dialog window.

3. Type over the *Inside Grad Angle* making is **270** instead of **90.** Click **[Okay]**

4. Go back to **[Group]** and **{Ungroup All}.** Now quit out of [Group].

You have rotated the direction of the End Color simply by changing the graduation angle.

White Rules

Here we are going to draw the white rules in place after setting our attributes to white.

1. **[Line] {Set Line Attributes}**

2. For *Color* Type in: **600** - This is the color number for white.

3. **[Okay]**

4. Start drawing the lines in the reversed area by **picking the start and then the end points of each line.**

Text Placement

Using {Place Text into Boxes}

Since our text on this form is minimal the option of {Place Text into Boxes} is best. It is found under the [Text] button.

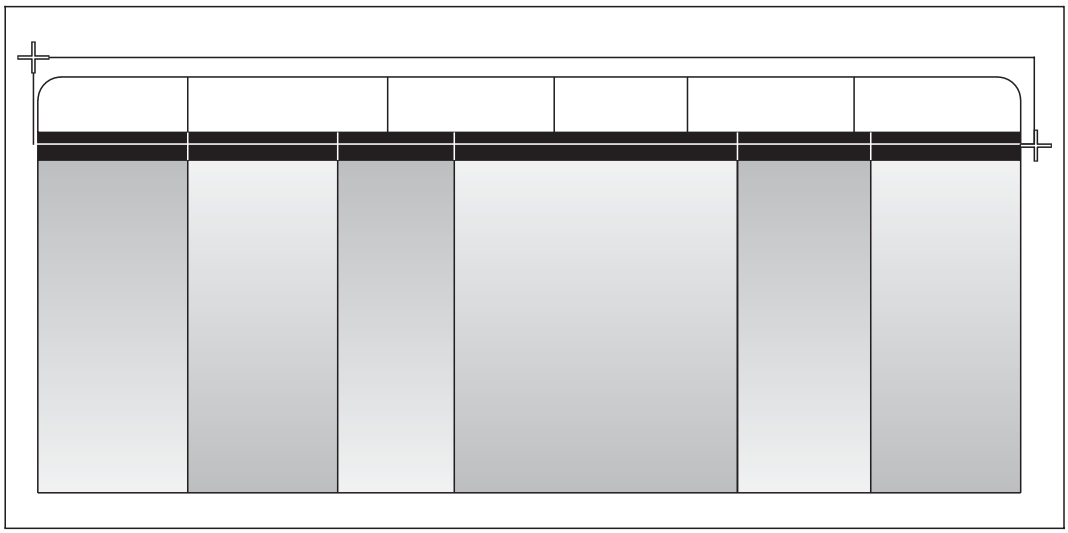
This function is devised to assist the placement of text into pre-drawn boxes usually found in business forms, organizational charts, etc. The boxes can be drawn with [Lines], {Prorated Rules} or [Draw]. The system is looking for four sides to determine the area. We are going to set our attributes for our text, then key in the text. Defining where the boxes are located designates positioning for the text.

1. **[Text], {Place Text into Boxes}**
2. **{Set Text Attributes}**
3. ***Font*** **{Geneva}**
4. ***Style*** **{Normal}**
5. ***Size*** **{6 point}**
6. ***Color*** - Type in: **700 [Enter]** for Black

Now we must setup how we want the text to be positioned within the boxes:

7. ***Mode*** **{Flush Left},** ***Vert*** **{Flush Top}, [Okay].**
8. **{Set Gutters}**
9. ***Top Gutter*** **-** Type in: **3p.**
10. ***Left Gutter*** **-** Type in: **6p.**
11. **[Okay]** - The gutters keep the text from touching the rules when composed.

12. **{Define Boxes}** - This works similar to the "zoom" function by use of a dynamic rectangle to determine the area in question. **Draw a dynamic rectangle around the first row of boxes.** When picking the boxes pick on the outside of the lines, as shown below.



13. The boxes selected for text will appear white with a diagonal line drawn through each one. If you happen to get a box you don't want, use {Modify Defined Boxes} and pick the diagonal line inside that box to unselect it.

14. **{Prepare Text to Paste}** - This is how you tell the program you are ready to input text. A text entry input window will appear. **Type in the first item; press [Enter] twice to leave a blank line between entries.** When you click **[Paste]** the text will compose and be placed in the box.

15. To do the second row of heads, **{Set Text Attributes}.** The text is Geneva, Bold, 7-point, with a color of 600 for White.

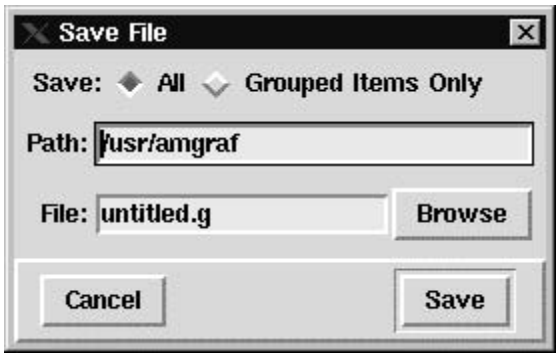
16. Another difference in the second row is the heads are centered. For both ***Mode and Vert*** select **{Centered}.** This will make them horizontally and vertically centered. Also, remember to **{Set Gutters}** back to 0. Then click **[Okay].**

17. Then, **{Define Boxes}** for the second row, again picking up and out. After your selected white boxes appear, **{Prepare Text to Paste}** and start typing the text.

As you can see, {Place Text into Boxes} is faster and definitely more efficient than {Input Text}. The positioning is done without you having to hold position or moving text.

Saving and Printing

The form is complete. Save the form; select [Project], {Save As}.



Arrow down to the *filename* input area of the menu and type in the path and file name for your drawing. We will use *form1.g,* with the ".g" extension letting us always know it is a graphic drawing.

To print: **[Project], {Print},** then **select your printer from the "pull-down" menu** and click **[Okay].**

Using the MICR Font

The MICR font width tables and WYSIWYG display characters are part of the MECCA 2000 system. To print the MICR font, you will need to have a license for the font.

Positioning of the MICR font for scanning purposes is critical. To assist in positioning, we have created a *micr.grid.* This file can be combined into your drawing. If you place the lower right corner of the grid to the bottom right edge of the form, the micr number can be positioned within the 1/8" spaces using {Place Text into Boxes}.

Character dimensions are controlled by placing another MICR number, which has been outlined in white on top of a standard MICR number. The size of this white outline knocking-out the standard MICR number, controls the thickness of the number being printed.

Use the following steps for creating your MICR number:

1. Edit the text file */usr/amgraf/formats/micr.txt1* and type in your MICR number in a format for {Place Text into Boxes}. This requires a blank line between each number. You can use the tilde (~) character for blank boxes.

2. Edit the text file */usr/amgraf/formats/micr.txt2* and type in your MICR number again. Make sure each number is outlined with the immediate commands for outline (\OL^) and cancel outline (\XOL^).

3. Combine in the drawing */usr/amgraf/formats/micr.grid.* Position the lower right corner to the bottom right edge of the form.

4. Set up the text attributes for the standard micr number:

   Font = mi
   Style = n
   Size = 12p
   Mode = Flush Left
   Color = 700

5. Use {Place Text into Boxes} and paste in the file *micr1.txt.*

6. Set up the text attributes for the white outlined micr number:

Font = mi
Style = n
Size = 12p
Mode = Flush Left
Color = 600
Outline Width = (percentages)

7. Use {Place Text into Boxes} and paste in the file *micr2.txt.*

You will end up with the white outlined MICR number on top of the standard number.

The MICR Font

The MICR font consists of numbers:

1 2 3 4 5 6 7 8 9 0

along with the following four transit codes:

Uppercase A = Routing and Transmit

Uppercase B = Amount

Uppercase C = Account

Uppercase D = Dash

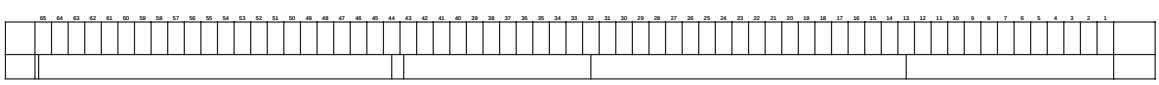
Example of micr.txt1

```
A
0
4
2
2
0
0
9
etc ...
```

Example of micr.txt2

```
\ol^A\xol^
\ol^0\xol^
\ol^4\xol^
\ol^2\xol^
\ol^2\xol^
\ol^0\xol^
\ol^0\xol^
\ol^9\xol^
etc...
```

MICR Character Grid



MICR Character Dimension Specifications

Standard 12-point

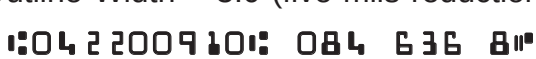
Outline Width = .6 (one mil reduction)

Outline Width = 1.2 (two mils reduction)

Outline Width = 1.8 (three mils reduction)

Outline Width = 2.4 (four mils reduction)

Outline Width = 3.0 (five mils reduction)



Digitizing with MECCA 2000

If MECCA 2000 starts with a tablet connected, the [Window] button's dialog will have a "Use Tablet" checkbox. The default is for this to be turned on when the tablet is seen.

When "Use Tablet" is checked digitize is activated. Digitize causes a one-to-one relationship between the tablet and window. The [Win-Fit] button will always take you into digitize at this time. Any of the [Zoom] and sizing buttons, take the tablet out of digitize automatically. Just [Win-Fit] to get back into the one-to-one relationship.

Getting Ready for Digitize

The MECCA 2000 Window must be enlarged to display 11" vertically. Pull down the bottom of the MECCA 2000 window down over the task bar.

Selecting the [Win-Fit] button fits the full one-to-one relationship of the tablet into the window. Move the cursor around on the tablet and visually locate the window edges.

Now you can tape the form down on the tablet anywhere within the window boundary. (You may want to draw a box representing this boundary using coordinates of 0/0 for the lower-let corner.)

If you want to use a Grid and its advantages, along with the grid reporting, do the following:

Go to [Window]'s [Grid Control] and set up the grid spacing, grid on, and how units are to be reported. Technical Drawing reports the Y=0 coordinate at the bottom of the drawing, while Print Position allows you to change the Y-position for reporting and move it to the top by typing in the Y-Position or length of page.

The grid report will only show while you are in a drawing function, such as Line. The Grid Snap options are found in two places: at the bottom of each drawing menu, or by pressing [Ctrl]-[Blue Button].

When using the tablet, the four buttons mean:

Yellow - Standard Pick
Green - Okay
Blue - Pop-Up Menu
White - Quit

Chapter 5: Scanning

General Information Concerning Scanning

All scanners use similar technology to scan and capture the image with the ability to scan line art, halftones, and color. Major differences are in the scanning resolutions and whether they recognize color.

A flatbed scanner resembles small photocopiers with a removable cover and glass platen. The user places the artwork or photograph on the platen, and the photosensitive sensors move across the scanning area. The scanning functions are controlled through menus which include resolution, brightness, contrast, scanning area, and type of scan (whether black and white, halftone, or color).

The default settings will usually be a good start, but sometimes you will need to make adjustments. Brightness and contrast functions work much like the same controls on a monitor. Brightness adjusts the lightness or darkness, where contrast adjusts the amount of difference between the two. You may be able to bring out greater detail by increasing these levels.

The scanning area is the actual glass platen. Since scans take up a lot of disk space, you will only want to scan the image you want to capture. This is controlled by adjusting the window to the location of your image. Interactively, using *Preview* is probably the best solution. Here you will get a low-resolution test scan to assist you in seeing your image before using it. You can adjust the window, if needed, before proceeding to scan at full resolution.

Once the scan has taken place you have created a scan file. This file is a collection of bits (either black and white, gray-levels, or color) that are gathered in columns and rows. We call this component a *Raster Image.*

Common Scanning Terminology

The terminology below is used throughout this chapter when we discuss scanning. It is not specific to any particular scanner.

Brightness:

It is used to darken a faint image or lighten a dark image. Increasing and decreasing brightness values allows you to control the reflecting image to allow for different paper or ink colors when you need to scan from printed material. Usually, it is better to spend the time obtaining the best results by scanning with different brightness controls, than it is to clean up a poor scan.

Color Scans:

Scanners that recognize color, can create color scan files. We can convert three types of color scan files: TIFF, DCS, and PCX.

Contrast:

Adjusts the amount of difference between light and dark areas.

Cropping the Raster:

An essential step of trimming down the edges, leaving only the image needed. Cropping reduces the file size because pixels being trimmed-off are actually taken out of the file.

DCS File:

These files are Desktop Color Separations (DCS) that will convert as an exact color match. The files convert as CMYK separations. They are usually one-third larger than TIFF or PCX, and take much longer to convert. If you are concerned about color accuracy, use DCS files. Adobe PhotoShop creates both DCS and TIFF file types. DCS files are DOS binary data.

Dithering:

This is a technique used by low-resolution scanners to scan halftones.

Gray Levels:

Each scanner can see a maximum number of gray colors when scanning halftones. For example, many scanners can produce 256 different grays. The gray levels chosen when scanned determines how smooth the contrast is between highlighted and shadowed areas. When there are too few levels used, a phenomenon called "posterization" occurs. This is a sharp contrast between highlighted and shadowed areas instead of a smooth continuous flow between shades.

Halftone:

A black and white photograph. This is the process used to convert a continuous tone photograph into a pattern of tiny halftone cells that may be easily printed. These multiple spots within one halftone cell allow different levels of gray to be achieved. A cell with less spots being imaged is going to be lighter than a cell that is full.

Line Art:

Only two color values are seen: black or white.

PCX File:

These color scanned images (Windows Raster Images) are usually generated by Paintbrush programs, desktop clipart, and screen dump images. MECCA supports 24-bit, 16-color PCX files. After the file is loaded you will need to assign each color to a separate layer for separation, or use CMYK separations. PCX files are DOS binary data.

Pixel:

One bit of a raster image. This bit is either black or white. Sometimes referred to as a "seed".

Preview:

Interactively looking at a low-resolution of the scan for window positioning before doing the actual scan. It will give you a general idea of what the scan will look like, and where it is located in the window so you can adjust the window boundaries. It is always faster to only scan what is needed.

Raster Image:

A file that originated from a scan. This scanned image is a collection of bits (patterns of light and dark squares) that give the illusion of being lines, areas, text, etc.

Resolution:

Scanning resolution is how many pixels are seen in one square inch (dpi=dots per inch). A resolution of 100 instructs the scanner to pickup 100 columns and rows per square inch when scanning the image. Naturally, if the resolution is higher, perhaps 800 dpi, then the squares are eight times smaller since the image has 800 columns and rows in one square inch.

Scanner Resolution can usually be thought of in two ways: For black and white output the higher the resolution the finer the output, since the squares are smaller. This is normally the case for black and white line art that has no screens. But when scanning with halftones, the *screen lineage* is a sufficient resolution, since the image is screened when output. See halftones.

Resolution also plays an important part during production of a piece of artwork. If the image is going to be reduced, you would lower the original scanned resolution because "effective resolution" is going to play a part. **Effective resolution** is the scaled resolution. For example, if an image is scaled by fifty percent, the pixels become smaller and so it takes twice as many to fill a square inch. In this case the original resolution may be 200 dpi, but the effective resolution is 400 dpi.

It would not be wise to scale an image where you would end up with an effective resolution of 3000 dpi. The amount of data the scan image is transferring is tremendous. The same effect can be created by rescanning closer to the size needed with a more normal resolution, possibly 400 dpi to 800 dpi. Remember scanning at 800 dpi and then scaling by half will result in an effective resolution of 1600 dpi.

TIFF File:

Tag Image File Format (TIFF) is a public domain format for storage and exchange of digital images made up of pixels. The pixels can be black and white, or RGB color (which we will convert to CMYK). MECCA's {Combine} option can load a TIFF file and convert it to a MECCA Raster component.

Technical Information - Black & White Scans

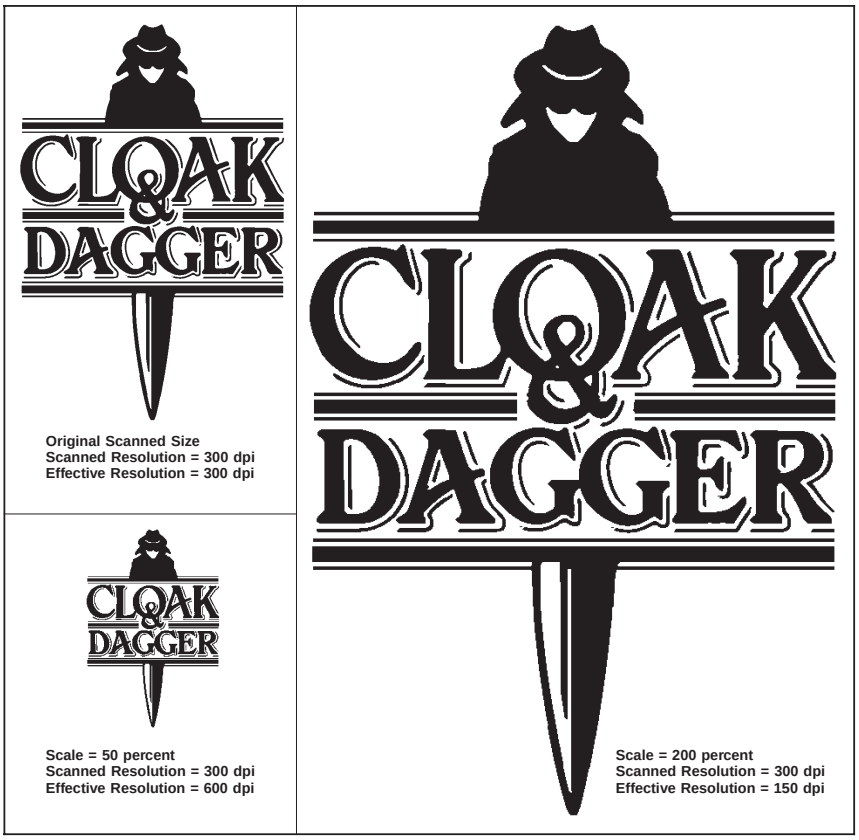
The most commonly used scan is a black and white image. To get the best results start with a good clean image. The crisper the original artwork; the better the scan.

Scan Straight

When scanning, it is recommended that care be given that the artwork is scanned in straight. Best results are seen when the image is taped down on a piece of paper first, making sure the image is horizontally level. This results in cleaner horizontal and vertical strokes.

Reducing/Enlarging Rasters

Since the technology of a scanner is similar to a camera, the image can be reduced successfully, but never enlarged. Enlarging tends to rough up the edges; that is usually not acceptable. When a scanned image must be enlarged, you will be better off vectorizing and filling the image with areas, than to enlarge the raster. Vectors and areas are smoother and can be scaled without any distortion.



Reducing a raster more than half-size is not usually recommended. The effective resolution becomes such that the image takes more processing time than is acceptable. You would be better rescanning the image closer to the size needed, than to reduce more than half. Be aware that if you reduce the image ten-times the original size, that image cannot be processed (it will not print).

Editing Pixels

Some of the functions found in {Raster Functions} allow you to do moderate pixel editing (such as crop and edit with a rectangular shape), but individual pixel editing and cleanup should be handled by a pixel editing software. Using GIMP's editing functions, you can quickly cleanup the file before combining the raster into MECCA.

Removing White Background

To remove the white background from a black-and-white raster file that someone else has scanned, requires that you turn the image into a 1-bit palette file through GIMP. Instructions follow: Open raster file in GIMP. Right-click on image, choose IMAGE from menu, choose INDEXED from menu, check USE BLACK/WHITE (1-BIT) PALETTE, Click OK.

The file must then be saved as a .bmp file. Right-click on image, choose FILE, SAVEAS, save as BMP. Combine into MECCA.

File Types

MECCA 2000 can load .PNG, .BMP, or .TIF files. The recommended file type is .PNG. A freshly scanned .PNG will combine into MECCA with the white pixels as transparent automatically. Once it has been brought into GIMP or any other pixel editing software, it will need to be set back to a 1-bit scan.

Resolution

With raster images usually the file size and print time are the two main concerns. If the image is to be used as a screened image, lower the resolution. With halftones, we recommend you match the screen lineage. The image will print faster and quality will appear the same as if scanned at a higher resolution.

If the image is to be a solid black and white, a higher resolution is usually needed, but take into consideration the file size. If the image is large, reduce the resolution until you see a significant quality difference. The lower the resolution you can get without destroying quality, the better you will be in the long run.

Raster Images Can Be Graduated

Raster images can be successfully graduated with a color start and color end. If this is needed you will have to Query the raster and give it the appropriate color values.

Edges Cut Off When Scanned

If the image scanned is not complete, (the left edge has not been seen by the scanner), take a black pen and draw a box around the image, The scanner will pick up the black lines as being the edge, which then can be cropped off later. Also, check the maximum image size per resolution in your scanner manual. You may have exceeded the size per resolution.

Technical Information Concerning Halftones

Before you try a digital halftone, you need to understand the process and rules that govern making a digital halftone. By following these rules, you will improve the look of your halftones and will also decrease output time.

What Makes a Halftone?

A *halftone* is the process used to convert a continuous tone photograph into a pattern of tiny halftone cells (screen lineage) that may be easily printed.

Screen lineage is a measure relating to the fineness of a halftone. The higher number is a finer the screen. Screen lineage values usually fall between 60 and 150 lines per inch. Magazines normally require finer, smaller dots so they need around 150 lines per inch, where newspapers need a larger, coarser dot somewhere around 60 to 85 lines per inch.

The screen lineage should be selected on the basis of the paper and printing press that you have chosen for the job, ask your printer. If the screen is too high you will experience muddy shadows and loss of highlighting in the halftone. Do not confuse this with output resolution.

Output Resolution is the measure of how many laser spots an imagesetter can make within a linear inch. This is called dots per inch (dpi). When setting a character, the letterform is made up of laser spots.

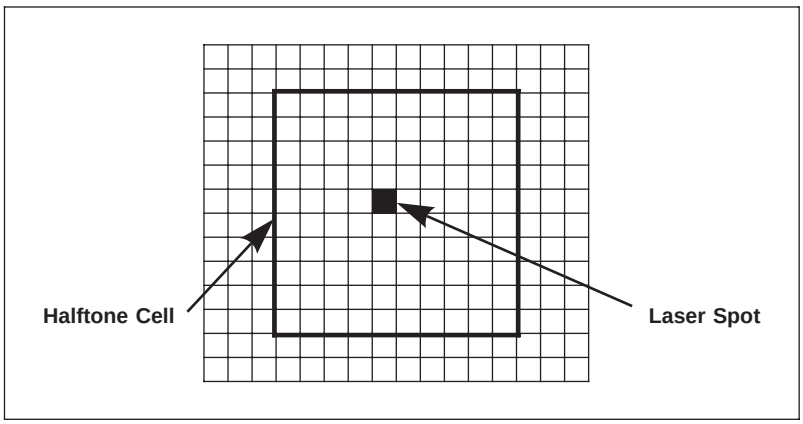


Figure 5-2: Laser Spot within One Halftone Cell

With halftones an imagesetter can place more spots in an inch (i.e., 2540 dpi) than a printing press can print. The higher the resolution the more spots it takes to make up one halftone cell of a screen. These multiple spots within one halftone cell (see Figure 5-2) allow different levels of gray to be achieved. A cell with less spots imaged is going to be lighter than a cell that is full.

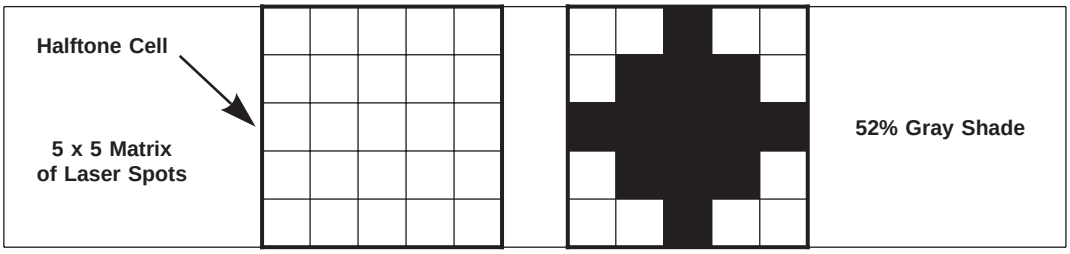


Figure 5-3: Halftone Cell Representing 52% Gray

How many **levels of gray** are produced is a mix between the screen lineage and the output resolution of the imagesetter. When too few levels are used a phenomenon called posterization occurs. Sharp contrasts between highlighted and shadowed areas occur instead of a smooth continuous flow between shades.

Resolution and Screen Ruling

You would think that you would always want the highest screen lineage and resolution available, the higher the better, but this is not the case.

Now let's take an output resolution of 300 dots per inch. Since there are 300 laser spots in one inch, a 60 screen lineage would produce a halftone cell composed of a 5 x 5 matrix of laser spots. This will allow 26 gray levels. Now this would be the case if the dot angle

was 0 degrees, but it is normally 45 degrees. With an angled halftone cell, your 300 dpi output resolution would be capable of about a 53 screen lineage.

There is a formula that can help you determine the levels of gray you will be getting in your halftone.

(Resolution/Screen Lineage)2 + 1 = Levels of Gray

The more levels of gray, the better the quality of halftone. Here is a calculation showing a higher resolution holds more levels of gray.

Output resolution is 2540, Screen lineage is 150.

(2540/150)2 + 1 = 288 Grays

Any value between 100 and 256 levels of gray is usually acceptable for halftones. Increasing resolution for the highest levels of gray possible will cause longer output times.

Scanner Resolution

There is another factor which plays a big part in the quality of your output and indirectly effects you in file size and output time - this is **scanner resolution.**

The basic rule when scanning for a halftone is that the scanner resolution should be between 1:1 ratio to 1.5:1 to the screen ruling; but remember the higher the ratio, the larger the file size and longer output time. So, for 150 screen lineage photo, a 150 dpi scan looks good and a 200 dpi scan is great.

Dot Angle

Dot angle is the angle of orientation of a halftone pattern as measured from a vertical axis. A 45 degree angle is commonly used for black and white halftones.

Keeping Your File Size Low

Once you start scanning images and reproducing them as halftones, you find out very quickly that the file sizes can be enormous. It is therefore important to keep the file size as small as possible without hurting the final quality.

The resolution of a scanner is the “key determining factor” in file size. To truly understand scanner resolution you have to think of it as if it were three-dimensional.

Scanners have not only the horizontal and vertical directions, but also a third dimension. Both scanners and image setters describe horizontal and vertical resolution in terms of dots per inch, but depth is only found in scanners. The depth is the number of bits of gray-scale information per pixel.

A line art scan is only one bit deep because one bit is all that is needed to distinguish black from white. Gray-scale information requires more bits. Most gray-scale images are 8 bits deep, enough to distinguish 256 levels of gray. See Figure below.

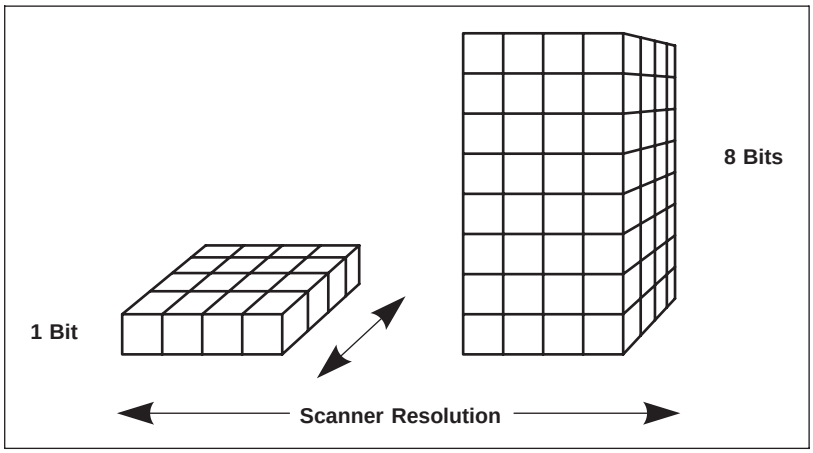


Figure 5-4: Resolution Represented by Blocks

Naturally, the fewer bits per pixel the smaller the file size. So if you only need 128 levels of gray, scan the image using 7 bits per pixel.

Choosing the Scanner Resolution

Choosing the scanning resolution requires you to know the halftone screen lineage that the image will be reproduced at and the size the image will be enlarged or reduced to. Enlarging or reducing an image effects the scanner resolution and must be taken into consideration. Enlarging reduces the initial scanner resolution, while reducing it increases the resolution.

As you can see in Figure 5-5, the 8 dots per inch scan being enlarged two times causes only 4 dots to be in one inch: 8 / 2 = 4. So, if you take a 300 dpi scan and enlarge it two times, you will end up with a 150 dpi scan. This is fine if your screen lineage is to be 150 and you only want a 1:1 ratio between scanner resolution and screen lineage. But if you want a 1.5:1 ratio, then you would need to scan the original at 450 dpi to get a final scanner resolution of 225 dpi after it is enlarged.

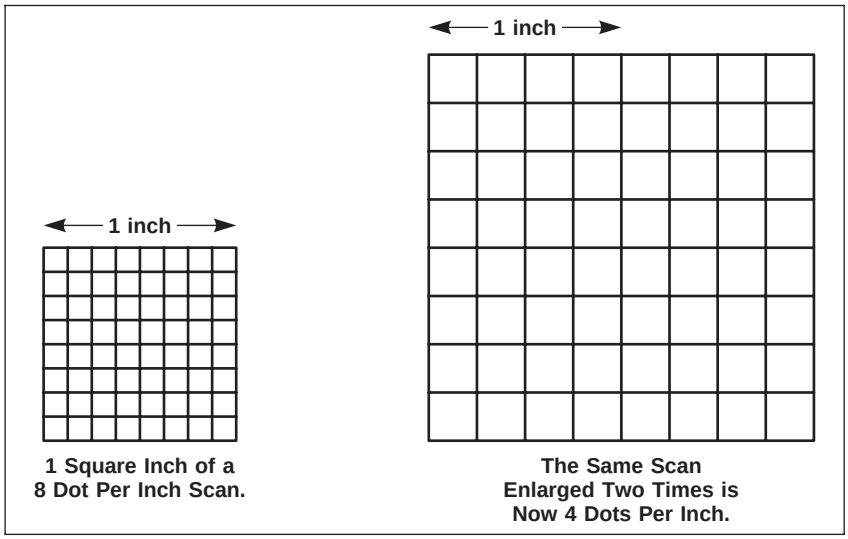


Figure 5-5: Enlarging a Scanned Image Reduces the Resolution

Making White Background of a Halftone Transparent

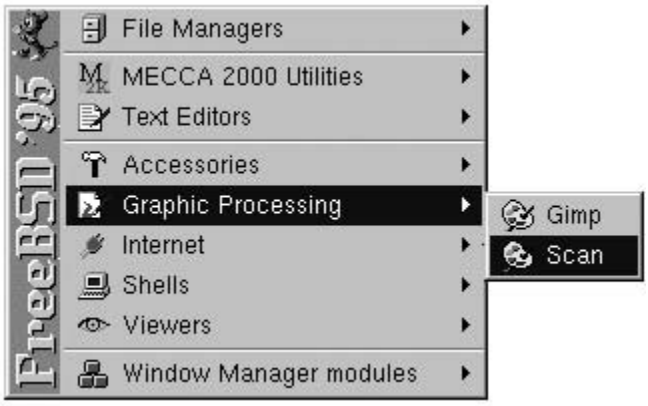
Open Halftone scan into GIMP. Use the following GIMP options to turn the White pixels into transparent pixels.

Use the Select by Color option to select the white background. Close Dialog.
Go to Layer, Add Alpha Channel
Go to Edit, Cut (This cuts the selected white and shows the plaid background.)
File, SaveAs as PNG
Turn off Save Resolution if Checked.
Combine PNG into MECCA.

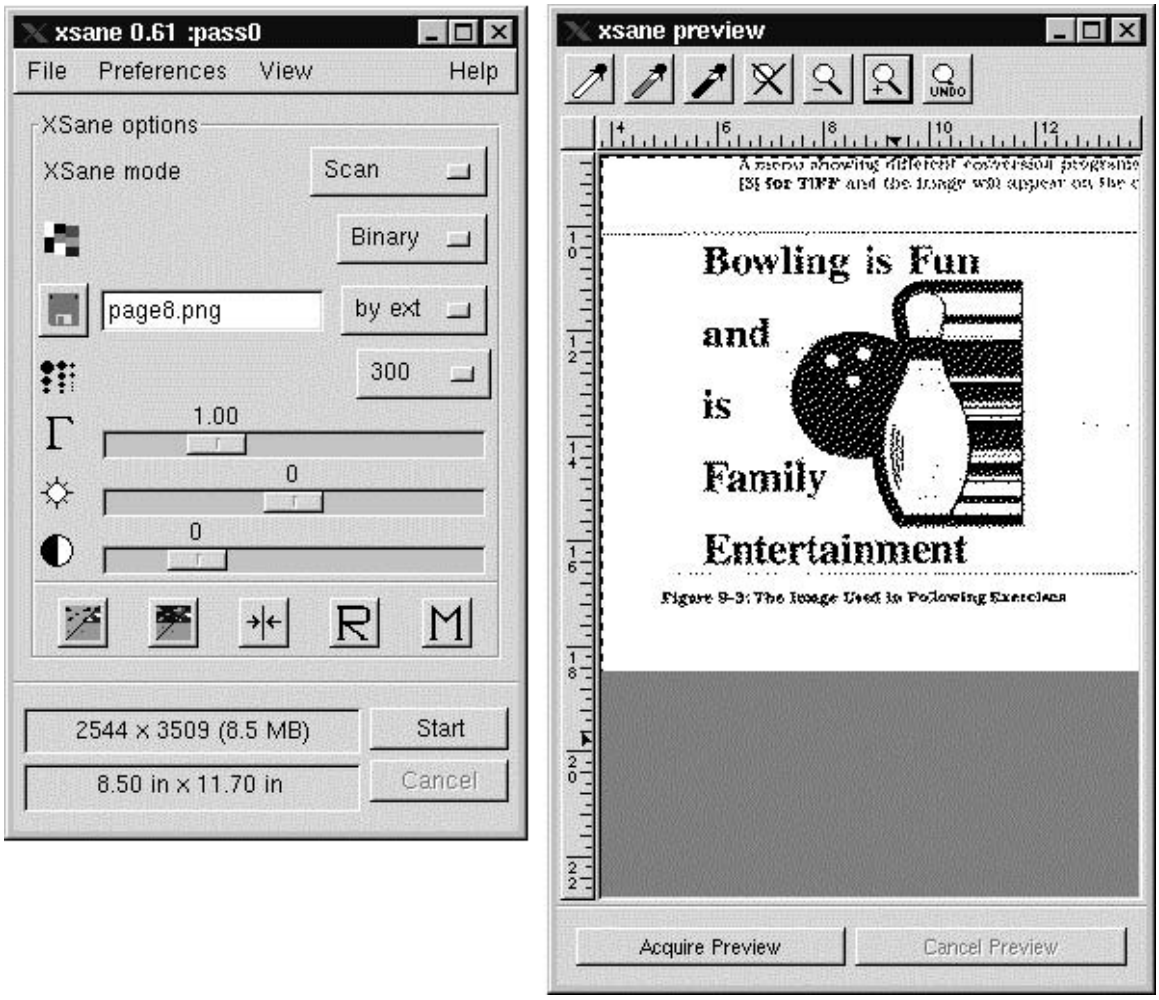
Scanning with Xsane

Your scanner can be accessed through Xsane. This is a graphical user-interface for SANE. It allows previewing and scanning individual images and can be invoked from the **Start, Graphic Processing, Scan** option. Xsane acts as a stand-alone program that saves acquired images in a suitable PNM format (PBM for black-and-white images, PGM for grayscale images, and PPM for color images) or converts the image to JPEG, PNG, PS or TIFF. The images can then be opened in GIMP for further processing, or combined into MECCA 2000 for cropping.

The GIMP image manipulation program has a full range of capabilities for editing raster data. GIMP also allows you to save the final raster image as a BMP file (if necessary) to be loaded into MECCA 2000 later.



Clicking on **Scan** brings up the following windows. Select the [Preview Window] button to see your image.



Typically with flatbed scanners, you will insert your original face down, top to the right, bottom to the left. Be careful that the page is aligned at this stage. If your image is scanned crooked, you will have to straighten it later by {Rotating}, and this doesn't always give you the desired results.

Select the area you want scanned in the preview window and then [Start] the scanning from the Xsane dialog window. This will create an untitled image file window showing the scan. Clicking your right mouse button while in this window will pop-up the options for saving the file. MECCA 2000 can load TIF and BMP images through its {Combine} option.

You will want to do your cleanup of the image before bringing into MECCA 2000. The [Raster] functions has options for cropping the raster, but minimal clean-up tools. Remember, you may also scale, rotate, mirror, and copy a raster just as any other graphic element.

Hints on Using Xsane with MECCA 2000

There are three types of scan modes:

Binary - Black-and-White Line Art

Gray - Halftones

Color - Color Photographs

When scanning **black-and-white line art,** you will need to go to Xsane's Preferences and Show Standard Options. Make sure that the Halftone selection is NONE, otherwise you will be dithering the pixels. Also, to make the white pixels transparent for loading into MECCA, scan as a file type of PNG. MECCA's Combine option recognizes a newly scanned PNG black-and-white as having the white transparent automatically. Otherwise, you must change the file to a 1-bit palette in GIMP and save as a BMP.

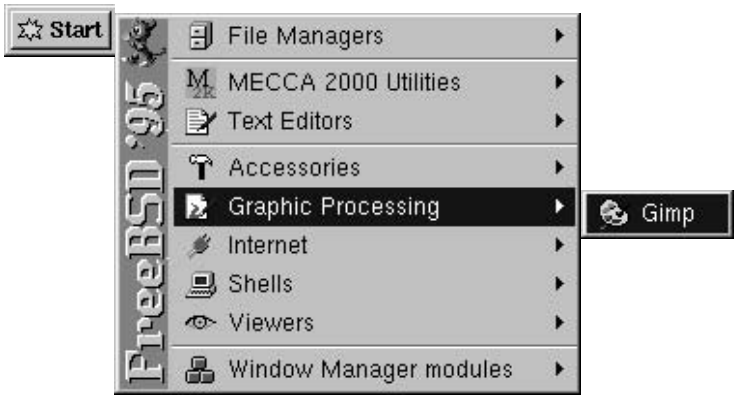
Using The GIMP Image Manipulation Program

This chapter is dedicated to the GIMP (GNU Image Manipulation Program) that is available for FreeBSD Systems. GIMP is a free software suitable for such tasks as photo retouching, image composition and pixel editing.

You can view the 1.0.0 version of GIMP documentation by starting **Netscape** and going to **http://localhost.**

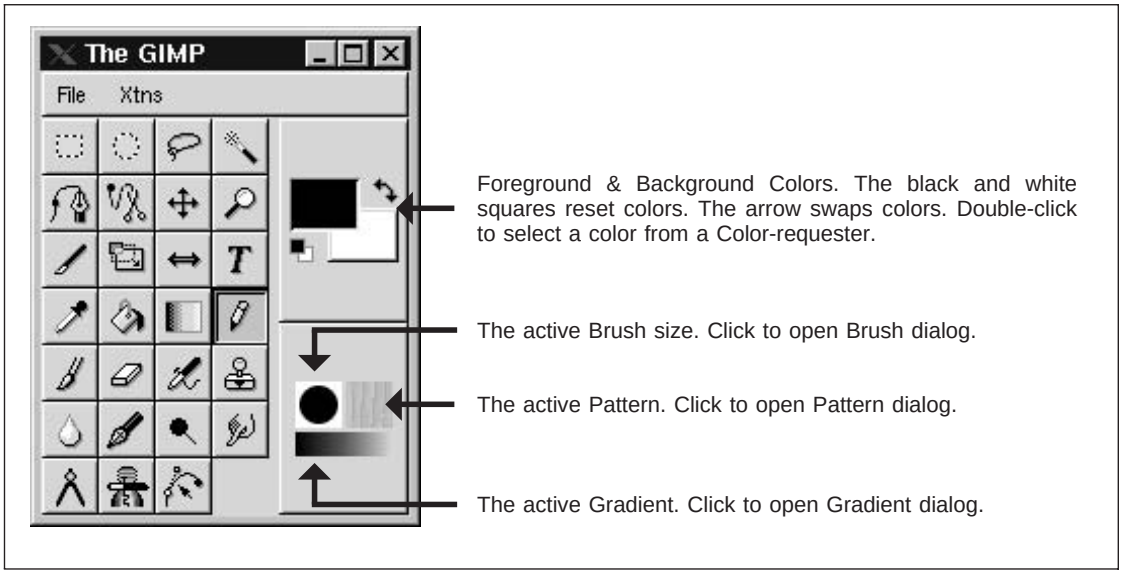
Starting Gimp

You can start GIMP by typing **gimp** from a command line within "Xterm" or by selecting **{Graphic Processing}** from the **[Start]** menu.

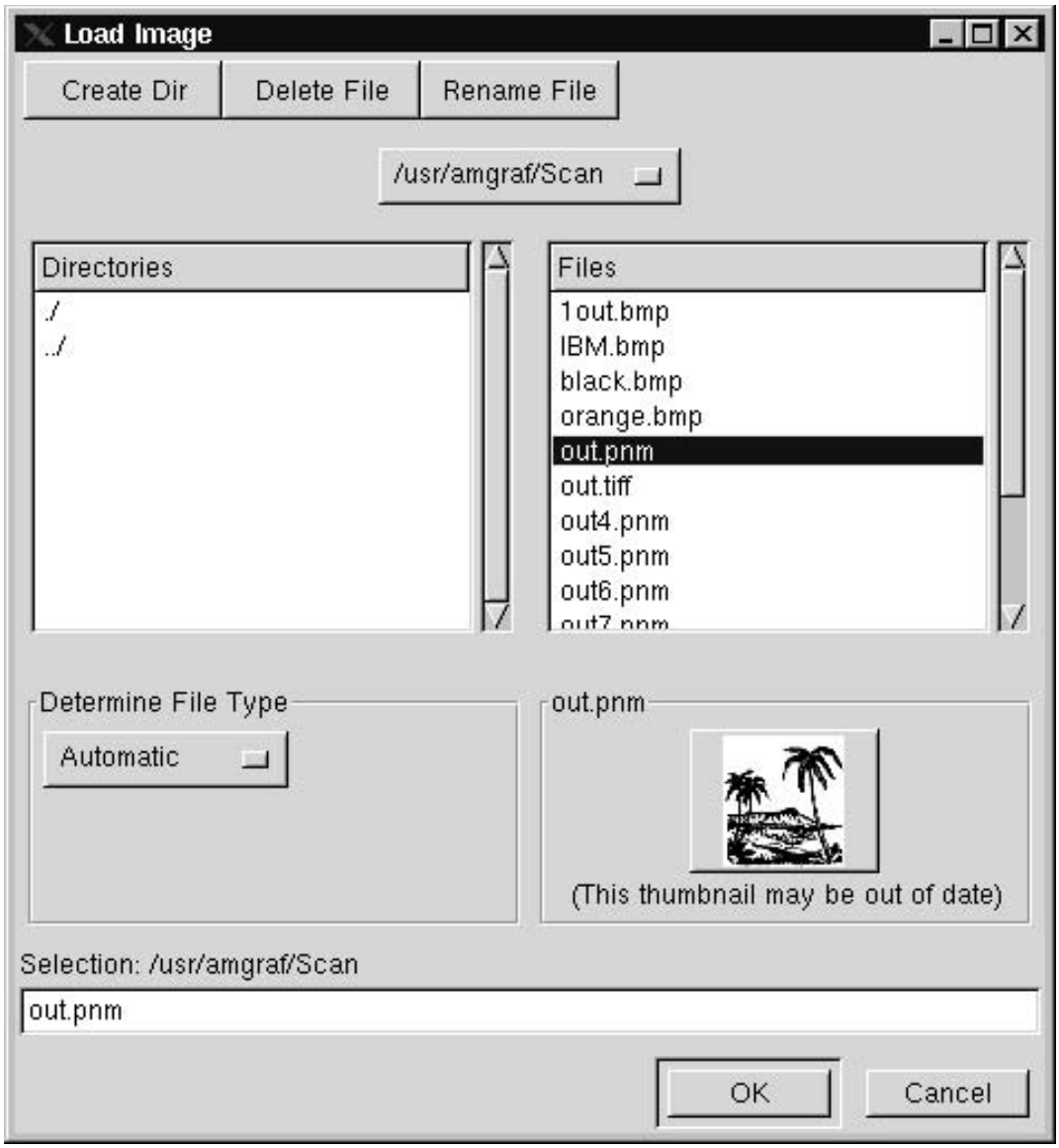


Once GIMP is started it will bring up its tool bar.

The Gimp Toolbar



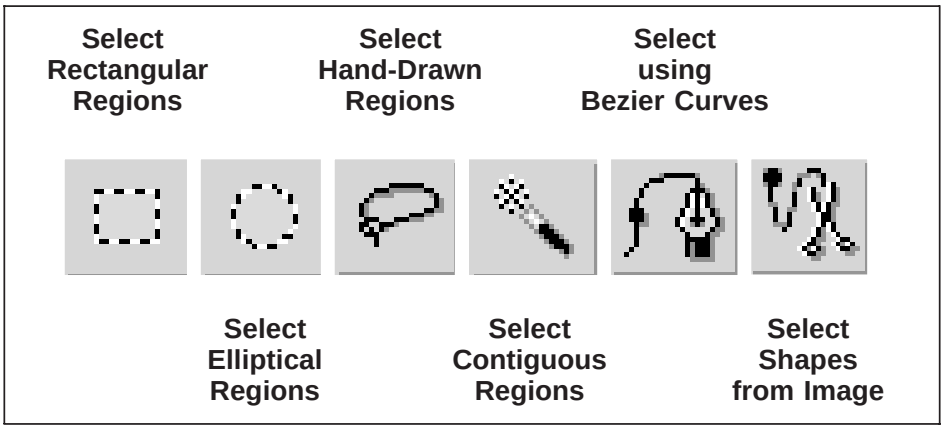
To open an existing image select [File], {Open}. This will bring up the following dialog box. This box will allow you to locate and preview existing images before actually loading them.


Load Image
Create Dir
Delete File
Rename File
/usr/amgraf/Scan
Directories
./
../
Files
1out.bmp
IBM.bmp
black.bmp
orange.bmp
out.pnm
out.tiff
out4.pnm
out5.pnm
out6.pnm
Determine File Type
Automatic
out.pnm
(This thumbnail may be out of date)
Selection: /usr/amgraf/Scan
out.pnm
OK
Cancel

Basic Controls

The tools in the toolbox allow you to select, paint, edit, and view images. The toolbox also contains controls for choosing foreground and background colors. Click a tool to select it.

Using the Select Tools



The first six tools in the toolbox are selection tools. In order to manipulate a specific part of your image, you first need to select that area. The trick is to find the right selection tool, or the right combination of tools to make your selection correspond as exact as possible to the object you want to work with.

When you have made a selection, the boundary of the selection appears with a blinking dotted outline, sometimes referred to as marching ants. Your selection is now the only active part of your image; the rest is masked and is not effected by your operations. To turn off the selection you must be in either "Rectangle", "Elliptical", or "Hand-Draw" and then click on the selected item.

Rectangular and Elliptical: If you click the mouse and drag, you'll get normal rectangular or elliptical selections, starting from the corner where you first pressed the mouse button. If you want to create circles/squares, or make your selection spread from the center, you must use the [Ctrl] and [Shift] keys.

> The [Shift] key constricts the selections to perfect squares and circles. The selection starts from the corner, and continues in the drag direction.
>
> The [Ctrl] key draws normal rectangular and ellipse selections, but with this key, selections will emanate radially from the point where you start dragging. This point is now the center of your selection.

Using both [Shift]+[Ctrl] results in circles or squares (as with Shift), but they grow from the center and out (as with Ctrl).

Hand-Drawn: Use the lasso to make a "Hand-Drawn" selection. Click and hold down the mouse button while drawing around the area to be selected. When you release the button, the option will make the selection.

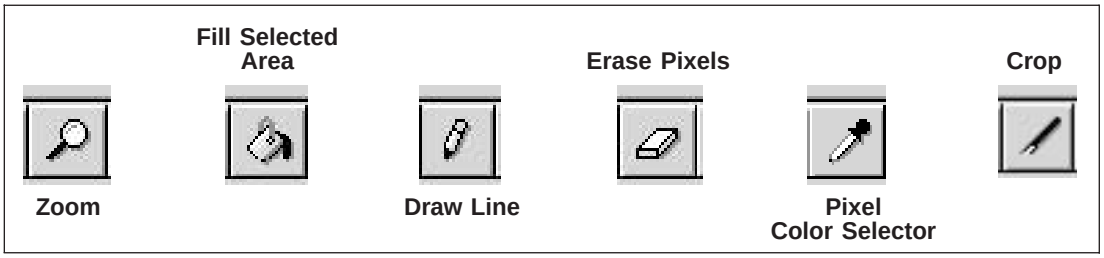
Contiguous: The wand selects images based on the color similarities of adjacent pixels. This tool is useful when you want to select part of an image (for example, a yellow flower) with out tracing the outline with the "Hand-Drawn" tool. When using the wand for color trapping, turn "Anti-aliasing" off.

Bezier Curves and Select Shapes: You use these tools by clicking out anchor points in a rough approximation of the shape. Don't try and make curves at this stage, just click out a rough, angular shape and make sure you close it by placing the last point on top of the first and click. When you're finished, click inside the shape and it will become selected.

There is no way to remove or add anchor points, so don't use too many points. Only one is needed for each curve. Modify to make curves of the straight lines. Click on an anchor point and pull the handles to change size and shape a curve. By pressing [Ctrl], you can drag and drop an anchor point anyway you like.

Other Useful Tools

The following five tools are easy to use. They will assist you in zooming around, pixel editing, and filling the selected area with color. The Pencil Tool lets you draw lines by picking a point for the line start and [Shift]-pick for the line end. And naturally, the Eraser is very handy.



The Undo

No matter how careful, you will always need an Undo. Gimp's Undo is found under the Edit Menu and also as a shortcut key [Ctrl]-[Z].

Color Separating Logos

The following instructions will walk you through the steps of color separating a Color logo into black-and-white separations. We will use the following image and create a three-color spot separation. Imagine our picture being outlined in black, the eyes are green, and the lips are red.

Before beginning separations, load and crop your image to size, then select **{File}, {Save}.** This will now become your original and will need to be re-loaded for each separation. It is important to maintain the same image size throughout creating separations to insure proper registration upon importing to MECCA.

Separation One - Black

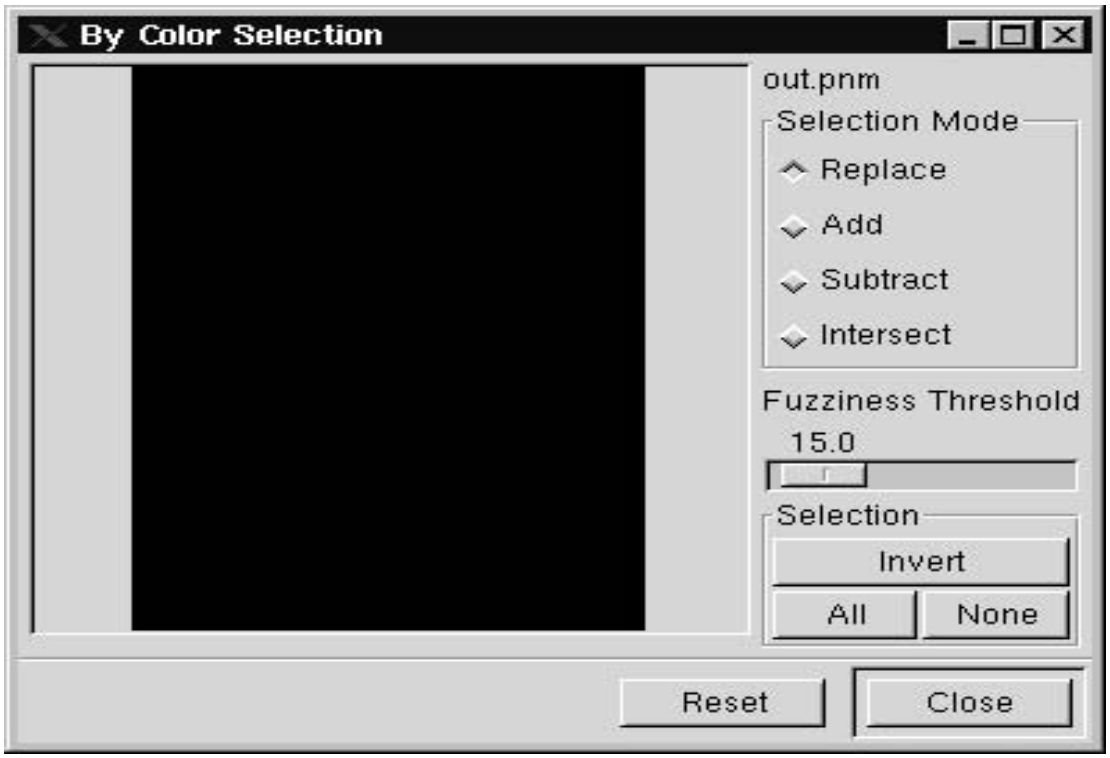
The first color we are going to separate is the black outline.

Step 1:

Go to the GIMP Toolbar and flip the Foreground/Background areas to be "White" for Foreground and "Black" for Background **by clicking on the arrows.**

Step 2:

Move the mouse pointer onto the image, **click the right mouse button** to bring up the menus. Choose **{Select}, {By Color}.** This will bring up a dialog box as follows.



Choose the options of **{Replace}** and set the **"Fuzziness Threshold"** to around 15. **[Close].** Now **pick a black area.** You will notice that all black areas are now selected. By making this selection we are telling the system that this is the area we wish to alter. What we want to do is isolate the black area and fill the rest of the image with white. As we stand now, if we do a Fill (with the paintbucket) we would be filling all of the black area with our Foreground color that is white. We want to do just the opposite so we will invert our selection. We want to fill everything but the black area with white.

Step 3:

Right click the mouse button. Choose **{Select}, {Invert}.** This function alters your selection by telling the system that we want to alter everything except black areas.

Step 4:

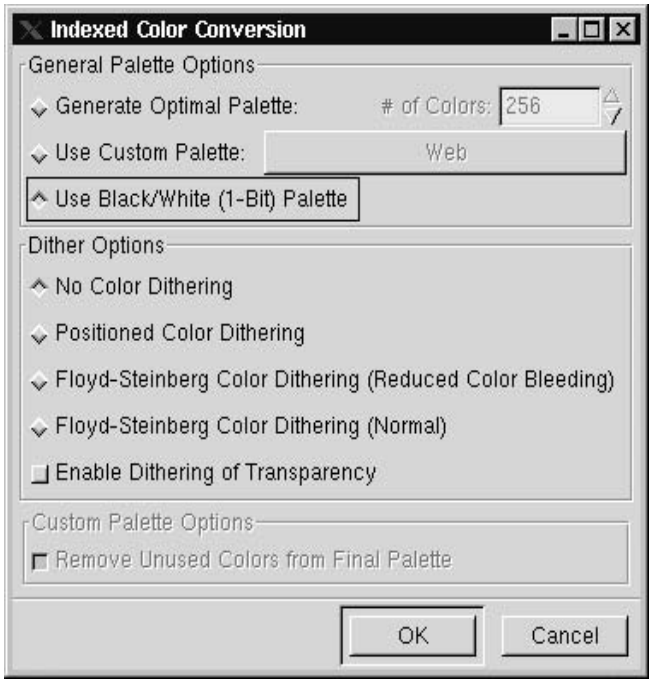
Go the GIMP Toolbar and select the **[Paintbucket]** for Fill and **pick on your image.** This should turn everything white except the black areas. *Remember the Fill is flooding your image with whatever your Foreground color is.*

Step 5:

Go to the GIMP Toolbar and choose the **[Rectangular Select]** tool. Now **click on your image.** Your image should now be unselected.

Step 6:

This is our first color separation. We need to turn our image into a monochrome file before saving. When creating files to be brought over into MECCA for Spot Color Printing they cannot contain any color. **Right mouse click,** select **{Image}, {Indexed}.** The following dialog box will appear. Select **Use black/white (1-bit) palette,** and **No color dithering. [OK].**



Step 7:

Right mouse click. Choose **{File}, {Save As}.** We need to save our image off as a **BMP.** Select **{By Extension}** from the **Determine file type** drop-down list. **Type in your filename** with a **.bmp** extension (such as sep1.bmp).

Step 8:

You are finished with the first separation, close this image by clicking on the image and choosing **{File}, {Close}** from the menus.

Separation Two - Red

Step 1:

Re-load in original drawing.

Step 2:

Click the **[Wand]** for Select Contiguous Regions from the Toolbar. **Click on the lower lip area.** This area now becomes selected. Now **hold down the [Shift-key]** and **click the upper lip.** Both areas are now selected.

Step 3:

Right click the mouse button. Choose **{Select}, {Invert} from the menus.** This will tell the system that we want to fill everything but the red areas.

Step 4:

On the GIMP Toolbar select the **[Paintbucket]** for Filling and then **click on your image.** This should turn everything white. The only things visible are the selected red areas.

Step 5:

Go to the GIMP Toolbar and choose the **[Rectangular Select]** tool. Now **click on your image.** Your image should now be unselected.

Step 6:

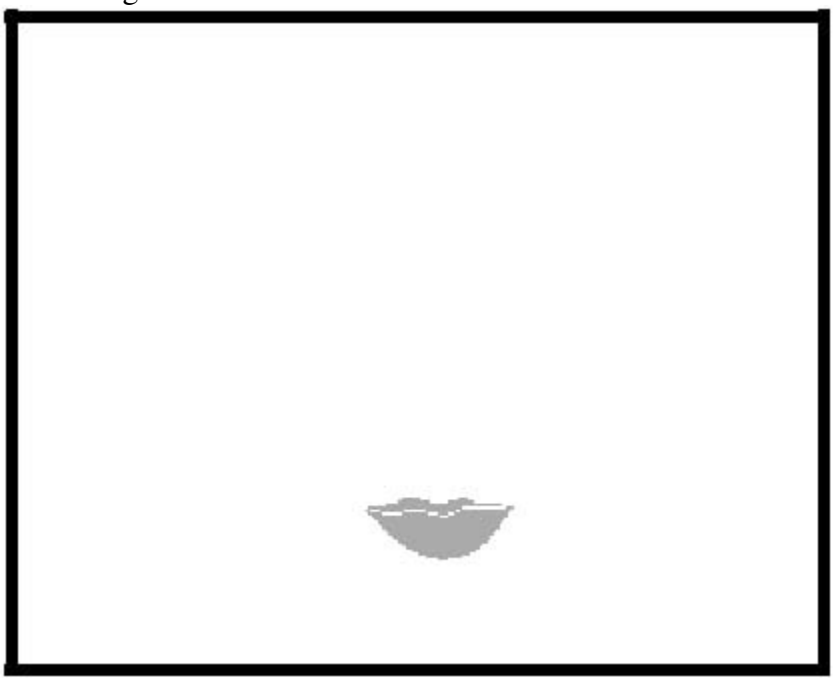
We have now made the second color separation. Right mouse click, select **{Image}, {Indexed}.** Use the same settings as in the first separation (Step 6) and say **[OK].**

Step 7:

Right mouse click. Choose **{File}, {Save As}.** We need to save our image off as a **BMP.** Select **{By Extension}** from the **Determine file type** drop-down list. Type in your filename with a **.bmp** extension (such as sep2.bmp).

Step 8:

Close this image.



Separation Three - Green

Step 1:

Re-load in original drawing.

Step 2:

Use the **[Magnifying Glass]** tool to enlarge the image enough to pick the green area clearly. Click the **[Wand]** (which means Select Contiguous Regions) from the Toolbar. **Click on the green** portion of the eyes. This area is now selected. **Hold down the [Shift-key]** and **click the remaining green** areas until all are selected.

Step 3:

Right click the mouse button. Choose **{Select}, {Invert}.** This will tell the system that we want to fill everything but the green selected areas.

Step 4:

Go to the GIMP Toolbar and select the **[Paintbucket]** for Filling **and click on the image.** This should turn everything white. The only thing visible are the green selected areas. The green used in this image must be turned into black before going through the Index color step, so **make the foreground black** and use the **[Paintbucket]** to fill the selected areas. Index color would have made our green white instead of black because it is too light of a color.

Step 5:

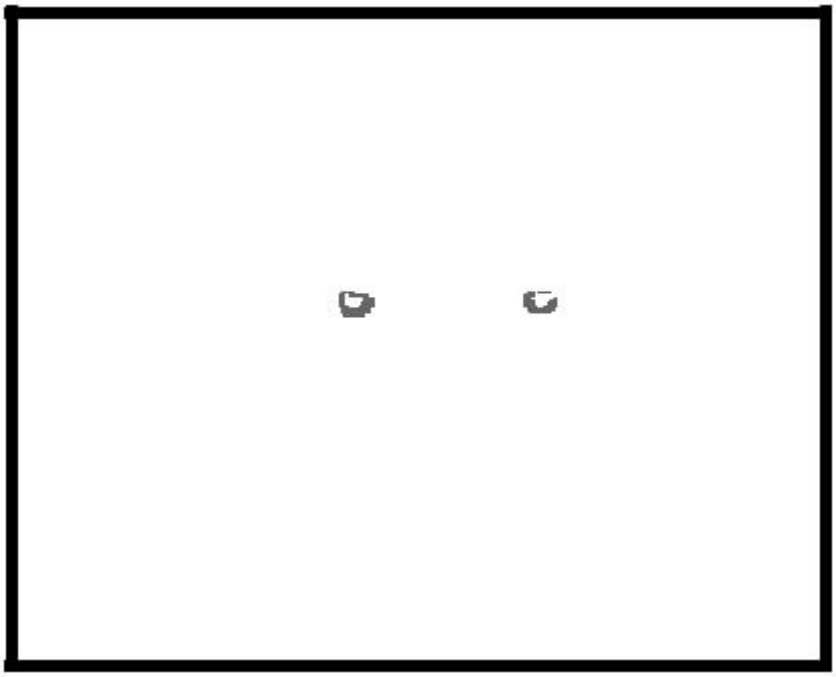
Go to the GIMP Toolbar and choose the **[Rectangular Select]** tool. Now **click on your image.** Your image should now be unselected.

Step 6:

We have now made the third color separation. Again **turn your image to a monochrome** by using the same steps in the first separation, Step 6.

Step 7:

Right mouse click. Choose **{File}, {Save As}.** We need to save our image off as a **BMP.** Select **{By Extension}** from the **Determine file type** drop-down list. **Type in your filename** with a **.bmp** extension (such as sep3.bmp).



Color Trapping

For trapping colors the steps are identical to the ones for the Red and Green Separations with the following additions between Steps 2 and 3. When you are using the [Wand] tool, check its dialog and always have "Anti-aliasing" off. To do trapping include **Steps 2a thru Steps 2d** after you have the areas selected.

Step 2a:

Right click the mouse button. Choose **{Select}, {Grow}.** This will expand your selection outward according to the number of pixels entered. A Grow of **1 pixel** is all that is needed.

Step 2b:

Now use the **[Dropper]** tool that is a Color Selector, to make the Foreground be the color you are trapping. **Click the dropper on the color (red)** and see the Foreground chip change.

Step 2c:

Use the **[Paintbucket]** to Fill the selected area with the new Foreground color **by picking within the selection.** Notice that your color has now been expanded by using this technique.

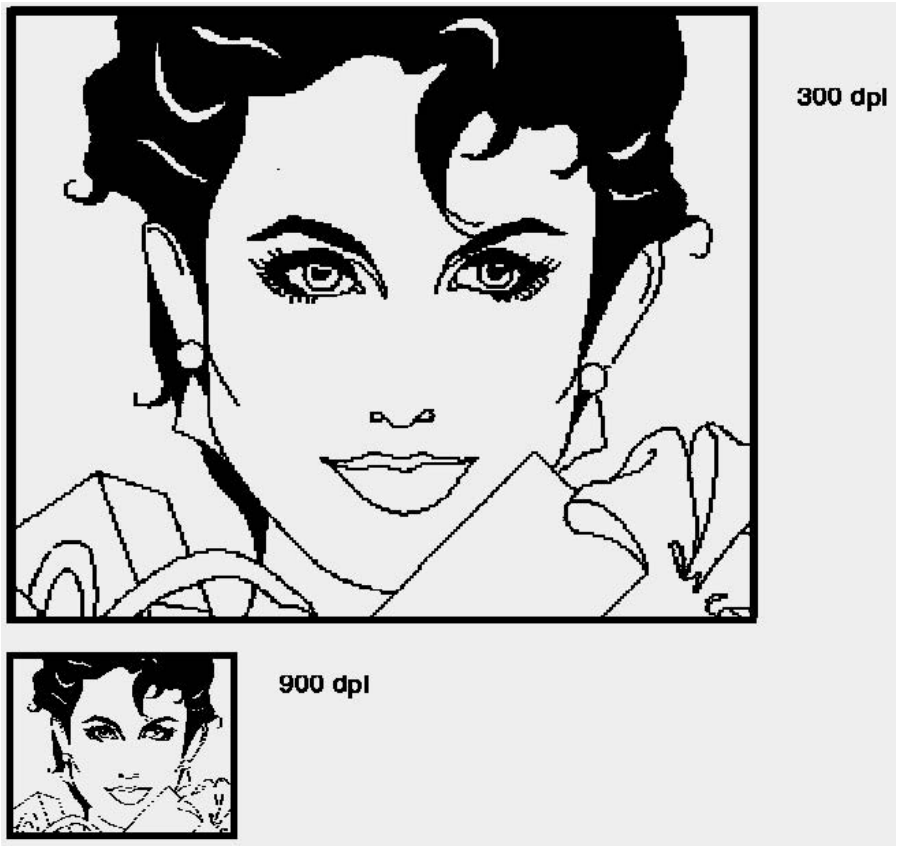
Step 2d:

Put the Foreground color chip back to "White".

Scanning Resolutions

For the best manageable file size and speed use a scan resolution between 300 - 400 dpi and try not to exceed 600 dpi. When you load your image into MECCA it will ask you what resolution you want. At this time you can enter in a higher resolution if needed.

You can also scale the image once loaded into MECCA to the effective resolution.



Importing MECCA Rasters to Gimp

To take a MECCA Raster image and load it back into GIMP, you must first save the raster into a file by itself and convert it into a BMP file.

Step 1:

[Query] the raster image and write down the resolution, effective resolution, and size.

Step 2:

[Group] only the raster image.

Step 3:

Go to **[Project], {Save As}** and from the menu click **{Save Grouped Items Only}.** Name your file and click **[Save].**

Step 4:

Go to **[Start], {Shells - Xterm Window}.** This will bring up a **$-prompt** window. At the $-prompt type

ixtobmp <(/path)/(filename.g) >(/path)/(newfilename.bmp)

For example: **ixtobmp </usr/amgraf/lady.g >/usr/amgraf/lady.bmp**

This command will turn your ".g" file back into a ".bmp" file which then can be loaded into GIMP.

> **NOTE:** When combining the ".bmp" file back into MECCA the resolution will need input again. And if needed the raster will need re-scaled back to the necessary effective resolution.

Making Black and White Scans Transparent in GIMP

If you bring the PNG file into GIMP, you will need to do the following after making any pixel changes to get the white background transparent. In GIMP, Right-click on image, choose IMAGE from menu, choose INDEXED from menu, check USE BLACK/WHITE (1-BIT) PALETTE, Click OK. This must be done before saving. The file must then be saved as a .bmp file. Right-click on image, choose SAVEAS, save as BMP. The BMP file type will recognize white as transparent, this is not the case for TIFF files. In MECCA, combine the BMP into the drawing or a new graphic screen.

Color Files Created on Adobe PhotoShop (TM)

When using PhotoShop you have three options for importing color files to the MECCA system. You can create a TIFF, PCX, or DCS Files. If you are concerned about the accuracy of the color, use DCS. It will make a larger file, but the color values will be transported, where with TIFF files RGB values are converted to CMYK by MECCA.

Creating a TIFF File

To create a color TIFF to be transferred to MECCA you must use the **SAVE AS...** option under **FILE** in Adobe PhotoShop.

Select **FILE** from the pull down menus. Then select **SAVE AS.** This will bring up the *File Naming Dialog* box. Make sure that the *Save File as Format Type* box has *.tif shown. If not, select ***.tif** from the pull down list. Now **type a name** for your file adding the extension of ".tif" to the end.

> **Note:** DOS can only have 8 characters before the extension, and the extension cannot exceed 3 characters.

Once you have keyed in the proper name select the **OKAY** button. The **TIFF OPTIONS** dialog box will now appear. Here you will select **IBM PC** from the Byte Order section. Make sure that neither the *LZW Compression* or *Save Alpha Channels* options have been chosen. At this point select the **OKAY** button and your file will then be saved into the current directory as a color TIFF image.

Converting a TIFF Image

Once the TIFF image has been transferred to MECCA you can load it on the graphics screen using **{Combine}**.

Creating DCS Files

When using PhotoShop to create a DCS (Desktop Color Separations) file you must first convert the image to CMYK (Cyan, Yellow, Magenta, Black). Photoshop scans in photos as RGB (Red, Green and Blue) To convert the photo you must select **MODE** from the pull down menus. Here you would select **CMYK Color.** This will automatically convert the image from RGB to CMYK. It is possible that you will see a color change appear on your screen upon conversion. This is due to the photos colors now being created from the 4 process colors rather than the 3 primary colors. You may have to do color corrections before going any further. Once corrected, select **FILE** from the pull down menus. Now select the **SAVE AS...** option.

Selecting the SAVE AS... option will bring up the *File Naming Dialog* box. First make sure that the *Save File as Format Type* box has *.EPS shown. If not, select ***.EPS** from the pull down list. **Type in a file name,** adding the extension of *.eps to the end. Once you have keyed in your file name, select the **OKAY** button. You will now be given the EPS FORMAT dialog box. In the *PREVIEW* section make sure that **NONE** is selected. In the *ENCODING* section, select **ASCII.** In the *DESKTOP COLOR SEPARATIONS (5 files)* section, select **MASTER FILE: No Composite PostScript.** Once all three options have been selected choose the **OKAY** button and your file will be saved in an EPS format.

By saving as a CMYK EPS file, Adobe PhotoShop will save your file as 5 individual files. One is a master file containing all of the Cyan, Yellow, Magenta, and Black images as one. There will also be four files saved, each containing an individual separation. These files will use the same file name as the master but have an extension of _c.eps for cyan, _m.eps for magenta, and so on. These are the files that need to be transferred over to MECCA. Use **File Express** to transfer the files across the network to MECCA.

Use Combine to Import DCS Files into Drawing

The Combine option has a DCS selection for bringing in DCS files and pulling them back together into one image. Pick on Combine, Combine DCS Files, and open the cyan (.c) file. This will also import the other three files and make your image.

Concerning Resolutions and File Size

There are some helpful tips on using PhotoShop files in your MECCA drawings. One thing to bear in mind is that color photos make very large files. These files are extremely large in comparison to those generated as strict black and white line art scans. This is due to the way that the file is stored. A CMYK color image must store the image information four times. Once for each of the 4 process printing colors. Each image is really a 256

grayscale scan. Whereas a black and white line art scan consists of only 1 image with only 2 pixel variations, on and off.

Therefore, it is important to try and compensate minimal file size without loss of quality in the image. If the photo to be used will be printed at 100% saturation it is best to scan the artwork at twice the printing screen lineage. For example scan in your photo at 300 dpi if it will be printed with a 150 line screen at full saturation.

If the photo will be scaled after being transferred to MECCA this will also change the effective resolution. This also must be taken into account when determining the scans resolution. For example, an original photo that is 4 inches square needs to be used in MECCA at 2 inches square. The printed screen lineage is to be 150 lines per inch at full saturation. The optimum scan resolution would be 150 dpi. The scans effective resolution would be 300 dpi after scaling by one-half takes place on MECCA.

If your photo will not be printed at full saturation (a washed out effect), it is best to make the your scan resolution the same as the final printed screen lineage. For example, if the photo will be used at 50% saturation, printed at 150 lines per inch. The optimum scan resolution would be 150 dpi. You will need to also consider whether the image is to be scaled on MECCA, since this will change the effective resolution.

PhotoShop Masks Cannot Be Imported

When using Adobe PhotoShop you have the capability of saving masks or selection borders for use later. MECCA will not allow these to be imported. You must first delete all masks or alpha channels (selection borders) before saving your files. You may want to save this file (without the masks or channels) as a new file if you need them for other reasons.

Working with Imported Color Files

It is important to remember that you can do nothing to these images other than Crop and Mask. You cannot Pixel Edit, Reverse Image, or use any of the other Raster Editing functions on the image. However you may Rotate, Scale, Change Screen Lineage, Move, etc., to the image.

Creating a PCX File

To create a color PCX to be transferred to MECCA you must use the **SAVE AS...** option under **FILE** in Adobe PhotoShop.

Select **FILE** from the pull down menus. Then select **SAVE AS.** This will bring up the *File Naming Dialog* box. Make sure that the *Save File as Format Type* box has *.pcx shown. If not, select ***.pcx** from the pull down list. Now **type a name** for your file adding the extension of ".pcx" to the end. Once you have keyed in the proper name select the **OKAY** button.

> **Note:** DOS can only have 8 characters before the extension, and the extension cannot exceed 3 characters.

Chapter 6: Label Composition

Where labels are concerned usually you are given black and white art, and then need to place colors, trapping, and text. This small exercise will help you to familiarize yourself with this process. We will scan an image, trim everything out but the drawing, set up a layer-color table, and then colorize the raster. Afterwards we will thicken the colored layers by one pixel for trapping.

Scanning the Image

To scan an image, see Scanning.

Figure 6-1

Color Separate Using GIMP

Use the Graphic Processing GIMP Program to add color to the black and white scan. Gimp allows you to change the Image Mode to RGB and add the red and green with the Magic Wand and the Paint Bucket.

Figure 6-2

Once you have color, you then separate each color into a separate file. Save these three separate logo files, one for each color and bring into MECCA.

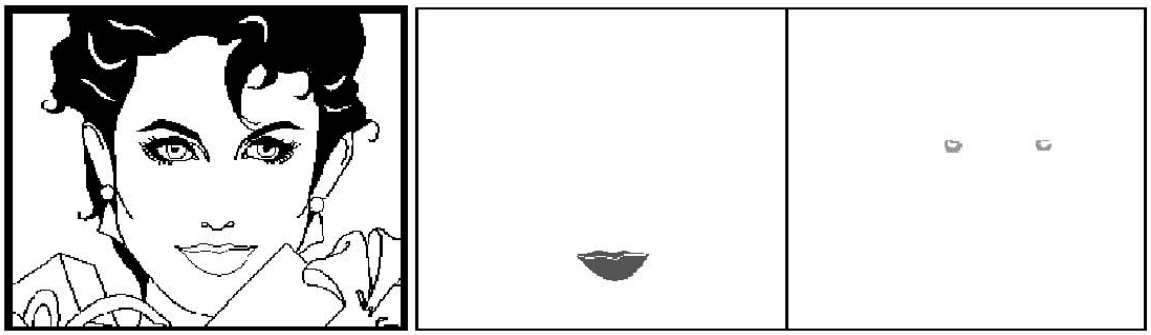


Figure 6-3

See Color Separating Logos for detailed instructions.

Loading Raster Files

Using {Combine File}

To load in a raster file you must use the {Combine File} option located under [Project]. This option will determine the type of file and automatically convert it into a MECCA 2000 loadable graphic file.

Drawing the Plate

Your plate size must be drawn as part of the label. Put in any trim marks needed on Layer 16. The Color Bars for each separation are individual layers since they do not step - we have used Layers 4 through 6 when creating those. See Figure 6-4.

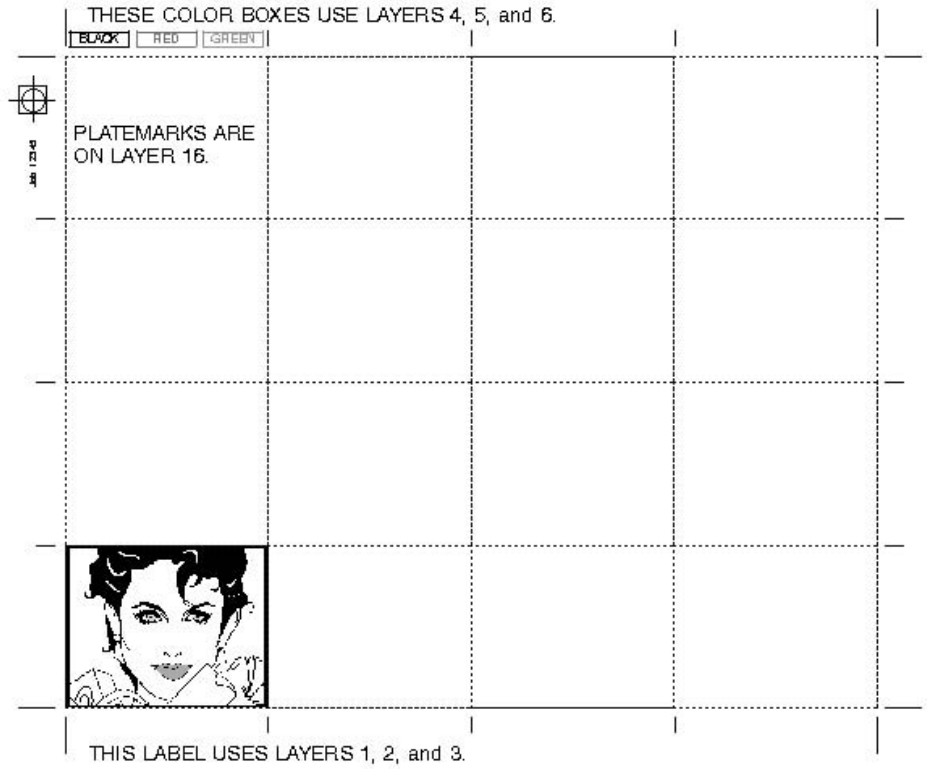


Figure 6-4

You can now save the label drawing.

Setting Up the Color Layer Table

Our example is being produced for "Spot Color" printing. See Figure 6-5. Since we want to display the raster in color, as it will be printed, we will assign an ink color to each layer.

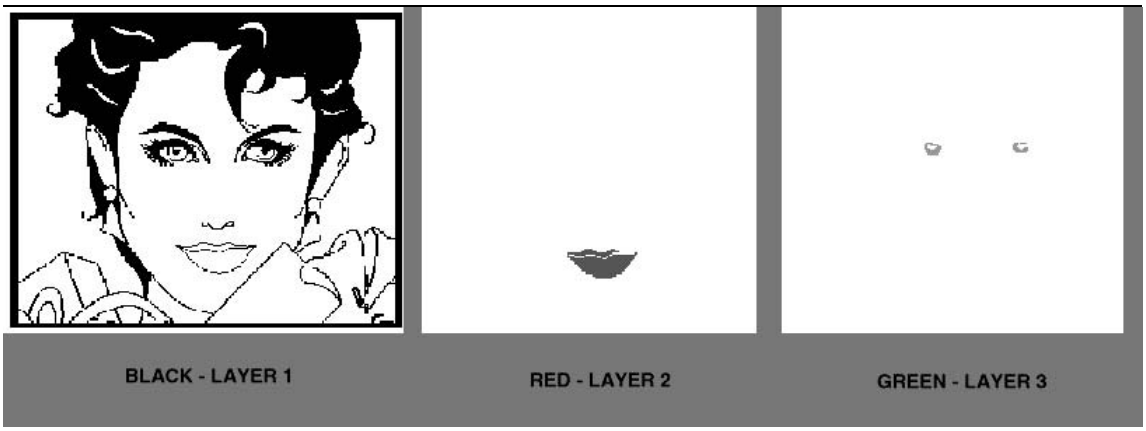


Figure 6-5

Step 1:

Go to [Layers], [Setup] to assign the following colors to our layers:

```
Layer 1 is Black      (Color 700)
Layer 2 is Red        (Color 185)
Layer 3 is Green      (Color 339)
Layer 4 is Black      (Color 700)
Layer 5 is Red        (Color 185)
Layer 6 is Green      (Color 339)
Layer 16 has not changed.
```

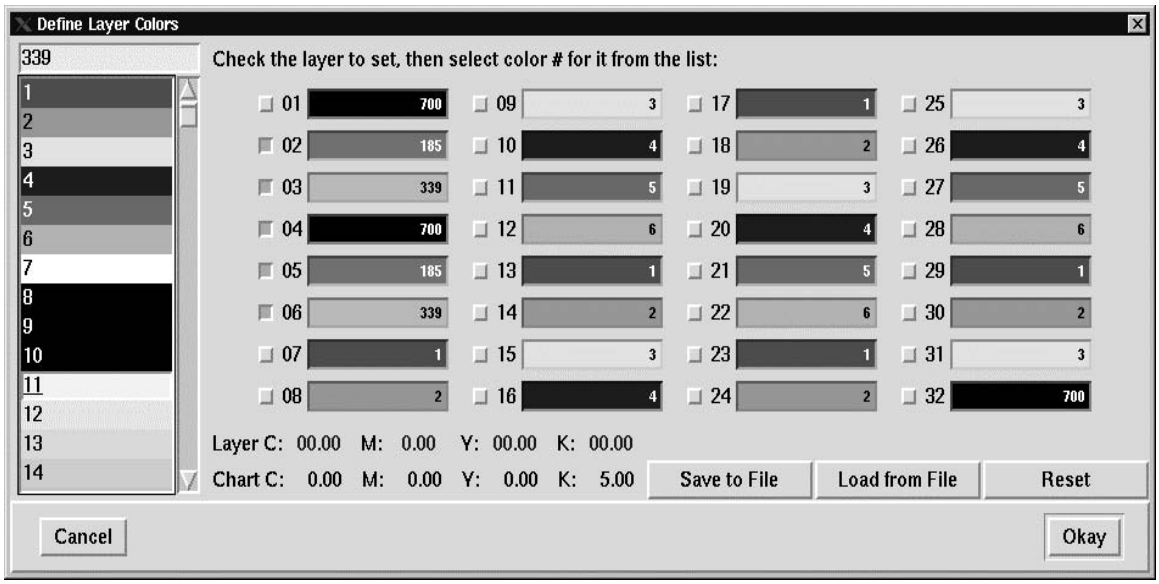


Figure 6-6

Step 2:

Click [Okay]. This will make the window area display the color values assigned to each of the layers.

Using Thick/Thin Raster for Trapping

Step 1:

We now need to set our newly colored areas up for trapping. The black will overprint on top of all the other areas, so it does not need the trapping effect applied. Layers 2 and 3 need to be thickened.

First, use **[Layers] to** turn "off" all Layers except Layer 2 which is the red. A quick way to do this is by **clicking the [All Off] button** and selecting **{Layer 2}, [Okay].**

Step 2:

Select the **[Raster] tool, {Thick/Thin Raster}.** The default of {Thick/Thin Raster} is to make the image thicker by one pixel on all boundaries. **Pick the red area** and you will receive a --BUSY-- signal above the prompt line. Your image will redisplay with all boundaries increased by one pixel, thus causing the trapping effect.

Step 3:

Use **[Layers]** to turn "off" layer 2 and turn layer 3 "on" then **[Okay].** You should now be viewing the green area only. **Pick the green area** and it too will be increased by 1 pixel on all boundaries.

Step 4:

Once you have each of the colored areas "thicker" by one pixel we can use **[Layers]** to turn Layer 1 "on" and Layers 2 and 3 "off".

Step 5:

You should now only have the black image displayed on screen. Select **[Change], {Depth Order} {Move to Front}. Pick the black image.** Your screen should clear and redisplay. This places the black on top of the other colored areas for overprinting.

Step 6:

Now go back to **[Layers]** and turn all Layers "on" and take a look at the completed graphic.

Step 7:

You can now **{Save}** your graphic.

Printing Your Label

To print your label is a little more complex than the standard {Print}. This is because we want each layer to output on a separate film, one for each color. This requires the use of Parts for output.

After you have defined the output specifications, you can then select Project's {Print}. This will bring up the following dialog:

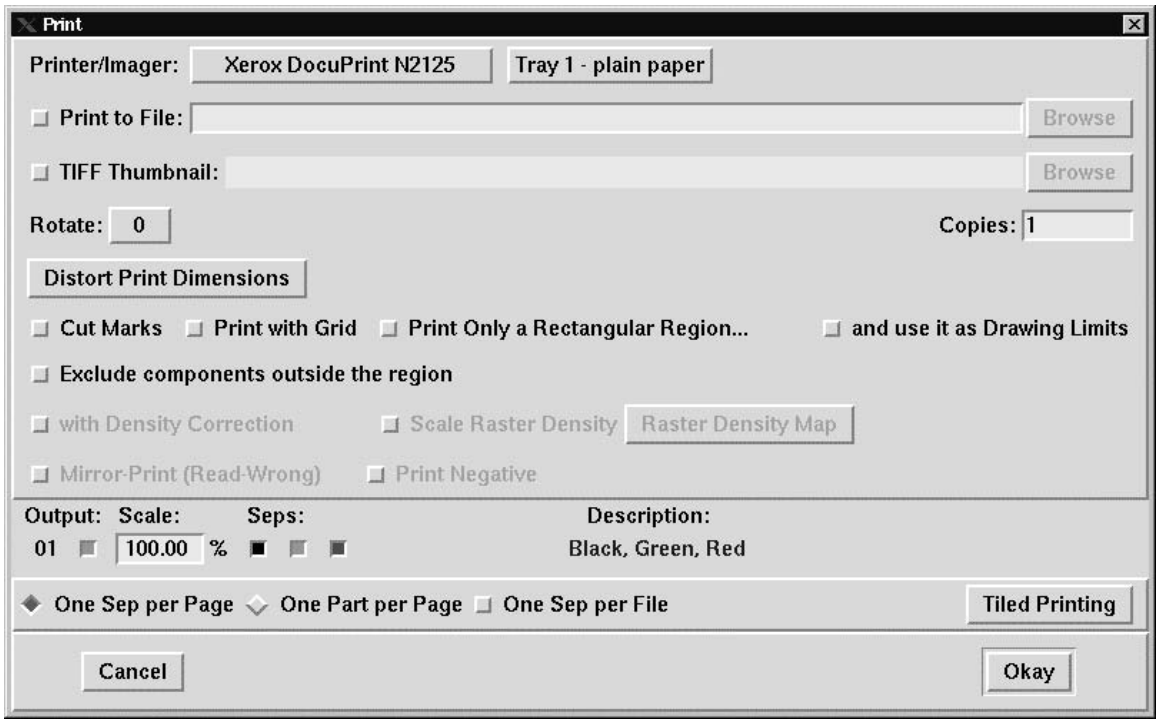


Figure 6-7

Notice that the Parts Output Specifications are shown at the bottom of the print dialog. In our case, Part 1 is defined for output with 2 Separations. The default is to separate automatically. If you want a composite instead, select "One Part per Page" before Okaying.

Step-and-Repeat for Labels

Stepping a label is not the same as copying your job across three or four times on the graphics monitor. It is controlled upon output. Why? Because the label itself is creating a large file, and to copy all of that internal information creates files even larger, so large they cannot be handled.

Instead, we are sending the printer one drawing and asking it to image it several times.

Looking at the Parts output specifications, Figure 6-8, you can see that each separation is calling up a different layer. Layers 4 through 6 are for the "Color Bars" needed at the top of our plate for identification, with Layer 16 being the Trim marks.

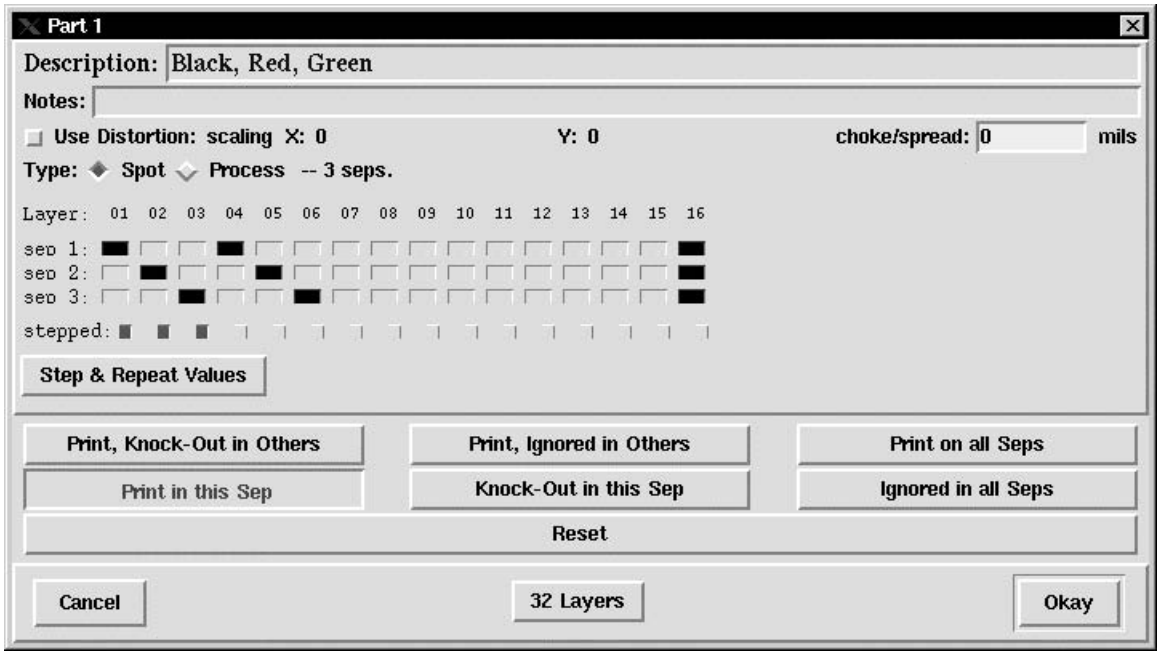


Figure 6-8

Checking Layers is saying to step only Layers 1 through 3. These are the ones we used for the label.

The *H Count* is Horizontal Count including the original. How many across. We want 4 across, including the original.

The *V Count* is Vertical Count including the original. How many up. We want 4 up, including the original. A positive number copies up, a negative number copies down.

The Offset Horizontal and Vertical is the physical dimension of the label width and height. If you need space between labels, add that to the dimension.

Note: Never input 0 for the count, this will cause the file not to print. Always count the original, so when wanting just 1 row or column, input 1.

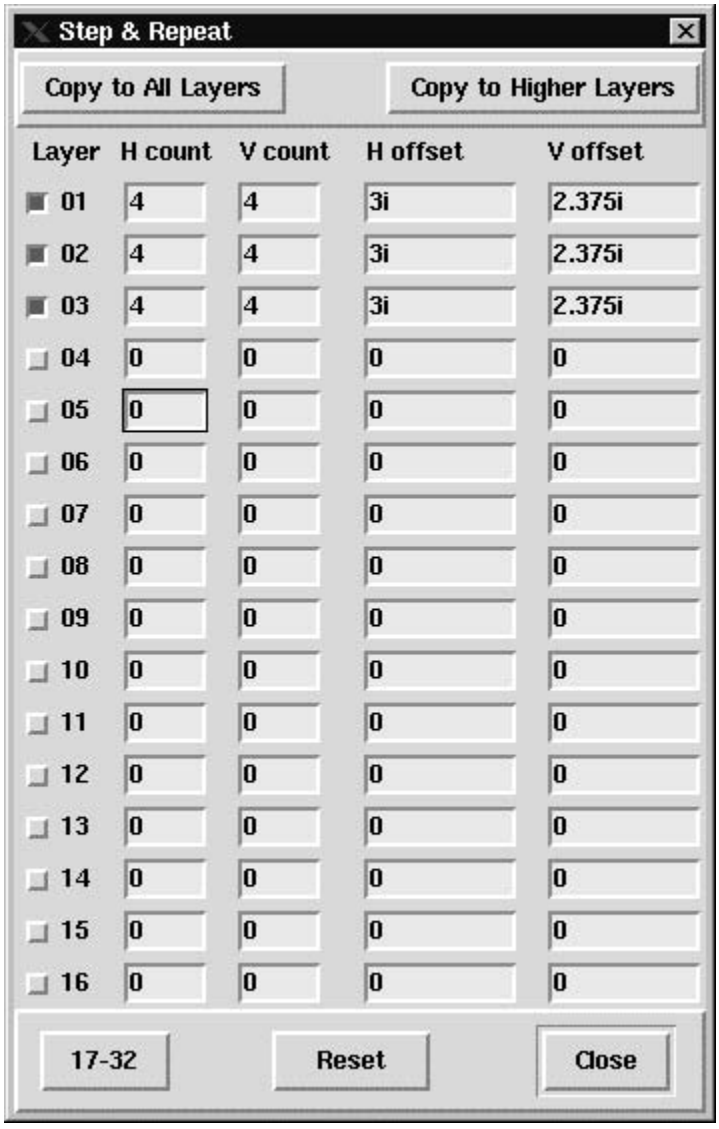


Figure 6-9

Composite of Final Output

Figure 6-10

Chokes and Spreads

During the printing process there are times when two or more colors will come into contact with each other. Requiring perfect registration on a press is not practical and normally impossible. Avoiding registration problems when printing requires the use of what we call "Chokes & Spreads". Whether you are choking or spreading, an image trap is being created. This is the color overlap value measured in mils (1/1000"). Having the colors overlap slightly eases the registration process on the printing press. During most situations you will find that it is the lighter ink color that creates the actual trapping effect.

There are distinct differences between a choke and a spread. A choke is when the hole created by the knockout is smaller than the item that created the knockout. A spread is when the hole created by the knockout is true to size, but the object that sits in the hole is larger. See Figure 6-11 for a visual example.

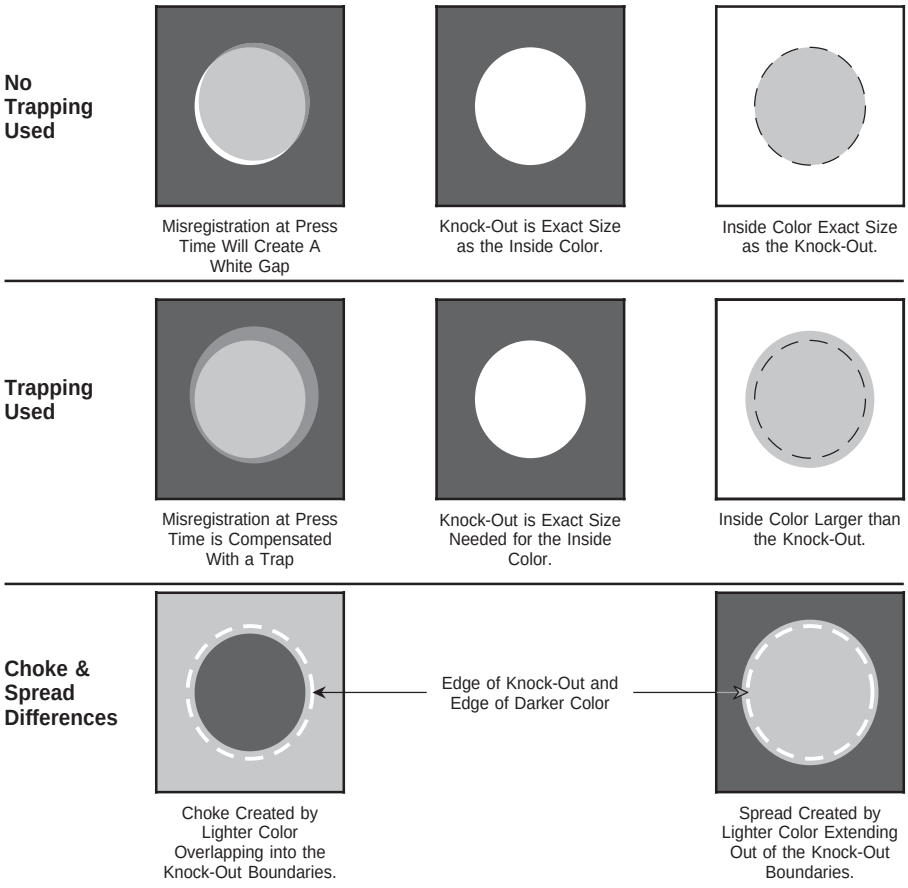


Figure 6-11

Determining Trap Value

The value to use for a trap should be recommended by your pressman, since chokes and spreads vary depending on the inks and presses used. The value for a one-dot choke/spread can be determined by dividing 500 by the screen lineage. The answer will be in mils (1/1000").

Formula: 500/Screen Lineage = Trap Value

Using this formula, to overlap one full dot when outputting 133 line screens, use a 3.75 mil trap.

Methods Used for Trapping

Below are six different methods of creating chokes & spreads on the MECCA system. Each of these methods is effective for handling color-to-color tight registration. The differences are in the types of components used and the complexity of the trap.

A. Manual Trap for Vectors, Vector Chains, Arc/Circles and Splines

B. Manual Trap for Areas - {Create Outlines}

C. Manual Trap for Scanned Images - {Thick/Thin Raster}

D. Manual Trap for Text (Entire Item is Not Trapped) - {Text to Outline}

E. Spec File - Automatic Choke & Spread for Text with a Single Global Value

F. Spec File - Automatic Choke & Spread for Areas with a Single Global Value

Before discussing the usage of these methods of creating a Choke & Spread, you need to know which method best suits your needs. This can be determined by answering the following five questions.

1. What are the proper ink darkness sequences for all colors being used in the file?

2. How will the contacting color effect each other? Do they over-print, knockout or possibly do both?

3. Which color actually creates the trap by spreading?

4. What kind of components are involved in the trapping?

5. Will one trapping value work for the entire file?

The first three questions allow you to determine what needs to be accomplished. The fourth question will help you determine which method is going to be used, according to the component being effected. If you are able to use the Spec File Choke & Spreads, question five will help you determine whether method E or F can be used.

By using a spec file during output you can create most knockouts needed automatically. There are times though that the automatic knockouts and trapping from the spec file will not work for every situation. If this is the case then you may have to manually create the trap yourself. It is possible to combine the usage of a spec file trap with that of a manual trap. When outputting drawings that contain multiple plies, it is required that you use a separate part entry for each ply.

Ink Darkness

Assigning ink darkness values is useful to help you clearly determine which colors need spread to create the trap between two contacting colors. In almost all cases it is the lighter of the two colors that creates the trapping effect by spreading. It is necessary to know the ink darkness order if you wish to have automatic chokes and spreads. The output specification program has to know the relative Ink Darkness to know whether to choke or spread the layer. The proper order of each separation is to use 1 through 8, with the higher number for the darkest color. Each separation is seen as having an increasing darker color. See Figure 6-12.

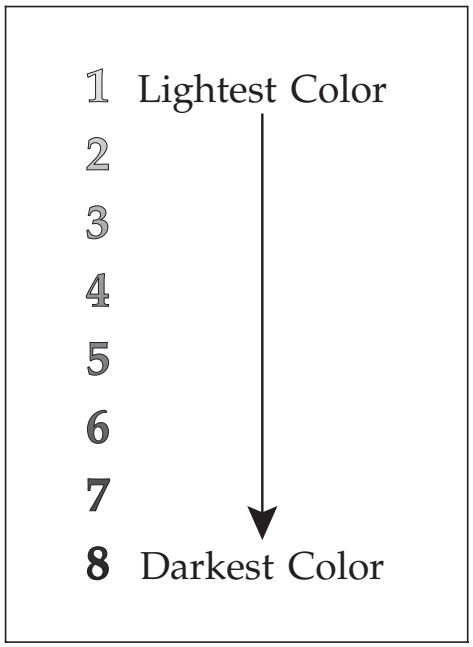


Figure 6-12

For example, let's take the colors red, blue, and black, and for argument's sake let's say that the blue is a pale sky blue, and the red is a saturated bright red. In this example, we would rate blue as the lightest, red as darker, and black, of course, the darkest. Therefore, blue is given a darkness value of 1, red 2, and black 3. If we later added a fourth color, such as yellow, we would change our separations to have yellow 1, blue 2, red 3, and black 4. These numbers are used as the Separation within the Part. Separation 1 must always be the lightest color.

The separations must be kept in a sequential ascending order. If two colors are approximately the same ink darkness, don't fret; go ahead and assign them separations one after the other because in this case it won't matter which color chokes or spreads.

Designating Layers

When designating layers you may find that there are times when one color may need multiple layers. This is true if one particular color needs to knockout as well as over-print another color. If you are manually creating trapping with outlines, you will need two layers for that color. One layer will be used to create the knockout and the other layer will be the manual trap that over-prints.

For spec files, it is also required that the layer colors of your drawing be in the same exact sequence as that of the ink darkness values. Separation 1 must be the lightest color and go in ascending order.

When to Use a Spec File

In a spec file, you may enter into the *Choke/Spread* field a value needed for trapping. This value is in mils (1/1000" increments), 7 mils equal 1/2 point. The value that you enter is considered to be a global value. Meaning that when a choke/spread is applied, the value entered is used on every choke/spread. The ink darkness fields give you the control over which color(s) will do the spreading. In order for the automatic Choke/Spread to take effect, the object that creates the knockout or receives the trap must be 100% totally enclosed within the other object's rectangular width/depth boundaries or you will get unwanted results. If it is not, then the entire boundary of the component will receive the choke and spread instead of just the overlapping segment. See Figure 6-13.

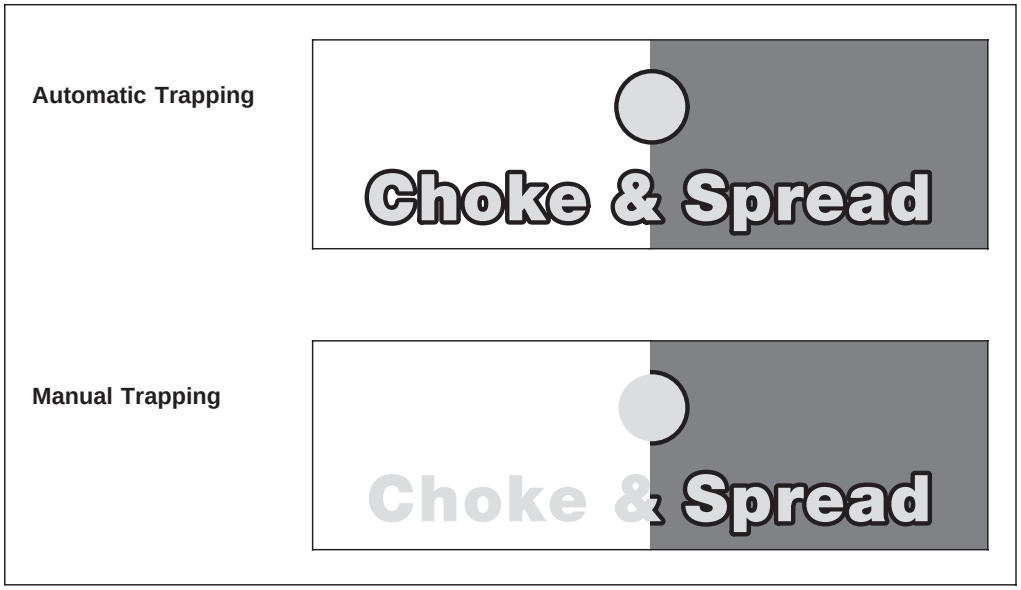


Figure 6-13

Component Limitations

When using the Spec File to create Automatic Chokes & Spreads there are limitations to what type of components you may use. Following is a listing of all of MECCA's elements and how they are treated during output with a spec file that uses automatic knockouts with chokes and spreads.

If the component that needs effected is any one of the following, then you will need to manually trap: Arc/Circle (this includes fillets) Box Edge or Corner, Border, Pantograph, Raster, Spline (Cubic or Bezier), Vector or Vector Chain.

If the component is Text, Area, Bar Code, or Box Insides and/or Odd/Even Bars, then a spec file's automatic choke/spread value can be applied.

This does not mean that you can't use the spec file for knockouts. All components knockout. So it would still be beneficial to knockout with the spec file while using a manual outline as the trap.

Manual Trapping

There are certain items or conditions that a Parts Specification Choke Value will not work. In those situations trapping must be done manually.

Vectors, Vector Chains, Arc/Circles, and Splines

Since a Parts Specification Choke Value will not choke or spread any of these objects automatically, you must manually create the trap yourself. This is done by copying the object(s) to the knockout layer and making its color white. You will have a white object directly underneath of the printing object. If the printing object needs to spread, change its line weight to be larger by two times the spread amount. (For example if the starting line weight is 5 points and your trap needs to be 1/2 point, change the line weight to be 6 points.) Leave the white object used as the knockout at a 5-point line weight. This will create a 1/2-point trap on all sides of the object. See Figure 6-14.

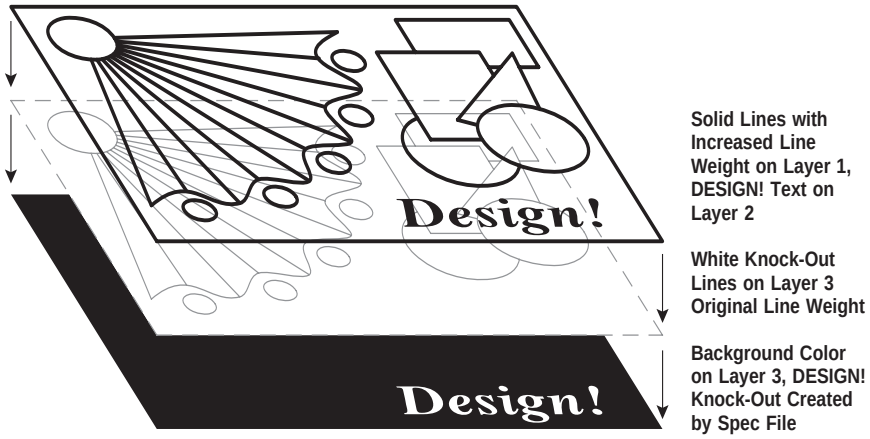


Figure 6-14

In your Parts spec the printing line must be set to ignore (over-print) the underlying color. This may require that you use two layers for the color of the printing line. One layer is needed if this color must create an automatic knockout somewhere else. Another layer is needed for the over-printing line used to create the manual trap.

If the printing line is to choke, then the line weight of the white line needs to be changed. Instead of increasing the line weight, simply reduce the line weight by 2 times the trap amount. The Parts spec and layering procedures are the same as that of a spread.

Area Components

Generally, most Areas will have no problems with traps created through a Parts Specification Choke Value. The most common problem arises when only a portion of the area overlaps onto another color. The trapping would only be needed at the point of overlap, not around the entire area. See Figure 6-13. This can be accomplished by using **[Area]'s {Get Outlines}.** This function will create a printing rule around the area's edges. The line weight used should be twice that of the trap required. See Figure 6-15.

Figure 6-15

You may need to remove a portion of the outline that is not needed. To do this you may have to {Break Spline} the outline to cut the path where needed. You will be required to use two layers for this color. One layer is needed for the area itself to do the knockout. The second layer is for the remaining piece of the path that creates the trap by over-printing. Your Parts spec will require that the areas layer use a knockout. In the same separation the other layer will be designated to ignore (over-print) the underlying color. These are the same procedures described in *"Manual Trapping - Vectors"*. See Figure 6-14.

Scanned Images

Creating traps for scanned images can be accomplished by using [Raster] {Thick/Thin Raster}. Raster images will not automatically trap through the use of a Parts Specification Choke Value. They will however, create a knockout if needed.

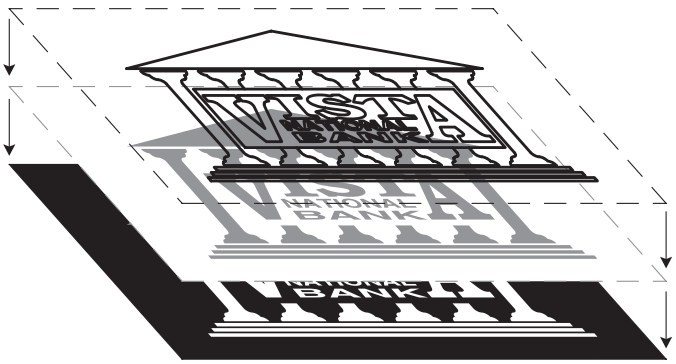
Using {Thick/Thin Raster}

To use {Thick/Thin Raster} you need to copy the scanned image to the knockout layer and make its color white. You will have a white scan directly underneath of the printing scan. Use {Thick/Thin Raster} to enlarge/spread the printing image or reduce/choke the white knockout image by the amount of trap needed. The {Thicker} option will enlarge and the {Thinner} will reduce the scan by a set number of pixels. Trapping is input in 1/1000" increments (mils), 14 mils equal 1 point. To convert a set number of pixels into a useful measurement, use the following formula:

```
ERes/100 x 1.5 = X
```

```
(X is the number of pixels that equal 1 point)
```

As an example, if you have a 900 dpi scan, 13.5 pixels equal 1 point. If the trap desired were 1/2 point, then 6.75 pixels (half of 13.5) would be the number of pixels that equal 1/2 point. The {Thick/Thin Raster} option only accepts whole numbers so you must round off the 6.75 to 7 pixels. This would either enlarge or reduce the edges of your scan by 1/2 point. See Figure 6-16.



Raster Trace Outlines with Increased Line Weight on Layer 1.

Raster Image on Layer 2, Knock-Out Created by Spec File.

Background Color on Layer 3, Raster Knock-Out Created by Spec File.

Figure 6-16

When using {Thick/Thin Raster} your Parts spec will have the printing scan set to ignore (over-print) the underlying color. This may require that you use two layers for the color of the printing scan. One layer is needed if this color must create an automatic knockout somewhere else. Another layer is needed for the over-printing scan used to create the manual trap.

Text Components

Text items can be trapped in a variety of different methods: either by the Parts automatic Choke/Spread entry, or manually adding the text outlines. Occasionally, text may not physically be completely enclosed in another objects boundary but visually appear to be. This may cause unwanted Choke/Spread results on the output. To resolve this you can manually add a trap to the text or the background that it sits upon.

INTENTIONALLY LEFT BLANK

Chapter 7: NEdit Text Editor

This chapter is dedicated to the NEdit text editor, which is available for FreeBSD Systems.

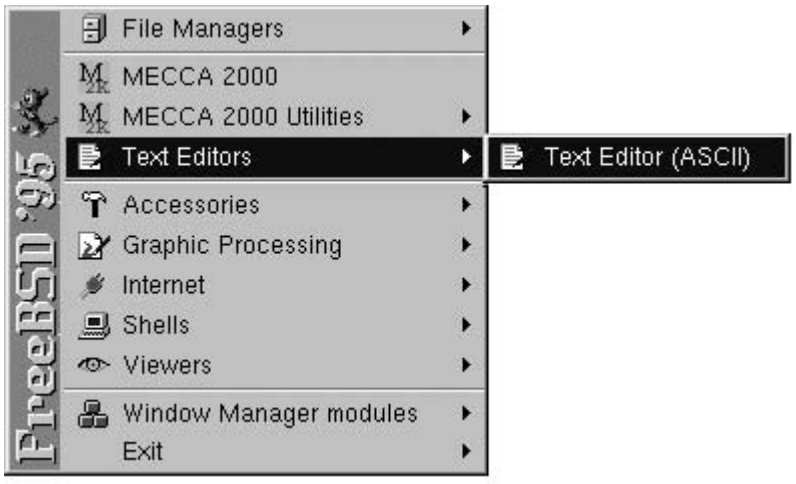
NEdit is a GUI (Graphical User Interface) style text editor for programs and plain-text files. NEdit provides the entire standard menu, dialog, editing, and mouse support, as well as all of the standard shortcuts to which the users of modern PC based environments are accustomed.

NEdit is free software that is the product of Fermi National Accelerator Laboratory, operated by Universities Research Association, Inc., under contract DE-AC02-76CH03000 with the U.S. Department of Energy.

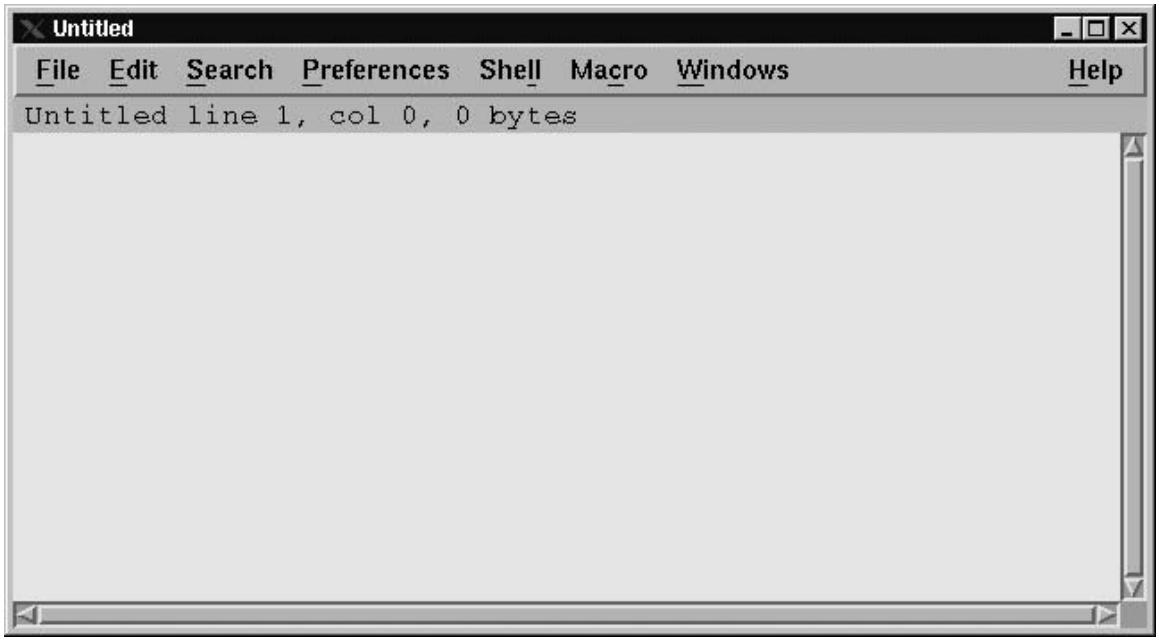
You can view the 5.0 version of NEdit documentation by starting **Netscape** and going to **http://localhost/M2KDOC.**

Starting NEdit

You can start NEdit by typing **nedit** from a command line within "Xterm" or by selecting **{Text Editor}** from the **[Start]** menu.



NEdit will open a window named "Untitled". You can create a new file by typing into this window and choosing {Save} or {Save As...} from the [File] menu. There is no "main window" in NEdit, all editor windows are equivalent, and NEdit remains running as long as at least one window is open.



Insert Text or Overtype Text

There are two data entry modes **Inserting Text** and **Overtyping Text.** When typing text with **NEdit** the default is **Inserting Text.** This mode will push existing text to the right as data is being entered. Toggling on **{Overtype}** will replace existing characters as data is being entered.

There is no way to change the default, but you can easily switch between the two by using the shortcut keys [Ctrl]+B. You can also change modes by selecting **[Preferences], {Overtype}.**

NOTE: [Ctrl-B] is a shortcut. When using shortcut keys be sure that [Num-Lock] and [Cap-Lock] keys are not in use.

Selecting Text

NEdit has two general types of selections, **Highlighted text,** and **Underlined text.** Selections can cover either a simple range of text between two points in the file, or they can cover a rectangular area of the file.

Highlight Selecting

To select text for copying, deleting, or replacing, press the left mouse button with the pointer at one end of the text you want to select, and drag it to the other end. The text will become highlighted. After releasing the mouse button, you can still adjust a selection by holding down the **[Shift]** key and dragging on either end of the selection.

Copy & Paste: To do a simple **Copy & Paste,** highlight the text to be copied then do a **[Ctrl-c].** Move cursor to where you want text to be placed and do a **[Ctrl-v].**

Cut & Paste: To do a simple **Cut & Paste,** highlight the text to be moved then do a **[Ctrl-x].** Move cursor to where you want text to be placed and do a **[Ctrl-v].**

Deleting Text Blocks: To delete a text block, highlight the text to be deleted and press the **[Delete]** or **[Backspace]** key.

Moving Text: To move text items, highlight text to be moved. Click the **middle mouse button** and drag to new location then release.

Underline Selecting

The **middle mouse button** can be used to make an **Underlined** additional selection. As soon as the button is released, the contents of this selection will be copied to your current cursor position.

NOTE: See the NEdit documentation for complete details of the middle mouse button.

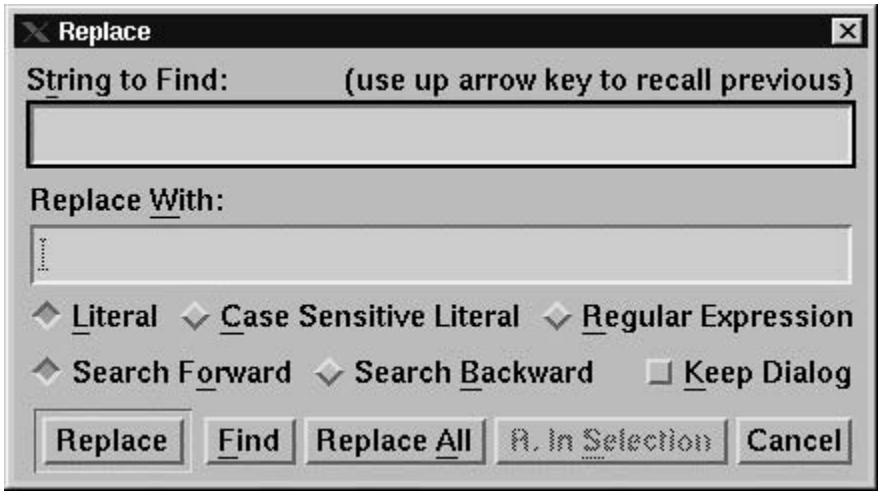
Rectangular Selecting

To select a rectangle or column of text, hold down the **[Ctrl]** key while dragging the mouse. Rectangular selections can be used in any context that normal selections can be used, including cutting and pasting, filling, shifting, dragging, and searching. Operations on rectangular selections automatically fill in tabs and spaces to maintain alignment of text within and to the right of the selection.

Finding and Replacing Text

The **[Search]** menu contains a number of commands for finding and replacing text.

NOTE: If you are finding or replacing text with a \ (backslash), ^ (caret), ~ (tilde), blank space (space-bar), < > (greater-than, less-than) characters, you must use the {Literal} option. Only use the regular expression option if you are replacing returns or tabs.



The **{Find...}** and **{Replace...}** commands present dialogs for entering text for searching and replacing. These dialogs also allow you to choose whether you want the search to be sensitive to upper and lower case, or whether to use the standard Unix pattern matching characters (regular expressions). Searches begin at the current cursor position.

{Find Again} and **{Replace Again}** repeat the last find or replace command without prompting for search strings. To selectively replace text, use the two commands in combination: Find Again, then Replace Again if the highlighted string should be replaced, or Find Again to go to the next string.

{Find Selection} searches for the text contained in the current **Highlighted Selection.** The selected text does not have to be in the current editor window, it may even be in another program. For example, if the word dog appears somewhere in a window on your screen, and you want to find it in the file you are editing, select the word dog by dragging the mouse across it, switch to your NEdit window and choose Find Selection from the Search menu.

Replacing Returns or Tabs

Putting the batch command at the end of lines: search for \n (this is a return), replace with \\nl^\n (this is the batch command with return). Be sure to check regular expression before replacing.

Replacing tabs with spaces: search for \t (this is a tab), replace with number of spaces. Be sure to check regular expression before replacing.

Selective Replacement

To replace only some occurrences of a string within a file, choose **{Replace...}** from the **[Search]** menu, enter the string to search for and the string to substitute, and finish by pressing the **[Find]** button. When the first occurrence is highlighted, use either **[Replace Again]/[Ctrl-T]** to replace it, or **[Find Again]/[Ctrl-G]** to move to the next occurrence without replacing it, and continue in such a manner through all occurrences of interest.

To replace all occurrences of a string within some range of text, select the range, choose **{Replace...}** from the **[Search]** menu, type the string to search for and the string to substitute, and press the **[R. in Selection]** button in the dialog box.

NOTE: That selecting [Replace] in the dialog box will unselect the text in the window.

NOTE: If you have a file that contains control characters that need to be stripped out, you will need to run "epsprep" from a $-prompt prior to editing.

Example: epsprep <filename >newfilename

Setting Up Custom Defaults

On your first initial use of **NEdit** there are two **default** preferences that you may want to set permanently.

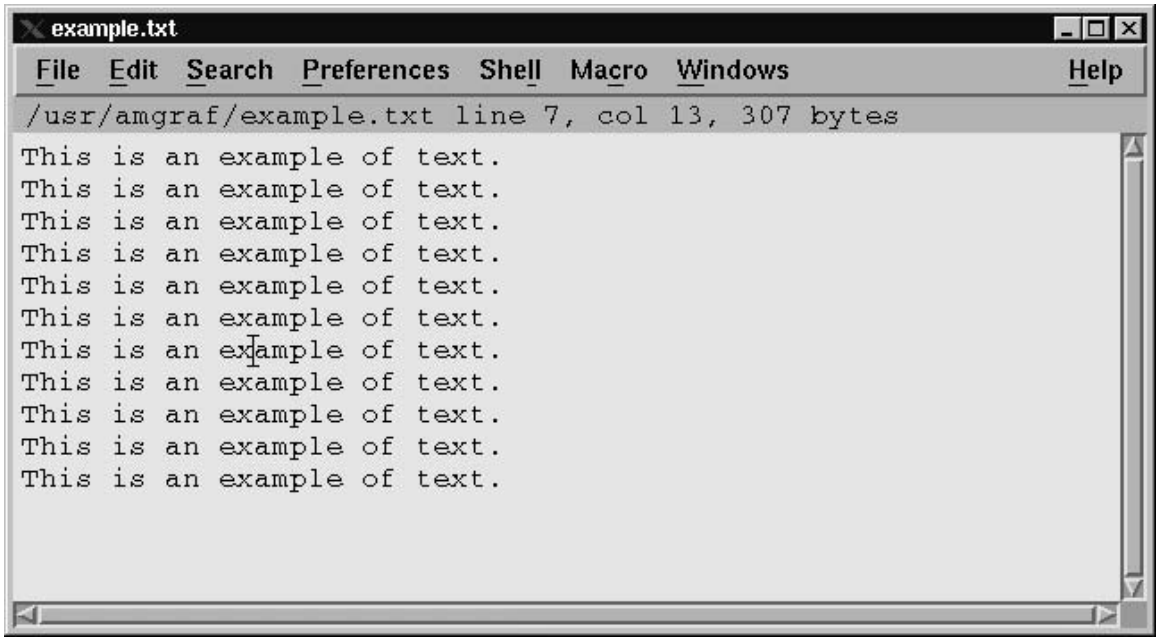
Statistics Line, Word Wrap

These settings are located under the **[Preferences]** button under **{Default Settings}** on your tool-bar.

Statistics Line

When **NEdit** is first invoked there is no line number or character position number showing, this is represented by the **{Statistics Line}.** The {Statistics Line} will show the full file name, line number, and length of the file being edited.

To turn on your Statistics Line go to **[Preferences], {Default Settings},** and select **{Statistics Line}.** This will put a grey line at the top of your window area containing your file information. Then be sure to **{Save Defaults}** to get the permanent setting.



You can easily turn this line on or off within each editing session by selecting the {Statistics Line} option just under the [Preferences] button.

Word Wrap

Word wrap is a feature that automatically supplies a carriage return before the next word is entered after the ruler bell margin setting. This feature allows inputting of text without having to watch the screen.

When the editor is invoked the file is opened and the editor is ready for input. Defaults are left margin at Column 0, word wrap margin (or bell margin) is indefinite.

To permanently set up a "Word Wrap Margin", go to **[Preferences], {Default Settings}, {Wrap}.** Select **{Wrap Margin}.** This will bring up the following dialog box.

There are two options under **{Wrap Margin}. {Wrap and Fill at width of window}** or **{Margin for Wrap and Fill}.** With the first option text will "Word Wrap" when it comes to the edge of your current window size. With the second option you can specify an exact character position for the text to wrap at by typing in that position number in the area provided.

Once you have made your selections choose **[Preferences], {Save Defaults}.** This will permanently save your selections. To see your changes take effect you must exit **NEdit** and then restart **NEdit.** Now when the **NEdit** editor is invoked the "Word Wrap" will be set.

To temporarily change the "Word Wrap Margin" per editing session, go to **[Preferences]** and select the **{Wrap}** option located on the primary menu. The same menus will pop-up as before. Once your selections have been made you will see them take effect immediately, but only in the current file.

Ispell Program for Spell Checking

NEdit utilizes the "ispell" program. This program is located under **[Shell]** on the toolbar.

ispell will display each word, which does not appear in the dictionary at the top of the screen and allow you to change it. If there are "near misses" in the dictionary (words which differ by only a single letter, a missing or extra letter, a pair of transposed letters, or a missing space or hyphen), then they are also displayed on following lines. As well as "near misses", ispell may display other guesses at ways to make the word from a known root. You have the option of replacing the word completely, or choosing one of the suggested words.

When a possible spelling error occurs the ispell window will appear showing the possible error highlighted. At this point you have the following options [SP], {number}, R)epl, A)ccept, I)nsert, L)ookup, U)ncap, Q)uit, e(X)it, or ?(help).

[SP] spacebar: Pressing the [Spacebar] will cause the speller to accept the word this time only and go to next.

number: Means to replace with one of the suggested words. If there is more than one possible correction for the misspelled word they will show up in a numbered list. Type in the number of the correction you want then press [Enter].

R)epl: If the speller doesn't give you a possible correction, or if none of the suggestions are correct, then you can type in your own. Press the [R] key and you will be prompted "Replace with:". At the prompt type in your correction, then press [Enter].

A)ccept: Means to accept the word for the rest of this check spell session. It doesn't however add it to the dictionary.

I)nsert: Accepts the word, capitalizes it as it is in the file and updates the private dictionary. This is *ispell_english* found in your home directory.

U)ncap: Accept the word, will add an uncapitalized (actually, all lower-case) version to the private dictionary. This is *ispell_english* found in your home directory.

L)ookup: This option looks up words in the system dictionary.

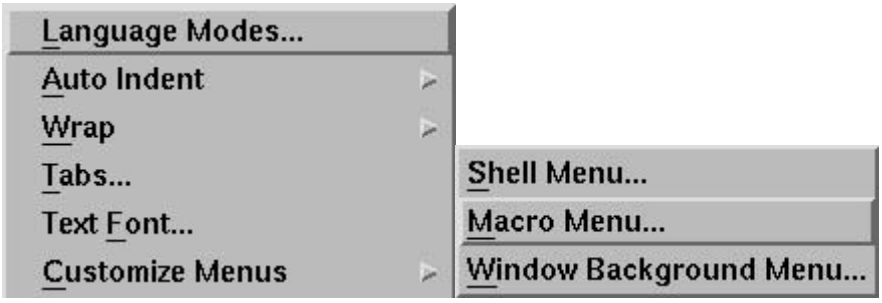
eXit: Typing X will save changes made and exit the file.

Quit: Will quit out of the file without saving changes.

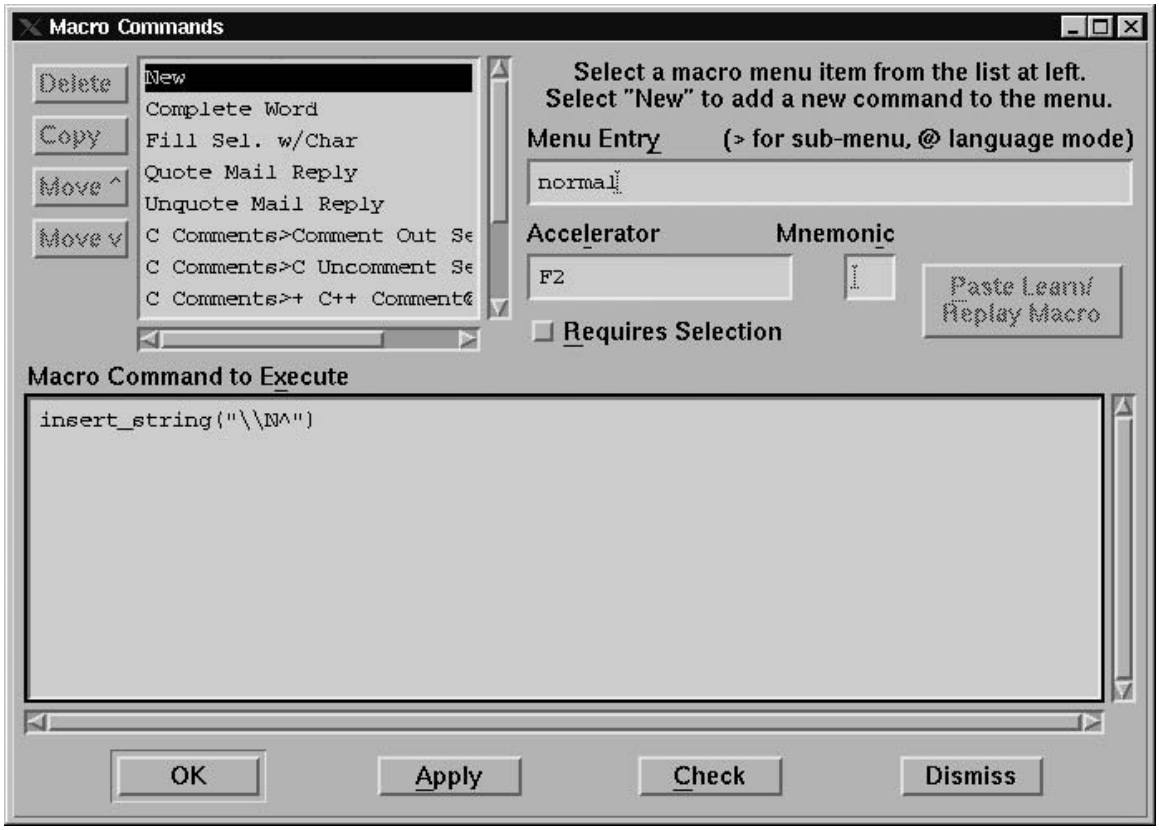
Programmable Shortcut Keys

User programmable shortcut keys are available with this editor. This feature will allow any key sequence to be defined by the user.

To create your own shortcut keys go to **[Preferences], {Default Settings}, {Customize Menus}, {Macro Menu}.**



This will bring up the following dialog box. The list box on the left contain previously set shortcut keys. You can either modify one of these or create a new one by selecting **New.**



Select **New** then under the **Menu Entry** area type in the related name of your shortcut (i.e. Normal). This will then be added to the list at the left. Under the **Accelerator** area enter the key sequence you wish to use (i.e. F2). Now, under **Macro Command to Execute** type in **insert_string("\\N^").** This is the command you wish to be inserted when you press the **F2** key.

NOTE: The insertable entry must be inside the double quotes, and inside the parenthesis. Also if the insertable entry is a command it must include two \ (backslashes).

To permanently keep your customized shortcut keys be sure to **{Save Defaults}.**

Delete Key

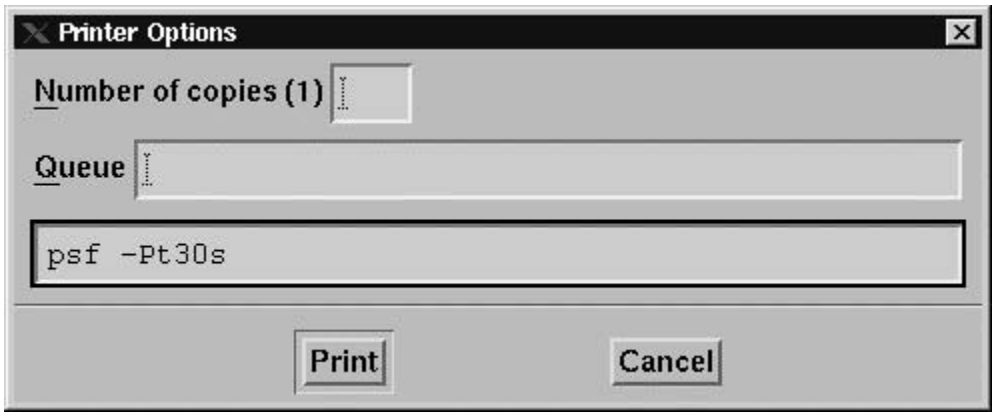
The default for the **[Delete Key]** is to act as a backspace. Erasing characters to its left. In order to have it delete characters to the right you must edit the **NEdit** file located in */usr/X11R6/lib/X11/app-defaults.*

At the bottom of this file add the following by typing ***remapDeleteKey: False.**

Save the file and exit **NEdit.** When **NEdit** is restarted the delete key will now delete characters to the right.

Printing From NEdit

NEdit's {Print} option will give you a "Raw Text" prinout. It will look exactly like it does on your text editor screen. To get this printout, select **[File], {Print}.** This will bring up the following dialog box. Type in **psf -P(que name)** then select the **[Print]** button.



Chapter 8: Security Document Composition

Security documents are special because of their function in representing negotiable value, legal ownership, and official status. Because of their value, the printed document is subject to counterfeiting and tampering. The MECCA 2000 System allows very complex composition and has a wide variety of security design features that can be incorporated into your artwork. The use of fine-line relief printing, superimposing hidden messages, original fine-line detailed borders, unique geometrical designs, spot color blending, and also micro-text create an effective counterfeiting deterrent when used in conjunction with specialty papers, inks and other treatments.

Graphical effects can be used to add security to almost any document. Unlike special papers, coatings and inks, graphical effects in general do not add to the overall production cost of a document. Given two documents that have the same value, a forger will most likely try to counterfeit the one with the least number of security features. In many cases, just adding a few of the graphic effects listed below will protect a document. All of the following counterfeiting deterrents can be created on MECCA 2000 Systems.

Prismatic Colored Backgrounds

Phantom Images and Logos

Void Pantographs

Fine-Line Relief of Logos

Printed Warning Bands

Subtle Monochrome and Color Graduations

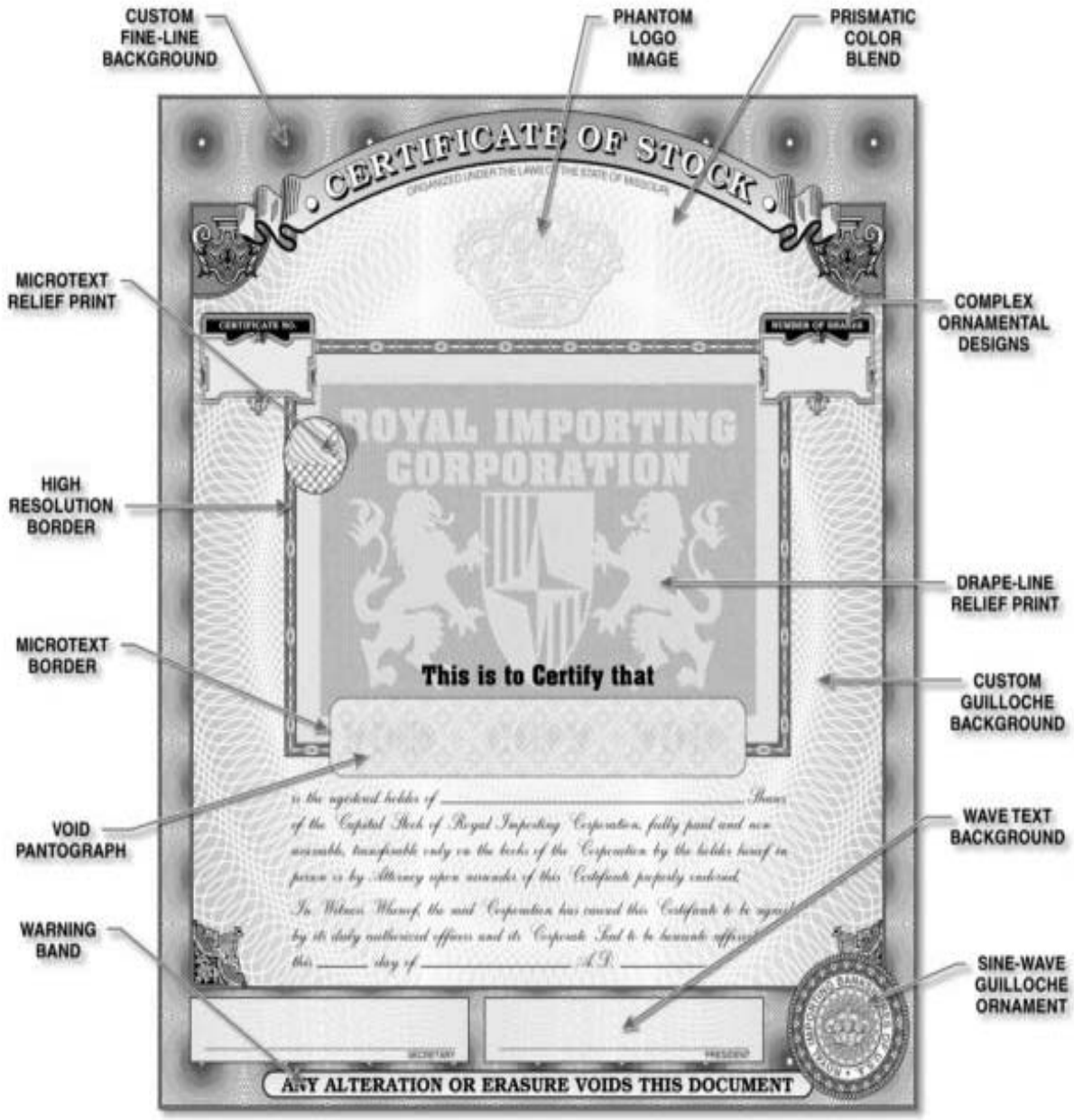
Color Radial Graduations

Micro-Text

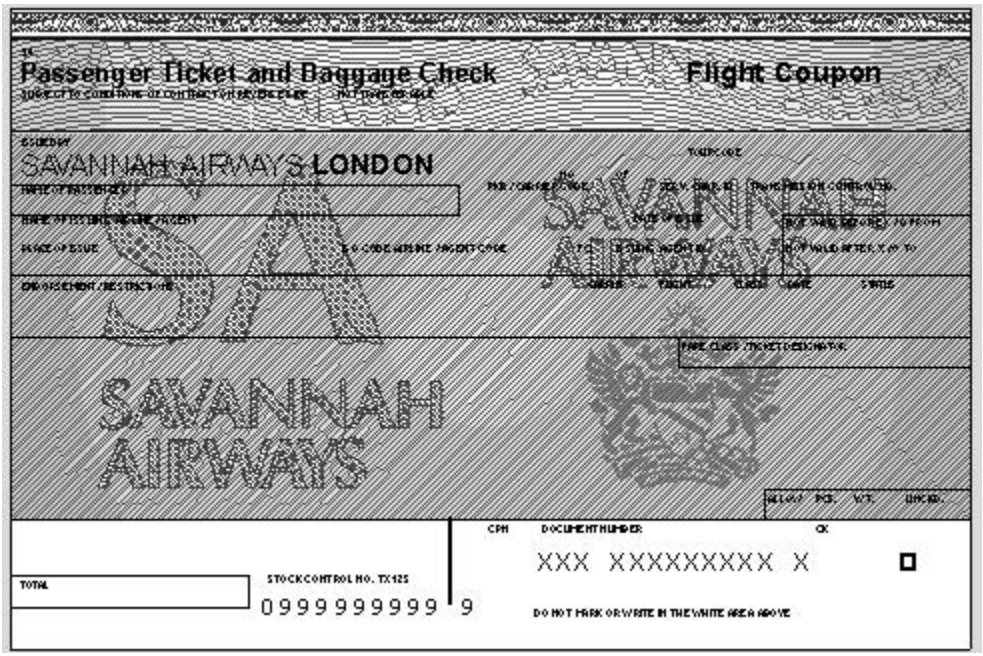
Unique Fine-Line Borders and Pantographs

Moiré Patterns

MECCA 2000 Security Features



The most effective copy-resistant graphical techniques are fine-line reliefs, micro-text, and simulated watermarks which can only be seen by holding the original document at an angle to the light.



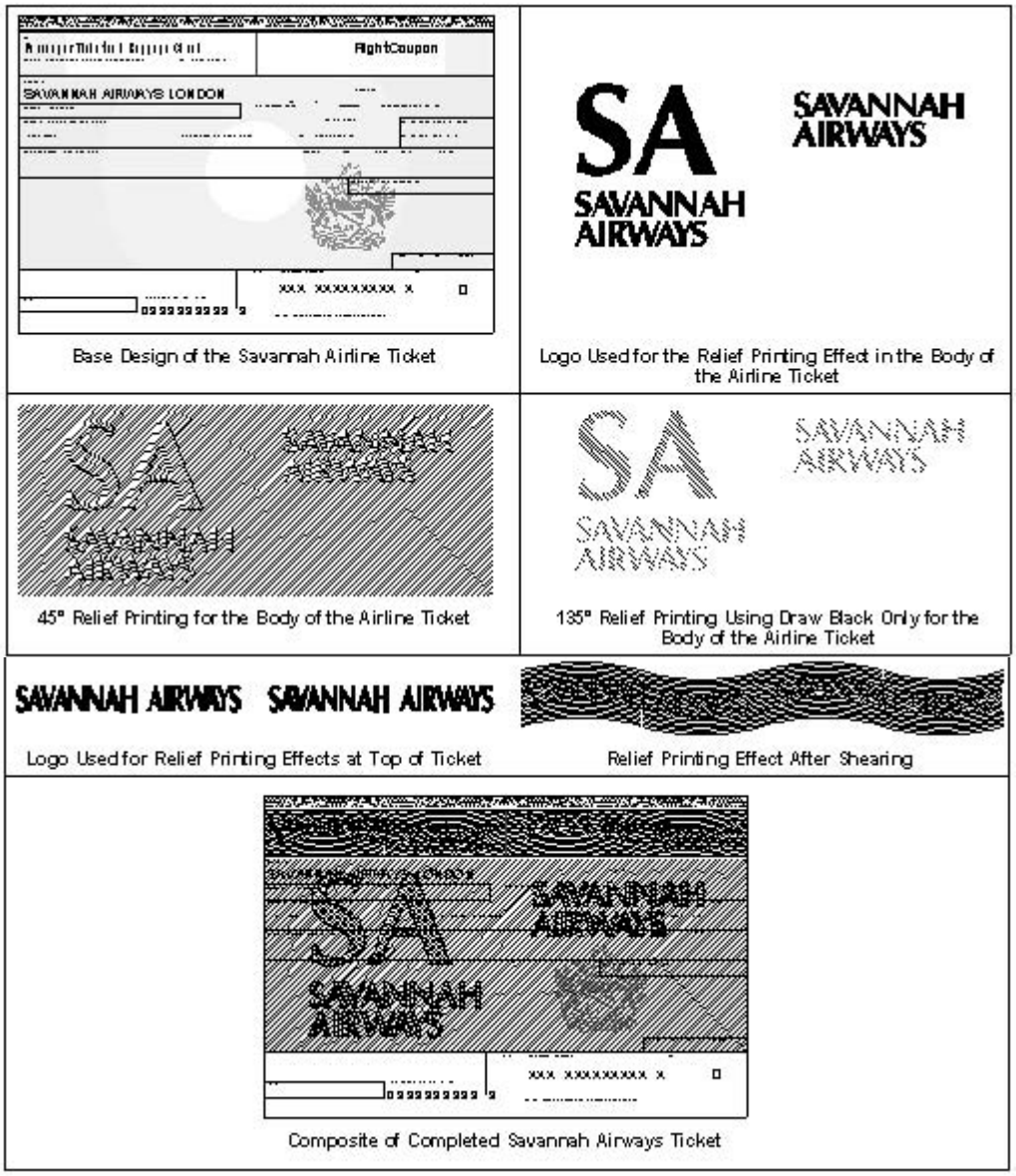
The creator of a secure document should use as many graphical security features as possible to produce a verifiable document which is difficult to forge and resistant to photocopying. Complex graphics and colors, along with fine-line lacy borders and pantographs are difficult to forge. The warning band also makes it clear to the forger that the producer of the document is committed to fighting fraud. Graphical features which are verifiable and easily created are micro-text, hidden messages and images, unique details, and subtle coloring.

Color copiers make it easy to replicate any document, however, they do have limits in resolution and color gamut. By understanding these limitations, documents can be graphically protected. Phantoms, void pantographs, and lacy borders and backgrounds are effective if used with other color blending features because the copier can be adjusted to render fine detail with over-saturated bright colors, or adjusted to render the subtle color with some loss of fine detail.

Individual Components Used in Airline Ticket

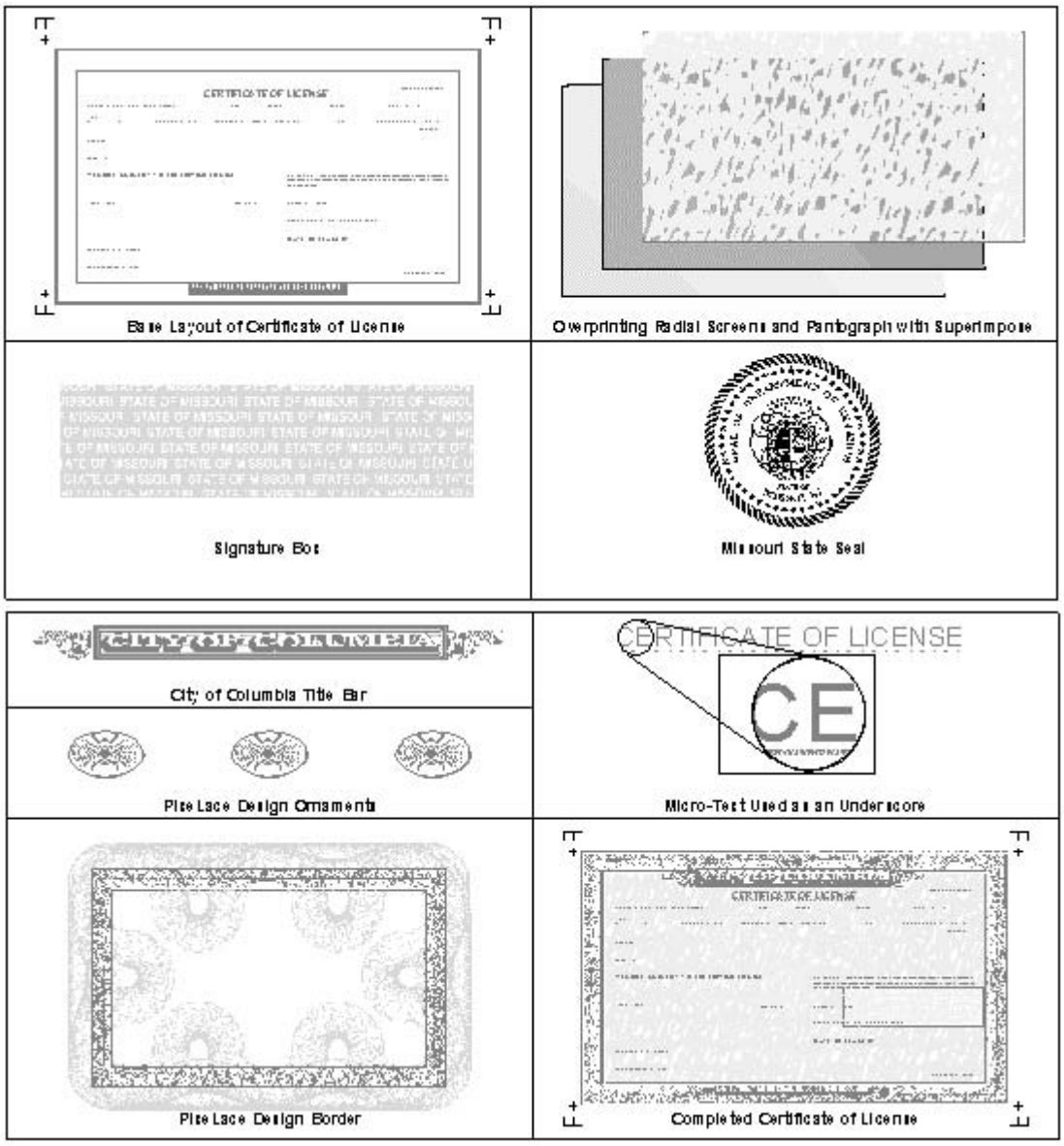
The basic composition techniques are shown in this diagram. The ticket uses radial graduation behind fine-line relief printing as a deterrent to counterfeiting. The light color shades of blues and reds become hard to copy and still pick up the fine-line detail.

The logo of Savanah Airways has been scanned so relief printing can be applied not only on the base of the ticket but also as a banner.



Individual Components Used in a Certificate

The certificate below utilizes the Micro-Text feature, prismatic colored background, hidden words, warning band, ornamental designs, and multiple fine-line borders. The basic composition techniques are shown in this diagram.

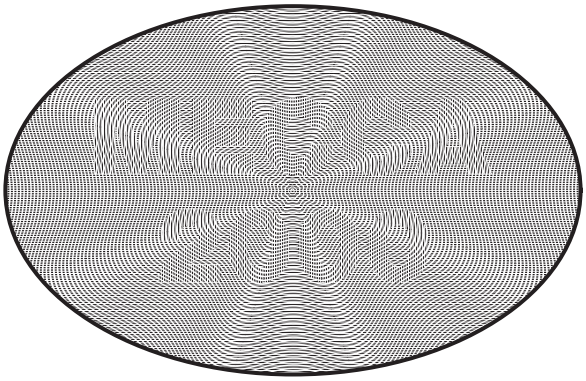


Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

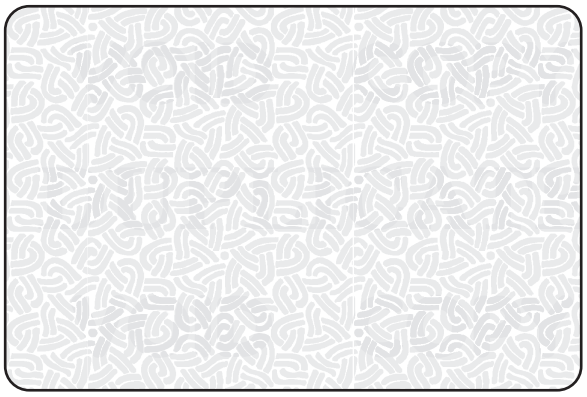
Void Pantographs and Hidden Images

The inclusion of hidden messages and void pantographs is an effective tool against document counterfeiting. By creating a custom hidden message or void statement makes the reproduction process difficult. Some techniques require a licensing agreement between the manufacturer and the respective patent holder.

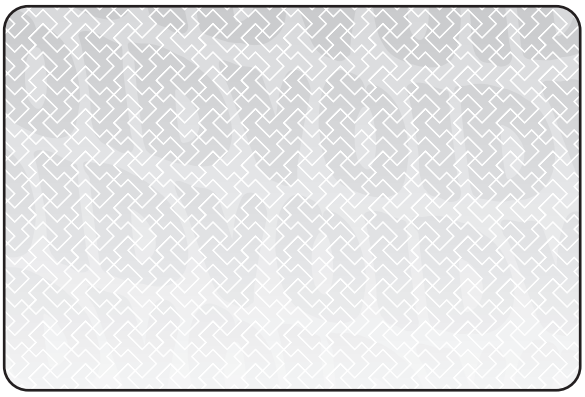


Hidden Latent Image within Background

Pantograph Dot/Dot Void Images

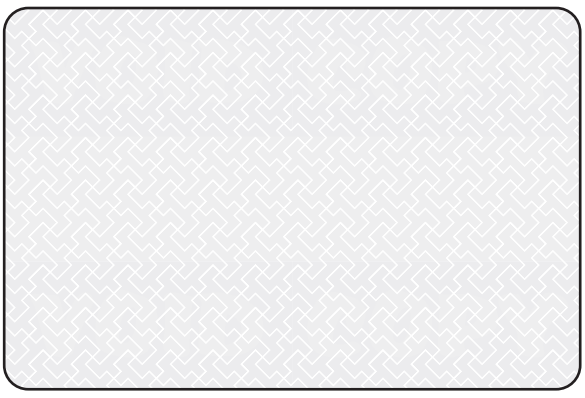


Pantograph Dot/Line Void Images



Standard Register CopyBan+ Void

Flat Line Screen Void



Pantograph Varying Line Screen Void

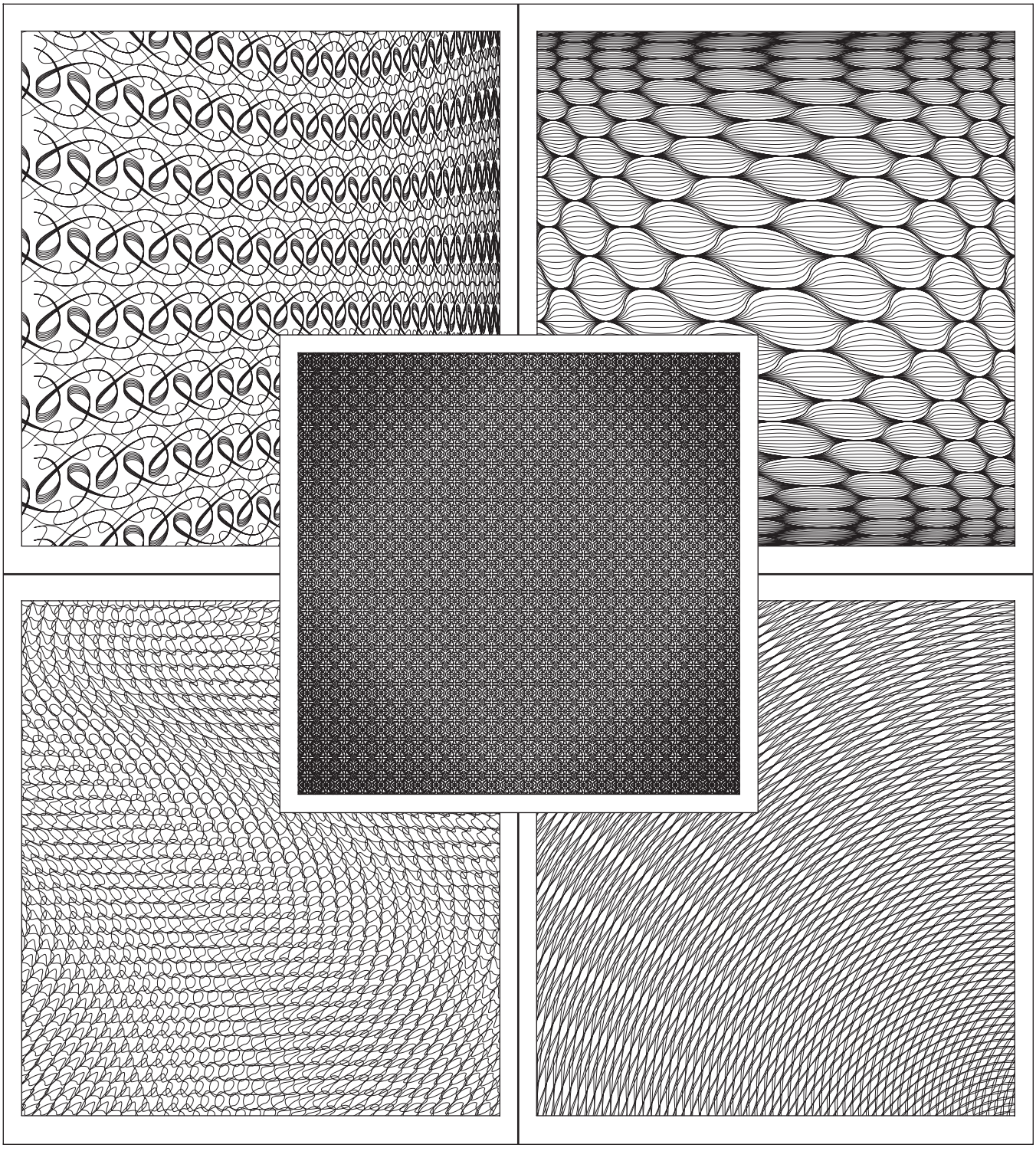
Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

MECCA 2000
INTEGRATED ELECTRONIC PUBLISHING SYSTEM

Guilloche Background Patterns

Guilloche patterns are created as a series of intricately designed lines that create highly complex security backgrounds. Because of their non-repeating nature, these backgrounds are a highly secure method to foil attempts to cut-and-paste sections and are difficult to reproduce during photocopying.

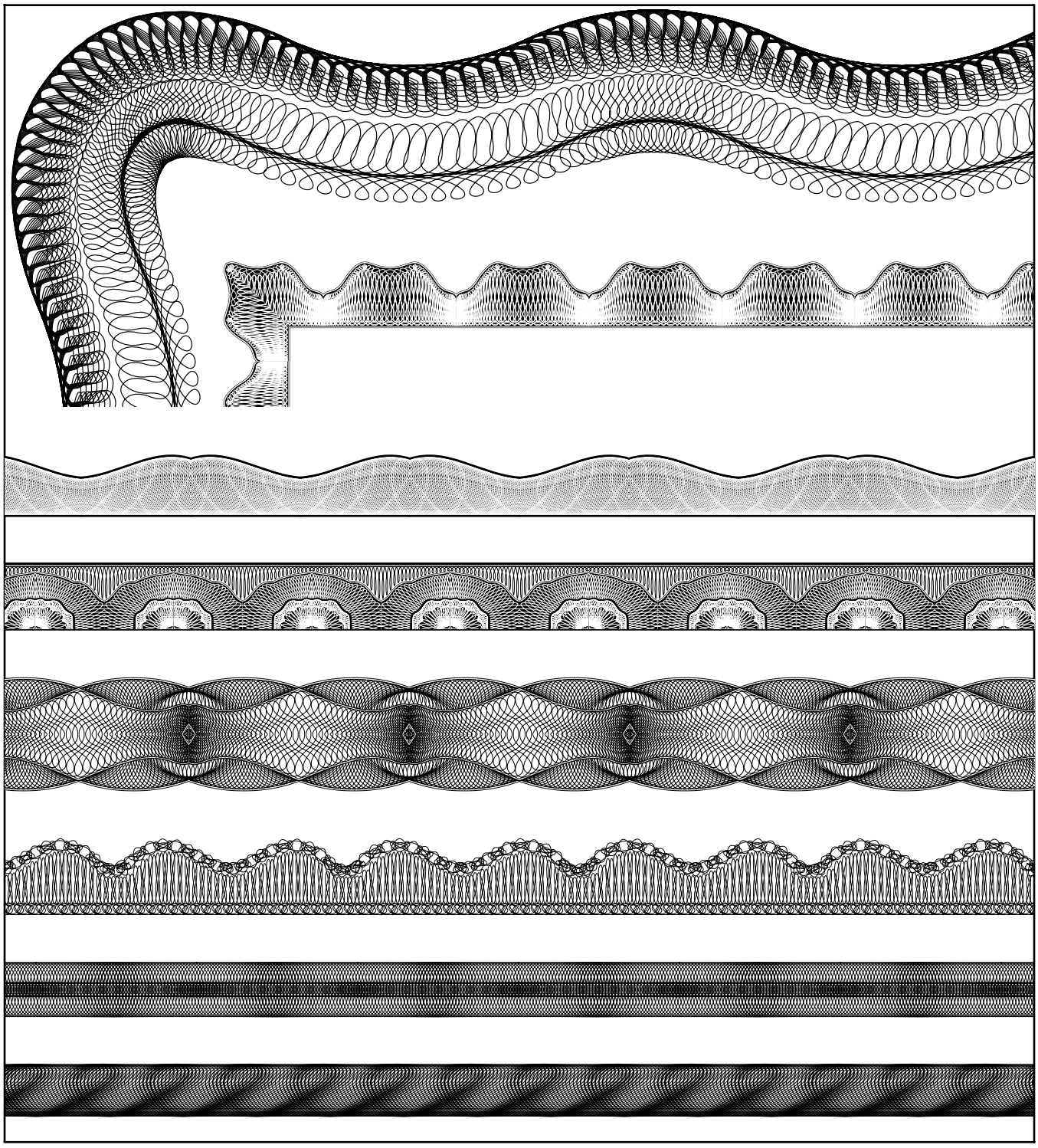


Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Custom Border Designs

The creation of custom fine line lacey borders is easily accomplished through the use of Mecca 2000's powerful security design and masking features. Custom one of a kind designs can quickly be created with the sine-wave pattern function and and further enhanced with the logarithmic move feature.

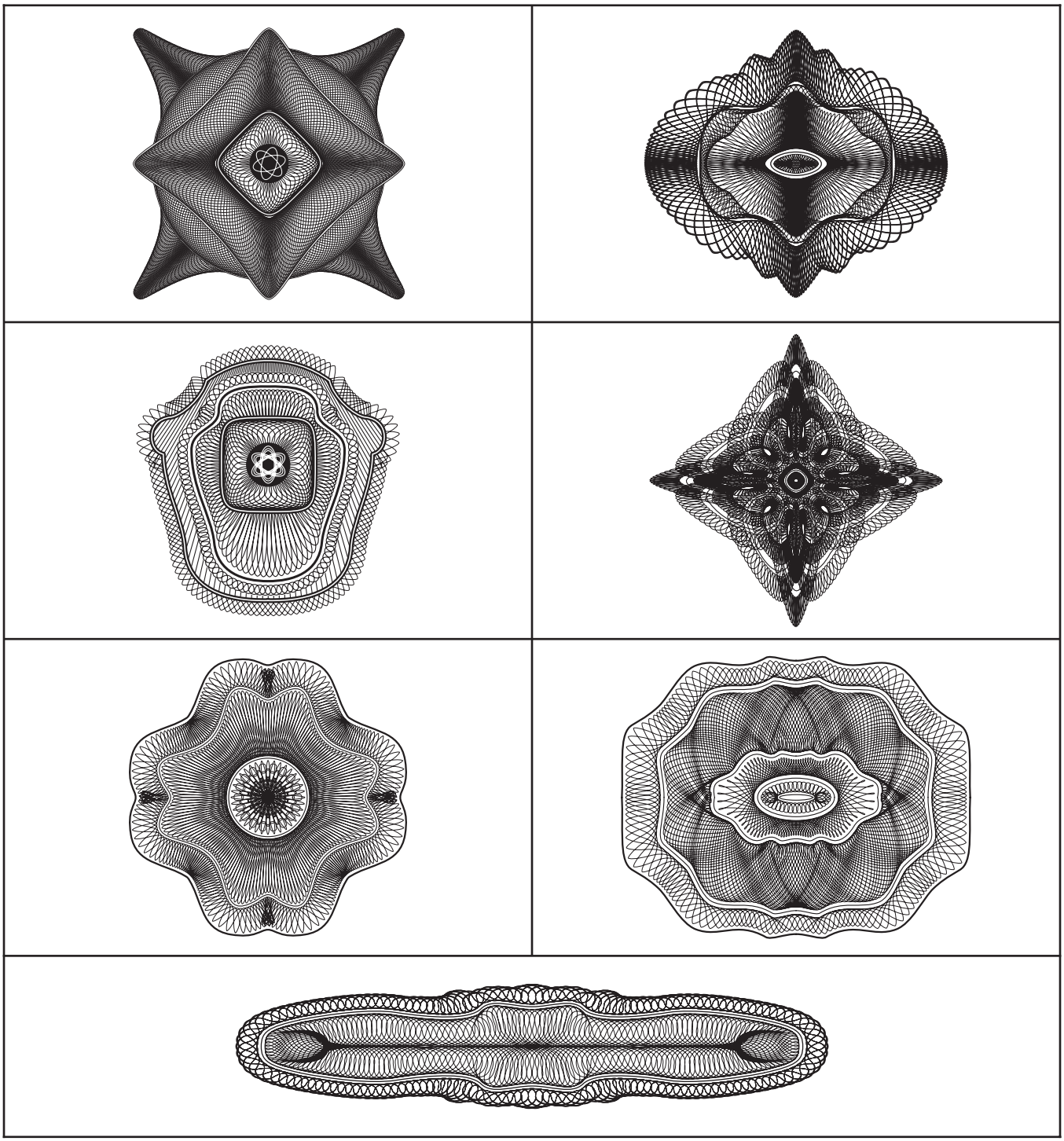


Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Sine-Wave Guilloche Ornament

Using Mecca™ 2000's Pattern tools allow the creation of custom sine-wave guilloche ornaments to quickly be created as vector based object. Custom path shapes can be quickly designed for use as a containment border for the guilloche.

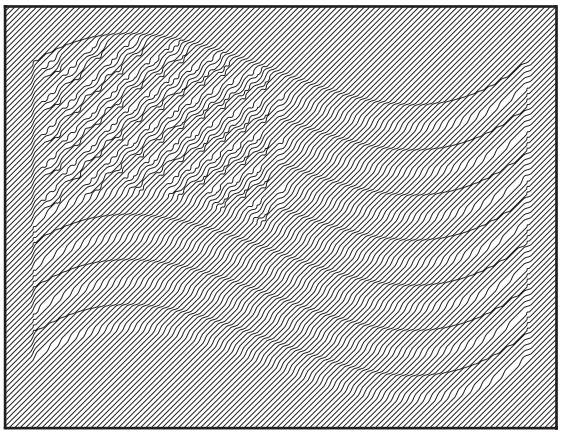


Security Document Composition Features

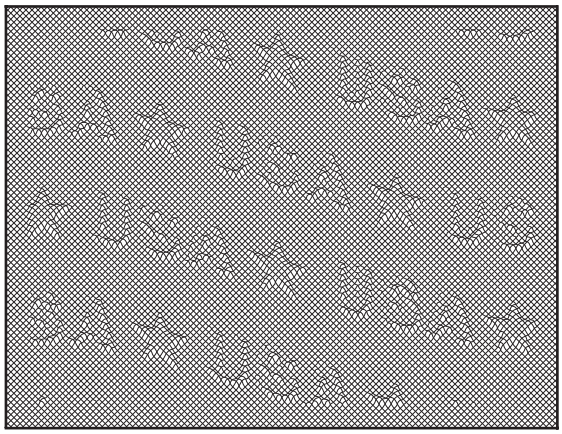
Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Relief Print Backgrounds

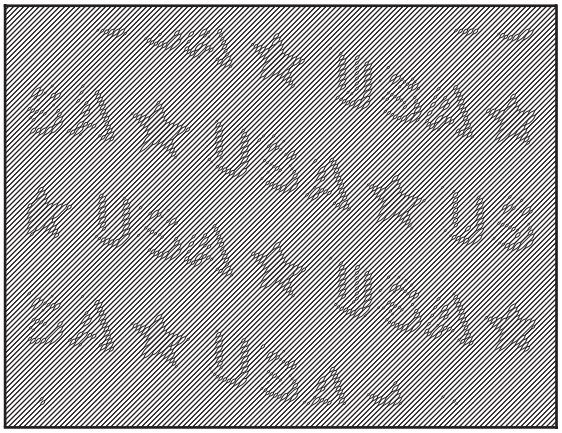
Relief printing is a highly effective deterrent against document counterfeiting. Relief printing is achieved by creating the illusion of an embossed image within a series of continuous lines. When used as a document background printed with light ink colors or multiple ink colors, it is almost impossible to recreate through digital capture.



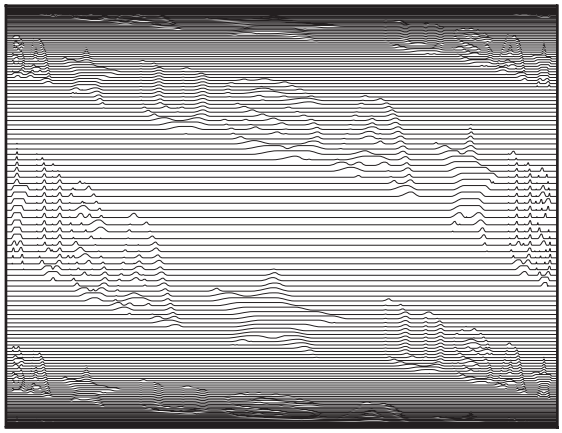
45° Raster Relief - Positive Attack Values



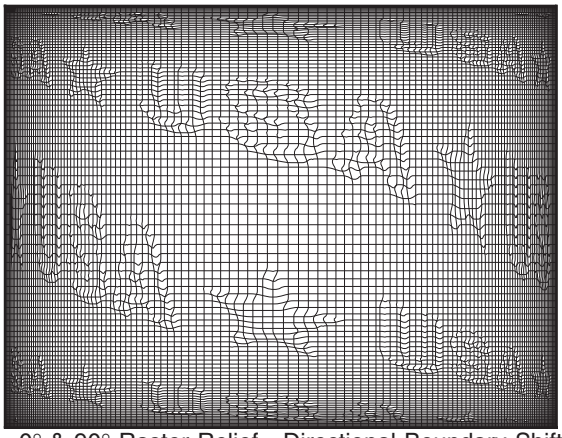
45° & 135° Raster Relief



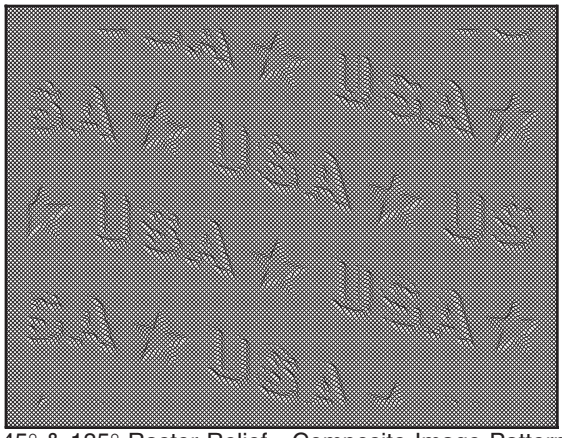
45° Raster Relief - Pos. & Neg. Attack Values



0° Raster Relief - Vertical Boundary Shift



0° & 90° Raster Relief - Directional Boundary Shift



45° & 135° Raster Relief - Composite Image Pattern

Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Prismatic Color Blending

Prismatic Color Blending is a technique that is effective for the copy protection of many security documents. Creating a background that changes from one ink color to another can often foil an attempt to counterfeit through the use of desktop scanners and color copiers.

This technique requires that the printing press run multiple screens in two or more ink colors surprinting one another. This can be accomplished by creating plate separations with complimentary dot angles to create a subtle color change.

Prismatic Color Blend - Blue on Left Changing to Red on Right.

Blue Separation - O%-30% Left Graduation, Dot Angle of 45°

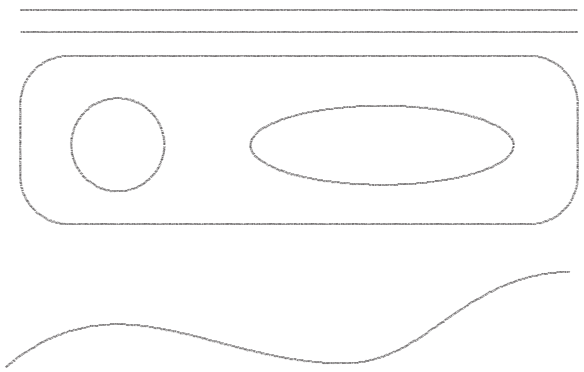
Red Separation - O%-30% Right Graduation, Dot Angle of 75°

Security Document Composition Features

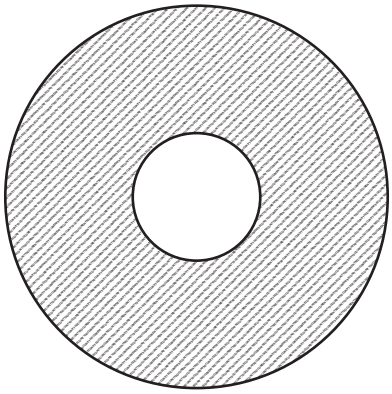
Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Microtext

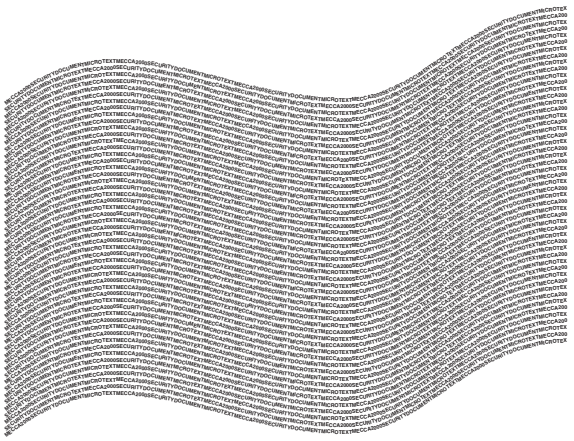
Microtext printing can be used in a variety of ways within security documents. Below are just a few examples of how microtext can be applied to shapes, paths, and backgrounds.



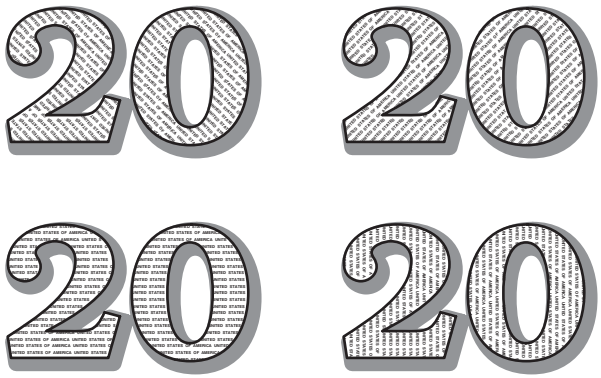
Microtext - Follow Any Path



Microtext - Flow Into Shape



Microtext - Sheared Background



Microtext - Designate Any Angle

Microtext - Interior Pattern Fill

Microtext - Concentric Circles

Security Document Composition Features

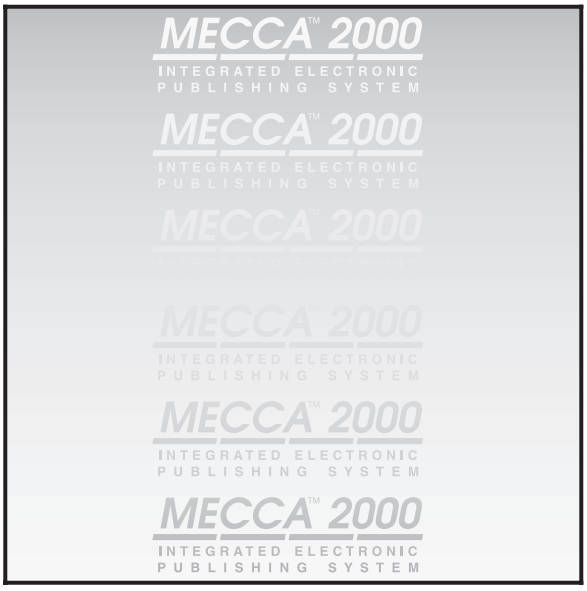
Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Phantom Images and Logos

Creating custom phantom images from logos and photographs is an effective method to deter against unauthorized reproduction of printed materials. Several methods of creating phantom images can be easily created on the MECCA 2000 System as illustrated below.

Drop Shadow Phantom Logo

Step & Repeat Phantom Logo



Alternate Graduation Phantom Logo

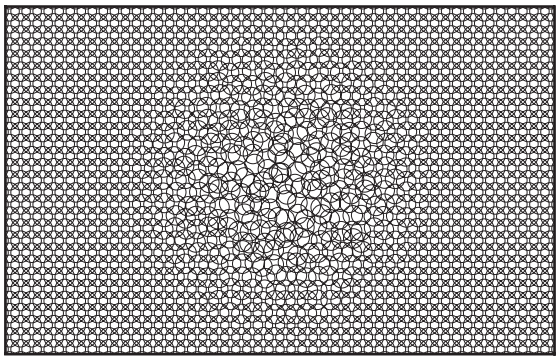
Photo Phantom on Custom Graduated Screen

Security Document Composition Features

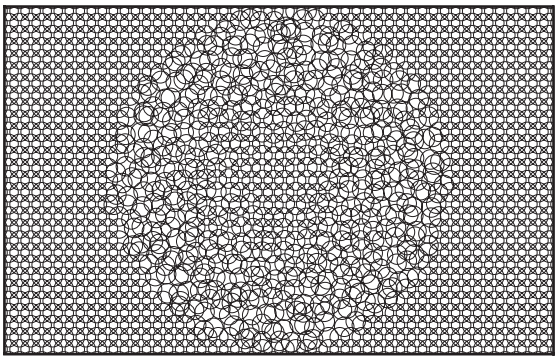
Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Point Shaker

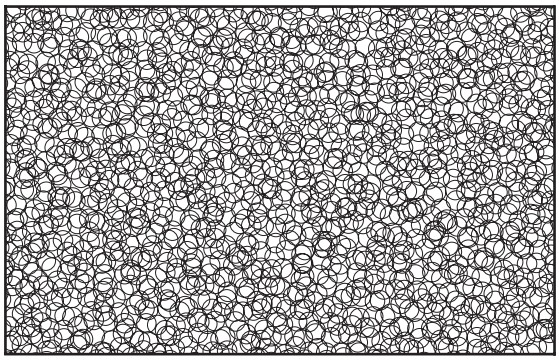
Computer generated artwork can be an effective deterrent towards document counterfeiting. The uniformity of the pattern can be difficult to reproduce. However, there are times that it becomes desirable to add minor inconsistencies to the pattern as an added level of security. The point-shaker allows specific regions to be altered as much or as little as needed.



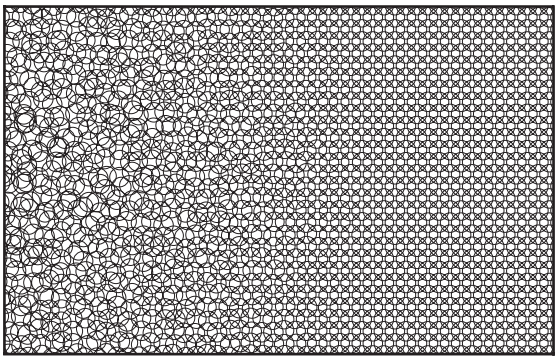
Point Shaker Distortion Center Constraint



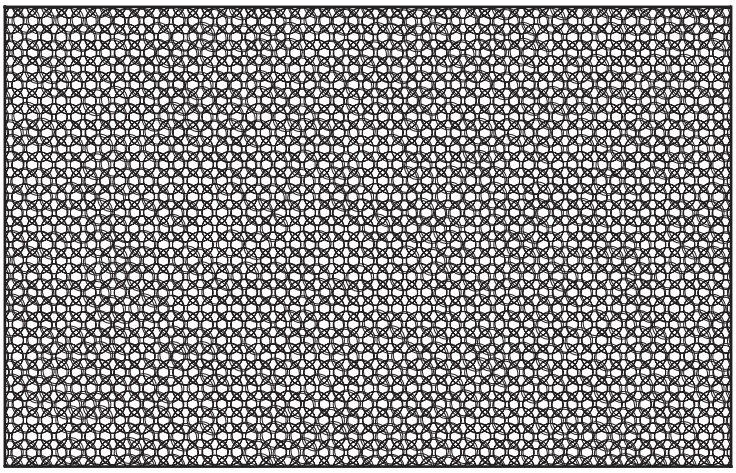
Point Shaker Distortion Tangent Edge Constraint



Point Shaker Distortion Overall Pattern



Fading Point Shaker Distortion



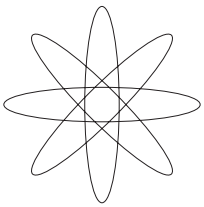
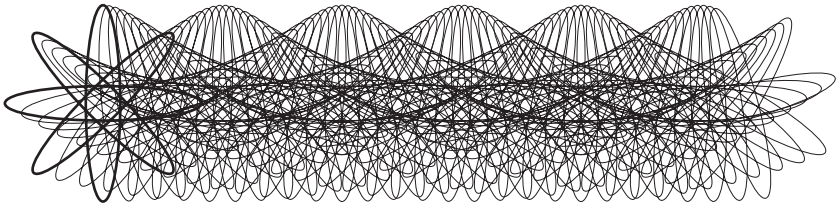
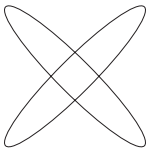
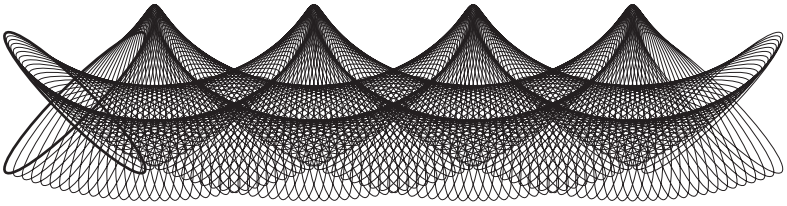
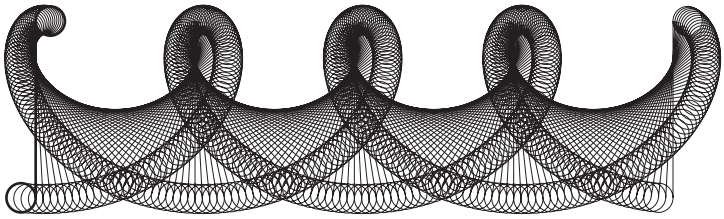
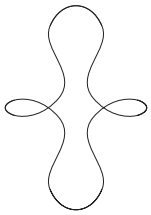
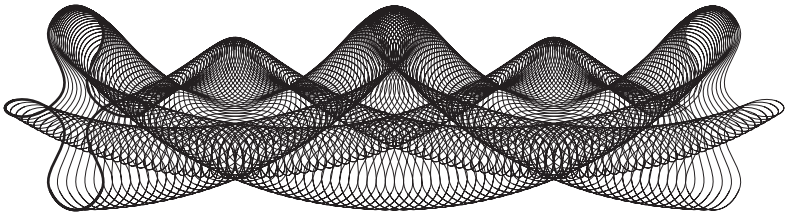
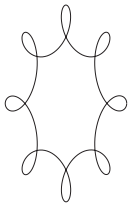
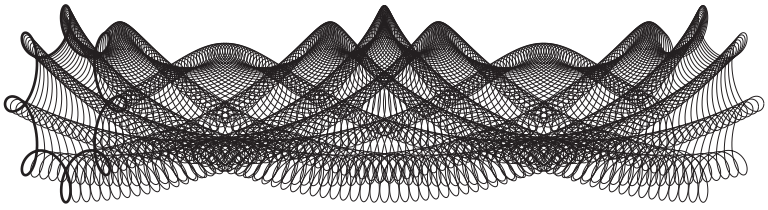
Original with Point Shaker Distortion Copy

Security Document Composition Features

Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

Rotate Pattern

Creating complex ornamental designs and custom borders becomes a simple process with Mecca 2000's rotate functions. The ability to use a base design while copying and rotating simultaneously creates unique patterns that are extremely difficult to reproduce.

 Angle 6, Copies 40, X-Offset 6p	
 Angle 3, Copies 120, X-Offset 2p	
 Angle 3, Copies 240, Offset X - 1p	
 Angle 3, Copies 120, Offset X 2p	
 Angle 3, Copies 120, Offset X 2p	

Security Document Composition Features

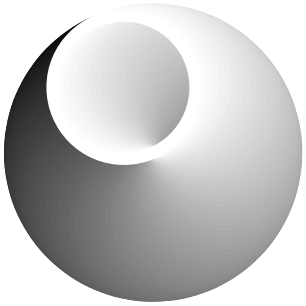
Amgraf, Inc.
1501 Oak Street
Kansas City, MO 64108
1-800-304-4797

MECCA™ 2000
INTEGRATED ELECTRONIC PUBLISHING SYSTEM

New Design Features

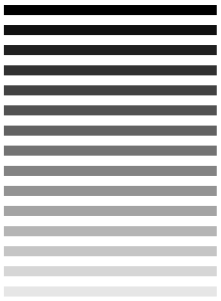
Target Color & Step Density

Rotate with Target Color

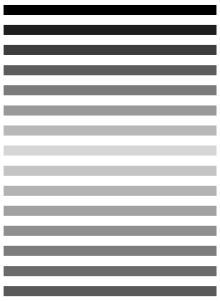


Scale with Target Color

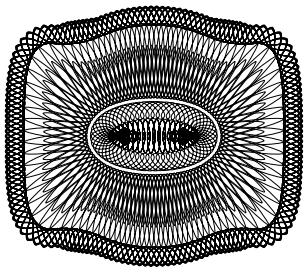
Copy with Target Color



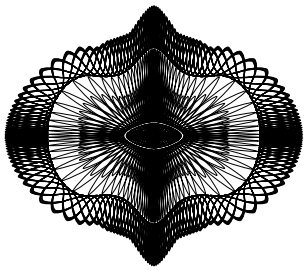
Copy with Density Step



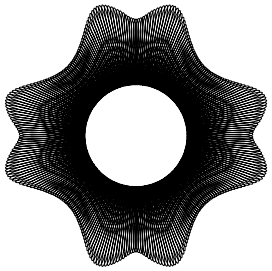
Logarithmic Move Transformation



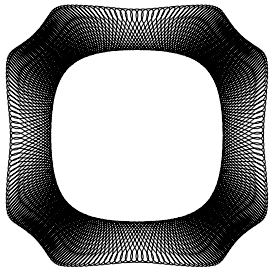
Original Pattern



Converge Towards Center

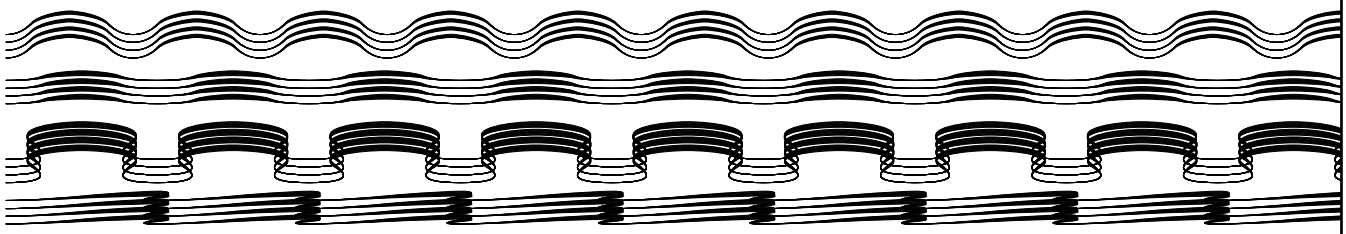


Original Pattern

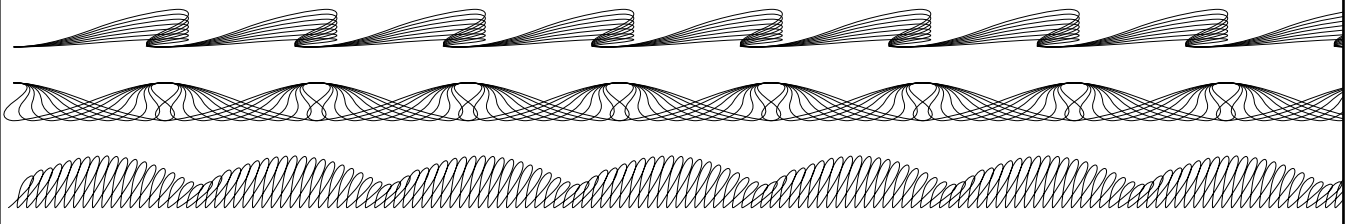


Converge Towards Boundary

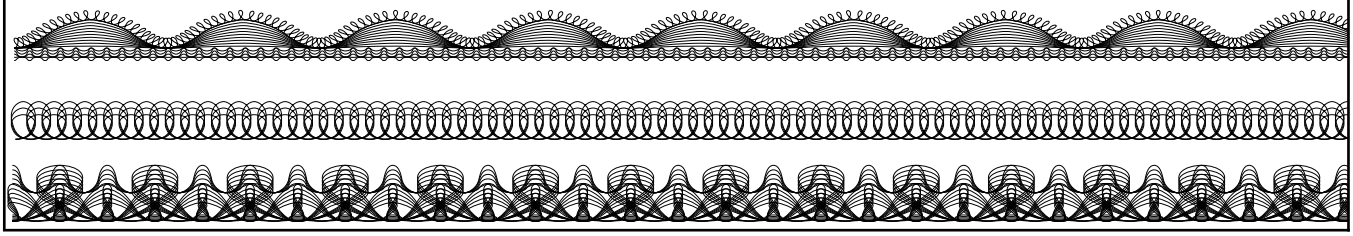
Variable Line Weight Patterns



Slope Shift Wave Patterns



Offset Copy Pattern Wave



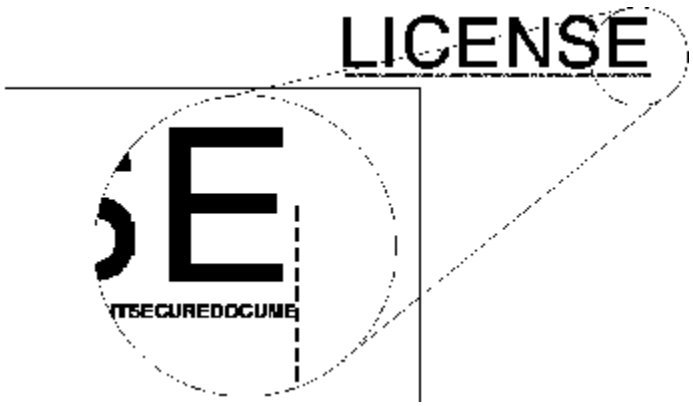
Creating Micro-Text

Micro-Text is extremely small print which is not legible to the naked eye and is used as a security feature on checks. It appears to look like a drawn line and when copied it loses its characters and cannot be read when magnified.

Micro-Text flows along arcs, circles, boxes, vectors, and splines. It will also outline areas by generating the outline of an area internally. The easiest Micro-Text to create is Signature Lines. Here you simply draw a line the length of the signature line and then go to the Micro-Text menu, type in your text and pick the line. This will cause the text to be repeated along the line with the current attributes.

The micro-text input is being stepped to fill the path length. It will cut off at any character once it fills the length. If the vector paths makes a drastic angle change, it does its best to achieve a smooth transition. Placement of the micro-text is centered vertically along the vector, spline, or box edge. Direction is determined by the start and end coordinates of the component. Circles for example always travel counter-clockwise, so you may want to get into the habit of checking the direction before exiting the function.

Groups of components can be used as a path. When picking a group, it again will flow along the start of the first component to the next connecting, etc. To have control over the path, you can select it yourself by toggling on the {Pick Path Items} option.



Example of Micro-Text Used as an Underline

Using the Micro-Text Option

Micro-Text flows along arcs, circles, boxes, vectors, and splines. It will also outline areas by generating the outline of an area internally. Selecting the Micro-Text menu causes the Simple Text Editor box to appear. Micro-Text wants the text to be input first. This text is repeated along a chosen path. If the path is one component, just picking the component will cause the micro-text to be created. When multiple components are needed, selecting the path is similar to picking Area boundaries.

Suboptions:

Undo, Set Text Attributes, Reverse the Micro-Text Direction,
Pick Path Items Like an Area Boundary, Done Path

The easiest Micro-Text to create is Signature Lines. Here you simply draw a line the length of the signature line and then go to the Micro-Text menu, type in your text and pick the line. This will cause the text to be repeated along the line with the current attributes.

Setting Micro-Text Attributes is similar to setting regular attributes. Defaults of the font, style, and point size can be selected by picking the [Set for Micro-Text] button on the attributes dialog box. (We don't limit the point-size just because of the function being named "micro".

Let's try a simple exercise of flowing micro-text along the edge of a rounded-cornered box.

Step 1:

First draw the [Box], but beforehand {Set Box Attributes}. We will make ours a .009i weight with a 600 (white) color. This edge can be used as a blockout if we need the micro-text on top of a screen. Our inside is -1 transparent. Now draw a box for our micro-text to use as a path.

Step 2:

Go to the [Text] button and select {Micro-Text} from the pop-up menu. This will immediately bring up the simple text input box. Type in the words you want repeated. It is best to type them in all uppercase with no punctuation to simulate a smooth rule. We will use "AMGRAF" as our text. Check "Do Not Spell Check" and [Okay] the text input.

Step 3:

Pick {Set Attributes} from the pop-up menu. This will allow you to set up the correct attributes for a 1-point, bold piece of micro-text by pressing the [Set for Micro-Text] button. [Okay] your settings.

Step 4: Simply pick the box edge and your micro-text will repeat itself along the entire box.

Step 5:

Zoom into the micro-text and notice the direction the letters are traveling. You have a one-time opportunity after creating your micro-text to {Reverse the Micro-Text Direction}.

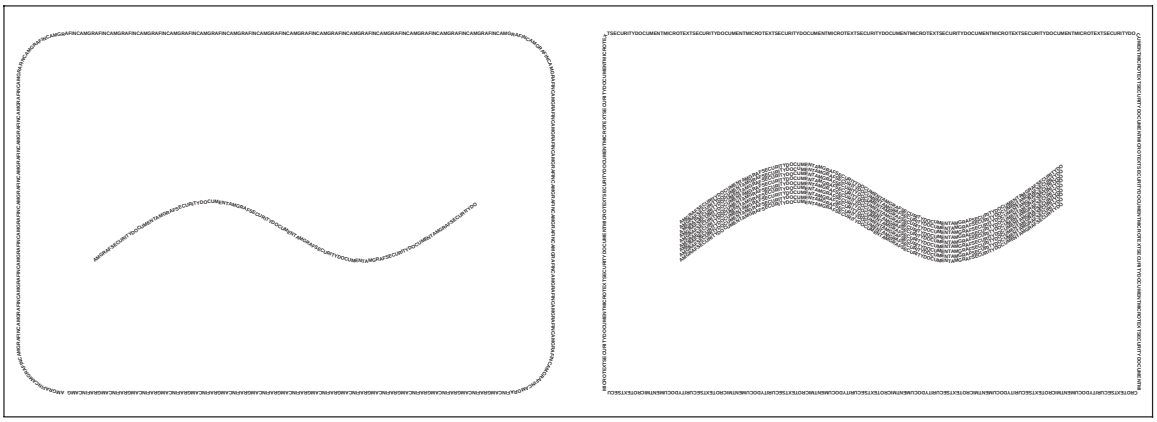
When you save the file you will have created micro-text. The text itself can be edited later for revisions through the normal {Edit Text} option.

Miscellaneous Information

The micro-text input is being stepped to fill the path length. It will cut off at any character once it fills the length. If the vector paths makes a drastic angle change, it does its best to achieve a smooth transition. Placement of the micro-text is centered vertically along the vector, spline, or box edge. Direction is determined by the start and end coordinates of the component. Circles for example always travel counter-clockwise, so you may want to get into the habit of checking the direction immediately after setting, since there is only a one-time opportunity to reverse the direction.

Groups of components can be used as a path. When picking a group, it again will flow along the start of the first component to the next connecting, etc. To have control over the path, you can select it yourself by toggling on Pick Path Items as a Boundary. Here you would select each item individually and finish with a {Done Path}. For example, if you only want the top and bottom of a box to have micro-text, toggle on {Pick Path} and pick the top. Immediately selecting {Done Path} will flow text only along that one pick. Do the same for the bottom.

Picking both the top, bottom, then {Done Path} will cause the two sides to be joined with micro-text along one side. It cannot jump from one disjointed component to another, it will always flow text between the components to complete the path.



Micro-Text Works with Vectors, Splines, and Boxes

The letterspacing and wordspacing is being controlled by the function and cannot be changed. All other attributes, such as layer, font, style, and point size can be set or changed. When changing or editing micro-text, it only has a picking point on its baseline.

The path of the micro-text cannot be changed, once created. You can undo at the time of creation and change the path, but afterwards the path is set in stone, only text edits and attribute changes can be made.

Immediate commands LYR, CF, PSZ, HSZ, VSZ, HSA, OL, XOL, GRS, GRE, STYLE CHANGES, and SPECIAL CHARACTERS are now honored. Commands other than these will most likely give you unusual results.

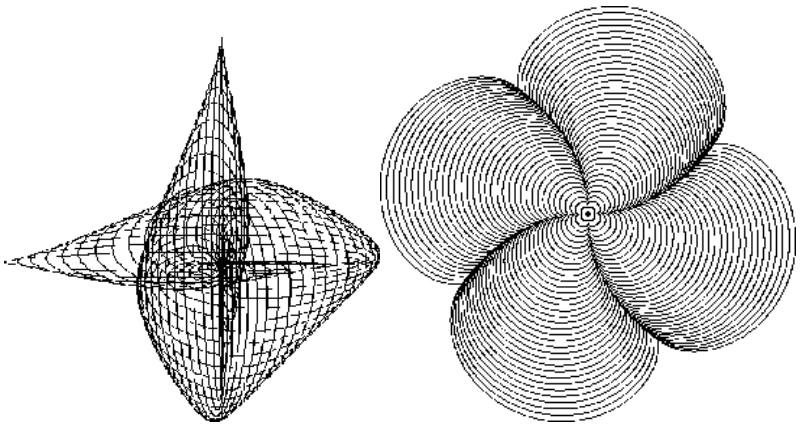
Graduated text with print sizes 3-point or smaller, does not get each letter graduated; instead, each letter is printed with a solid color, determined by: grad angle 0 or 180 and the letter position in the grad range along the path. Other angles: half way between start and end colors, for all letters.

Outlined text does not graduate, each letter is colored and printed in outlines. Note this behavior differs from the "normal text" grad-outline treatment: those are graduated first, then the choke color, or white if no choking specified, is used to super-impose outlines on each letter.

If path is closed, a 0- or 180-degree graduation will go from start, to end, and back to start. The ending color occurs at midpoint on the path.

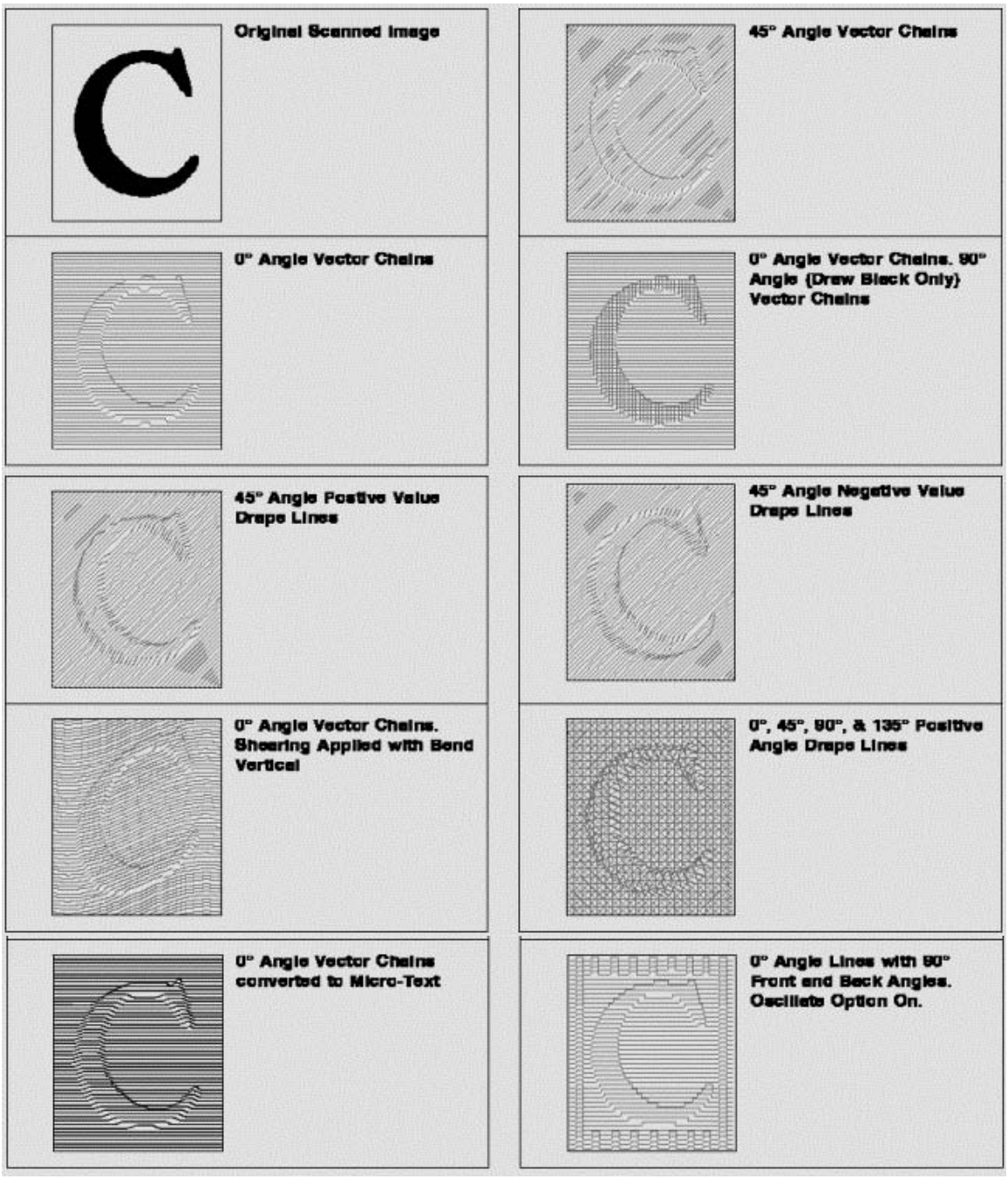
Fine-Line Ornamental Designs

There are 49 ornamental designs available as fine-line rasters. These pieces can be copied, scaled, mirrored, used as is, or have sections cropped out to create even more fine-line backgrounds. They are located in the directory */usr/Amgraf/OrnamentRasters*.



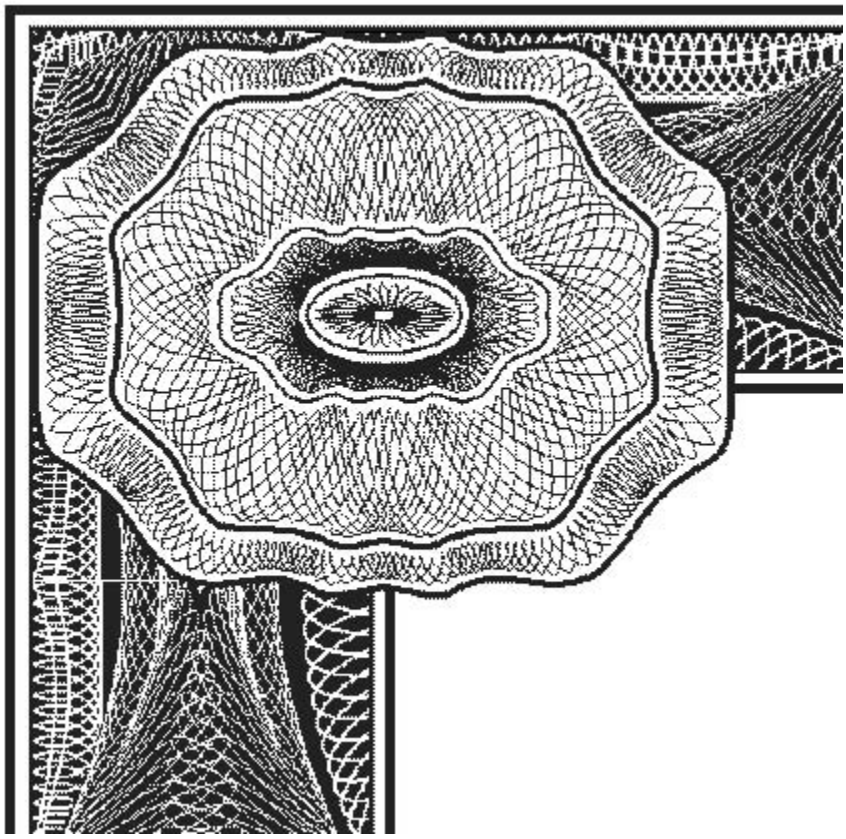
Variations of Raster Relief

Raster Relief is a complex series of lines that lift and lower over a scanned image. The lifting and lowering process creates the illusion of an embossed logo. It is an effective counterfeit deterrent because it is very difficult to digitally capture through the use of scanners and color copiers. Following are different variations from the same scan.



Creating Custom Patterns

Unusual types of backgrounds, borders and ornaments can be created through the Spiral and Sine-Wave generators. The inclusion of a custom created ornamental design to a document reduces its chances of being successfully counterfeited. Images which contain highly detailed fine line designs and patterns become extremely difficult to digitally or photographically capture.



The creation of a new ornamental design is achieved through the use of MECCA 2000's Spiral and Sine-Wave Generator features. Originating with a base contour design of the ornament, either a spiral or sine-wave pattern can quickly be applied. The appearance of the generated pattern is fully controllable by the designer during the creation process.

Features such as wave height, wave width, cycle count and boundary offset are just a few of the controls available. Additionally, other options allow the appearance of the wave shape, spiral perimeter, and pen position to be adjusted if needed. In addition, the geometry that generates the pattern can never be replicated, even by the same designer using the same MECCA 2000 system.

The Pattern Options

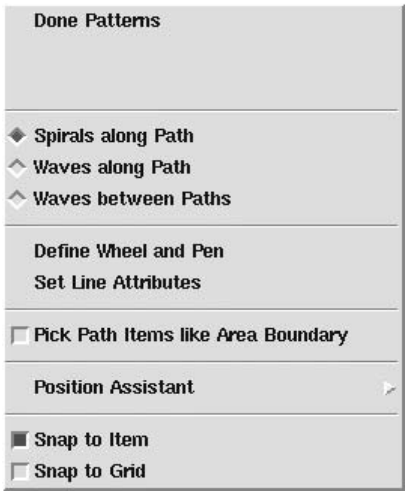
The pattern generator options allow you to create custom backgrounds, borders, and ornaments.

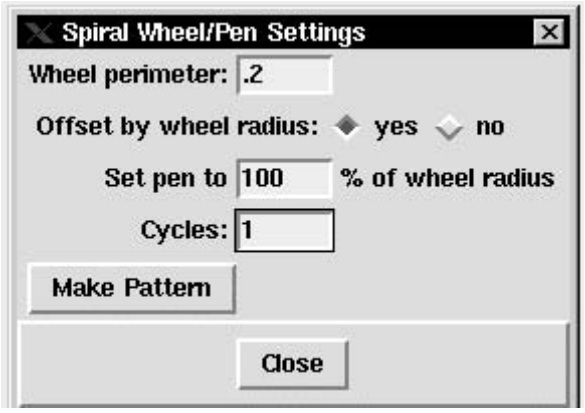
Spirals Along Path

This unique design program allows you to create beautiful geometric designs along a path. These designs can be used as borders, ornaments, or background pantographs. You can also create some very unique designs by layering individual designs together.

The design being placed along the path is controlled by four attributes: wheel parameter and offset, pen percentage, and number of cycles. These designs are vector chains.

For your convenience, there is a library of path files found in ***/usr/amgraf/PatternFrames.***



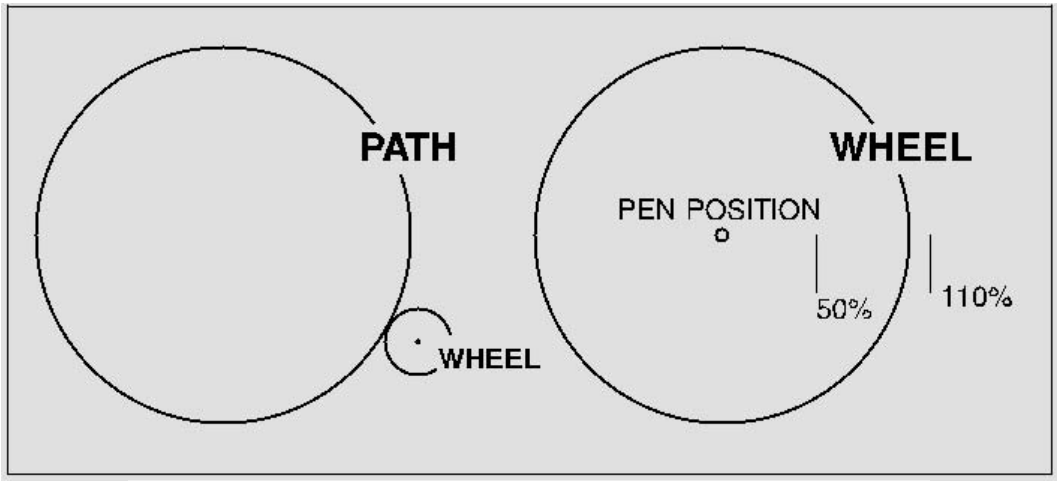


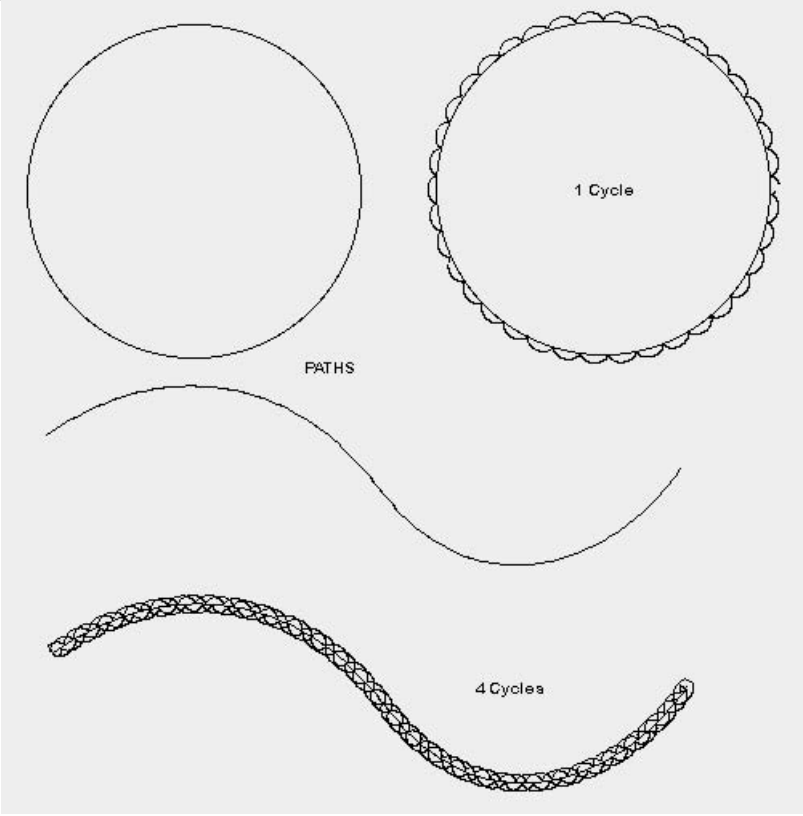
Wheel Perimeter: The wheel travels around the path. If the path is not closed, such as our spline example, it will travel along the top side and then the bottom side to complete the path. This will control the size of the wheel as it rolls around the path.

Offset by Wheel Radius: Selecting "Yes" causes the pattern to offset itself from the path. Selecting "No" causes the pattern to center itself along the path.

Pen Position: The wheel has pen positions starting from the center in percentages of the wheel radius. A pen position of 100 would be drawing from the tangent of the wheel, a pen position of 1 from the center of the wheel. You can have up to 10,000 percent. A negative pen position will cause the pattern to travel inside of the path.

Cycles: This is how many times you want the wheel to travel around the path.





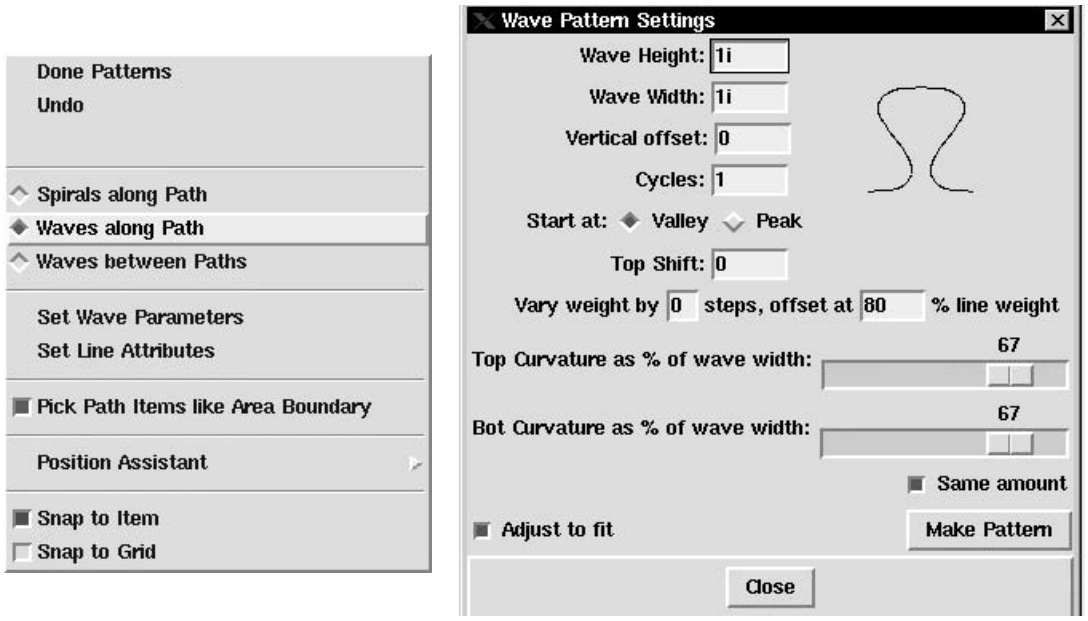
Once you have selected your path, you can experiment with the pattern by using the {Undo} and [Make Pattern] alternately while you adjust the values.

If the path is made up of multiple splines, then select "Pick Path Items Like Area Boundary" before picking. This will allow you to pick around the entire boundary, then select {Done}.

Waves Along a Path

This option allows you to apply a sine-wave pattern along a path. The appearance of the generated pattern is fully controllable by the designer during the creation process. A segment of the design will appear as you adjust the controls. These designs are creating splines in which you can control the line attributes.

For your convenience, there is a library of path files found in ***/usr/amgraf/PatternFrames.***



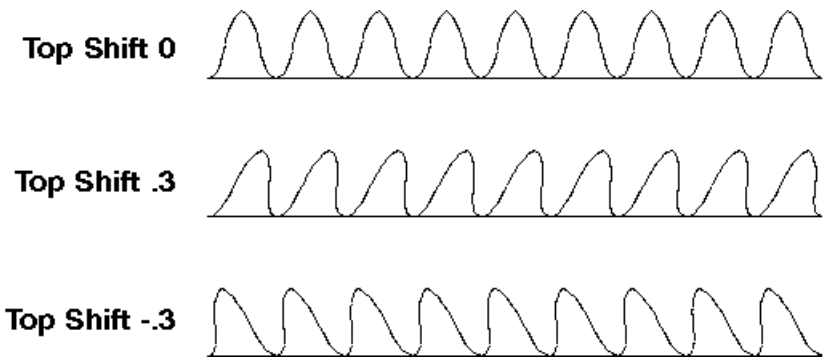
Wave Height and Width: This controls the size of the design segment which is to travel along the path. The Height value can be either a positive or negative number. The positive value will travel along the outside of the path relative to start and end. The negative value will travel along the inside of the path (again relative to the start and end.

Vertical Offset: This causes the pattern to offset itself from the path.

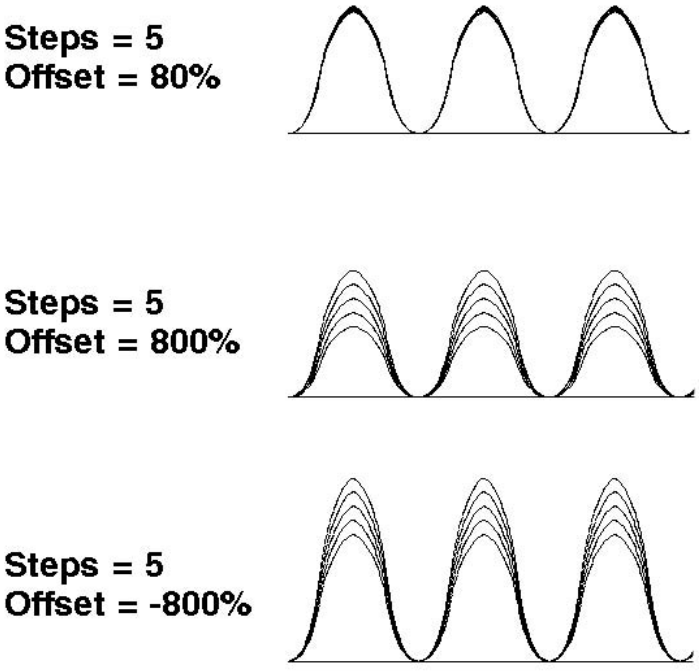
Cycles: This is how many times you want the pattern to travel around the path.

Start at Valley or Peak: The bottom of the segment is the valley, the top of the segment is the peak. When drawing what part of the segment touches the path.

Top Shift:A positive number slants the top of the curve to the right, a negative number slants the top to the left.

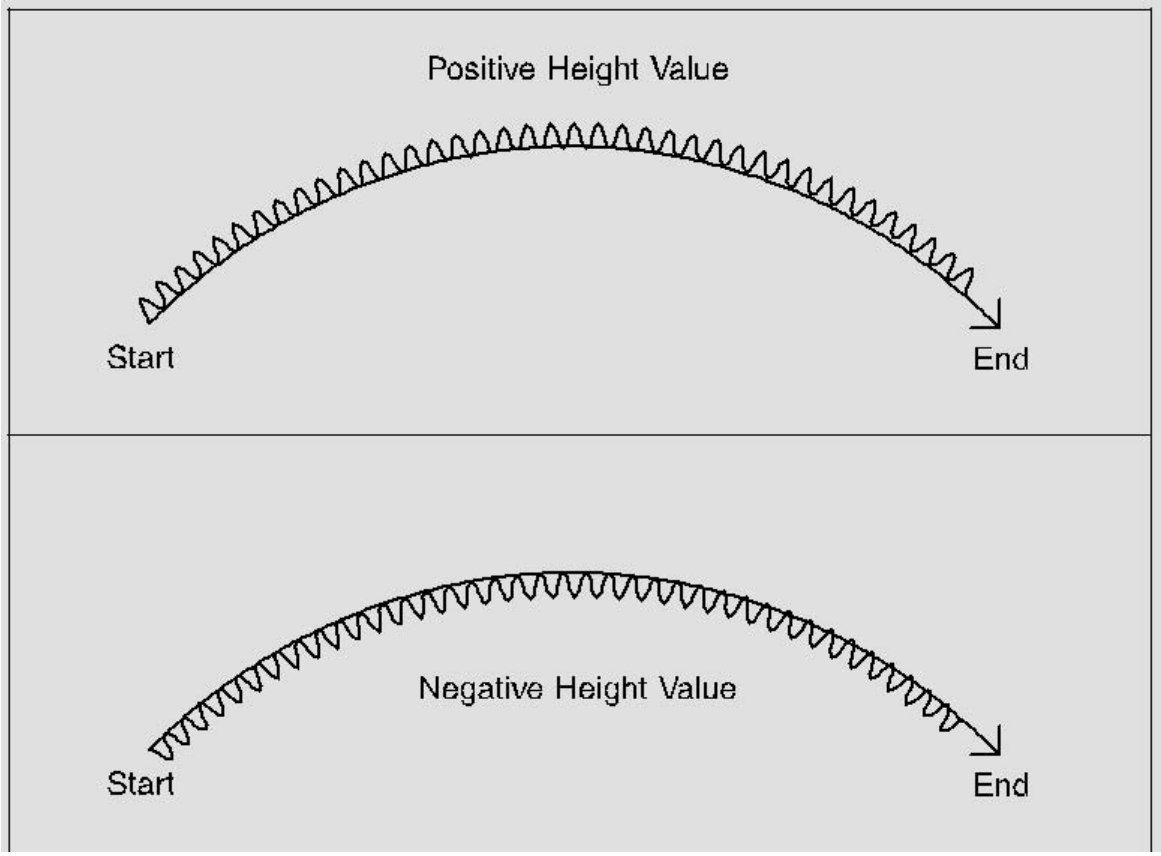


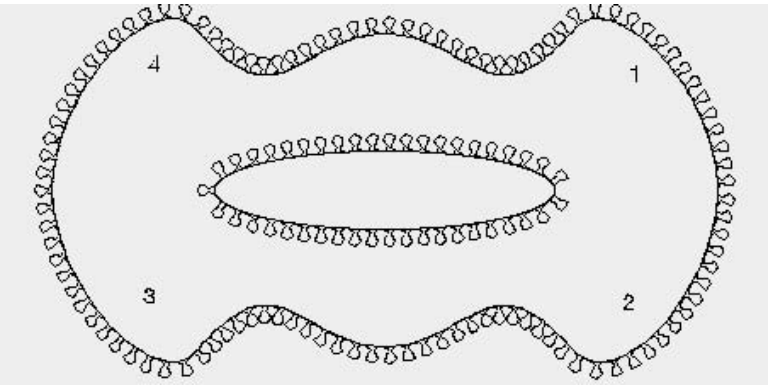
Vary Weight: This option allows you to vary the weight of the line making the pattern. It is repeating the line a number of times (steps) and offsetting that line a percentage of the line weight. A positive value will offset the copy below the original line, a negative value will offset the copy above the original (increasing the height). Notice that giving it an 80% offset causes the copies to overlap, this varies the weight of the line at the peak of the curve.



Curvature Percentages: You can adjust the top and bottom curvature percentage size of the segment just be sliding the bars. If you want different percentages, click off the "Same amount" checkbox. As you adjust the curves, you will see the segment thumbnail change.

Adjust to Fit does just what it says, it will adjust the width of the segment to fit the path with equal segments allowing the pattern to close.





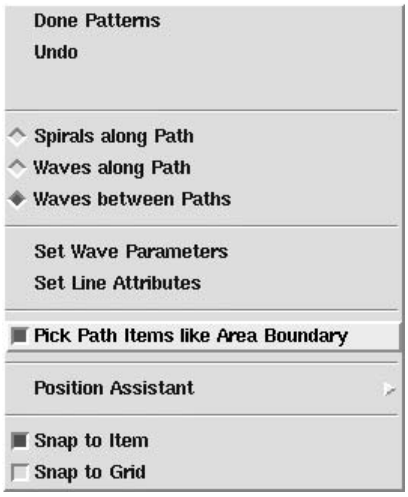
Once you have selected your path, you can experiment with the pattern by using the {Undo} and [Make Pattern] alternately while you adjust the values.

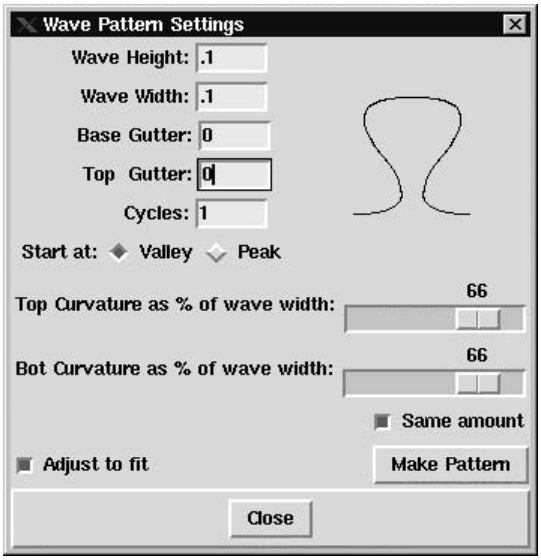
If the path is made up of multiple splines, then select "Pick Path Items Like Area Boundary" before picking. This will allow you to pick around the entire boundary (the sample above has 4 picks along the outer boundary), then select {Done}.

Waves Between Paths

This option allows you to apply a sine-wave pattern between two paths. The appearance of the generated pattern is fully controllable by the designer during the creation process. A segment of the design will appear as you adjust the controls. These designs are creating splines in which you can control the line attributes.

For your convenience, there is a library of path files found in ***usr/amgraf/PatternFrames.***





Wave Height and Width: This controls the size of the design segment which is to travel along the path. The Height value can be either a positive or negative number. The positive value will travel along the outside of the path relative to start and end. The negative value will travel along the inside of the path (again relative to the start and end.

Vertical Offset: This causes the pattern to offset itself from the path.

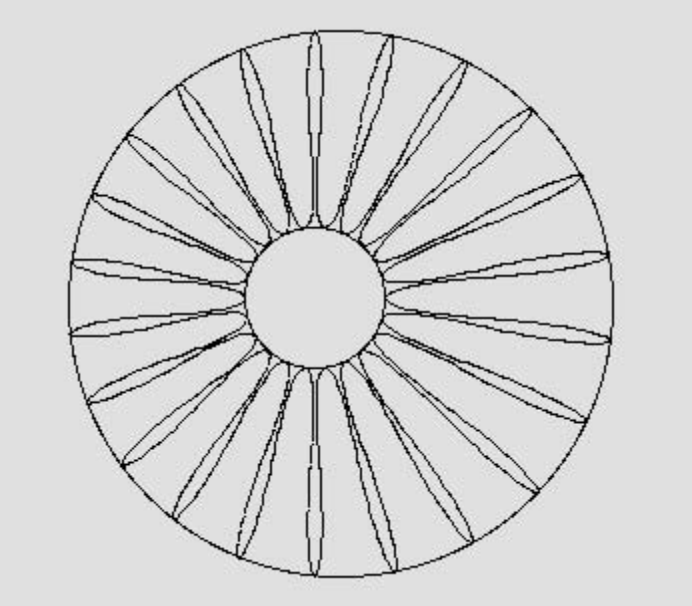
Base and Top Gutter: This lets you apply a gutter to keep the pattern away from the path if needed.

Cycles: This is how many times you want the pattern to travel around the path.

Start at Valley or Peak: The bottom of the segment is the valley, the top of the segment is the peak. When drawing what part of the segment touches the path.

Curvature Percentages: You can adjust the top and bottom curvature percentage size of the segment just be sliding the bars. If you want different percentages, click off the "Same amount" checkbox. As you adjust the curves, you will see the segment thumbnail change.

Adjust to Fit does just what it says, it will adjust the width of the segment to fit the path with equal segments allowing the pattern to close.



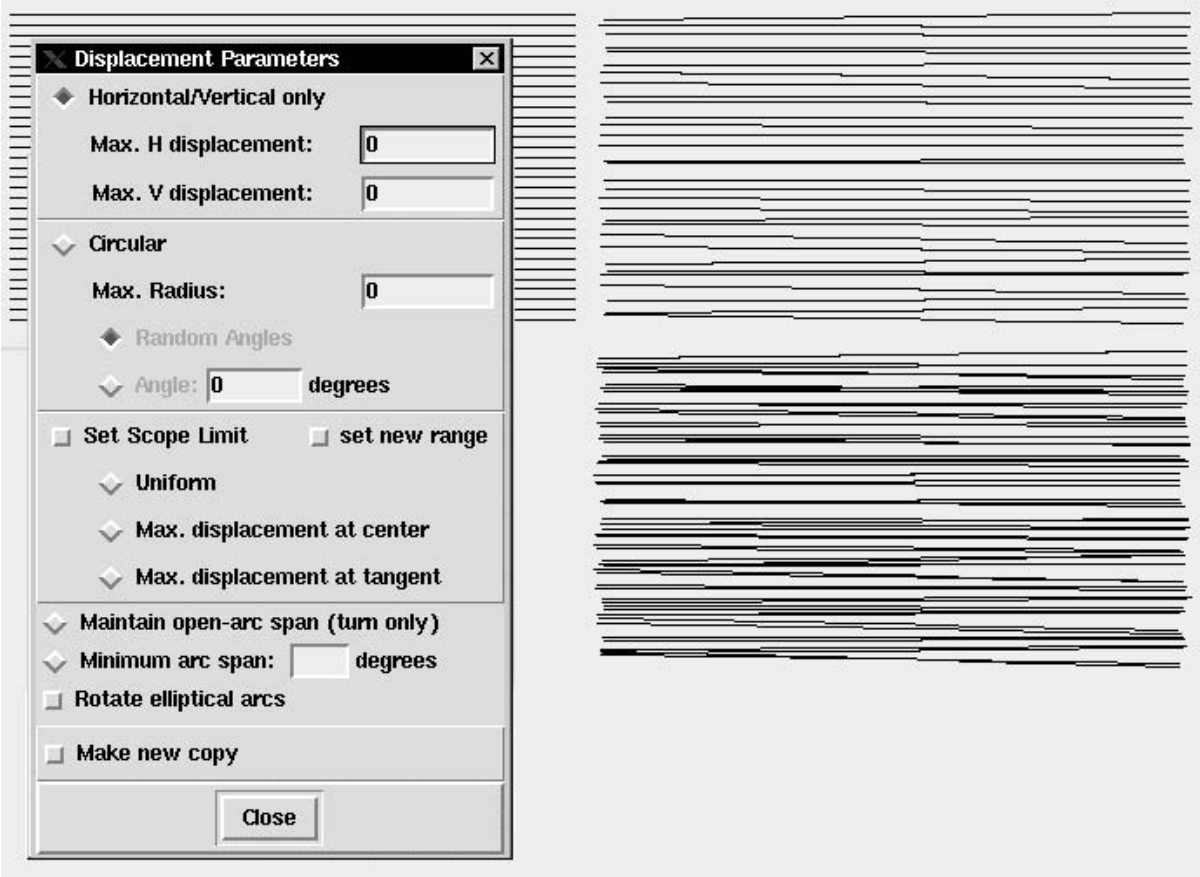
With this option you will be picking two separate paths: an outside and inside. In the sample above, there are just two picks since the circles are closed paths.

Once you have selected your paths, you can experiment with the pattern by using the {Undo} and [Make Pattern] alternately while you adjust the values.

If the path is made up of multiple splines, then select "Pick Path Items Like Area Boundary" before picking. This will allow you to pick around the entire boundary. You will need to specify that you are done with each path by picking the top/outside path and then {Done Path). At this point you select the bottom/inside path and {Done Path}.

Using Point-Shaker

[Transforms] {Point-Shaker} allows you to modify vectors and splines in such a way to create original background images. The endpoints of the vectors and splines are moved randomly which creates a unique effect each time. In the following example 30 equally spaced lines where drawn, grouped, and displaced. As you can see, the lines on the right appear to have more of a fiber look than computer generated. The third group of lines was done by making a copy as it was displaced.

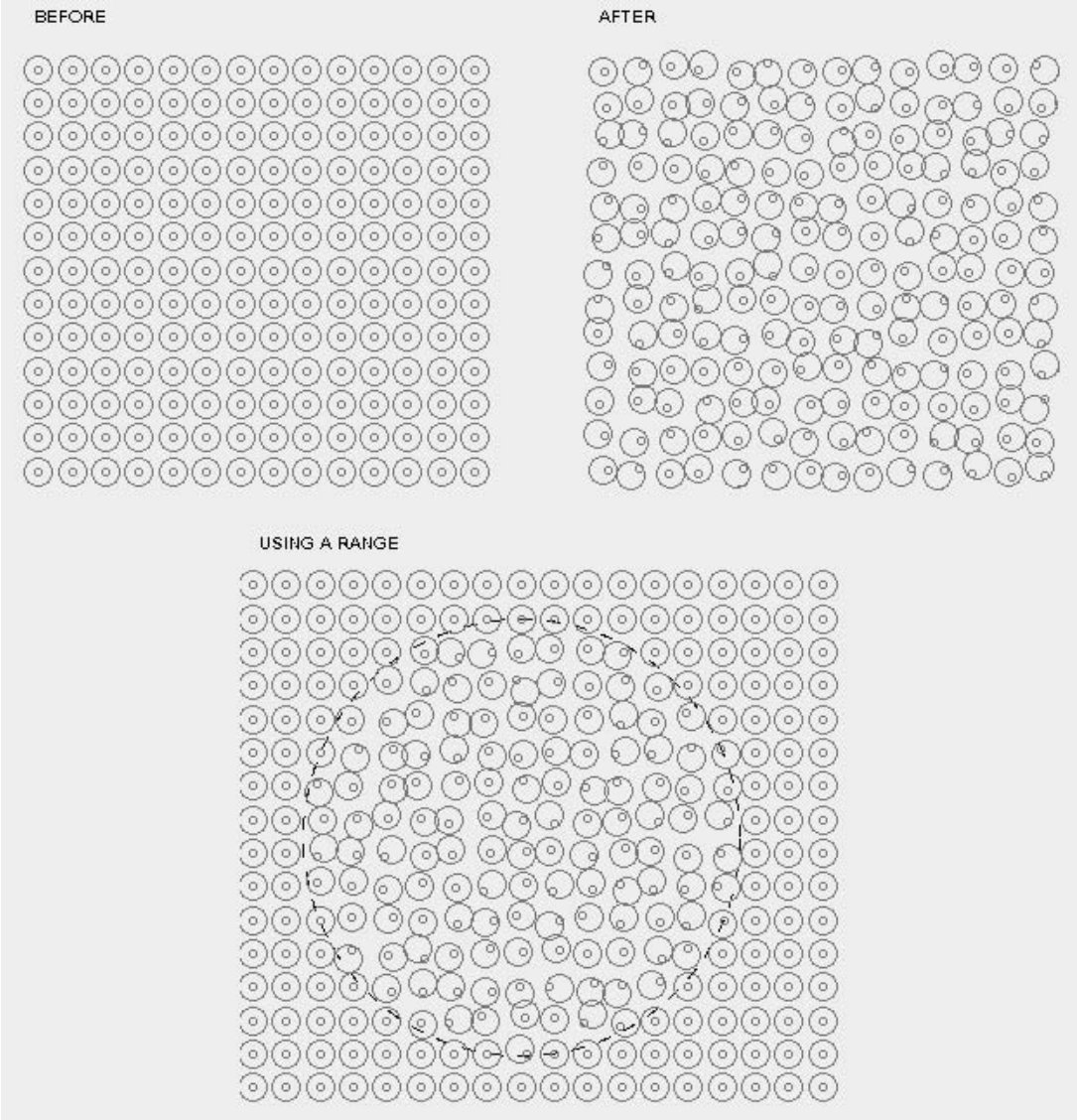


With this option, you can create very unique backgrounds which can be masked and placed inside of your form or check. Just input the maximum amount for displacement and the program will randomly move the endpoints (but not exceed) your amount.

Set Scope Limit: If you do not want the entire background to be displaced you can draw a circular boundary and have it only disturb the points which fall within the boundary. Checking "Set new range" will allow you to draw a circle as the boundary after you have [Closed] the dialog.

Example of Circles Being Shaken

In the example below, the center of the circles are being displaced.



When applying the feature to a uniform patterned background, a new custom non-repeating background pattern is generated Using the effect within a constrained circular region (scope limit), the amount of displacement can be maximized to either the center or tangent edge of the designated boundary.

IBFI Security Regional Briefing
September 17, 2000

Creating Security Documents on the MECCA 2000 System

by
Raymond L. Garner
Security Document Specialist
Amgraf, Inc.

The MECCA 2000 System is the next generation of Amgraf's MECCA III - the world's premier business forms composition system. The MECCA 2000 software offers graphic designers a comprehensive suite of tools to create multi-color, multi-part forms with graduated screens, borders and pantographs, scanned logos, barcodes, and fine typography. For label manufacturing, the software includes trapping, flexographic distortion, and a unique step-and-repeat feature.

MECCA 2000 also contains a comprehensive set of design tools to add copy-resistant graphical safeguards to certificates, coupons, titles, tickets, monetary or legal documents, and other valuable forms, labels, and tags. Our graphical effects are easy to create but virtually impossible to duplicate.

Finished designs are output via PostScript to monochrome and color proofing printers, or as flawless color-separated negatives or plates for printing presses.

Security documents are special because of their function in representing negotiable value, legal ownership, and official status. Because of their value, these documents are subject to counterfeiting and tampering.

Four classes of security technologies are often utilized to protect a document. Three are material-based. First, manufacturers can choose security papers from controlled sources or papers that have verifiable characteristics such as watermarks or embedded threads. Second, special inks and coatings can be used which have fluorescent or thermal characteristics, or which discolor if tampered with. Third, appliques such as holograms and foils can be affixed to the document to distinguish it. The fourth class of safeguarding technology, which is what Amgraf provides, is complex graphical imaging for the body, background, and borders of the document. The safest document is one that includes all of these four technologies in its makeup.

You will be hearing from other speakers about the most effective papers, inks, and foils. In this presentation we'll take a closer look at what is involved in the creation of security graphics.

We will review MECCA 2000's security capabilities starting with the easiest to create and following through to the most complex. The first technique is not really a unique graphical feature, but its importance should not be overlooked.

Warning Bands

The warning band is a simple statement of the security technologies that are present within the document. Although it is the simplest thing to add, the warning band is one of the most effective deterrents to a potential counterfeiter. Every security feature in the document must be defeated and criminals are more likely to abuse an unsecure document than one boasting of multiple security features. Most often, the warning band identifies measures such as colored backgrounds, the appearance of microprinting, artificial watermarks, thermochromatic ink, foil stamps, and other overt features.

Warning bands are common on checks, stocks, and titles, because they alert the receiver of the document as to what features should (or should not) be present in a valid original document. Warning bands on titles and certificates typically state that the document may become null and void with any attempt to erase or alter information.

Phantom Logos and Images

The inclusion of a phantom logo on any document is another easy method to add security. However, the phantom must be used in contrast with other graphical effects. For example, place a lightly screened logo image within a document's background adjacent to fine-line borders. This combination can quickly frustrate an amateur counterfeiter's attempt in copying. When adjusting the brightness level on the copier or scanner to pick-up the phantom image, the borders of the document become muddy and lose definition.

To further enhance the appearance and complexity of the document, include gradient screens within the phantom image. Again, this will make the effort of photocopying even more tedious and frustrating. Whether the gradient effect is contained within a single image, or applied to a step-and-repeat background, the digital capture process can become too cumbersome for the amateur counterfeiter.

With MECCA 2000, phantoms can be generated from simple line art, scanned images, or from photographic sources. When placed at strategic locations on the document, such as signature lines, amount boxes, or name fields, these areas are less likely to be altered on the original document.

Prismatic Color Blending

The above techniques also apply to Prismatic Color Blending.

Prismatic Color Blending is the technique of overprinting multiple ink colors to create a blended color effect. The overprinting of 2 ink colors will visually blend together forming a third blended color. When applied to a document, this effect can become quite difficult to match during color copier reproduction.

MECCA 2000 creates the prismatic color effect by generating multiple printing plates. These in turn are overprinted, creating a new blended color. Due to the nature of overprinting screened images, each separation must contain complementary dot angles to avoid moir@'e patterns on the final product.

Prismatic color blending is visually similar to that of split-fountain printing, however, differences between the two printing methods become apparent during magnification of the final printed material.

The prismatic printing method requires that a minimum of 2 ink towers overprint screens on the final product. Whereas split fountain printing require that 1 ink tower be loaded with multiple ink colors printing from a single plate. The multiple colors on the ink tower are separated by a "dam" at the inking rollers.

When magnified, the prismatic blend method shows multiple sets of ink dots on the printed product. Magnifying the split fountain method shows that only 1 set of ink dots are present. As the dots are viewed across the blended area, the color of the ink dot actually changes. Color consistency throughout a large print-run is more difficult to control with split-fountain printing than with prismatic color blending.

Again, when placed at strategic locations on the document, such as signature lines and dollar amount boxes, these areas then become less likely to be altered on the original document.

Microtext and Microprinting

As color copier technology improves, some of the most popular graphical security effects (such as Void Pantographs) are being defeated. Not so with microprinting. Created from type that is too small for the naked eye to clearly see, it is perceived as a printed line. When viewed under magnification, the line becomes legible as tiny letterforms spelling out a message. Most attempts to photocopy or scan micro-text produce illegible results due to its small character size.

Micro-text in its simplest form is typically used for a line or a box frame. It is now commonplace for signature lines on checks to be made up of microprinting. In more elaborate documents, micro-text is used within the background image itself. With MECCA 2000, the application of micro-text is as simple as picking a path to follow and inputting the wording. Also revisions to the wording of the micro-text are minor edits with MECCA 2000.

To increase the level of security within a document through the use of microprinting, the illusion of a background screen or inside fill can quickly be created. Since micro-text can follow any path or shape with MECCA 2000, the creation of these complex backgrounds is quick and easy.

By combining the usage of micro-text with MECCA 2000's relief print feature, the level of complexity within the security document greatly increases. A relief print pattern is generated within a document's background. Micro-text is then applied to the pattern resulting in an incredibly complex background image.

Fine Line Relief

The addition of relief lines can instantly increase a document's level of design complexity. MECCA 2000's relief pattern is a series of lines and curves that originate from a high resolution scanned image. The resulting lines are overlain upon the original image, creating the illusion of depth similar in appearance to that of embossing. Once the relief lines have been generated from the high resolution image, that image is typically discarded.

With MECCA 2000, the characteristics of the relief lines are controlled through a visual dialog panel. Attributes such as line spacing, drape height, front and back angle, drape effect, and draw direction are controlled by the user. Other characteristics available to the operator are line thickness, density and ink color. Once the designated image is identified, the application of the relief pattern is almost instantaneous. For further complexity, the relief lines can be solid or screened, and can be reversed-out of another background color or image.

Altering the origin offset allows the relief lines to be shifted to any position for final pattern adjustment. Overlaying multiple sets of relief lines at varying angles and spacings creates intricate background images that are extremely difficult for the counterfeiter to reproduce.

Adjusting values such as positive and negative drape angles, often create very interesting effects within the relief patterns. The relief pattern can alternate between positive and negative drape angles through the use of an oscillate feature.

Once created, relief lines can be further enhanced if desired, such as replacing with micro-text or by applying a distortion effect to the overall relief pattern.

Hidden Messages or Images

To make a document even more complex, you can insert hidden images within a pattern. The use of hidden or latent images within a document can be an effective tool in its verification process. Images or words can be embedded within a document's border, background, or ornament where only a trained document receiver knows to look.

Visually subtle, the hidden message is often overlooked by the untrained eye. Under magnification, it becomes obvious that a message is present within the document. The MECCA 2000 software has the ability to create these hidden images or messages.

For example, a series of multi-angled rules are often used to create a hidden message as a graphic object. Then the area surrounding the message is covered with lines at a contrasting angle. Adjustment to the thickness of the rules allows the message to become more or less hidden within the background pattern.

Void Pantographs

Although not fail-safe due to enhancements in copier technology, the void pantograph background is effective against the casual counterfeiter using a photocopier. Messages hidden within the background appear when attempts to duplicate the original are made. This feature is most commonly found in checks, but many additional applications for the void pantograph exist in documents today.

The Void phenomenon is based on the copier's inability to accurately reproduce screen densities of differing resolutions and dot angles. The naked eye sees an even color density while the copier sees a

glaring difference. Several techniques of the void background feature exist, some are patented processes requiring licensing, while others are in the public domain. Amgraf's MECCA 2000 software allows a wide variety of void background methods to be generated.

A large library of standard pantograph patterns exist with MECCA 2000 for use in the superimposition of a void message, but unique custom security background patterns can be created for use with voids as well. Messages that are to be hidden in the background, can vary in font, style, and point size.

The designer has full control over the final appearance of the Void text and background pattern during its creation. Variables such as screen density, lines per inch, dot shape and dot angle are fully adjustable. All are important factors in obtaining optimum results whether the void background is designated for black-and-white or color copier protection.

Guilloche Patterns

The Guilloche pattern is a unique non-repeating spiral design. The usage of a Guilloche pattern as a background can be an effective deterrent against a counterfeiter's attempt to cut-and-paste information since the pattern is non-repeating and unique, especially in areas of critical concern.

With the powerful tools available in the MECCA 2000 software, the creation of a Guilloche pattern can be achieved easily and quickly. You begin with a single pattern cell drawn through the use of MECCA's standard drawing tools. The ability to scale and copy simultaneously allow for an individual segment of the Guilloche to be created. Then using the rotation feature, the base section can be duplicated to create the Guilloche background. Simple shapes such as circles or ovals can be quickly converted into a complex background Guilloche pattern. Simply copying a single circle and then using the Shearing feature to distort the section creates a unique pattern segment. Mirroring the segment creates a pattern section for the final Guilloche. Again, using the rotation feature this section is then replicated around a central point of origin.

Once the desired background effect has been generated, the powerful clipping mask tool allows the Guilloche pattern to be applied to any document as a background or within an individual shape.

Custom Geometric Patterns

The MECCA 2000 can transform a simple geometric shape into a highly complex design pattern. Due to the fact that the originating shape can be freely designed, each resulting transformation then becomes a unique custom creation.

Almost any shape that can be created on MECCA 2000 can quickly become a complex design pattern. Items such as curves, ovals, circles, spiral shapes and even straight lines can create some of the most unique designs. By simply adjusting the amount of rotation and cell spacing, a single shape can create many varying and interesting results.

Once a geometric pattern has been generated, it can quickly be used for several different purposes. By merging several patterns, the complexity level of a design increases. Using MECCA's masking feature allows a geometric design pattern to be quickly produced for use as a one of a kind custom border for any document.

Point Shaker

The point shaker feature can take a computer-generated geometric design and give it human imperfections. A custom uniform pattern can be very effective when placed upon a document, but sometimes it is desirable to disrupt the uniform pattern with a small imperfection that a trained document receiver is knowledgeable about. This then becomes a visual indicator of the document's authenticity.

The Point Shaker option within the MECCA 2000 software allows a designated region to receive a distortion effect. This effect can be applied as a global feature or constrained within a specific region. The

amount of both horizontal and vertical displacement becomes user-defined as well as the method of displacement.

When applying the feature to a uniform patterned background, a new custom non-repeating background pattern is generated. Using the effect within a constrained circular region, the amount of displacement can be maximized to either the center or tangent edge of the designated boundary.

If used in a situation that requires the overprinting of multiple colors to create a color blend, the effect can be applied to a single color if desired. This in turn creates the illusion of misregistration at the press, but only within the designated area. As a document receiver, this becomes a visual key as to whether the document is an original or counterfeit attempt.

Custom Patterns

Other types of backgrounds, borders and ornaments can be created through the Spiro and sine wave generators. At we have seen, the inclusion of a custom created ornamental design to a document reduces its chances of being successfully counterfeited. Images which contain highly detailed fine line designs and patterns become extremely difficult to digitally or photographically capture.

The creation of a new ornamental design is achieved through the use of MECCA 2000's Spiral and Sine Wave Generator features. Originating with a base contour design of the ornament, either a spiral or sine-wave pattern can quickly be applied. The appearance of the generated pattern is fully controllable by the designer during the creation process. Features such as wave height, wave width, cycle count and boundary offset are just a few of the controls available. Additionally, other options allow the appearance of the wave shape, spiral perimeter, and pen position to be adjusted if needed. In addition, the geometry that generates the pattern can never be replicated, even by the same designer using the same MECCA 2000 system.

While generating sine-wave patterns, controls allow the wave to follow along a simple outline path or be contained within the framing of an inside and outside boundary. Both the spiral and wave patterns can be applied either to the interior or exterior of any path designated.

Within an ornamental design, combining both the spiro and sine wave features, result in a highly complex image which can be quickly customized for any document.

The use of fine-line relief printing, superimposing hidden messages, original fine-line detailed borders, unique geometrical designs, prismatic color blending, and also quick touches such as microprinting and phantom photo images, create a highly effective counterfeiting deterrent, especially when used in conjunction with security papers, inks and other treatments.

Keep in mind that graphical effects can be used to add security to almost any document. Unlike special papers, coatings, and inks, graphical effects in general do not add to the overall manufacturing unit cost of a document. Given two documents which have the same value, a forger will most likely try to counterfeit the one with the least number of security features. In many cases, just adding a few of the graphic effects described in this presentation will protect the document and keep it safe from criminals.

Chapter 9: The PostScript Interpreter

PostScript is the publishing industry standard page-description language developed by Adobe Systems and interpreted by PostScript printers. PostScript provides a programmable set of tools for easily imaging all graphic elements.

EPS files were developed for transfer between software applications and usually convert more successfully than other formats. This makes it an obvious choice as a conversion file type.

When you need to get a good start on a file that has already been created on another type of software, creating an EPS file and importing into MECCA 2000 is most efficient. This will save you from starting from scratch, but it doesn't mean that there will not be any work involved, or that the MECCA 2000 file does not need to be proofed for anything that didn't convert well.

PostScript File: A file written in PostScript (PS) language. It can be printed by printers that interpret PostScript. These files are in ASCII text format, but can include binary information such as scanned TIFF images.

PostScript Printers: A printer or imagesetter that contains the PostScript language interpreter. Both printer and imagesetter provide text and graphics, however the imagesetter produces higher quality output.

Encapsulated PostScript: Encapsulated PostScript Format (EPS or EPSF) is a file format for PostScript graphics that contains PostScript code for the image, as well as an optional preview version. The EPS standard enables device-independent transfer of graphics between different applications.

PostScript Interpreter: A PostScript Interpreter is just that, it interprets PostScript code to be read into MECCA 2000. This file is a MECCA 2000 file, but it has problems inherent to converted files.

Checking Out Files

If at all possible we recommend that you work with EPS files versus standard PostScript (PS and sometimes PRN). EPS files were developed for transfer between applications and usually convert more successfully because they do not contain device specific PostScript code.

Encapsulated PostScript files start out with the heading stating it is a EPSF file, version number, followed by the creator. Most PostScript files can be opened with a text editor.

Determining whether your file is a PS or EPS will require that you look at the top of the file (use *more* at $-prompt). These files are normally ASCII text files, but since they can include binary information, you will want to run *epsprep* on the file if you need to edit the file. This shell will convert binary to ASCII and give the file proper line breaks needed for an editor. At the $-prompt type:

epsprep newfilename.prep

Determining File Type

Below shows a variety of file heads from different applications. Notice that each application follows the standards slightly different, but you you can distinguish PS and EPS files.

PS File

```
% BLOC Forms printing system --

Form:C:\F3\FORM\SRVRO.FDB

% Printer:GENERIC POSTSCRIPT PRINTER

================================================
```

EPS File

```
%!PS-Adobe-2.0 EPSF-2.0

%%BoundingBox: 95 396 141 590

%%Creator: CorelDRAW!

%%Title: AB-LGBUG.EPS
================================================
```

EPS File

```
%!PS-Adobe-2.0 EPSF-1.2
%%Creator:Adobe Illustrator(TM) 1.5
%%Title:01316.EPS
================================================
```

PS File

```
%!PS-Adobe-2.0
%%Title: drbrown.pm2
%%Creator: PageMaker 3.0 mof-pvk-jdn
%%Document PaperSizes: Letter
================================================
```

PS File

```
%!PS-Adobe-2.0
%%Creator: Mecca III(TM) 9.0
% Amgraf, Inc.
%%BeginProcSet: PSTRAY_LGR 0~~0
================================================
```

EPS File

```
%!PS-Adobe-2.0 EPSF-1.2
%%Creator: Mecca III(TM) 8.0
% Amgraf, Inc.
================================================
```

EPS File

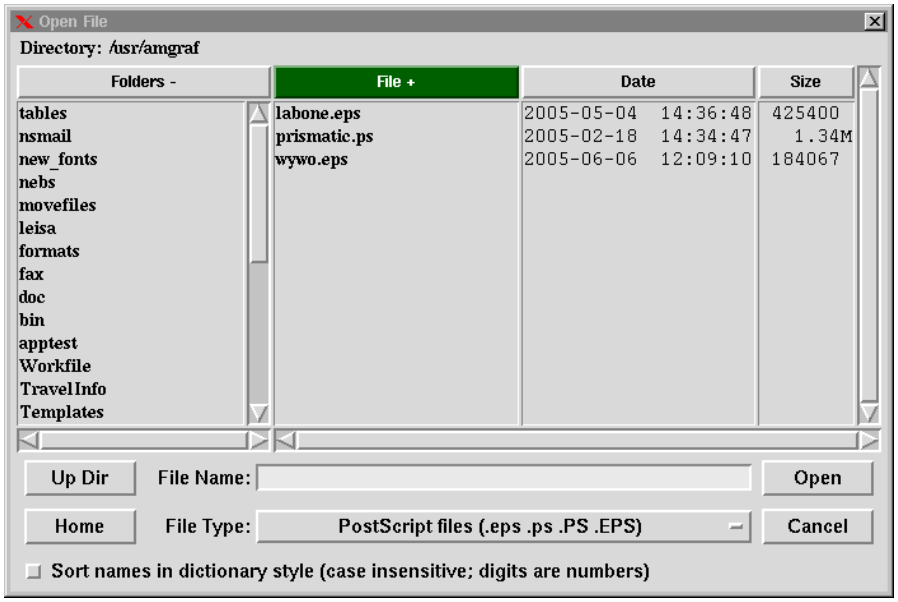
```
%!PS-Adobe-2.0 EPSF-1.2

%%Creator: QuarkXPress(R) 3.0

================================================
```

Try to minimize the nesting of EPS files. Printing an EPS within the EPS increases the chance that the file will not convert properly. Generally, if it won't print to a laser printer, it will not convert.

Opening an EPS File

MECCA 2000 has the capability to interpret standard PostScript (.ps) and Encapsulated PostScript (.eps) files and convert them into MECCA 2000 graphic files. This is accomplished through the {Open} option found under the [Project] menu.

{Open}ing an EPS file is easy. First, start a new file. Then, go to the [Project] menu and select {Open}. You will need to select "Files of type" and choose "All Files" or "PostScript files (*.eps, *.ps)", to have your file show up in the listing. Choose your file. It will recognize the file type and convert the EPS file to a (.g). Once the file has been converted and saved, it can be opened normally.

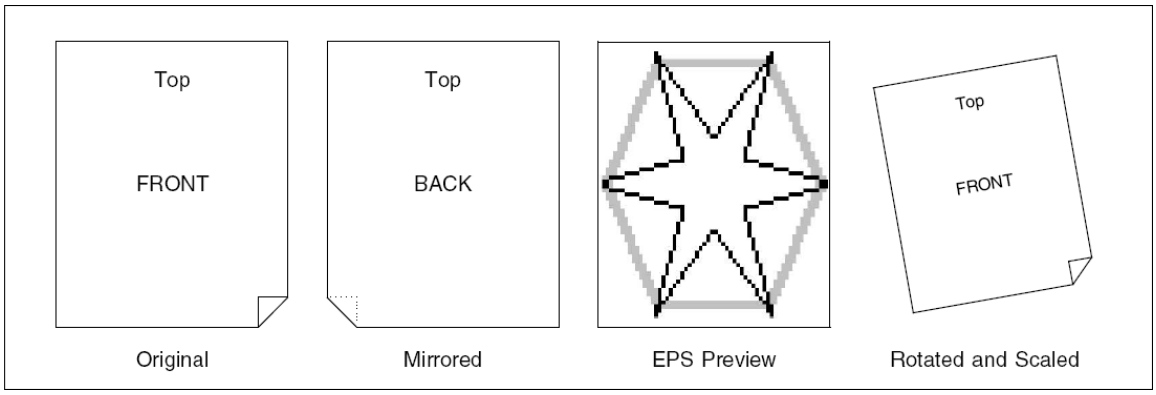


Including (Combining) an EPS File

Encapsulated PostScript files can be included in your drawing by using [Project]'s {Combine} option. It is similar to combining an external scanner file; a reference to the included encapsulated file is stored with your drawing when saved. The file itself must be in the same directory as your graphic for it to be located during loading and output.

When including the encapsulated file, an icon will display showing the boundary of the file and its orientation. A preview of the EPS within the boundary can be turned on through the Window, [EPS Preview] option. Just check "Enable" and Okay.

If you only see the boundary icon, the lower right corner is turned up. If the turned corner appears dashed, it means the icon has been mirrored and you are looking at its back. The icon can be moved, copied, deleted, and grouped. You can also scale, rotate, mirror and control the layer of the included Encapsulated PostScript file through its icon. When picking the icon, you must pick on an edge.



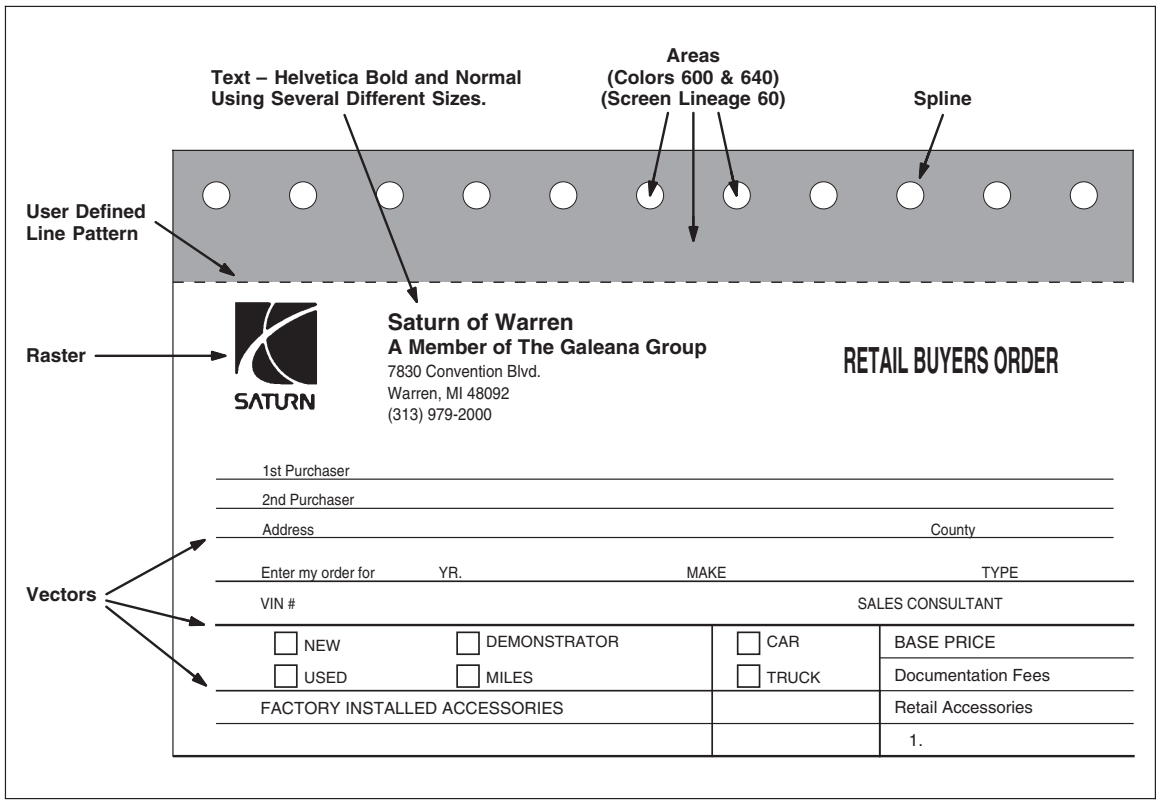
Multiple Page PS Files

If the file has multiple pages, we suggest creating an EPS file for each page. You may combine the pages once they have been converted into MECCA 2000 files. There will be less problems converting and naturally, if there are problems, it is easier to find a problem on one page rather than on multiple pages. However, if you do have a multiple page PostScript file, each page should convert to a different layer. Then you can see your individual pages just by turning the Layers On/Off.

Typical Converted EPS File

Below is a look at a typical converted EPS file. Notice the variety of components. The area does have a 60 line screen.

After importing a file, save the file with a .g extension. It is now ready to proof and clean-up.



You will see text, vectors, splines, areas, arc/circles, and rasters. At this point it is your responsibility to proof the file for conversion correctness. You have the ability to modify any of the components through their respective options. It is definitely better than starting from scratch, but is not always easy to modify.

Since the EPS file is a printer driver, what you think the application has done to create the image, is not always the case. What appears as vectors, is sometimes handled as areas in some applications. What appears as text is sometimes rasters. Screens, usually in the case of graduated areas, can be vectors.

Also, vertical vectors can be many tiny line segments instead of one line. This is usually seen when the original file comes from a word processing package instead of a graphic application.

Working with Converted Files

MECCA 2000 files which are generated from PostScript files have inherent problems which can be made easier to handle if the original files are created knowing about them. Here are some suggestions on how to handle the following.

Text Issues

- Text only converts as individual lines of text. They will never be multi-line paragraphs. PostScript issues beginning positions only and is not aware of leading. To make a paragraph out of these individual lines requires you to pull the lines together and modify attributes. See *Cleaning-Up Converted Text.* You should only massage text that needs to be edited or changed.
- If you use letter spacing in the original document, it will cause the text lines to convert as individual letters, not just lines of copy.
- If you use word spacing in the original document, it will cause the text lines to convert as individual words, not just lines of copy.
- If you use kerning in the original document, it will cause the text lines to break into letters whenever kerning is encountered.
- Be aware that justified paragraphs may also come in as either individual letters or words. How the application justifies determines what the EPS file will contain.
- Psuedo-condensing causes the text to come in as individual letters.
- Psuedo-italic in most cases will be ignored.
- Any special characters included in the file should be referenced, if a match cannot be found they will convert as question marks (?) and will need to be replaced.

Graphic and Font Issues

Also, some of the problems cannot be resolved and must be avoided at the application level. These are:

- If the original document has include files (such as rasters, logos, Encapsulated PostScript), do not forget to copy or transfer them also. Just because they are referenced in the PostScript file, does not make them accessible during conversion.
- It is desirable not to download the fonts with the PostScript file since we do not process the font information during conversion. Not including font information will allow the file size to be more manageable and the conversion to run faster.
- The PostScript interpreter does not convert any fonts that are downloaded into the file. You must have the real font on your computer. Any font that is not found on your computer, will convert as Helvetica.
- TrueType Fonts will be converted to Helvetica, despite the printer settings.
- Line patterns from other applications will not convert.

- It is best not to place graduated screens in original document. Graduated screens usually convert as individual lines with varying screen values. Thousands of lines copied across the job makes working with the file difficult.
- Screen lineage may be lower than you would like. If the file was originally set for a low-resolution printer which normally uses a 60 line screen, the file will reflect that lineage. It can easily be changed by Modifying the component properties

Cleaning-Up Converted Text

Text only comes in as individual lines of text. They will not be paragraphs. To make a paragraph out of these individual lines requires you to use [Text]'s two assemble options described below.

This is not hard, but there will be some cleanup needed to the leading, justification, and possibly line breaks; so only cleanup the text which needs revisions.

If line breaks are not correct, then you will need to edit the content of the paragraph with [Text]'s {Edit Item} option. Use the Immediate Command \NL^ (New Line) to force lines to break at the correct word and stay flush left. Use the Immediate Command \FJ^ (Force Justify) to make the line justify but break at the assigned word.

Check for any style changes or special characters, etc. You would be looking for any internal paragraph changes that we control with the Immediate Commands or through the Pop-up menu.

If lines of text extend beyond your boundaries, it could be an issue with your Letter or Word Spacing.

Some fonts may be substituted. This is usually the case either if the font is TrueType or if the font is Not Found on the current computer. Just Group the text and change the font properties to one that exists.

Use {Combine Text Items} and {Word(s) from PS Letters} to Clean-Up Text

---

The following features assist in the clean-up of converted PostScript and Encapsulated PostScript files.

- Word(s) from PS Letters, and
- Combine Text Items

Text which has been horizontally adjusted (such as letterspaced, wordspaced, kerned, or justified) usually convert as individual characters or words. This is because PostScript only knows X-coordinates of these items. Use the **{Word(s) from PS Letters}** option to pull letters back into words, and words into lines.

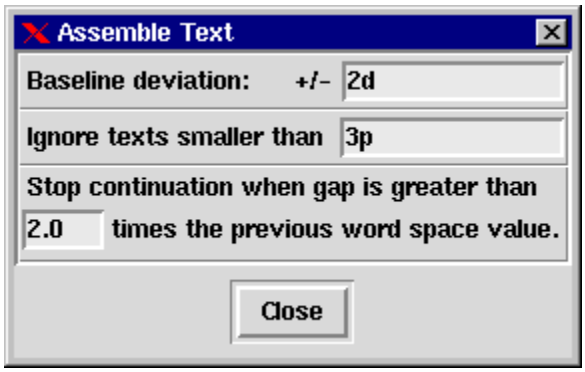
It looks at the horizontal distance between letters and if it is smaller than the standard wordspace for that point size, then it assumes that the letters should be pulled together to form a word. If the distance is larger, it assumes a wordspace is needed.

There is an {Undo} option under the right-mouse menu, so if you get unwanted results, then {Undo} the results. Possibly the letters are not pulled into words within a widely spaced justified paragraph. You can adjust the value considered as the correct spacing for words, just increase the wordspace gap value and try pulling the words together again.

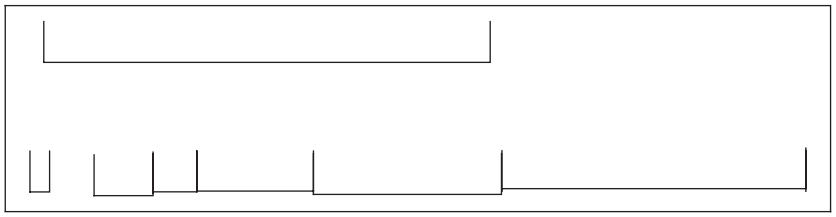
You can also {Change Attributes} of the letter spacing and decrease the values. The function looks at letter spacing and word spacing values, as well as point size.

After you assemble letters into words, and words into lines, then go back and combine the lines into paragraphs.

The{Word(s) from PS Letters} option is the function which pulls the letters into words and words into lines. It looks at any group picked. To assemble the entire file Group All. As items are touched they will ungroup. What is left grouped wasn't touched.



Baseline Deviation: Text pieces in PostScript converted files are not always sitting on the same Y-coordinate. We have found, it can be off as much as 6-decipoints. This is a tool to help the program know when to pull characters together and when not. Recommended setting is 2-decipoints (2d). If you leave it at 0, it will not pull together any characters that have a different baseline.



Example of Uneven Text Baselines

Gap Spacing: If the horizontal distance is more than the value of the figure space, then you can still pull text together by changing the gap spacing. Just increase the value. Re-assemble uses the text word space and letter space value to determine when to pull letters into words and words into lines. If you do not get the desired results, {Undo} and increase the word spacing or letter spacing values.

{Combine Text Items}

Use the {Combine Text Items} option found under the [Text] menu to pull lines of text into paragraphs.

First, figure out the paragraph leading and change it. During cleanup of PostScript converted files, you will need to change leading since all text is converted with lead values of zero. Determine the leading by picking the baselines of the first two lines within the paragraph.

Change the leading of the first line in the paragraph. Group from the second line to the end of the paragraph. Now use the {Combine Text Items} to pull the first line and the group of lines together. The text will have a measure of the width of the longest line within the paragraph being pulled together.

Creating EPS Files for MECCA 2000

In this section are instructions for creating Encapsulated PostScript (EPS) files for MECCA 2000 if you are using a Windows Application. We recommend the following printer setups when creating an EPS File.

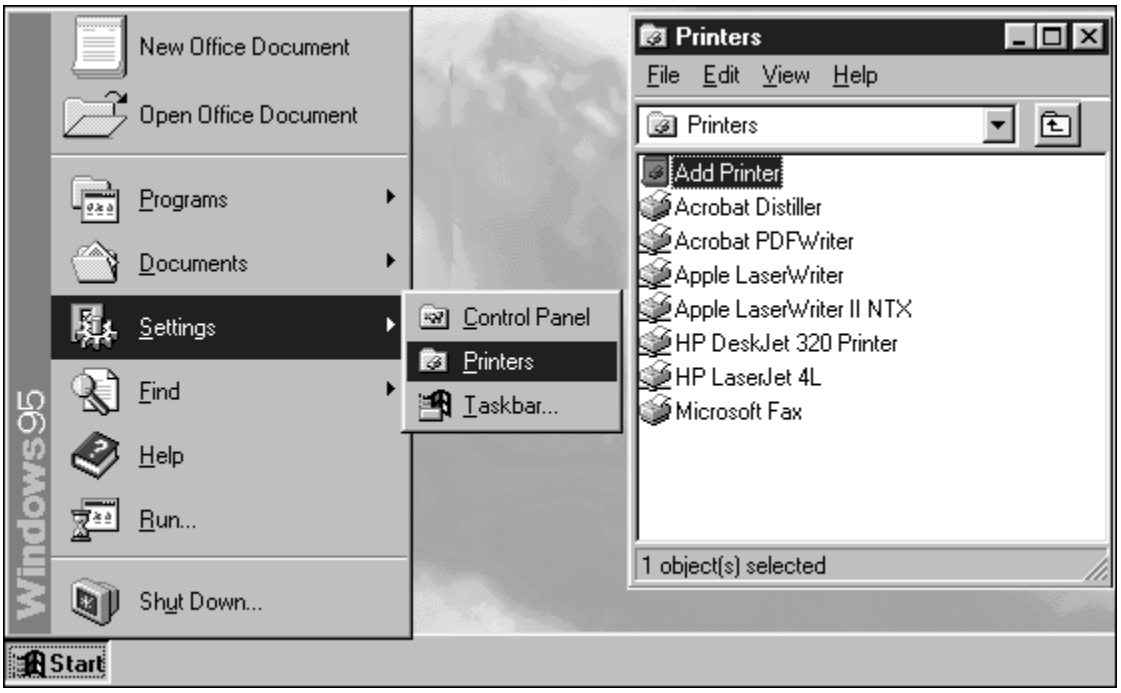
Since PostScript is a printer language, controls for creating EPS files are found in the printer setup menus.

- **Add a New Printer for EPS Files**
- **Printer Properties**
- **Create and Convert an EPS File as a Test**

Add a New Printer for EPS Files

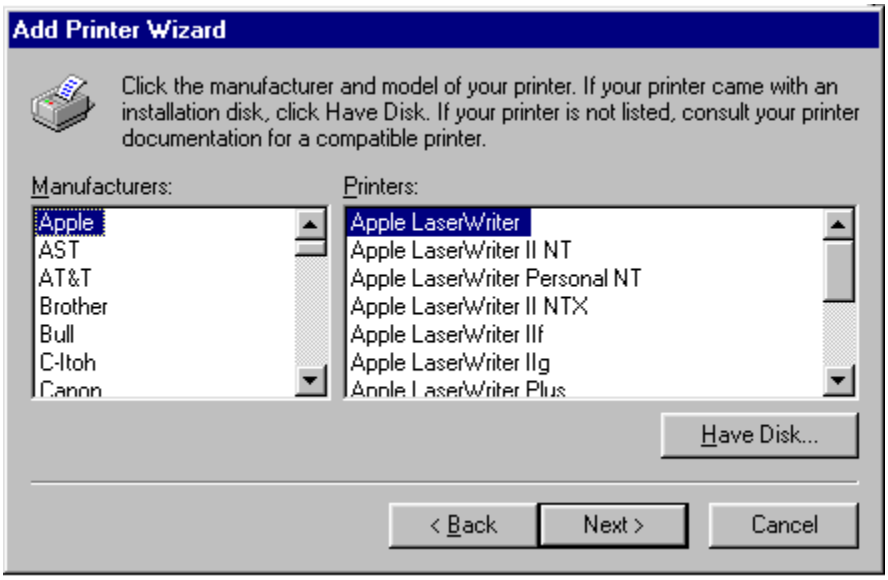
It is hard to decipher why an EPS file will not import, so adding a printer driver to specifically create EPS files for MECCA 2000 will increase the reliability of the interpreter.

Go to Start and select **Settings, Printers.** Double-click on **Add Printer.**



This will take you to the Add Printer Wizard. Select [Next] to get started. It should already have "Local Printer" chosen, so select [Next] again.

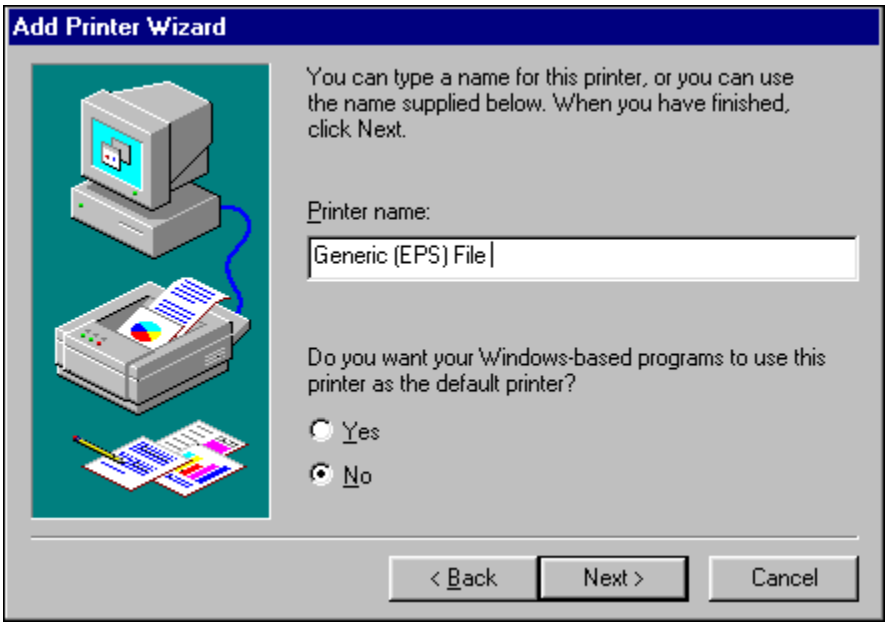
You will be asked to select a manufacturer and model for a printer. Select **Apple LaserWriter.** Normally it is at the very top of the list. This is the most generic PostScript print driver found, and makes excellent EPS files.



Select [Next]. If you already have that driver installed, it will ask you if you want to replace it or use the existing. Just use the existing and select [Next] again to get to the Available Ports.

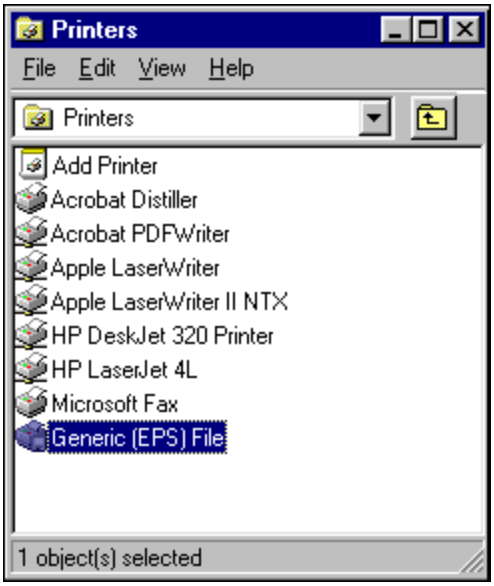
Here you want to select **FILE: Creates a file on disk.** This will bring up the file naming dialog box when you use this printer selection.

Select [Next] and you will be taken to the Printer name. Type in a printer name that you will recognize as the one for creating generic EPS files, such as ``**Generic (EPS) File''.**



Select [Next] until you get to [Finish].

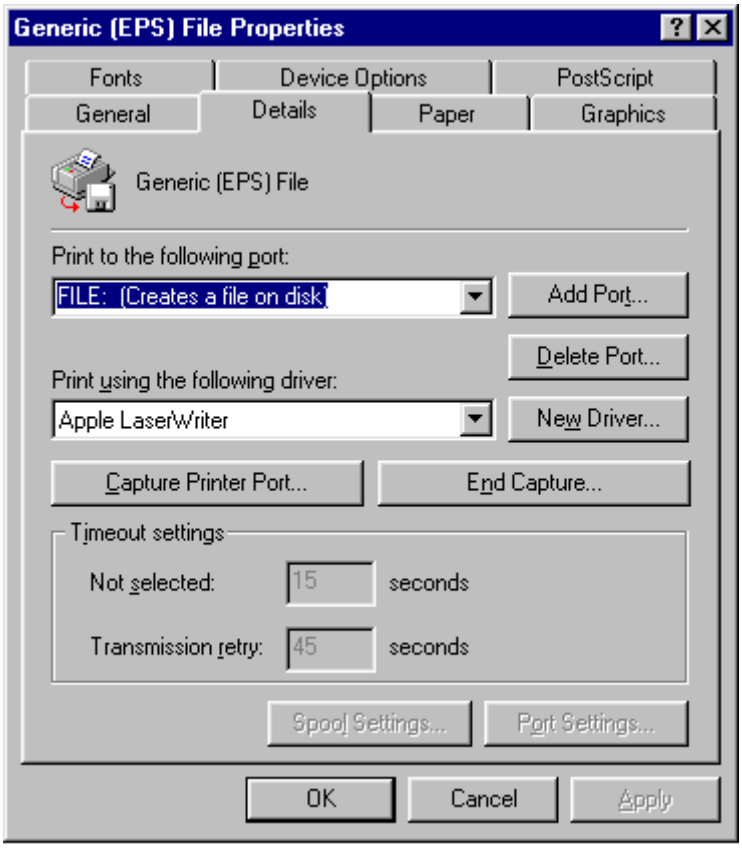
You have successfully added the new print driver specifically to be used for creating EPS files. You should now see the new driver in the list of printer choices.

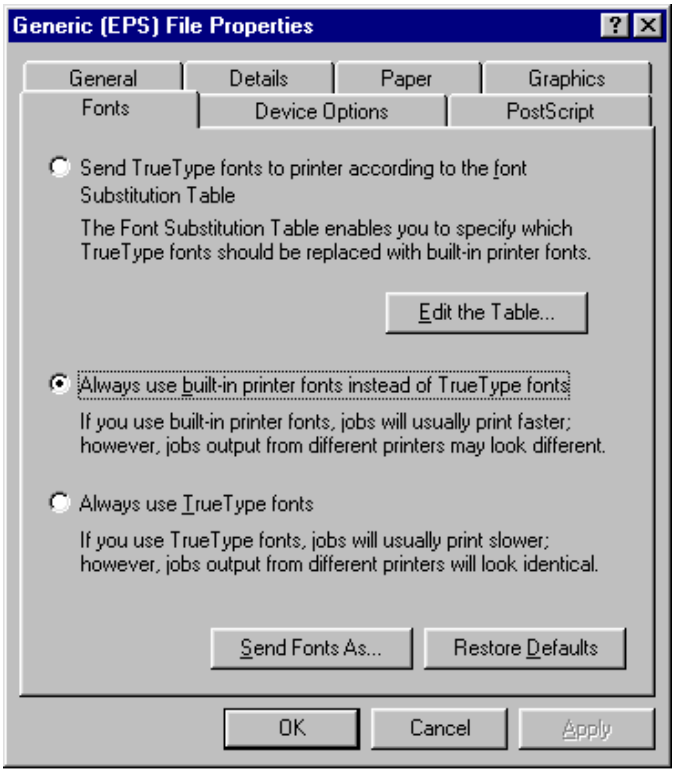


Printer Properties

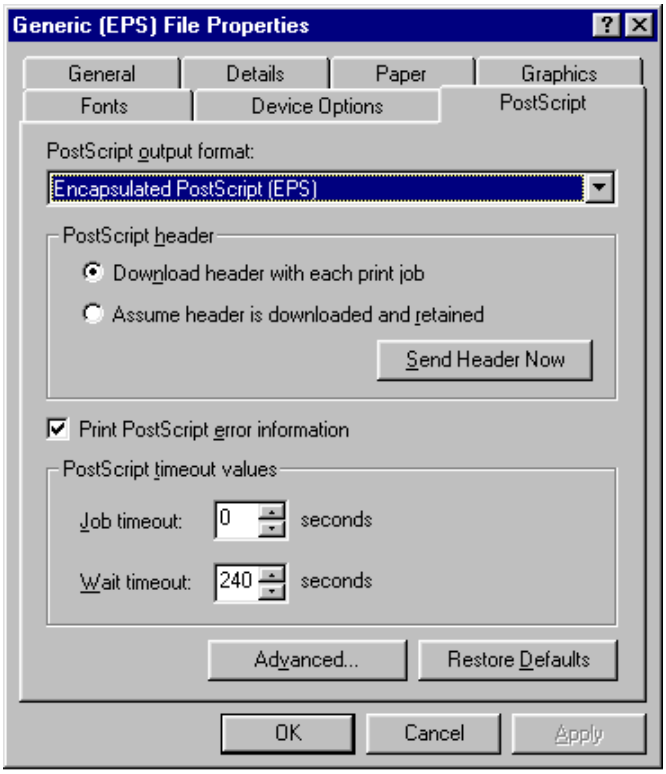
Next you need to be aware of certain printer properties that affect your EPS file.

Go to your printer properties and make sure the following screens match ours. Your details should show you are sending to a file using the Apple LaserWriter driver.

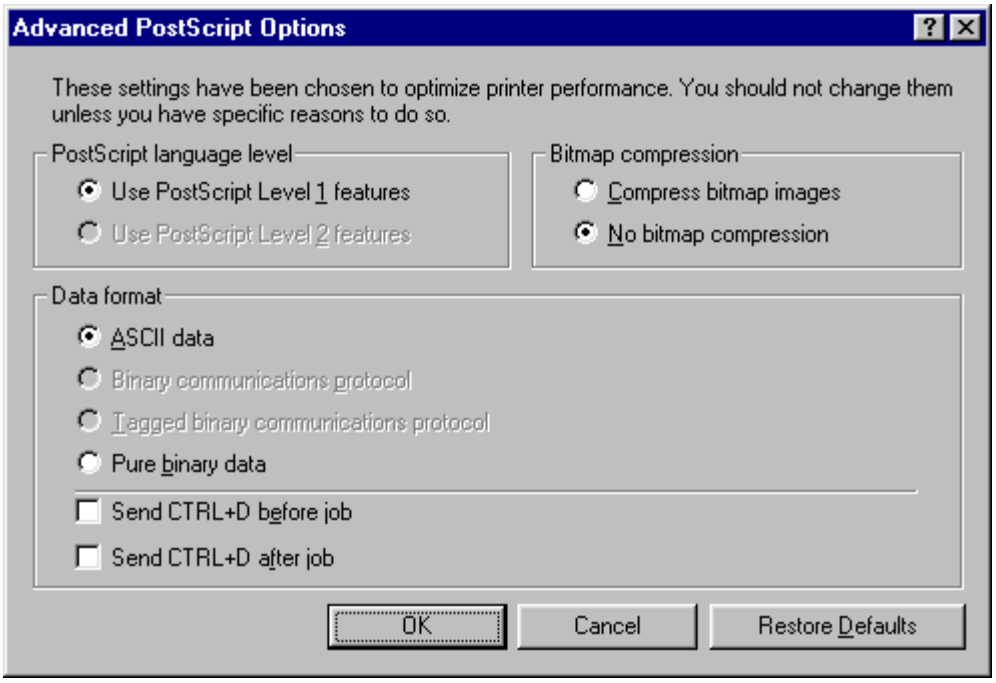




Under the PostScript Tab make sure you are asking for Encapsulated PostScript, with a header downloaded with each print job.



Under the [Advanced] PostScript tab, select Level 1, ASCII data, with No bitmap compression.



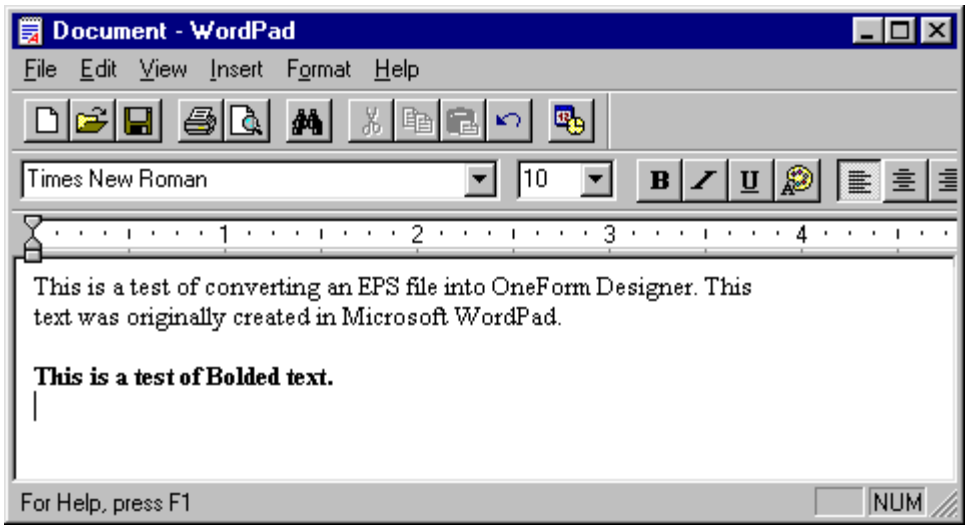
You are now ready to create EPS files through any Windows program using your new Generic EPS File print driver.

Create and Convert an EPS File as a Test

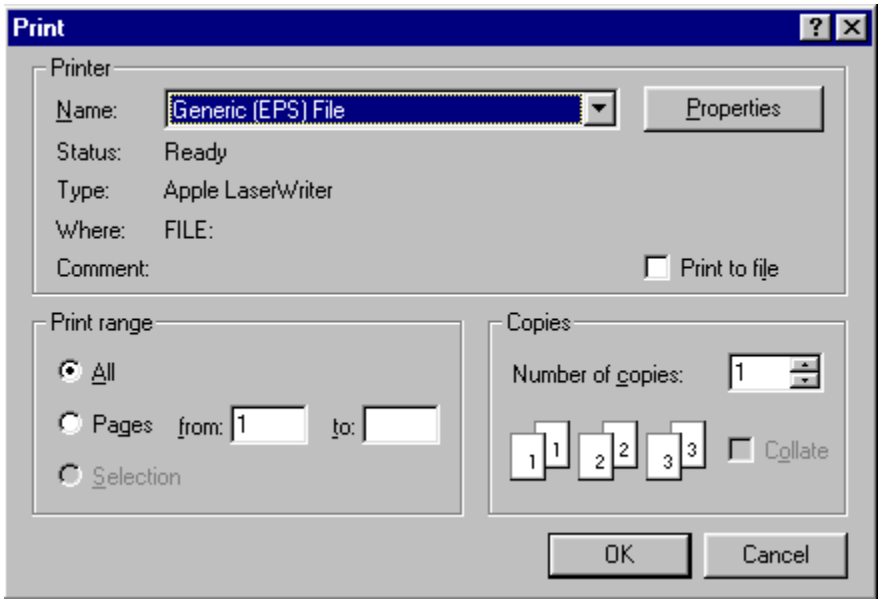
Creating an EPS file is easy. It just takes knowing a little about the software you are using to create the file. It is always under the [Project] menu in one of three places: Print, Save As, or Export.

For our simple test we are using **WordPad.** It is found under Start, Programs, Accessories. When starting WordPad, it will automatically place you into a new file.

We are ready to type in two paragraphs, similar to the ones shown on the next page.

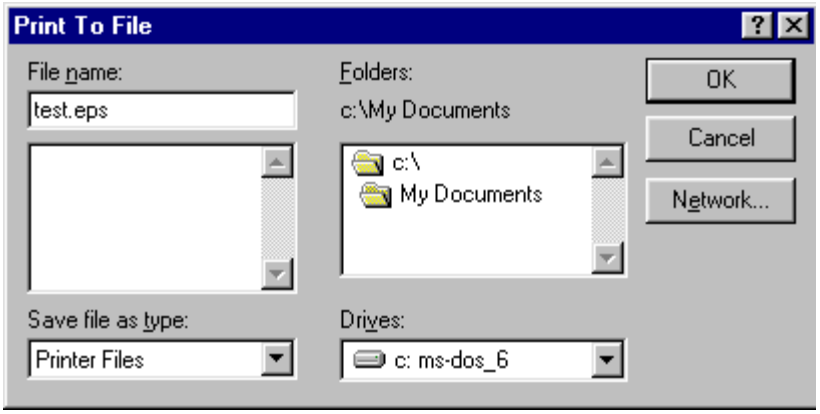


To create an EPS file in WordPad go to the File, Print option.



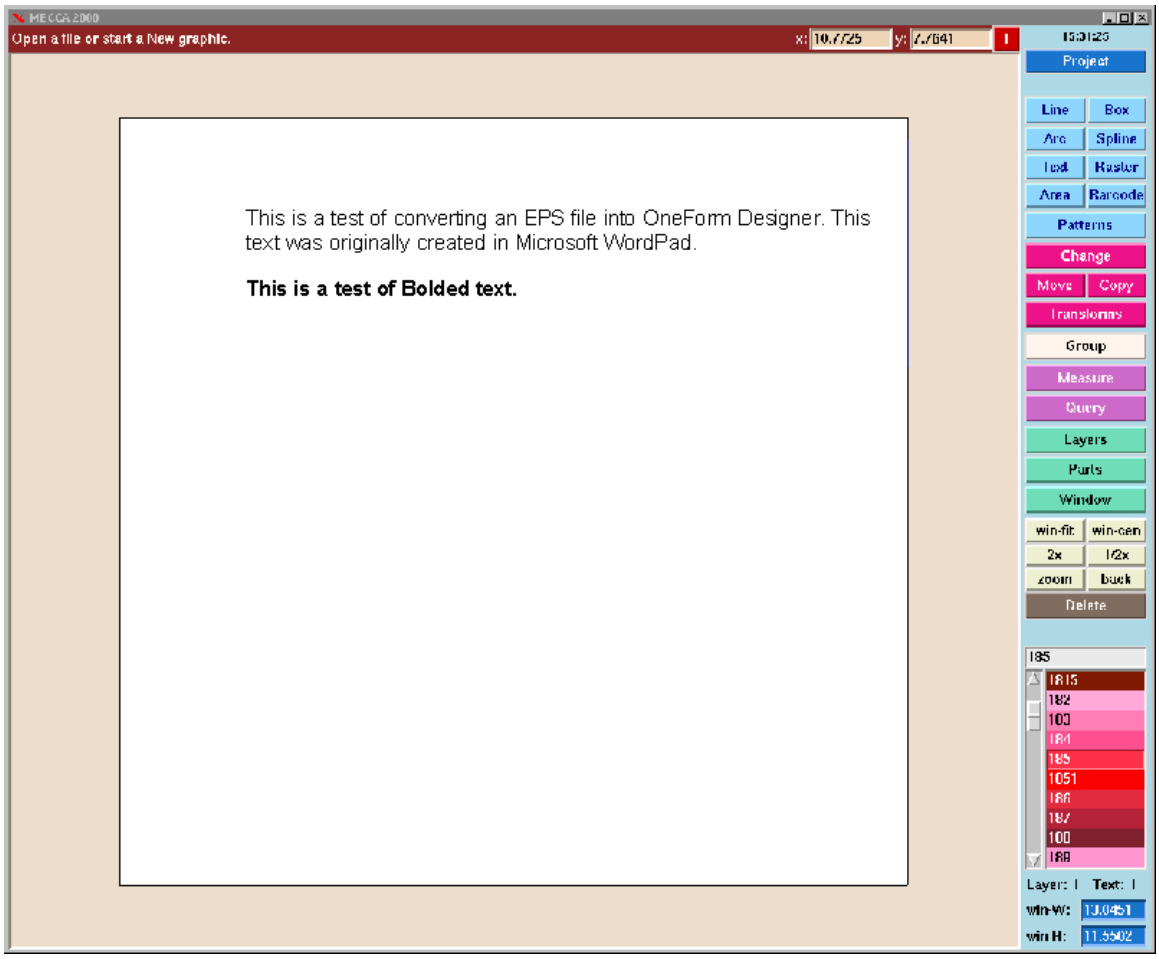
The most important part is to open the list for Printer Names and select your generic printer as shown in Figure 8-13. This is our Generic (EPS) File selection.

Selecting [Okay] will bring up the file naming dialog box. Be sure to input the name with an extension .eps, not .prn. MECCA 2000 is looking for .eps and .ps files only.



Choosing [Okay] twice will then create the .eps file on your hard drive in the location specified. We placed our file in My Documents.

You can now start MECCA 2000 and Open your newly created .eps file.



Accepting Diskettes from Customers

When you announce that you are accepting diskettes from customers it can cause all types of misunderstandings, unless you have coordinated up-front many issues. *What type of diskettes can you read? What types of files can you use?* These questions must be answered for the client, and even a form for them to use helps alleviate potential problems. Otherwise, you will be receiving files which you cannot use, and your customers will not appreciate the problem, nor understand what they did wrong.

Following is general information concerning diskettes and a form which might be a handy beginning when starting your acceptance of EPS files.

1. The diskette must be a DOS diskette. (Either 3.5 or 5.25)

2. All files on the diskette must be Encapsulated PostScript (EPS), or PostScript Print (PRN), or ASCII text (ASC) files.

3. Text documents should be saved as ASCII Text Only, not document files.

Almost every program has the capability to create PostScript files, but the procedures may vary. Have them look up "Encapsulated PostScript Files" in their program's user manual.

CONVERSION FACT SHEET

CUSTOMER NAME	PHONE	CONTACT	DATE

FILES

EPS FILES	PROVIDED ON DISK? ☐ YES ☐ NO If No, Explain: _____	FILE NAMES (DO NOT USE AMPERSANDS, DOLLAR, ETC.)
OTHER FILES	PROVIDED ON DISK? ☐ YES ☐ NO If No, Explain: _____	FILE NAMES

DISKS

3.5"	DENSITY ☐ HIGH ☐ DOUBLE	☐ MAC **(Must be DOS disk created with Superdrive.)**	☐ PC
5.25"	DENSITY ☐ HIGH ☐ DOUBLE	☐ MAC **(Must be DOS disk created with Superdrive.)**	☐ PC

SOFT-WARE

☐ F-3 ☐ VENTURA

☐ QUARK ☐ OTHER _____

A POSTSCRIPT (PS) OR ENCAPSULATED POSTSCRIPT (EPS) FILE MUST BE PROVIDED REGARDLESS OF SOFTWARE USED WITH THE EXCEPTION OF A TEXT-ONLY FILE WHICH MUST BE SUBMITTED IN ASCII FORMAT.

FONT HANDLING

☐ NO FONT CHANGES NEEDED

☐ CHANGE FONT TO _____

IF OTHER THAN ADOBE FONT, PROVIDE FONT USED.
MANUFACTURER, NAME OF FONT, STYLE

☐ TRUE CONDENSED	☐ TRUE ITALIC	☐ NORMAL LETTER/WORD SPACING
☐ PSEUDO-CONDENSED _____ Indicate +/- Increments or Percentage	☐ PSEUDO-ITALIC _____ Indicate Degree or Percentage of Slant	☐ ALTERED LETTER/WORD SPACING _____ Indicate Increment or Percentage of Alteration

LOGOS

☐ ADD ☐ REPLACE

☐ SCAN & DOWNLOAD TO DISK (YOU MUST PROVIDE DISK)

SPECIAL

☐ SPECIAL CHARACTERS (i.e., Dingbats, Fractions, Symbols) VENTURA

☐ COLORS ☐ SCREENS _____ ☐ PANTO# _____ ☐ BORDER# _____

Be sure to fill out this form for each file you send. Your job may be delayed if not filled-out completely. A hard-copy proof must be supplied along with the diskette.

☐ HARDCOPY PROOF

Converting a PostScript File From Xterm

The conversion program is named "PS". It uses standard input and output. You can access this program from the Xterm $-prompt:

To convert a file:~~**PS (options) <inputfile >outputfile**

To get a list of its arguments:~~**PS -?.**

The **-3** option allows output of Type 3 font characters.

The **-p** option allows you to send directly to the monitor (MECCA cannot be running).

You would type in:~~**PS -p (inputfile).**

The **-n** option turns on output of clip paths. This will give you the clip boundaries.

Environment Variables

The following environment variable is found in */usr/bin/amgraf/ mecca.include.* It defines the location of the *Fontdict* directory. After any variable is set, it must be "exported" at least once before it is known to any software.

Default Syntax:
M_PSCONVERT=/usr/bin/amgraf;
export M_PSCONVERT

Limitations

At this time Clip Operators, True Type Fonts, and PostScript Level 2 Only Commands are not supported.

Using Xpdf

Xpdf is a viewer that will load a .pdf file and allow you to create .ps files.

Xpdf allows you to page through a multiple page .pdfs. Zoom on particular areas. It also has a Search option that will allow you to search for key words. You can also print the file or create .ps files.

To use Xpdf go to an X-term Windows $-prompt. Type **xpdf (filename).** This will load the .pdf file.

You then can create a .ps file by clicking the printer icon. If you create a multiple page .ps file upon loading, MECCA will place each page on separate layers. You then need to create a Spec File using the [Parts] tool. Putting each page in its own part.

Adobe Acrobat May Help with Problem Files

If you continue to have problems with importing EPS files, it may be font related. One solution can be to import the EPS file into Adobe Acrobat and write out another EPS file. Many times Adobe's Distiller will clean up the problem and correct the font errors when it writes out a new EPS file.

Adobe Acrobat Distiller is a part of the Adobe Acrobat package of products that imports and distills PostScript into its PDF format. The PDF file can then be printed again to create another EPS file. Recreating the EPS file through Acrobat insures it is written in the proper format.

Distilling the EPS File

---

1. Start the Adobe Distiller Program.
2. From the Project menu choose Open and highlight the .EPS file and then OK.
3. In the Specify PDF File Name Dialog, enter the new PDF file to create and OK.
4. This will create a new file in PDF format.

Printing New EPS File

---

1. Double-click on the newly created PDF file.
2. This will open either Adobe Acrobat Reader or Exchange.
3. From the Print dialog box, select your "Generic EPS File" printer and name it.
4. Okay, and you will be creating a new EPS file ready to be opened into MECCA.

INTENTIONALLY LEFT BLANK

Index