MECCA™ 2000

INTEGRATED ELECTRONIC PUBLISHING SYSTEM

Illustrating and Drawing

AMGRAF, INC.

MECCA™ 2000 Version 5.05

These specifications are subject to change without notice.

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Overview

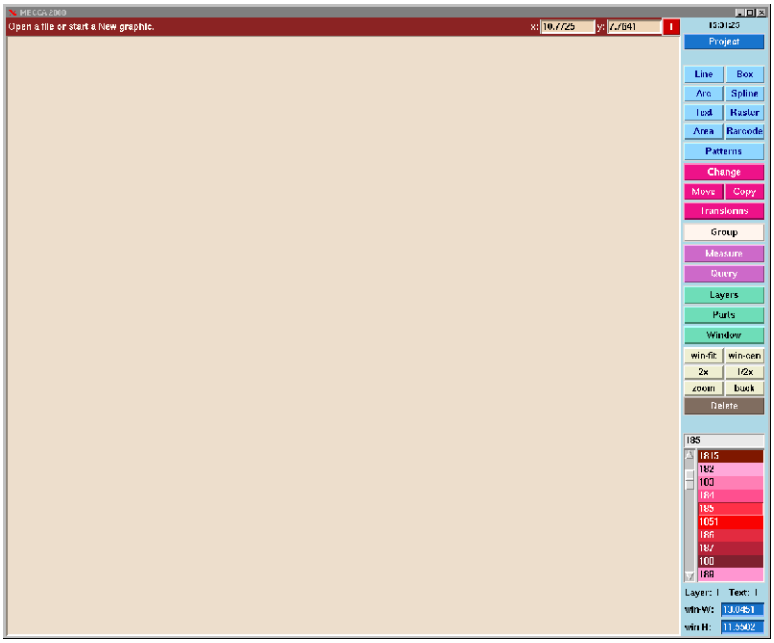
What's in this Book?

This volume is designed to give you all of the details concerning the MECCA 2000 tools controlling illustrating and drawing. The basic structure of this volume is based on these various tools and submenus. Each major tool has been broken down into its own chapter.

You'll get the most out of this volume if you actually run through the exercises that are found in this volume. The exercises are easy. All major (and most minor) aspects of each option have had exercises created for them. If you go through all of the exercises, you'll be drawing complex graphics in a much faster time than you expect.

Starting Up MECCA 2000

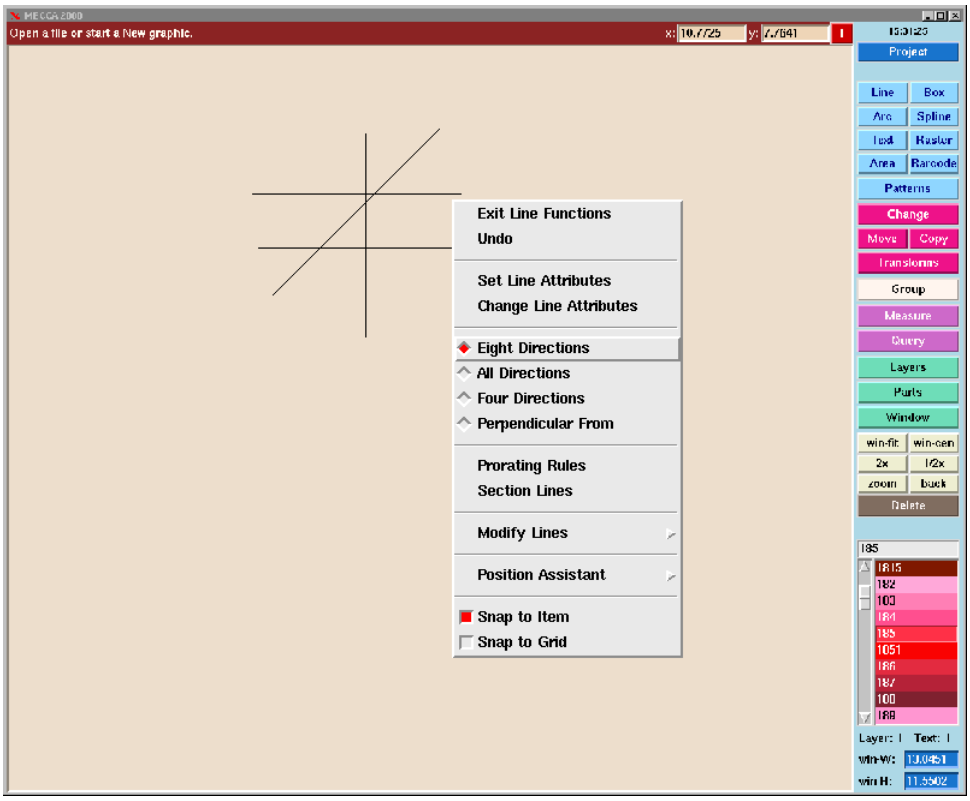
Start MECCA 2000 by picking the **MECCA 2000** option on the start menu. You'll then see a display that looks like the one below.



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 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.

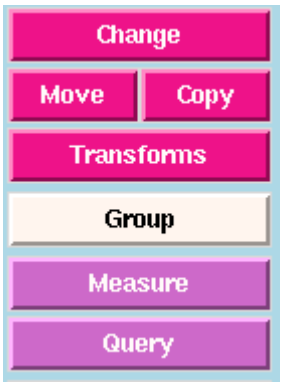
Naturally, the right-hand side holds the buttons for our main different types of functions. Let's quickly review their actions.

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

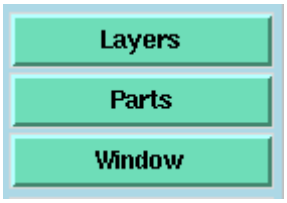
Each of these tools includes a pop-up menu with access to the {Position Assistant} tools. These are used to allow precise positioning of the cursor when needed.

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



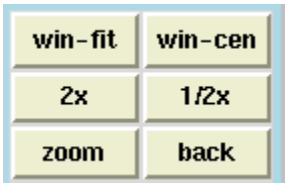
Altering and Assistant Tools

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

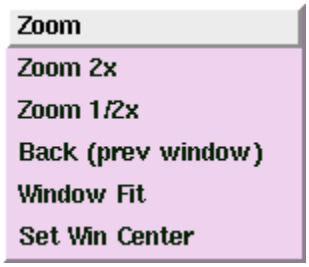
The tan Zoom Functions control how large components will be displayed in the Window Area of your screen.



Zooming Buttons

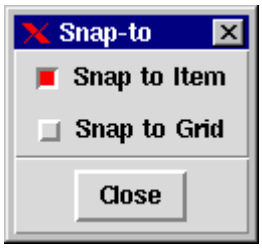
Hot Key Shortcuts

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

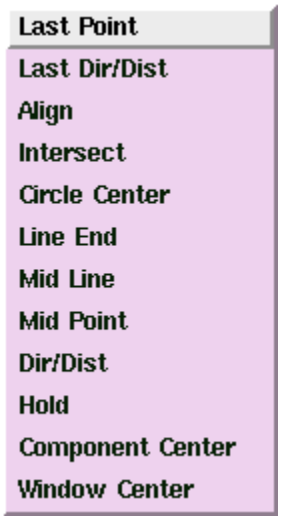


[Shift]- Left Mouse (Button1**)** brings up a "quick function select" menu:

[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:

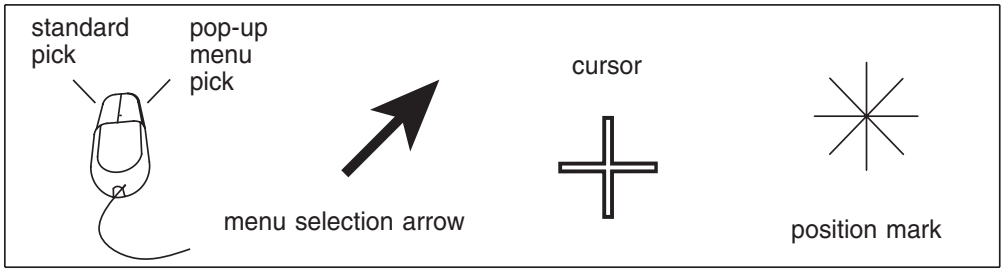
[Ctrl]-z & [Ctrl]-/ is Zoom 1/2x
[Ctrl]-Z & [Ctrl]-? is Zoom 2x
[Ctrl]-f & [Ctrl]-k is Window-Fit
[Ctrl]-a & [Ctrl]-; is equivalent to a mouse right-click
[Ctrl]-g means invoke group function

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.

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.

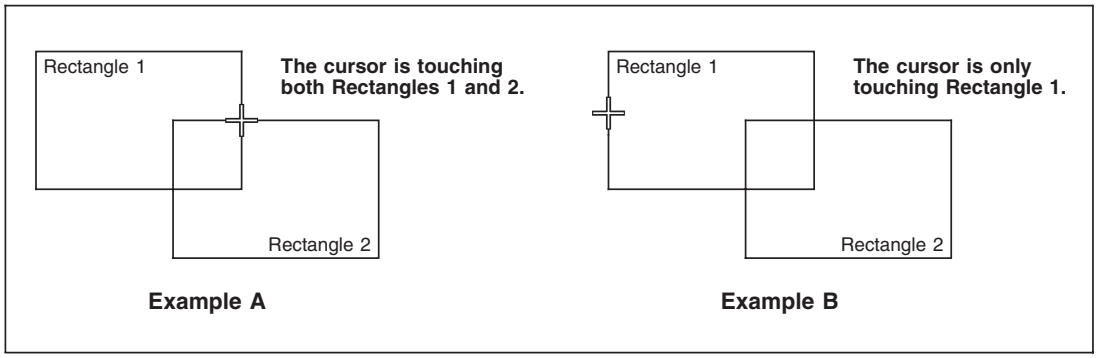
When using a mouse, hold it in your regular drawing hand and place your index finger gently on the left button. The mouse sits on the mouse-pad and glides smoothly around the drawing area. Pressing the *left* button causes MECCA 2000 to pick a point or choose an option, according to where the cursor 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

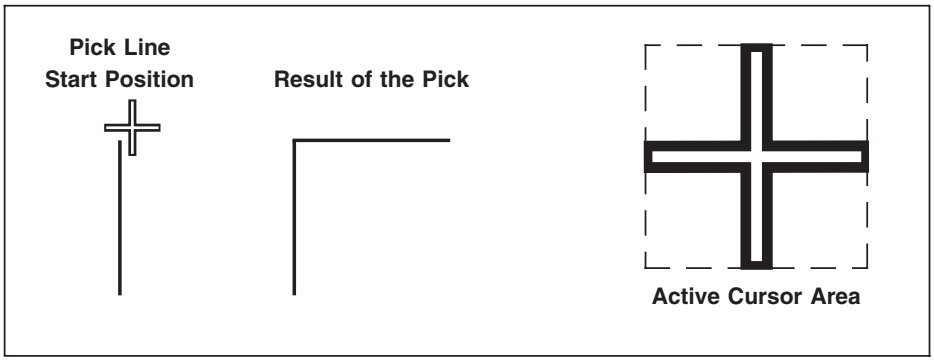
As used in these books, "choosing" refers to moving the cursor over the various buttons and options listed in the pop-up menus, and pressing the *left* mouse button down to indicate what option you want MECCA 2000 to do next. Throughout the rest of this chapter, we'll be using **boldfaced** type to tell 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.



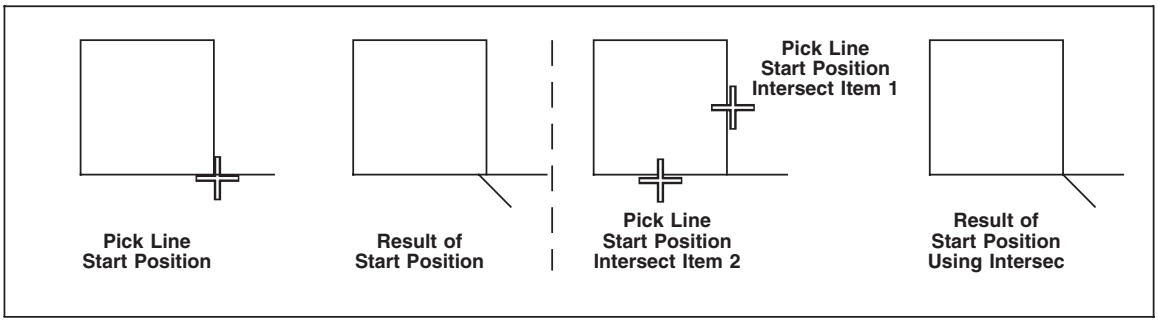
Picking Rectangles to Delete

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

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. These are handled internally by MECCA as fonts except for the 2D Bar Code.

Chapter 1: The [Project] Tool

Here we are going to cover the menus found behind the **[Project]** tool.

- {Open File}
- {Combine File}
- {Save} and {Save As}
- {Print}
- {New Graphic}
- {Window Bitmap}
- {Batch and More}
- {Version Info}
- {Exit}

Let's try clearing the window using **{New Graphic}** and then draw a few lines. Do not save the lines but go to [Project] and **{Open File}.** The system knows that the current drawing has not been saved. A message "Current drawing not saved, abandon it?" will appear. You will have two options:

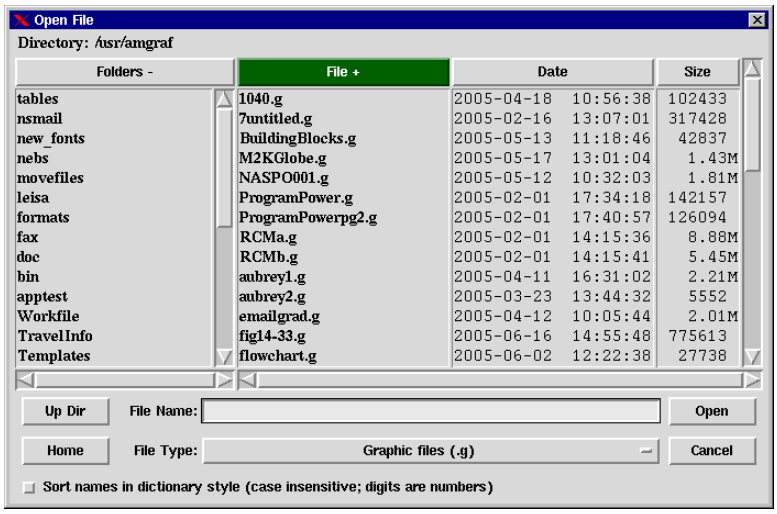
- Choosing {Yes} will cause MECCA to continue and allow you to load another drawing losing the current one.

- Choosing {No} will stop the load process and keep the current drawing, allowing you to continue to the {Save} menu and save if needed.

{Open File} - Loading in an Existing ".g" Drawing

To load in an existing MECCA ".g" file select [Project], {Open File}. Once you have selected {Open File} this will bring up a "pop-up" window showing all of your files and directories. You can search through the directories and files to locate your drawing. Once located, highlight and "double-click" the file name or click on the [Open] button.

NOTE: You must "Unpack" any packed files prior to opening and "Uncompress" any compressed files prior to opening.



You can also key in the “File Name” in the user input area. Here the system assumes the current path. While typing in the filename the following syntax can be used to have it look in another directory:

~ - The tilde character (~) means HOME as the location path. HOME being your login. Example: *~/mydrawing.g* means */usr/amgraf/mydrawing.g* if I was logged in as /usr/amgraf.

/ - Any filename which starts with the forward slash character means *respect the absolute path being input* and ignore the Set DEFAULT path. Example: */tmp/mydrawing.g* means put the drawing in the directory /tmp and ignore all other settings.

../ - Any filename which starts with a double period forward slash (../) means *drop back one path level.*

Note: Open also coverts PostScript files. See *Getting Started, Chapter 9: The PostScript Interpreter.*

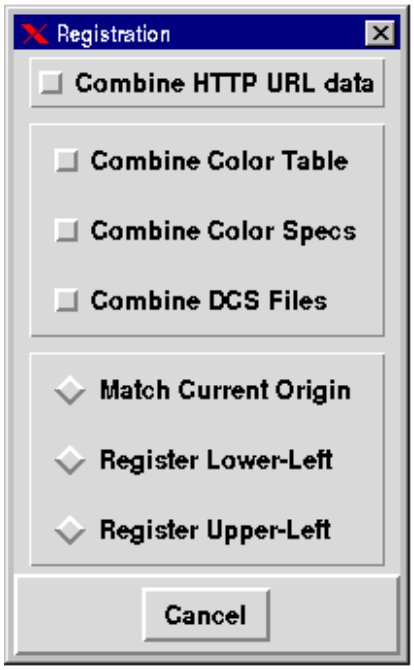
{Combine}

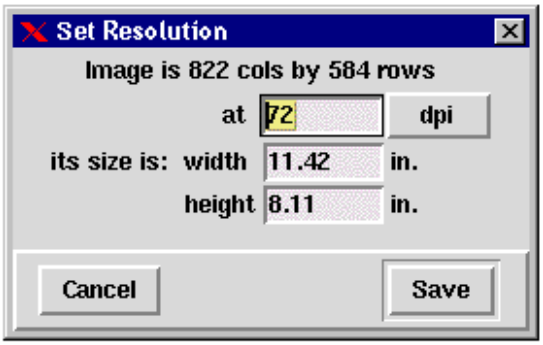
Combine Illustration allows you to load a drawing, while keeping the drawing that is already on the screen. This allows two drawings to be "combined" into one. The drawing that you are combining will come in "grouped" so that you can move it to the location desired. Because it is grouped it will appear as one white object.

You must select one of the three positions for combining. *Match Current Origin* will combine the drawing (into the current drawing) according to the X and Y coordinates of the combined drawing. *Register Lower/Upper Left* will combine the drawing by using the upper left or lower left position of the combined drawing and placing it on the position picked. If it does not appear to fall in the correct location, this is because the combined drawing was not [Win-Fit] before it was saved and the upper left of the drawing has a window coordinate, which is far away from the object.

> **Note:** Since combine illustration causes a group to take place, beforehand, make sure there are no groups in the current drawing. Once your combined illustration is moved into position and has the correct layering, you can {Ungroup All} to ungroup the drawing.

Combine Color Table will replace the current drawing layer colors, with the new combined drawing layer colors. *Combine Color Specs* will replace the current output specifications, with the new combined drawing specifications.





Using {Combine} to Load Other File Types

The {Combine} function also brings in other file types. When choosing a scanned image (such as BMP or TIF), it actually does two things: it converts the scanned image and then combines it into the current drawing. At the time of the combine, you will be able to set the resolution and see the size of the image in the Set Resolution dialog.

If you have a drawing on the screen and you want to bring in a scanned image for the first time, you have two options; 1) combine it into the current window and drawing, or 2) select {New Graphic} first to clear the window, then {Combine} it.

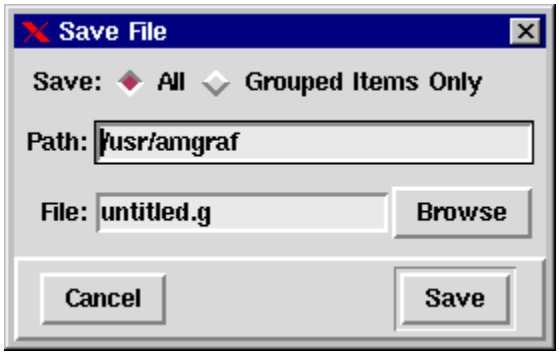
Once the scanned image is brought to the screen and saved, it can be loaded as any other standard ".g" file using {Open File}, but that first time, you **must** use {Combine} to get the conversion to take place.

Since DSC Files are separated as CMYK Color files, you also have a selection for combining in a DSC file, (bring in the Cyan piece). There is also a "Convert DSC File"

{Save}

Choosing this option will place the changes that you have made to the drawing over the original drawing that you pulled up.

With both the {Save As} and {Save} you have the option of saving the entire drawing or selected grouped components.



{Save As}

When you start a new graphic and want to save it for the first time you must use {Save As}.

{Print}

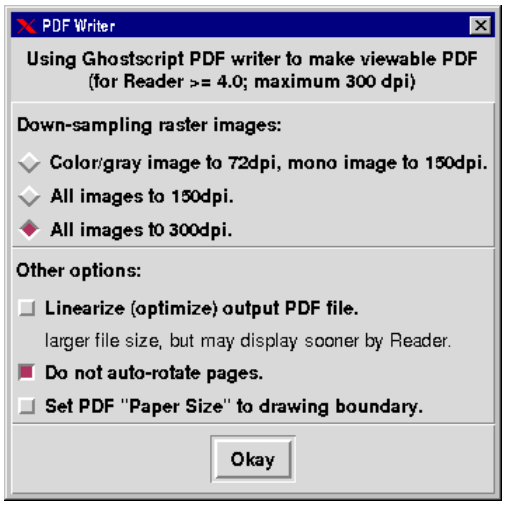
When you select the {Print} option the dialog below will appear. The difference may be whether you have Part Specifications or not. When Separation specifications are available through the use of [Parts], each part will have its own dimension calculated, and window-fit will fit to the parts selected for display. This can also change the per-part scaling factors as shown in the Print dialog.

Printer/Imager - this is where your select your output device and trays by using the "pull-down" menus.

Print to File - this option allows you to send output to a file. It will create a PostScript file when you use the extension ".ps" and an Encapsulated PostScript file when you use the extension ".eps", and a PDF file when you use the extension “.pdf”. Printing to a file is handy if you need to create a printer file for a service bureau. PostScript Level 3 is available when printing to an Encapsulated PostScript file, use the extension ".ep3 or .eps3". The file name extension will automatically reset to ".eps" when the output file is created.

Printing to a Viewable PDF File

The print-to-file option checks whether Ghostscript is available, if so and the user types in a file name ending in ".pdf", then a viewable PDF file will be made directly. The user's choice of printer page size is used for scaling/rotation as usual, but when making a viewable PDF, the following dialog will appear:



Note: Such PDF file is good only for viewing on screen. For more sophisticated PDF file generation, ordinary PS files should be made and then processed by Adobe Distiller (with suitable Distiller settings).

Set Paper Size - This allows you to control the output file page size when printing to a file. It is especially handy for creating standard letter size PDF's. A dialog will appear so that you can type in the page size.

TIFF Thumbnail - you can attach a tiff file to the Postscript file for use with Windows applications, which can see thumbnails.

Miscellaneous Options

You also have the options of "Rotating" or "Scaling" upon output. Whether these cause tiling is reported under the [Tiled Printing] button. Other options available are multiple "Copies", printing with "Cutmarks" surrounding the image, or with the file's "Grid".

Printing Only a Portion of the Drawing

During printing the entire file boundary determines the drawing limits, regardless of layers being printed. If the drawing limits need reduced to not include outer proofing marks, for example, then use the two options: **Print Only a Rectangular Region** and **Use as Drawing Limits** together.

When you select "Print Only a Rectangular Region" there are two choices: draw a rectangle or pick an existing box component. This lets you define the portion of the drawing that is to print. Afterwards, select the checkbox for *Use as Drawing Limits* to force the drawing dimensions to be that rectangular region.

The tray or film size and the scale percentage that the entire file is causing would determine needing these options. If the file's drawing limits cause the output to scale, then using the smaller rectangular region's drawing limits would make a difference, and possibly allow the file to print at 100 percent.

Exclude Components Outside the Region

This option works in conjunction with "Print only a Portion of the Drawing".
It works similar to a "clipping mask", when selected, anything outside of the rectangular region will not print.

If your drawing contains step-and-repeat objects that originate outside the selected region but, when printed fall within the region, you will need to turn off the "Exclude" option so these items will print.

RGB as CMYK

If your drawing contains an RGB raster image, you can have it printed as CMYK without having to modify the image itself. This may help with some printers if color shifting is a problem. When needing CMYK output, this will separate the image during output, instead of you having to replace the image in the file.

Printer Specific Options

The print dialog reflects the settings in the printer device file. When seen the features will be available in the print dialog.

Once you have filled out your selections choose [Okay] and printing will begin.

Part Specifications

If your drawing contains a Part Specification, you then have the option of picking which Part and Separations to print. You can either print all at once or make individual selections. See *Chapter 13: The [Parts] Tool* for more information on Part Specifications for Spot or Process Color and how parts effects printing.

Density Correction

Density Correction is used to compensate for errors in PostScript laser imagesetting technology. Some laser imagesetters do not produce an exact 5% screen density when commanded to, and must be given a higher density command to produce a "true" 5%. Other percentages also may be wrong. The problem is generally more pronounced in

reverse image (negative) films. To overcome this problem, one or more density correction tables can be established for automatic density correction.

The density correction file provides for the correction of the screen percentage values for output to imagesetters that do not render exactly the correct density values in reverse image screens. Entries should be put in this file for every actual densitometer reading that was done on the physical film, and the program will interpolate values in between.

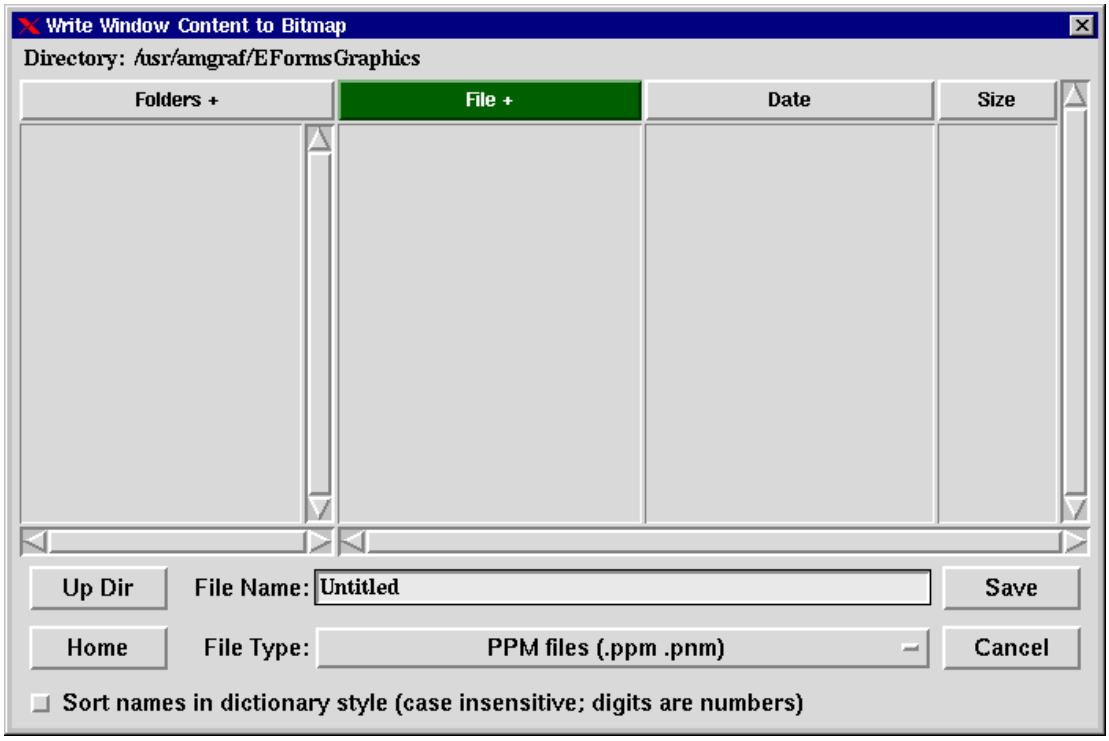
The two fields are: 1) the density requested, and 2) the output density measured on film. A table to review as an example, is stored at */usr/mecca/color/correction01*.

The correction tables are specific to the printers. Place a correction table in */usr/mecca/cfg/printer_files* and rename appropriately.

To use Density Correction, just check on With Density Correction and proceed with the other output steps as you normally would.

{Window Bitmap}

The **{Window Bitmap}** option allows you to take only whatever is in the window's viewing area and create a .PPM file. This file then can be loaded into any "photo editing" package.

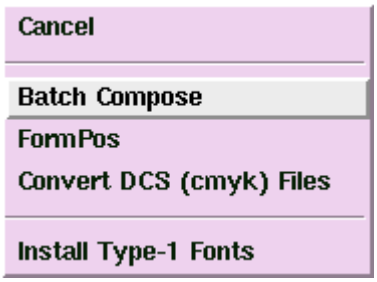


{New Graphic File}

Use this option to start a new graphic file and reset the attribute defaults at the same time.

{Batch and More}

When you select the {Batch and More} option other program choices will be displayed:



Batch Compose is a pagination program on MECCA 2000 that turns regular ASCII text files into final composed artwork through batch markup commands Please refer to the *Batch Composition* manual for complete details.

FormPos is a program that is used in conjunction with the *Batch Composition Merged Form Process.* This program creates the ".fp" and ".mf" files required by merged forms. See the *Batch Composition* manual.

The ***Convert DSC File*** option converts the DSC File into a ".r" raw raster image file that can then be saved as a ".g" graphic.

Note: DSC Files are separated as CMYK Color files. You also have an option of combining in a DSC file, (bring in the Cyan piece), under the Project, Combine option.

Complete details for ***Installing Type-1 Fonts*** are found in the *System Administration* manual. This option also has a choice for installing TrueType fonts if needed.

{Version Info}

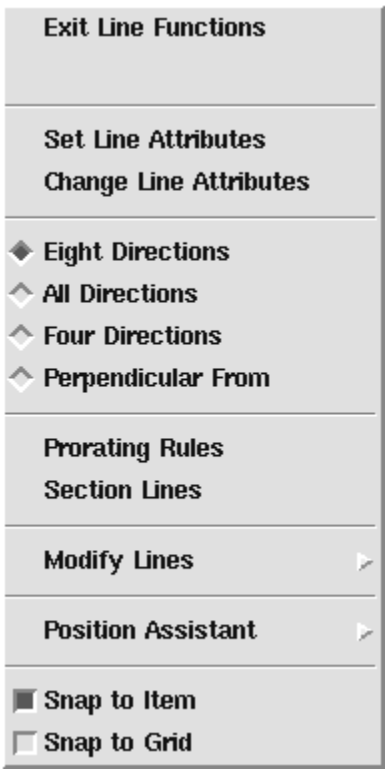
When you select {Version Info} a "dialog window" will display showing your most recent software version that you are currently running.

{Exit}

When you select {Exit} this will stop the graphics progam and take you to the **MECCA 2000 - Startup** window.

Chapter 2: The [Line] Tool

Here we are going to cover the options found within the **[Line]** tool. You get to these options through the right-mouse button pop-up menu. {Set Line Attributes} is for setting the weight, style, and color of your lines. {Change Line Attributes} allows you to change existing lines. {Prorating Rules} is an assist in drawing a given number of evenly spaced parallel lines. The {Modify Lines} contains the tools used to alter a line.



Drawing Lines

Once you are in the Line Menu, you don't have to select any of its options in order to start drawing lines. This is if you're willing to accept the default values. You'll see the "pick line start" prompt appear. Pick anywhere in the Window, the prompt will read "pick line end", then move the cursor away slowly and a line will appear on the screen, and expand, contract, and move around to follow the cursor's movement. Picking again will actually draw the line corresponding to the default values of a **solid 1-point line, on Layer 1.**

Defaults:

Line Weight = 10 decipoints, Line Style = Solid, Line Layer = 1,
All Directions, Color = 0 (Black), Screen Lineage = 133,
Screen Dot = Dot, Dot Angle = 45 degrees

Line Drawing Direction

{Eight Direction} and {All Direction}
Choosing {Eight Directions} tells the computer that you want all your subsequent lines to be drawn at multiples of 45 degrees (that's 0, 45, 90, 135, 180, 225, 270, and 315). Choosing {All Directions} tells the program that you want to draw lines at any angle you like.

{Four Directions}
tells the computer that you want all your lines to be drawn at 90 degree angles.

{Perpendicular From}
This option allows you to draw perpendicular lines from a given line. This is done by picking the line to draw perpendicular from. It will stay locked into perpendicular drawing mode until you pick a directional mode again or start drawing instead of choosing a line to draw from.

See Figure 2-1 for examples of all modes. Choosing either directional mode will bring up the "pick line start" prompt.

Default:

Eight Directions

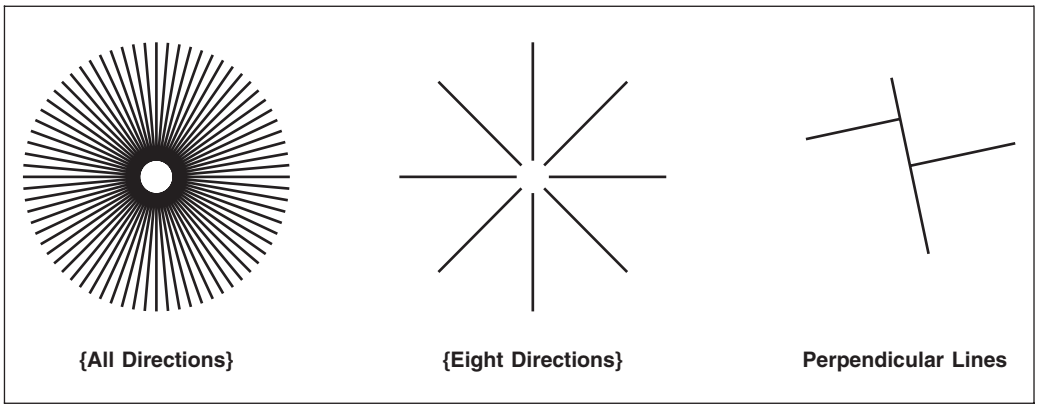
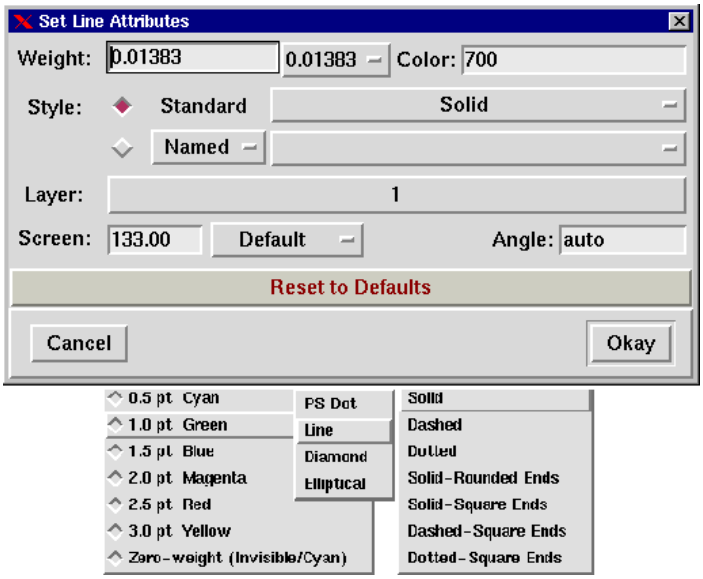


Figure 2-1: The Different Drawing Modes

{Set Line Attributes}

If you'd prefer a different line weight (or possibly need to add a color to your line), choosing this option will bring up a "dialog window" so you can select the attributes of your choice. After you have chosen your attribute selections, you must click [Okay] to save your choices. Afterwards you will be prompted by a "pick line start" again to start drawing.



Setting an attribute is for controlling the attributes of items which have not been drawn as of yet. You are "setting the attributes" before the item is to be drawn. Once a component is drawn and displayed, you will need to use the {Change Attributes} option to change a component's existing attributes.

Once an attribute has been set by any {Set Attributes} menu, that attribute is being recorded throughout all set attribute menus.

Setting Line Weight

If you'd prefer a different line weight from the default value, you can either type in a weight in the box provided or select one from the "pull-down" menu.

You can set the weight of your lines anywhere from half a point (5 decipoints) to 3 points (30 decipoints). You can even have "invisible" lines of 0 points, which will appear on the screen, but not print when output.

Default:

10 decipoints = 1 point (green lines on screen)

What's not so obvious is that you can also have line weights of 2.5 points, 3.7 points, 4.6 points or other odd sizes. To do this, you have to type in the size of line weight you want with its unit of measure and press [Enter] instead of selecting from the "pull-down" menu. For example, you could enter **2.5p [Enter]** for a 2.5 point line. The practical upper limit seems to be 500 points (5000 decipoints), though you're unlikely to ever need a line that thick.

The practical lower limit is 0.1 point (1 decipoint). This is because most output devices can't make a line thinner than one decipoint.

The window display of *Type Color* shows lines with weights from 0 to 5 decipoints in cyan, those from 6 to 10 decipoints in green, from 11 to 15 decipoints in blue, from 16 to 20 decipoints in magenta, from 21 to 25 in red, and from 26 up in yellow.

Figure 2-2 shows lines of several weights. All of these lines would look alike on the screen, except for their colors while in the [Window] thin line display. Thicknesses of the lines extend both above and below their picked position. The 10-point line in the figure has 5-points of the line extending up from the picked center, and 5-points down from the picked center. To see the relative thickness of the lines on the screen select **[Window]** and for *Line Mode* click *Thick* so that the box next to it turns red, now select **[Okay].** Your line weights are represented now by color and thickness. While in "Thick Line Display" your dotted and dashed lines will show as solid and at times you will need to [Zoom] to see relative thicknesses.

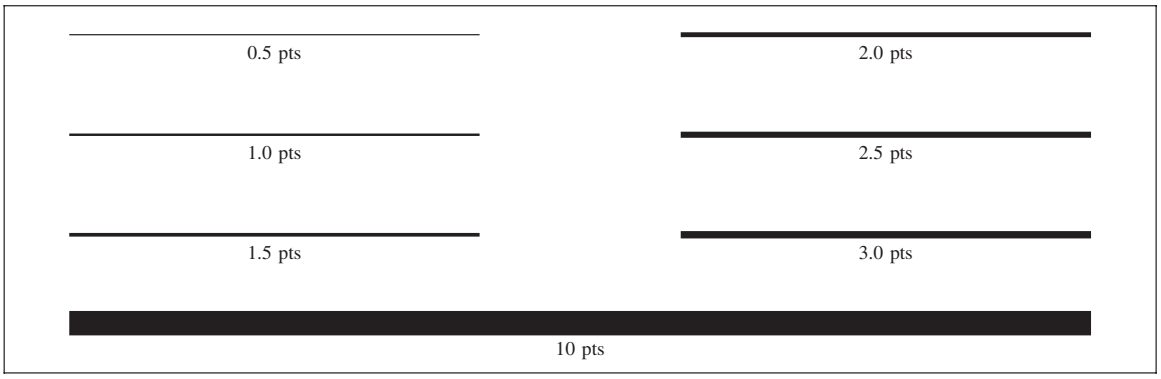


Figure 2-2: Line Weights

Select a line weight, either by choosing an option or by entering in a weight from the keyboard. When satisfied select **[Okay]** to accept setups. You are now ready to draw and the "pick line start" prompt will reappear, and your subsequent lines will now be at your chosen weight, as shown by their color and thickness.

Setting Line Style

There's more than one style of line. To choose a style first click whether it is a *Standard* or *Named* line style, then for "Standard" styles click on the "pull-down" menu and choose one from the list. For a "Named" style you must first {Combine} in the ".pat" file from the /usr/amgraf/LineStyles directory. Once combined you will then have access to them thru the "pull down" menu.

After you choose a line style, select [Okay] to accept the setups. This will bring up the regular "pick line start" prompt and you are ready to draw and all your subsequent lines will be in that style.

Default:
Solid

How can you decide what kind of line style you need? Take a look at Figure 2-3. As you can see, lines made with the {Solid} option have squared off ends. The other options of {Solid Round Ends}, {Dotted}, and {Dashed} are simple. Dotted and dashed lines are easy to tell apart, on screen and on paper, but the round vs. square ended lines can be hard to tell apart on paper below about 2 points of weight. There's *no* visible difference on screen between the Solid and the Solid Round Ends style unless you look at the drawing using [Window]'s *Thick Line Mode*. When drawing corners use {Solid Square Ends} instead of {Solid} to get a nice squared corner.

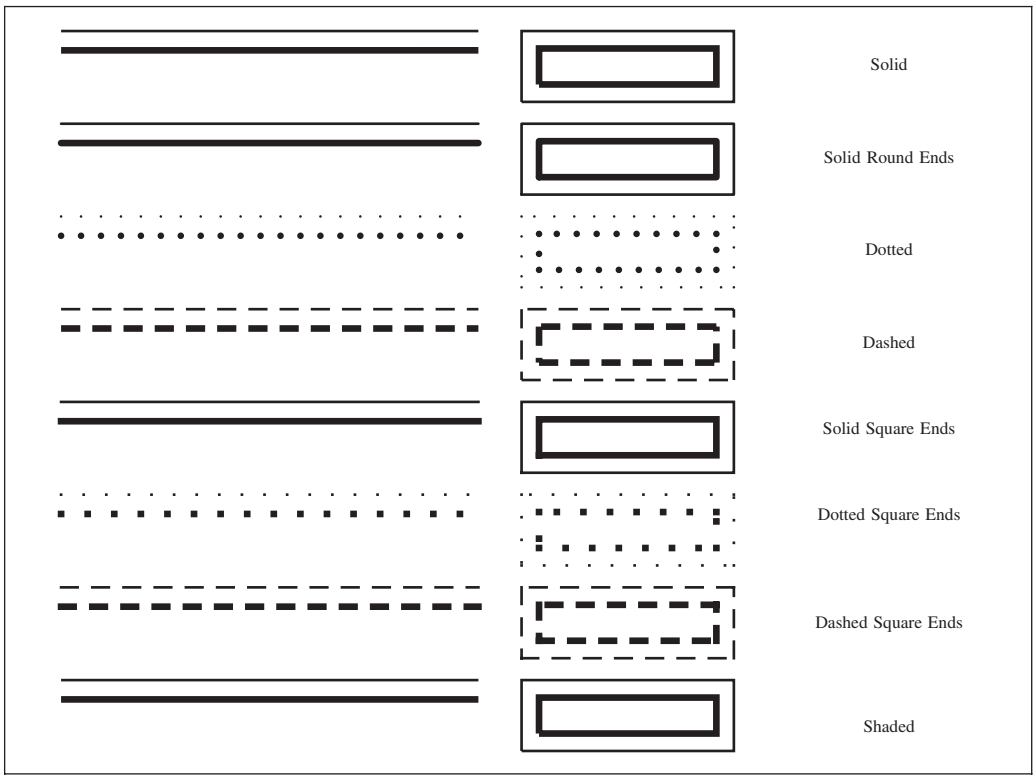


Figure 2-3: Line Styles Drawn at 1 Point and 2.5 Point

{Solid Square Ends}
Mostly used with rectangles for nice squared corners, but is also necessary for lines which makeup a corner. Since lines meet on center points, squared ends extend half of the line weight to meet and fill-in the notched corner. By selecting {Solid Square Ends} the system will automatically compensate for the line thickness to produce perfect square corners.

Named Styles
The three basic line style options (solid, dashed and dotted) found under {Set Line Attributes}, occasionally, is not enough pattern variety. MECCA solves this dilemma by allowing the operator to choose a linestyle from the Library.

Defining your own line style is a menu driven process, which creates a "pattern file" describing a line that can be combined into your drawing. See page 52.

Setting Layer

If you are going to be doing any sort of color printing, or overlay components, you'll find it handy to be able to draw on several "layers" in the same drawing. With this option you can select one of 32 separate layers to draw on. This allows you to display or hide particular layers on the screen as well as output certain layers together.

This gives you the ability to separate color artwork at the time of creation and output automatically those separations. It also allows you to separate complex drawing components from each other by placing them on different layers and turning layers off when not needed.

Layer is where you choose what layer the item is to be created on at the time of creation. Once an item is drawn you would then be "changing" the layer if you wanted it on another layer.

To set the layer, click on the *layer bar*. This will bring up a color chip panel showing the first 16 layers. Click [Next 16] to see the remaining 16 layers. Now click on the "color chip" next to the layer number that you want your items to be drawn in. Once you make your selection you are then taken back to the {Set Line Attributes} menu, now select [Okay] to accept your attributes. The standard "pick line start" prompt will reappear, and all subsequent lines will be in that Layer.

Default:

Layer 1

See Also:

[Layer] *Turning Layers On/Off*,
Spot Color, *Seeing Layers in Color*, and
[Print], *Spot Color Separation Output By Layer*

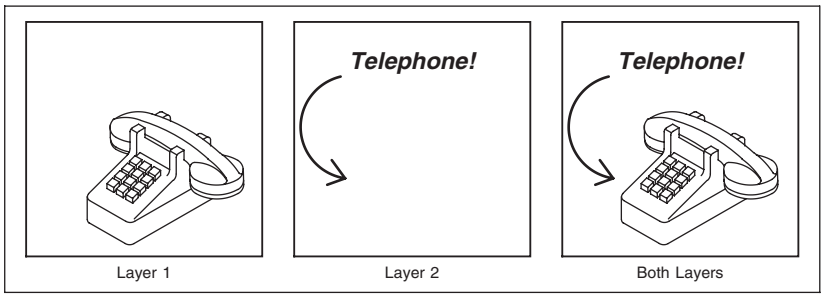


Figure 2-4: Line Layers

Setting Color

To set the color of an item you must type in a number that is defined in your color table and select [Okay] to save your color setting. Color attributes can be assigned to any component - the line you are about to draw, a piece of text, etc.

Default:
0 (100% Black)

See Also:
Process Color, Displays Items By Their Color Number

The color number you choose to input must be in your color table. All MECCA systems have the colors 600 (white) through 700 (Black), with the gray colors found in the six hundred series of numbers. They are percentages of gray from 1-percent to 99-percent. The number 605 will give you a 5-percent gray screen. The number 630 will give you a 30-percent gray screen, etc.

For Process color work you also have the ability to input CMYK color numbers. For more information see Process Color.

Setting Screen Lineage

The Screen parameters will appear for every component type. They consist of the Screen Lineage, Dot, and Angle. For lines, set the screen linage value in the box provided.

Default:
133 (This is for high resolution.)

The number of dots in a row is referred to as lineage (also known as screen frequency, gauge, or ruling) measured in linear inches. The screen lineage value controls the number of dots to be used for gray percentage colors or FCP colors when asking for a screen.

The default value for lineage is set at 133. This is correct for high resolution imagesetters and when sending to a proof printer it is automatically adjusted upon output.

For final artwork on low resolution printers the values between 40 and 60 are better. If a lineage is set too high for the output device, the screens will appear to be darker than they should.

What type of output device the artwork is output on and also the press that is printing the job normally determines the proper screen lineage.

Setting Screen Dot

When asking for a gray screen through the series of six hundred color numbers, dots produce the screen. This can be changed to line screens by clicking on the "pull-down" menu and choosing {Line}. Instead of dots in your screens you would get lines drawn at the standard angle assigned for that color. If no angle is assigned, it would receive standard treatment and pull the angle from */usr/mecca/color/fcpangles.* See Figure 2-5 showing line screens vs. PS dot screens at different angles.

Defaults:

Default PS Dot

Suboptions:

Adobe Dot, H-Line Screen, V-Line Screen, Diamond, Ellipse, Square

Figure 2-5: Lines Drawn with Line Screens and Various Screen Angles

Be aware that line screens are not supported by all printers and output devices. Also, line screens normally do not rotate, so if your image rotates on the film you may get unwanted results. It is best to determine how each output device handles line screens beforehand. Output the file */usr/amgraf/doc/laser/linescreens.g* with and without rotation. Look at the line screens and compare the angles. The default angle on MECCA is 45 degree. The output which gives you 45 degree should be noted. Many printers need the page rotated to print line screens at 45 degree.

Setting Screen Angle

The dot angle assigned to a separation or color determines the direction that rows of dots (or lines) travel to create a screened area. Improperly angled dots cause moiré patterns that interfere with the appearance of a final color. As a component is drawn the dot angle can be set specifically for that component. This setting would override the default */usr/mecca/color/fcpangles* setting and the *active* color/layer angle settings. Auto in the {Set Line Attributes} menu means use the standard dot angle treatment by first going to the active table setting and then the default fcpangles setting.

Default:

Standard Treatment is 45 degrees for Black

Entering a screen dot angle and then clicking [Okay] will cause the next item drawn to have a new dot angle setting. See Figure 2-5 showing line screens vs. PS dot screens at different angles.

Line screen angles may appear to be the exact opposite, since most output devices cannot rotate line screens. See Setting Screen Dot for more information.

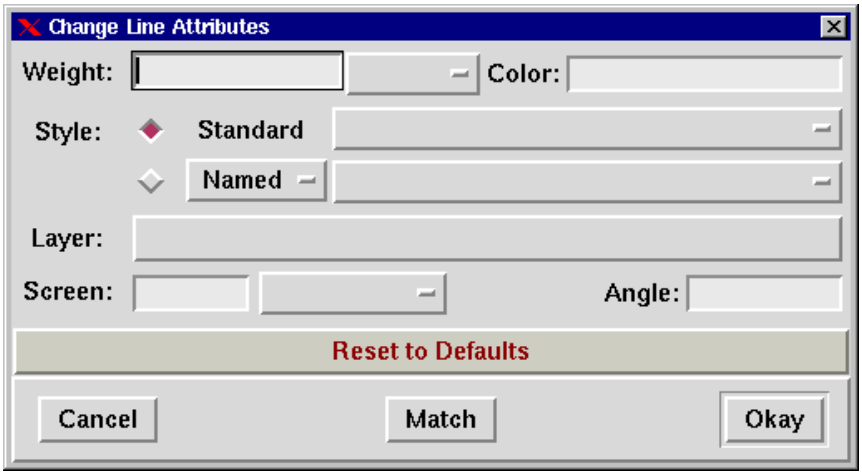
Using [Match] with {Set Attributes}

This option sets your variables to match an existing line simply by picking that item.

First click [Match] then click on the item you are matching. You will notice now that the attributes menu now contains the variables of the item you selected. Select [Okay] to accept those attributes. Now all subsequent items drawn will have those attributes.

{Change Line Attributes}

This option lets you change your mind about the lines you have already drawn. You can change their weight, style, layer, etc.



Prompt:

Pick item to change

Changing the Line Weight, Style and Layer

Changing the line weight, style or layer produces immediate visual feedback. The exercises shown in Example 1 and Example 2 will show you how. We'll do *Weight* and *Style* first.

Step 1:

Use default settings and draw four solid, horizontal, 1-point lines.

Step 2:

Then from either the [Line] function or [Change], choose {Change Line Attributes}. This will bring up the "dialog window". Choose {3.0 pt yellow} from the *Weight* "pull down" menu. Select [Okay], then pick one of your lines and it will change to be a 3 point solid line.

Step 3:

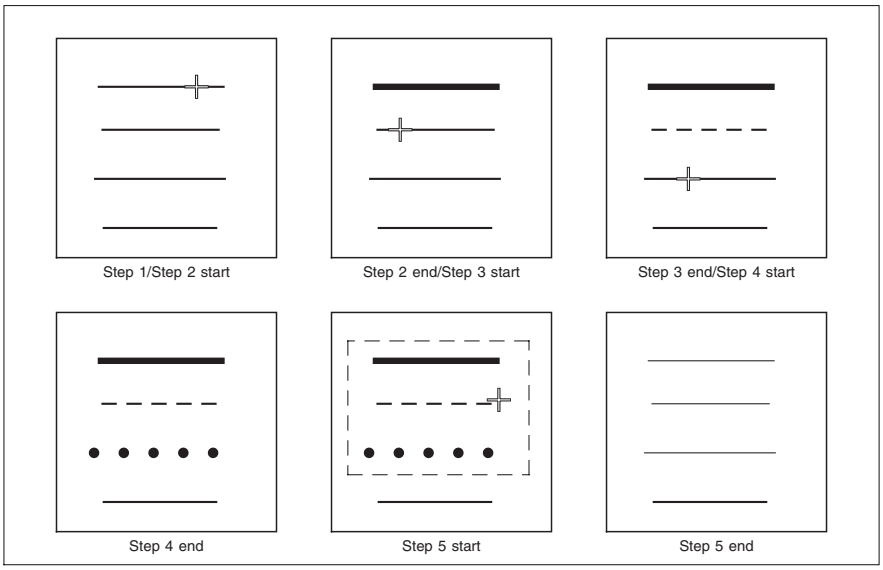
Again choose {Change Line Attributes} then select {Dashed} from the *Style* "pull-down" menu. Select [Okay] to accept your changes. Now pick the second line and it will change to be a 1 point dashed line.

Step 4:

Now we're going to change two things at once. **{Change Attributes},** for the *Weight* type in **5p** and for *Style* choose {Dotted} click [Okay]. Finally, pick the third line somewhere. It will change to a 5 point (yellow) dotted line.

Step 5:

Now click **[Group.]** Choose **{Inside}**, and draw your grouping box around the top three lines. Then repeat Step 4. Pick any of the [Group]ed lines, and they will all turn into 5 point dashed lines.

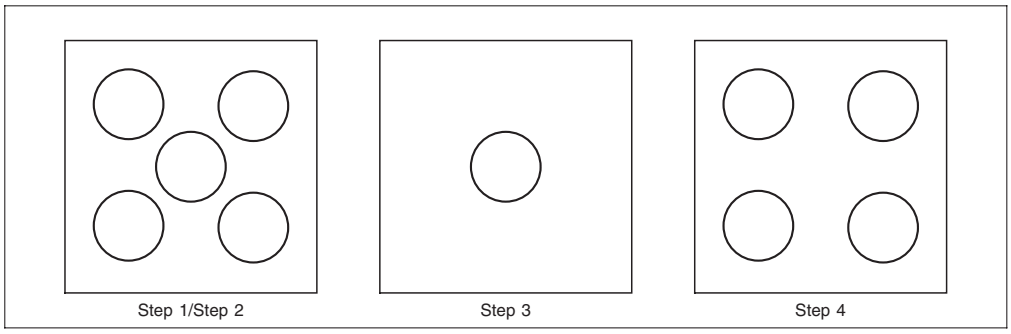


Example 1: Altering Line Weights & Styles with {Change Attributes}

Now let's change [Layer] on something but first let's clear our window click, **[Project], {New Graphic}, [Yes].**

Step 1:

Draw five circles arranged as shown in Example 2.



Example 2: Altering Line Layer with {Change Attributes}

Step 2:

Then from either the [Arc] function or [Change], choose {Change Line Attributes}. This will bring up the "dialog window". Choose the **[Layer]** button. This will open up the Layer panel showing the first 16 layers. Click the color chip for "Layer 2".

NOTE: Notice that this "layer panel" denies access to turning layers on or off. If you want to view individual layers you must select the [Layers] option.

As soon as you make your selection you are taken back to the {Change Line Attributes} menu. You will notice that now the number 2 is shown on the [Layer] button. Select [Okay]. Pick the middle circle. Your circle should now be shown in the color representing layer 2.

Step 3:

Choose the **[Layers]** button, then toggle *Layer 1* to turn it off. [Close]. The four outer circles will vanish.

Step 4:

To see layer 2, do the opposite. Choose **[Layer],** then toggle *Layer 1* to turn it on. Then toggle *Layer 2* to turn it off, **[Close].** Now the four circles will be back and the middle one will be gone.

Using [Match] with {Change Attributes}

This option changes your variables to match an existing item simply by picking that item.

Prompt:

Pick item to match

Choose {Change Line Attributes}. Notice that the "dialog window" is completely empty. Select [Match], your menu will temporarily disappear. Select the item you want to match. After your selection the menu will return displaying the attributes of the item you picked. Choose [Okay] to accept these attributes then pick the items you want to change.

Changing the Color

From either the [Line] function or [Change], choose {Change Line Attributes}. This will bring up the "dialog window". *Color* is where you would go to change the color attributes that have already been set. For example you have a line that is white (color 600) and now

you have decided you need it black (color 700). Instead of deleting the line and redrawing it, you can change the color number.

Modify Lines

Choosing **{Modify Line}** will bring up a menu with the following tools to help you alter your current drawn lines.

{Trim Line}

This option allows you to lengthen or shorten lines to and from a selected point. It will never change the direction of the line(s). Lines to be trimmed can be grouped and trimmed with a single pick, with all lines going to one location. You'll understand this option better if we do an exercise, shown in Figure 2-6.

Prompts:

Pick point or line to trim to
Pick line to trim

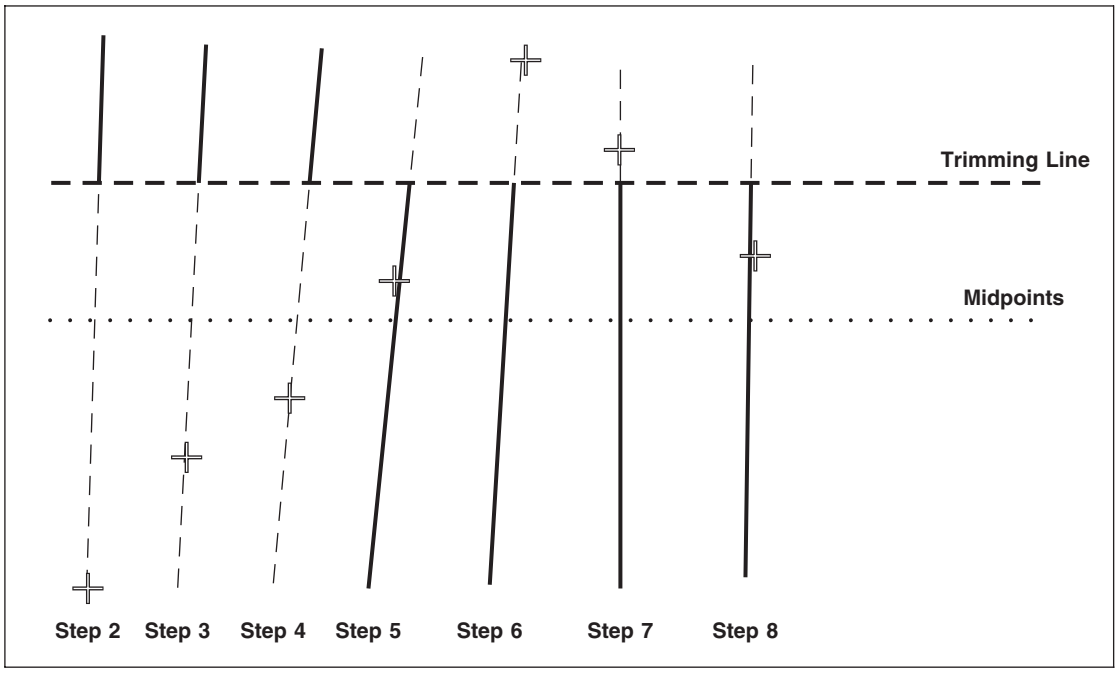


Figure 2-6: Using {Trim Line}

Step 1:

Start by drawing eight or nine more-or-less vertical lines with a single horizontal line about three quarters of the way up. Choose **{Trim Line}** and (when prompted for trim position) pick the horizontal line. This will turn white.

Step 2:

Since you're now being prompted, "pick line to trim", pick the *very bottom* of the leftmost vertical line (where the cursor mark is in Figure 2-6). The line will vanish from there to the horizontal line.

Step 3:

The "pick line to trim" prompt will reappear, so pick the next line in from the left, about a quarter of the way (total line length) up from the bottom (see the cursor mark). Again, all of the line that is below the trim line will vanish.

Step 4:

Pick the next line in, this time a little bit *below its midpoint.* The same effect occurs.

Step 5:

Pick the next line a little bit *above its midpoint.* The line vanishes *above* the trim line.

Step 6:

Now we're going to start picking lines at points above the trim line to see what happens. First, pick the next line in from the left at its top endpoint. Not too surprisingly, it vanishes down to the trim line.

Step 7:

Pick the next line near, but still above, the trim line. Again, it goes away above the trim line.

Step 8:

Pick the next line below the trim line, but above the vertical line's midpoint. You should get the same result as in Step 5: the vertical line gets trimmed above the trim line.

Step 9:

{Cancel Trim} takes you back to the "pick line start" prompt.

By now it should be clear that the center-point of the line being trimmed determines which part of the line will be affected. Experiment around with trimming lines from several angles and directions, until you feel comfortable.

What if the trim position you need isn't a line but an arc? You would [Zoom] up on the area and to "pick the edge of the circle as near as you can to the line coming from the box" to select your trim position. Since you're in [Line] Mode when using {Trim Line},

you can't actually pick an arc as a "line", since the program handles lines and arcs very differently. What happens is this: your chosen position (if it's not on a line) is marked on the screen by a set of crosshairs. As soon as you pick a line to be trimmed, an imaginary perpendicular line is created (crossing it at right angles), running through the crosshairs. This becomes the trim line. Then the line you selected to be Trimmed gets affected, just as if a regular visible trim line were being used.

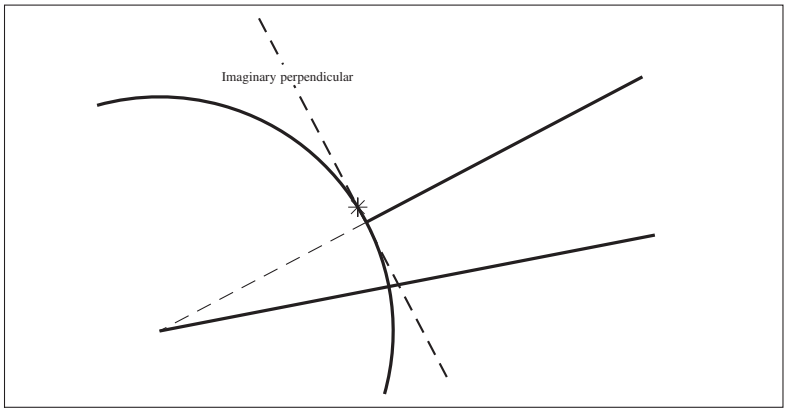


Figure 2-7: Using {Trim Line} Near an Arc

What if you accidentally trimmed a line you didn't really want or need to trim? Just use the {Undo} option to restore a line back, the way it was.

{Modify Ends}

Suppose you have a line that is too short, either because you originally made it that way, or else because you trimmed it incorrectly several steps back. Or perhaps you have a line that's too long and you want to shorten it, but there's not a handy line to pick on to use the Trim Line option. With Modify One End, you can extend the length of a line almost indefinitely, or cut it down to a tiny fragment or delete it altogether. Try this exercise.

Prompts:

Pick line end to modify
Pick new position

Step 1:

Draw three short lines, about one quarter, one half and three quarters of the way down the screen, angling upwards slightly as shown. Choose **{Modify Ends}.** You'll be prompted, "pick line end to modify" so pick the right-hand endpoint of the top line. The cross hairs will appear there.

Step 2:

You'll be prompted next to "pick new position". Move the cursor to the right, staying more-or-less in the same direction as the line is aimed, and pick a spot. The line will instantly extend to a point that seems as close as possible to where you indicated you wanted it to go. The "pick line end to modify" prompt will return.

Step 3:

This time pick a spot between the midpoint and the right-hand endpoint of the second line. You'll see the crosshairs appear at the (right-hand) end of the line, and the "pick new position" prompt will be back.

Step 4:

Pick a spot to the right well above the horizontal plane of the second line. The line will again extend, but this time it should be noticeable that it's *not* to a point very close to the picked spot, nor even directly below it.

What happened? That same imaginary perpendicular line, that we mentioned previously with the {Trim Line} option, changed the apparent results. The line extended itself until it ran into where that perpendicular would be. In fact, this is what happened with Step 2 as well, it's just that the perpendicular was so short that the visual effect was indistinguishable from what would have happened if the line had met the picked spot.

Step 5:

Since the "pick line end to modify" prompt has returned, pick the third line's right-hand endpoint.

Step 6:

The crosshairs will appear there. At the "pick new position" prompt, pick a point fairly close to the left-hand endpoint of the line. The line will instantly shorten to the point you picked.

If for some reason you had needed to, you could have picked a new endpoint by using the cursor to pick a spot above or below the line, using the same imaginary perpendicular line as in Step 4.

Step 7:

{Cancel Modify Ends} takes you back to the "pick line start" prompt and you are ready to continue drawing.

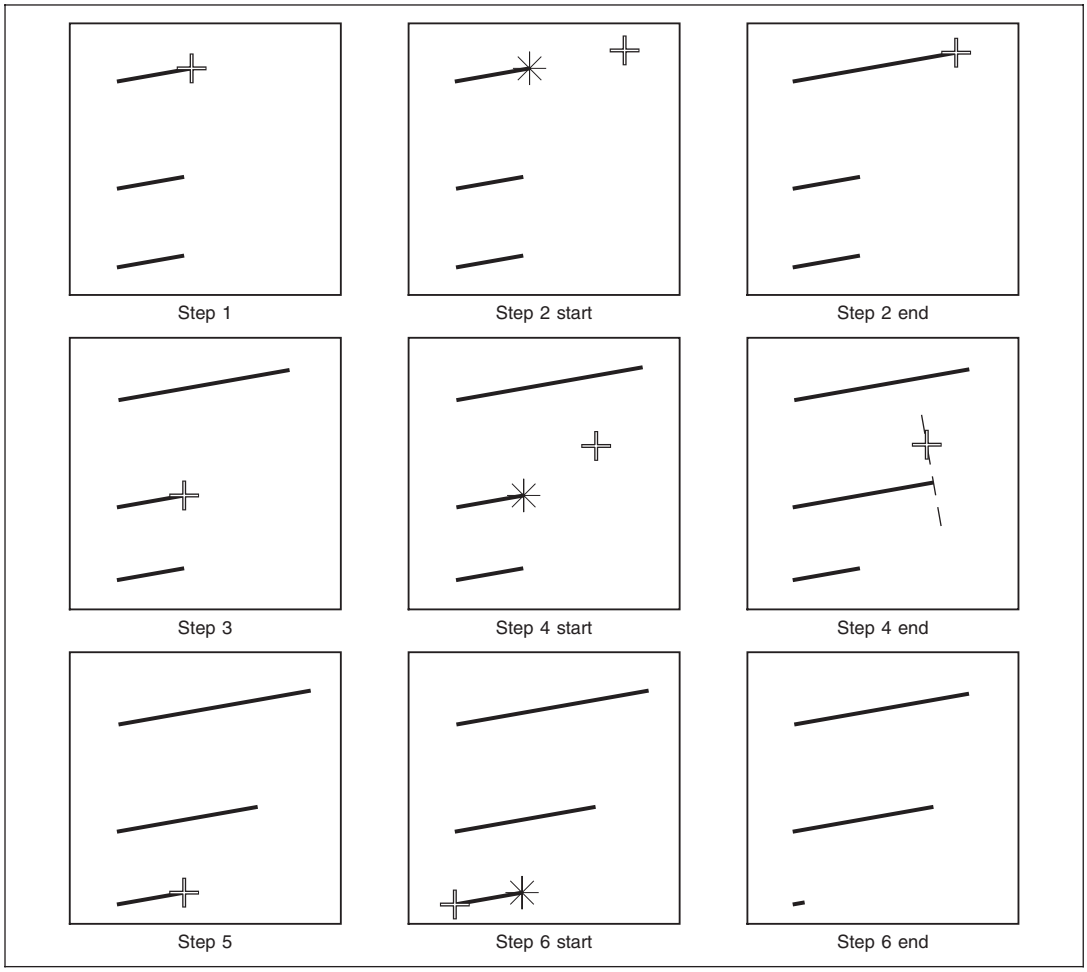


Figure 2-8: Using {Modify One End}

{Move Ends}

While {Modify Ends} affects the length of a line, extending it as needed in its original direction, *this* option will change *both* the direction and length. Below is an exercise that will demonstrate how easy this one is to use.

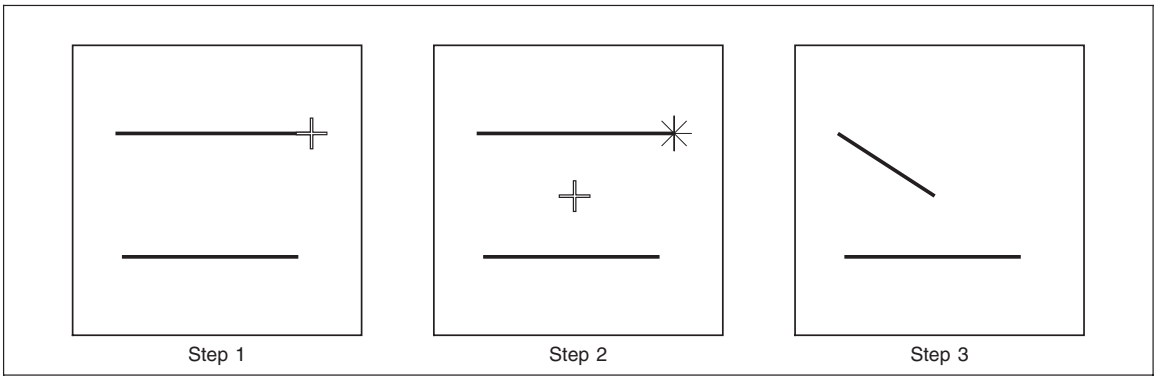


Figure 2-9: Using {Move Endpoint}

Prompts:

Pick line end to move
Pick new position

Step 1:

Draw a couple of horizontal lines about a couple of inches apart on screen. Choose **{Move Ends}.** When prompted to "pick line end to move", use the cursor to pick the right-hand end of the top line. As with {Trim Line}, you can actually pick the line anywhere between its midpoint and the preferred endpoint.

Step 2:

The crosshairs will appear at the line's right-hand endpoint. You'll be prompted to "pick new position", so move the cursor to the spot you want the line to go to, (say halfway down to the second line) and pick it.

Step 3:

The old line will disappear and a new one, starting at the same old (left-hand) starting position but ending at your newly selected (right-hand) spot, will appear on screen. The "pick line end to move" prompt will come back.

Step 4:

{Cancel Move Ends} will take you back to the "pick line start" prompt.

{Break Line}

This option lets you break a line into two segments or cut out a middle portion of the line. (See {Trim Line} for cutting off an end.) To see how {Break Line} works, do the exercise shown in Figure 2-10 at least Steps 1 through 5. Break line will also break "vector chains" into segments.

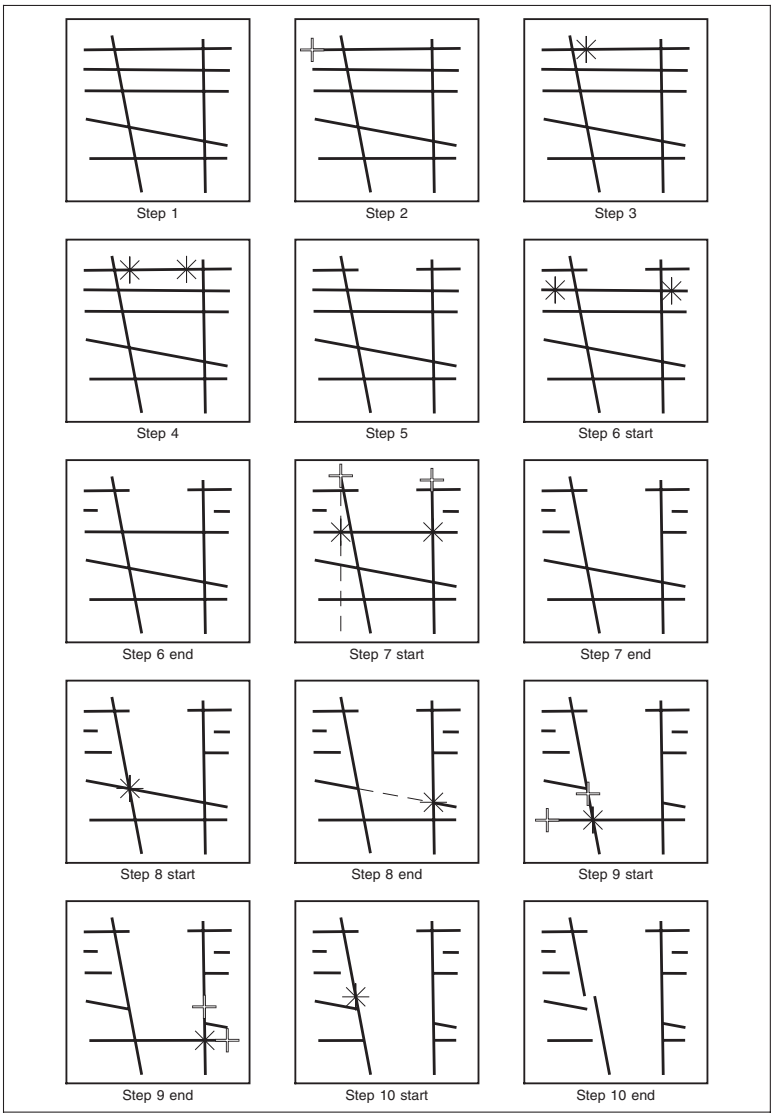


Figure 2-10: Using {Break Line}

Prompts:

Pick line to break
Pick break point 1
Pick break point 2
Pick anywhere to break

Step 1:

Draw several more-or-less horizontal lines (with the fourth one slanting sharply down), with a couple of vertical lines crossing them. Matching Figure 2-10 closely.

Step 2:

Choose **{Break Line}.** When prompted to "pick line to break", pick the line you want to alter. For this exercise, we'll start with the top one.

Step 3:

You'll be prompted to "pick break point 1", so pick a spot about a third of the way in from the left end. Crosshairs will appear there.

Step 4:

You'll be prompted to "pick break point 2". This time, pick a point about a third of the way in from the right end. Another set of crosshairs will show up there.

Step 5:

The Prompt Area now reads, "pick anywhere to commence break", you can click anywhere on the screen. The middle third of the line vanished. The "pick line to break" prompt will return.

Step 6:

Repeat the previous steps, this time with the second line down. Pick it at points close to (but not on) the endpoints. You can make the vast majority of the line vanish, leaving only short segments at either end of the original line.

Step 7:

Do it again on the third line down, this time picking as break points the tops of the vertical lines. The crosshairs will appear directly below each picking spot, at least if your third horizontal line really is horizontal. Notice that although one of the vertical lines in our example (the right-hand one) is very vertical, the other one slants a bit to the right. Click to {Break} the line. It broke directly under where we picked.

Step 8:

Now we're going to {Break} the fourth line. The "pick line to break" prompt is back, just pick the one we want. Then pick the intersections of the two vertical lines that cross it. The crosshairs will show up, "click" to break. If you [Zoom] you will notice the breaks are not perfectly on the intersections.

Step 9:

Let's {Break} the last horizontal line. This time using the {Position Assistant}, {Intersec} option to pick our breakpoints. Pick line to break, now select {Intersec} then pick the vertical line and the line we are going to break. This will find the intersection of the two lines and our break point 1 crosshair will appear. Select {Intersec} again and pick the second vertical line and our line to break, this will give us the second crosshair. Click to {Break} the line.

Step 10:

Breaking a line in two segments also uses the position menu. Let's break the first vertical line in half. Pick it as our line. Select the first break point by touching the line in the middle. Now choose {Last Point} in the position menu. This has chosen our first pick as our second pick also. Click to break. The vertical line is now two separate segments, move the bottom half.

Step 11:

{Cancel Break} back to the Line Menu. The "pick line start" prompt will appear for you to start drawing again.

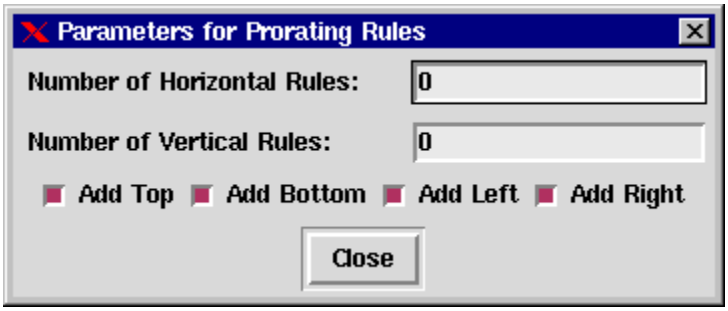
Drawing Rectangles

If you need to draw a simple rectangle, we suggest that you use [Line]'s {Prorate Rules} option. Type in 0 for the number of rules for both the Horizontal and Vertical values while keeping the edges turned on.

{Prorating Rules}

Prorating rules divides an area by a given number of rules, placing the rules equally spaced. Technically speaking, it generates a number of parallel rule lines, within a specified rectangular region, such that the rules are placed evenly within the region.

In order to generate rules, three things must be known: region corners, direction of rules, and number of rules to make up. After selecting {Prorating rules} click the right mouse button to see the list of options. If you need {Set Line Attributes}, you can do that now. Then select {Set Parameters}. This will bring up a dialog window.



Fill out the menu with the parameters you want then select [Okay]. You are then prompted to "pick corner one". Select a position and "click", the prompt then asks you to "pick corner two". After making your selection you will see your rules appear on the screen.

Suboptions:

Set Line Attributes

Prompts:

Pick corner 1, Pick corner 2

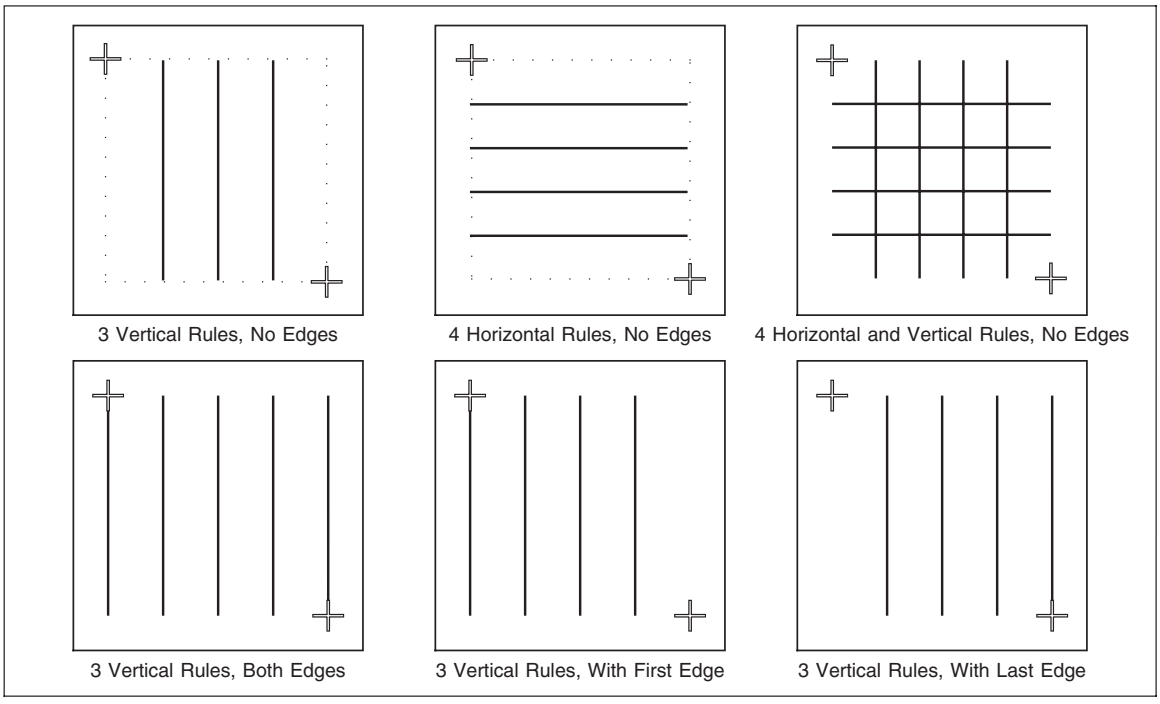


Figure 2-11: Using {Prorating Rules}

The rules drawn with {Prorated Rules} are internally combined together, so that they can be deleted in one step.

All parameters selected are used repeatedly until you change them.

{Set Line Attributes}
This option is the same as that under the main [Line] menu.

Entering in a number in the input area for **rules** indicates how many rules to be *inserted between* the two edges of the given rectangle drawn when picking the two corners. Any reasonable number is accepted, including zero. *Horizontal* will give you horizontal rules splitting the area evenly with rules creating rows. *Vertical* Rules will split the area with rules, giving you equal columns.

In Step 1 of our Example, we just did the Vertical direction. We entered **3** for our *Vertical* value and **0** for our *Horizontal* value. We are then prompted to "Pick corner 1" so we picked corner 1 and then corner 2, giving ourselves approximately 4 inches of working space. As soon as it had all of the information needed, (region, direction and number) 3 vertical rules were drawn inside the region, giving us four equal columns. We then only used the Horizontal direction and entered **0** for our *Vertical* value and **4** for our *Horizontal* value. Again we are prompted to "Pick corner 1" and "Pick corner 2". Four horizontal rules are immediately drawn giving us five equally spaced regions.

The *Add Top, Add Bottom, Add Left, Add Right* are toggle switches that will include an edge rule according to whichever one you have asked for and will include it with the *number* of rules.

{Section Lines}

This option is for sectioning areas. "Sectioning" is filling in a selected area with straight lines. The style, weight, angle, and spacing between the lines, are controlled by you. Sectioning an area twice would create a "crosshatch" effect.

Sectioning requires a group to be present. It will only affect the areas inside of a grouped boundary. If no group is present, a prompt will state "Nothing in group list". Group the area needing sectioned and then try again.

Defaults:,
Line Weight = 10 decipoints, Line Style = Solid, Line Layer = 1,
Line Angle = 45 degrees, Line Spacing = 10 points,
Line Origin = 0x,0y, (absolute lower left corner)

The best way to learn sectioning is by doing the following exercises.

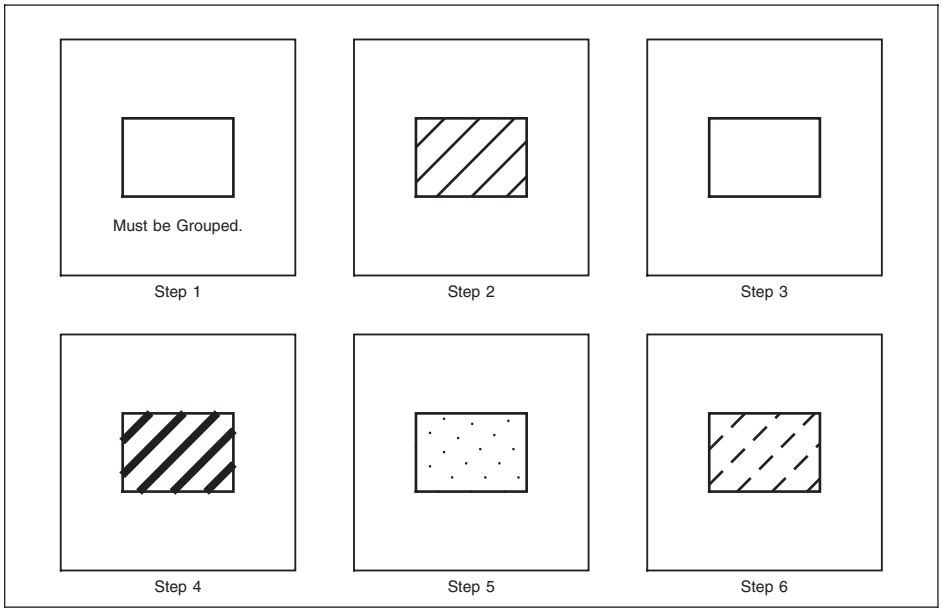


Figure 2-12: Using {Line Sectioning}{Set Line Attributes}

Step 1:

Draw a rectangle. Sectioning will only work within a grouped area, so, **[Group] {All} {Done Group}.** Choose **{Section Lines}.** Right mouse click to show the suboptions then select {Set Line Attributes} and/or {Set Parameters}.

Step 2:

If you don't want to change any of the current setups then you're ready to section. (Section will always retain your last setups.) Pick any one of the grouped items and a bunch of lines at a 45 degree angle will fill your rectangle. Assuming you haven't changed the defaults, these are 1 point lines, separated by 10 points of space between each.

Sectioning looks for a group and according to the line attributes, angle and spacing, draws lines *inside* the group. Later, we will section other shapes and groups within groups.

Step 3:

Choose **[Delete]** being careful to **pick the middle** of a section line, not our rectangle. All of them will disappear. This is because they are combined; they belong to an automatic group like the sides of a rectangle. If you had sectioned several boxes at once, deleting just one of the sectioning lines would have emptied all of them.

Step 4:

{Exit Delete}. Go back into **{Section Lines}.** The **{Set Line Attributes}** menu takes you to the familiar submenu listing for line weights, styles, layers, color and screen.

Let's set our line weight to 3-points and section the rectangle again. **{Set Line Weight}, {30 (3.0 pt) yellow}, [Okay].** Pick anyone of your grouped items this time the lines filling up the box will be yellow (3 points) instead of green.

Notice that with 3-point section lines inside of a 1-point rectangle, the ends of the section lines hang out. It is suggested that you section with a line weight that is either the same or smaller than the outside border line. If necessary you can draw an invisible (color 600-white) rectangle around the outside to knockout the over hang.

Choose **[Delete]** and **delete the section lines.**

Step 5:

Let's go back to **{Section Lines}** and **{Set Line Attributes}.** Set the line weight back to **1-point** and choose **dotted** line style. **[Okay]** your setups and pick anyone of your grouped items.

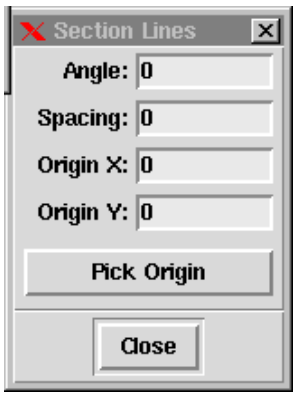
Choose **[Delete]** and **delete the section lines.**

Step 6:

Go back to **{Section Lines}** and **{Set Line Attributes}** and this time set the line style to dashed. Be sure to [Okay] your setups and then **pick anyone of your grouped items.** Here you can see the dashed section lines. Sectioning is relatively easy. Let's move on to the angle and spacing options. Again, choose **[Delete]** and **delete the section lines.**

Setting the Angle and Line Spacing

Now that we know how to section, let's experiment with the angle and line spacing. The angle is what direction the section lines are to be drawn in, default is 45 degrees. The spacing is how much space between each section line. Doing the exercises in this Example will step you through creating different effects by changing these two setups.



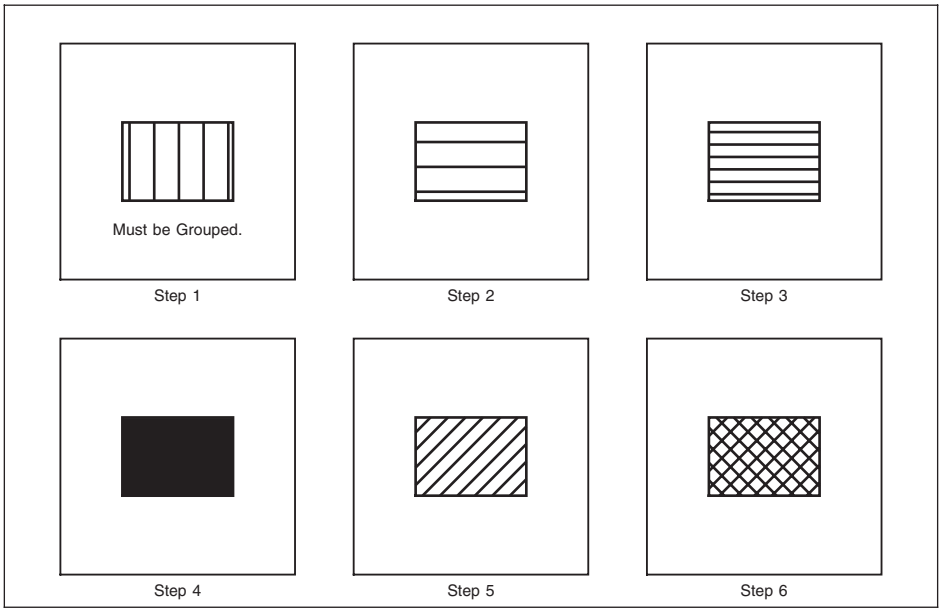


Figure 2-13: Using {Set Line Angle}and {Set Line Spacing}

Step 1:

If you don't have a rectangle drawn, go ahead and draw one. In our example we are using 1-point, solid lines. Remember, the rectangle must be grouped for it to be sectioned. Select the option **{Set Parameters}**. This will bring up a "dialog window" that will allow us to choose the direction of the section lines, so type **90** for the *Angle,* then [Close] Pick anyone of your grouped items to see vertical lines fill the rectangle.

Your lines will probably not start in the same position from the left as mine. This will be covered in the exercise discussing line origin. For now ignore the origins of the lines.

[Delete] the section lines, get back into sectioning and let's try another angle.

Step 2:

{Set Parameters} type in **0** for *Angle,* then [Close]. Then pick anyone of your grouped items. The results will be the lines are now horizontal. **[Delete]** the section lines.

Step 3:

Here we are going to affect the space between the lines. The default is 10-points. Let's set it to 5-points. **{Set Parameters}** type in **5p** for *Spacing* then [Close]. Now when you pick your grouped item the results will be the lines are closer together, 5 points apart. **[Delete]** the lines before the next step.

Step 4:

{Set Parameters} set the *Spacing* to **1p** [Close], and pick your grouped item. Horizontal solid lines will cover the entire rectangle. We have 1-point lines, that are 1-point apart. Basically, they are right next to each other. When printed it would look like a solid black box. Again, **[Delete]** the lines before the next step.

Step 5:

Creating a crosshatch is relatively easy. **{Set Parameters}** and set the *Spacing* back to 5-point by typing in **5p.** Also set the *Angle* to **45** [Close]. Pick your grouped items. The diagonal lines will be drawn. *Don't delete these lines or ungroup.*

Step 6:

Now we will set the *Angle* again. **{Set Parameters}** set *Angle* to **135** [Close]. Pick your grouped items. We are sectioning the same rectangle twice. We now have a pretty crosshatch.

Positioning the Line Origin

When picking an origin for a section, you are selecting a point in which one section line will draw and from that origin, according to spacing where the other lines fall. For the exercises shown here, we need two identical rectangles. Draw one and then copy it in the Y Direction.

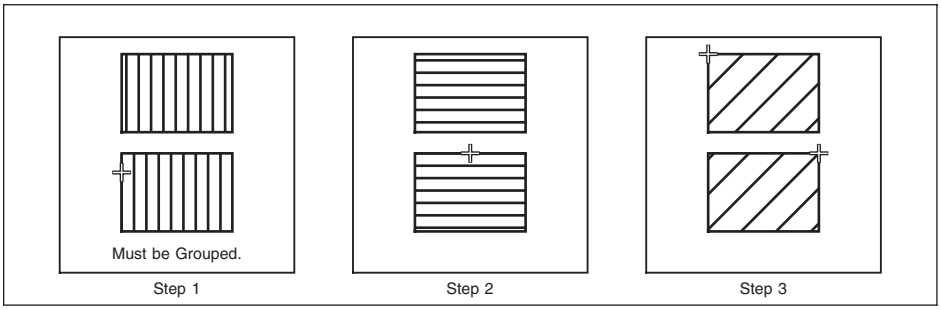


Figure 2-14: Using {Set Line Origin}

Step 1:

Setup for this exercise a 1-point solid line, with an angle of 90 degrees. Put the line spacing at 5-points. **[Group] {Pick}** the **top rectangle** only, **{Done Group}** out of group. **Then "Pick grouped section boundary".** There was no control of where the section lines fell. They were drawn using MECCA's default (0x, 0y) as being the origin.

[Group] {Ungroup All}, then **{Pick}** the **bottom rectangle** only. **{Done Group}** out of group. Now here's the difference, we are going to pick the left side of the rectangle as a beginning point for our section lines. **{Set Parameters},** ***Pick Origin*** and **pick the left side.** You will not see any visible response until you pick your grouped items. See how the section lines start at the edge and are exactly 5-points apart until there is no more area.

Compare the two rectangles and you will definitely see a difference in where the section lines start. **[Delete]** the section lines for both and continue on.

Step 2:

[Group] {Ungroup All}, then **{Pick}** the **top rectangle** only. {Done Group} out of group. We are going to do the same thing, but set the ***Angle*** to be **0 [Close].** The angle plays a part, simply because now we want the lines to flow horizontally. Pick your grouped items. Again you did not specify a starting point, so it is using our last origin.

[Group] {Ungroup All}, then **{Pick}** the **bottom rectangle** only. **{Done Group}** out of group. ***Pick Origin*** to be the **top of the grouped rectangle.** Now when we pick our grouped items we will see a difference from the top rectangle because the lines have started at the top and are sectioning down 5-points apart. Again, **[Delete]** the section lines for both and continue on.

Step 3:

[Group] {Ungroup All}, then **{Pick}** the **top rectangle** only. **{Done Group}** out of group. Set the ***Angle*** this time to **45** and the ***Spacing*** to be **10-points** (for a more dramatic effect). Here ***Pick Origin*** to be the **top left corner** before picking your grouped items. Since the corner has no room for a line the first line drawn is exactly 10-points away.

On the second rectangle, ***Pick Origin*** to be the **top right-hand corner.** Now, pick your grouped items. See how a section line is coming right to that corner, and drawing out in both directions 10-points apart.

{Line Sectioning} with Unusual Shapes

What happens when you have shapes within shapes, or wrapped around each other? The sectioning process sections the most outside boundary first. The next boundary becomes an inside boundary that is not sectioned. It starts over and continues sectioning and not sectioning until all boundaries are exhausted.

Doing the exercises shown in Figure 2-15 may help explain.

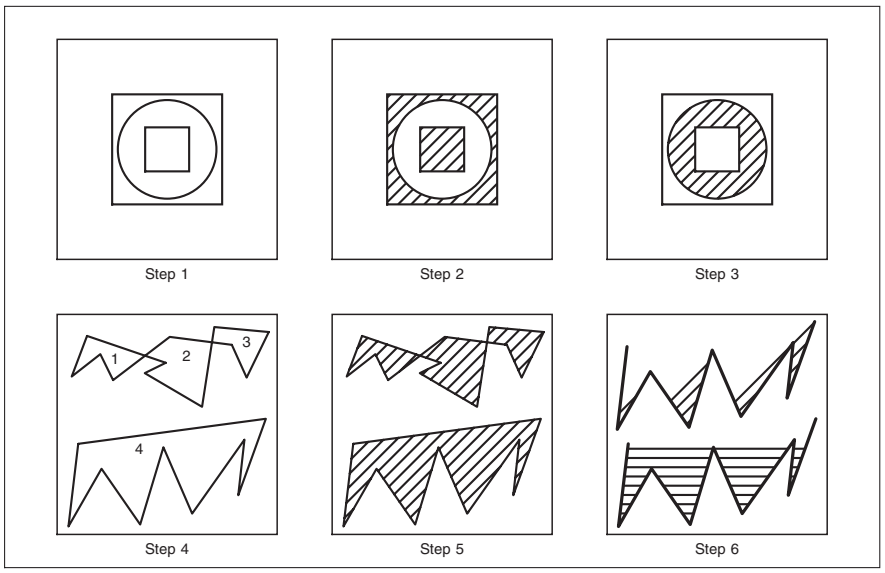


Figure 2-15: Sectioning Unusual Shapes

Step 1:

Start with a clean window and **draw a square.** Place a **circle inside of your square** being sure not to touch the sides of the square. **Draw another square** inside of the circle, again being sure nothing is touching. We have three distinct boundaries: outside square, the circle, and inside square. There will not be any confusion with the program knowing what to section.

Step 2:

[Group], {All}. Without bothering to change the current settings, go to **{Section Lines}**, and pick your grouped items. The outer square will section until it is stopped by the circle. The circle will not shade, being the second boundary. The inside square will section (ON, OFF, ON).

[Delete] the section lines and continue.

Step 3:

If we wanted the completely opposite effect, we would *not group* the outer square. **[Group] {Ungroup Pick}** and **pick on the outer square.** {Done Group} out of group. Now you are ready to pick your grouped items again. Starting the group with the circle (ON) makes the inner square (OFF) not section.

Step 4:

Draw shapes consisting of lines going at different angles. You may cross the lines, but try not to have the sides of any two areas sharing the same boundary line. Looking at our drawing we have four distinct areas. There will not be any confusion with the system knowing what to section.

Step 5:

[Group], {All}. Without bothering to change the current settings, go to **{Section Lines}**, and pick your grouped items. It shaded all of the internal areas.

[Delete] the section lines and **one side of your shape.**

Step 6:

When sectioning a shape that is not entirely closed, you need to go ahead and close it with an invisible line. Let's go ahead though and section an open area, so that you can understand what will happen.

[Delete] one side of your shape. **[Group]** the rest of your shape and pick your grouped items. At a 45 degree angle, the lines do not have much to section. A section line will not be drawn, if both endpoints can't reach the outer boundary. **[Delete]** the section lines, **{Set Parameters}** and set the *Angle* to **0** and pick on your grouped items again. This time you can clearly see more sectioning because more lines could get both endpoints to touch the boundary.

Note: Section Lines are Vectors which fill a boundary, if you are wanting to fill in small curves made up of splines, you would be best to use the clipping mask feature to get nice smooth clips along a curved edge.

Named Styles - User Definable Line Styles

Occasionally, the three basic line style options (solid, dashed and dotted) found under {Set Line Attributes} is not enough pattern variety. MECCA solves this dilemma two ways: 1) by allowing the operator to choose a linestyle from the Library located in the */usr/amgraf/LineStyles* directory, and; 2) by allowing the user to create new line styles and save them into a retrievable pattern file.

One pattern file can hold many line styles. When you save a pattern file, it will write out all styles found in the current file.

If you need the same pattern in five different colors, it would be necessary to create five different line styles, one for each color. The Color is part of the line's style. This also applies for Line Weight and Screen Lineage.

After a user defined style is drawn, it is treated by MECCA as any line with the exception that its style attributes cannot be changed. It can be placed on any layer, drawn to any size and trimmed or modified. It can be copied, moved, scaled, deleted, and rotated.

Using the New Line Style

To access a User Defined Line Style you must first {Combine} in the ".pat" file. The {Combine} causes the line styles to be displayed under the {Set Line Attributes}, *Named* menu. Inside this menu are the defined line styles found in your pattern file.

Choosing a user defined line style causes the {Set Line Attributes} to be automatically filled-in for line weight, color, etc., except for the *Layer*.

Each time you {Combine} a Line Pattern the *Named* menu will display that pattern file's line styles. You may combine in line pattern files as you need them. But be aware, the line style attributes are saved and stored with the drawing file, but are referenced by the line style name. You must not have two line styles with the same name in the same file. The line style information is retrieved by its line style name. The last combined line pattern file will overwrite the previous line styles that have the same name. This overwrite feature is an advantage. You may globally change a line style by modifying the pattern file and then recombining the pattern file into the drawing.

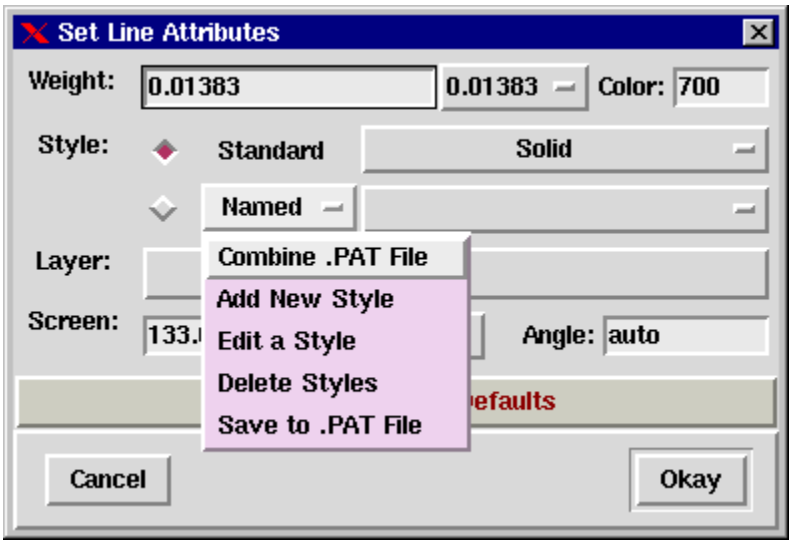
Combining in an Existing Pattern File

You can combine a pattern file into your current drawing two ways:

1. The easiest way is to go to {Set Line Attributes} and use the Combine PAT File option found under the Style: [Named] button, or

2. By using the {Combine} selection found under the main [Project] tool.

Both of these options want you to select a pattern (.pat) file to be loaded and [Okay] it. MECCA 2000 has a library of dash and dot pattern files ready to use. See page 60.

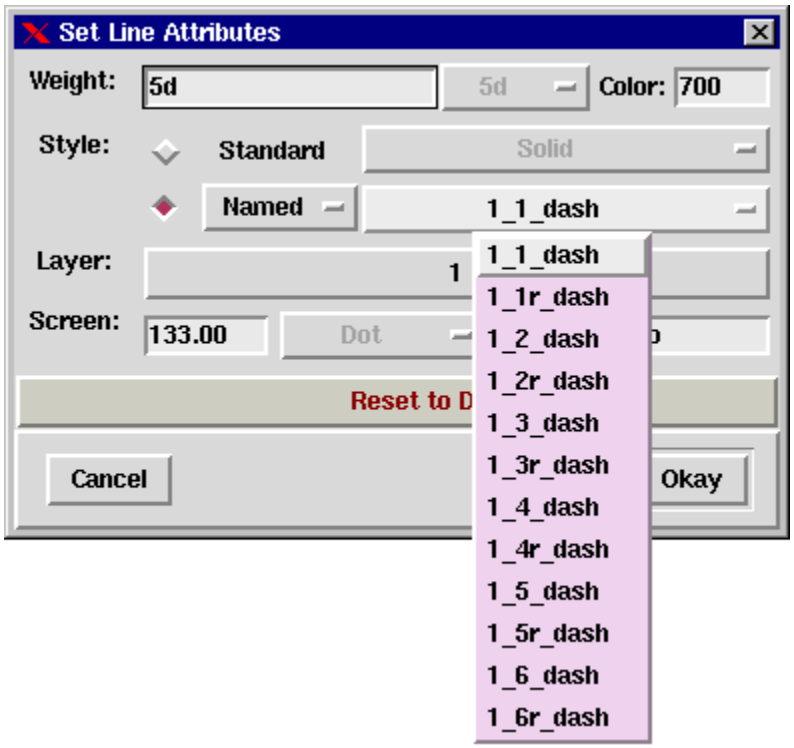


You may combine in line pattern files as you need them. Line styles are stored within the drawing by their name. MECCA's Line Style Library does not have any duplicate and conflicting names.

Unused line styles within the drawing file may be discarded by using the [Named] Line Style {Delete} option.

After Combining the Pattern File

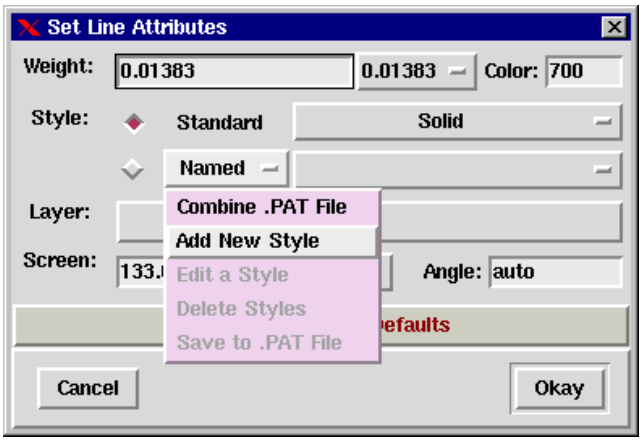
Combining causes the line styles within that pattern file to be displayed under the {Set Line Attributes}, Style: *Named* menu. Notice that clicking on the Named checkbox allows a list of the twelve defined line styles found in the pattern file to drop-down (along with any other user defined lines found within the drawing).



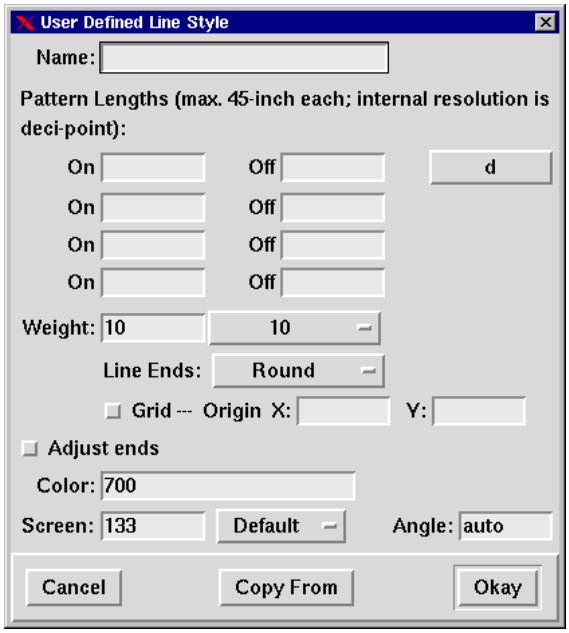
Choosing a user defined line style causes the {Set Line Attributes} to be automatically filled-in for line weight, color, and lineage. The Layer can be set by the user.

Creating a New Line Style

Go to [Line] tool's {Set Line Attributes} dialog. Pointing to the [Named] Button will drop down a list of options for creating and maintaining User Defined Line Styles.



Add New Style allows you to do just that. It will bring up the following dialog so that you can describe the line style pattern. Name the line style using the standard naming conventions. But be aware that line styles within a file are controlled by their name. If you combine two files together that have the same line style names, it will use the attributes of the last one combined. If the attributes are the same, this is of no consequence, but if the attributes were different the previous version would be overwritten.



Pattern Lengths: This is where you establish its look. There are four pairs of On/Off pattern segments, but most patterns are just one pair of on/off values. To create a dashed line, specify the amount the dash is to be drawn within the ON field, then how much space in the OFF field. The pattern will automatically repeat through the length of the drawn line.

Specifying two pattern segments can create a small dash, large dash effect:
ON 2p, OFF 2p, then
ON 4p, and OFF 2p.
The pattern will repeat both segment pairs the length of the drawn line.

Units: Since all pattern segments must be specified in whole numbers, the units can make a difference. Decipoints is recommended since most lines are made up of small units.

Line Weight: One of the disadvantages of a user line style is that the line weight attribute is part of the pattern and cannot be changed. If you need two different line weights of the same pattern, you will need to create them individually.

Line Ends: This is whether you want the line segments to have rounded, solid, or solid-square ends. If you choose rounded or solid-square, be aware that the bullet being placed on the endpoints is extending into the OFF segment one-half of the line weight. Default is round.

Color: This is a color number. The default color number is 700 (which means 100-percent Black). This value cannot be changed by the {Change Attributes} menu. If you need the same pattern, but with a different color, you must add another line style.

Remember, when choosing a user defined line style the {Set Line Attributes} to be automatically filled-in for line weight, color, etc., except for the *Layer*.

Miscellaneous Options

Gridded: Do you want all line patterns to start from a specific point. This will cause the pattern segments to align when drawing multiple horizontal and vertical lines. Default is not gridded. See Figure 2-16.

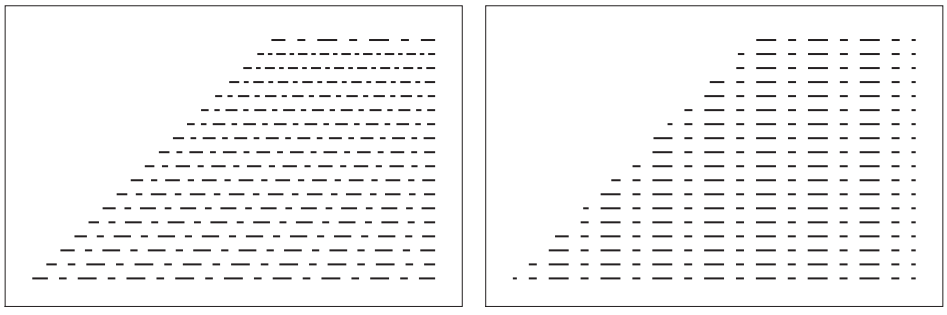


Figure 2-16: Use Adjusted Ends, or a Gridded Pattern, Not Both

Grid Origin: X and Y coordinates can be given for the starting position of the pattern when asking for a gridded pattern. The default is X=0 and Y=0.

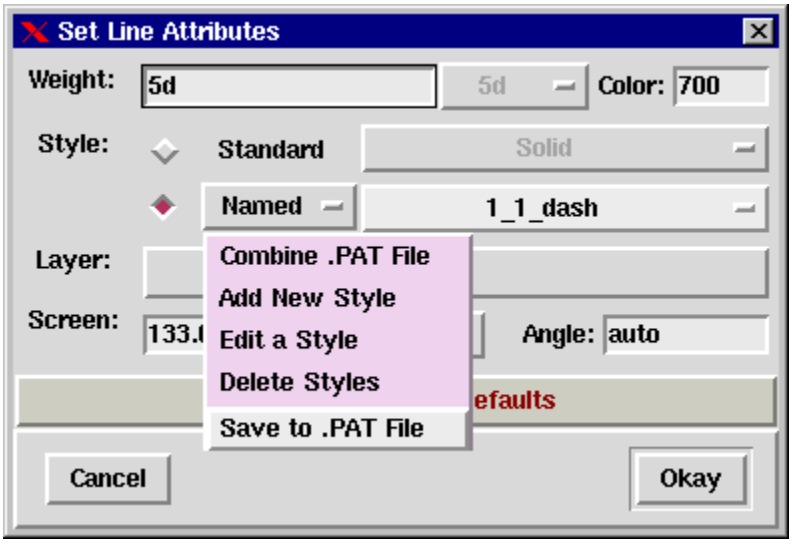
Screen Values: This is the screen lineage, dot and angle. The default value is 133, Dot, Auto. This value cannot be changed by the {Change Attributes} menu. If you need the same pattern but with a different lineage, you must add another line style.

Creating a New Pattern File

Line styles can be stored into a pattern (.pat) file, simply by going to the **Save to .PAT File** option.

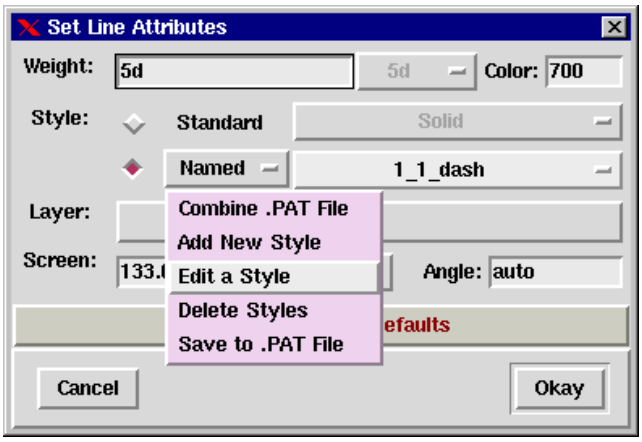
Line styles accumulate in a drawing several ways: created by user, brought in from other combined graphic files, or combining in specific pattern files.

This option will save all line styles within the current drawing, so before saving look at the line style list and delete any styles which you may not want in this particular pattern file.

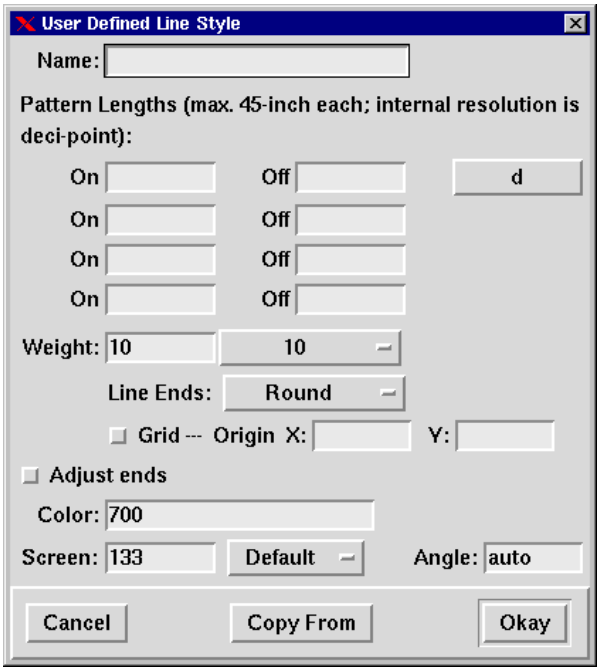


Editing an Existing Line Style

Go to [Line] tool's {Set Line Attributes} dialog. Pointing to the [Named] Button will drop down a list of options for creating and maintaining User Defined Line Styles. Select the **Edit Line Style** option.



This will bring up a list of all line styles in the file. Choose the line style you wish to edit and [Okay]. This will bring up the attributes for that line style.



Make any changes to the line and save. This will affect all lines of that style in the file.

Changing the name will copy the attributes into the new style name, for starters on making different varieties of the same dash pattern. Remember, choosing a user defined line style causes the {Set Line Attributes} to be automatically filled-in for line weight, and color, except for the *Layer*.

Be aware, you are only changing this particular file. If needed elsewhere, you will want to save the line style into a pattern file. For management purposes, when editing a line style that exists in a pattern file, it is best to start with a blank window, combine in the

pattern file, edit the line style, and then save back the pattern file. Then when inside of an existing drawing that needs updated, just combine in the updated pattern file. Since line styles are referenced by name, the previous line pattern will be overwritten with the new values at the time of combine.

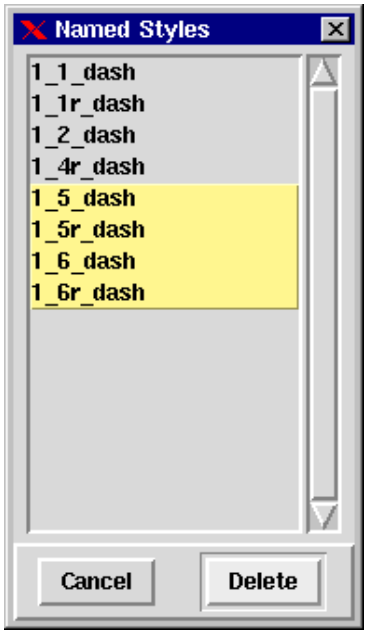
Saving the Drawing with Defined Line Styles

When the drawing is saved, only those line styles (with their attributes) used in the drawing are saved with the drawing. If during a revision, you needed another line style type, you would need to {Combine} in the Line Pattern again.

Deleting Line Styles from Your File

Unused line styles within a drawing file may be discarded by using the [Line] tool's {Set Line Attributes}, [Named] Line Style {Delete} option.

Simply click onto the [Named] button and a list of options will appear. Selecting {Delete} within the list will cause a Delete Named Line Styles dialog to appear in which you can highlight styles and delete them from your file.



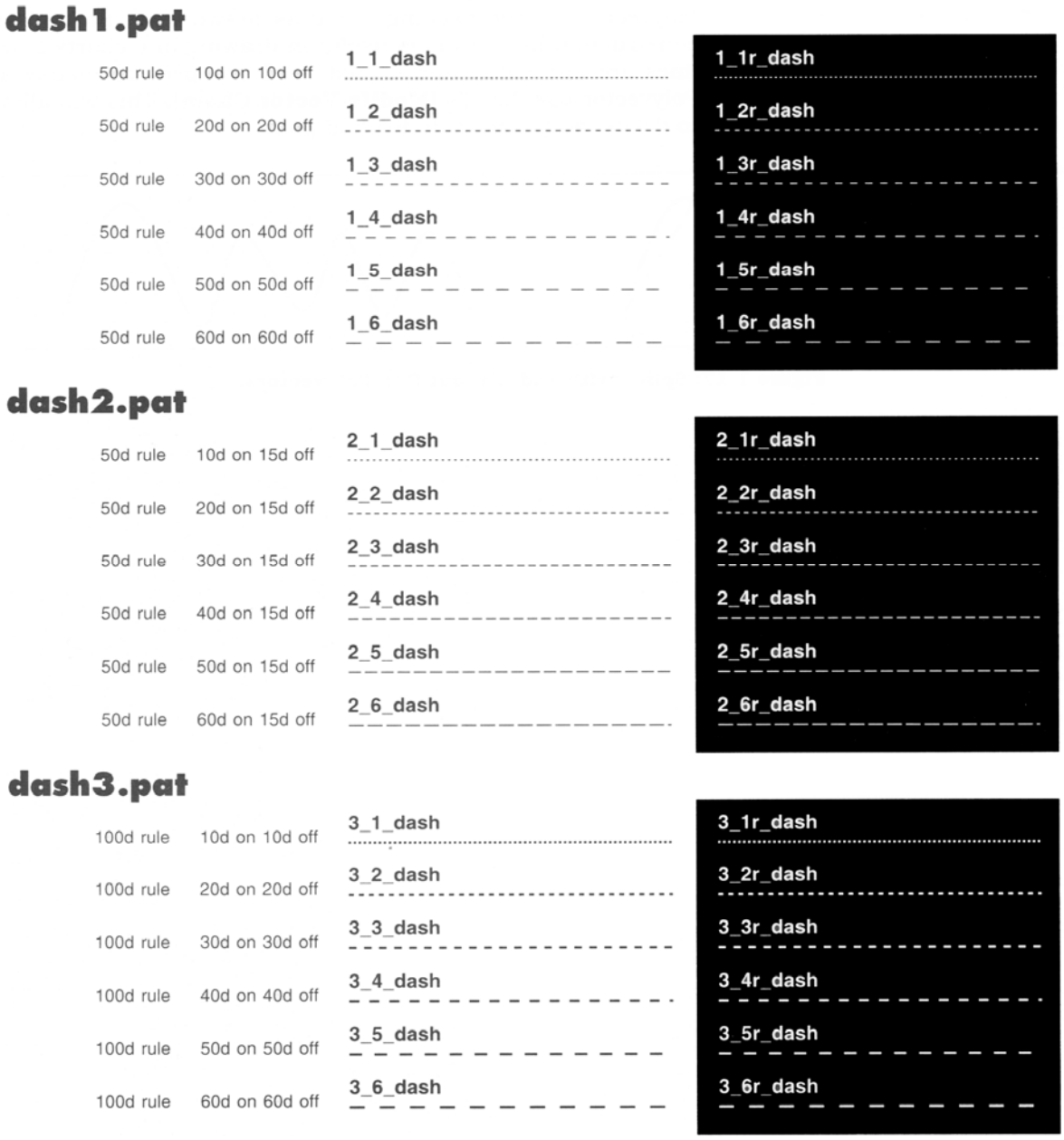
Highlight items using the standard pick, [Shift]-pick, and [Ctrl]-pick.

If a line style is being used in the drawing, it will not be available for deletion.

Line Style Library Selections

A variety of line styles are already provided with MECCA 2000, through a library of line "pattern" files. This library contains varying dots and dashes, in both solid (black) and reverse (white). The library is located in */usr/amgraf/LineStyles.*

Dashed Patterns



dash4.pat

100d rule	10d on 15d off	4_1_dash	4_1r_dash
100d rule	20d on 15d off	4_2_dash	4_2r_dash
100d rule	30d on 15d off	4_3_dash	4_3r_dash
100d rule	40d on 15d off	4_4_dash	4_4r_dash
100d rule	50d on 15d off	4_5_dash	4_5r_dash
100d rule	60d on 15d off	4_6_dash	4_6r_dash

dash5.pat

150d rule	10d on 10d off	5_1_dash	5_1r_dash
150d rule	20d on 20d off	5_2_dash	5_2r_dash
150d rule	30d on 30d off	5_3_dash	5_3r_dash
150d rule	40d on 40d off	5_4_dash	5_4r_dash
150d rule	50d on 50d off	5_5_dash	5_5r_dash
150d rule	60d on 60d off	5_6_dash	5_6r_dash

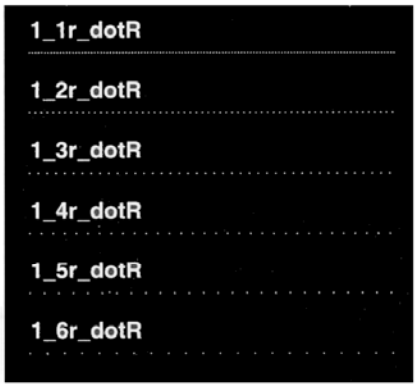
dash6.pat

150d rule	10d on 15d off	6_1_dash	6_1r_dash
150d rule	20d on 15d off	6_2_dash	6_2r_dash
150d rule	30d on 15d off	6_3_dash	6_3r_dash
150d rule	40d on 15d off	6_4_dash	6_4r_dash
150d rule	50d on 15d off	6_5_dash	6_5r_dash
150d rule	60d on 15d off	6_6_dash	6_6r_dash

Round Dotted Patterns

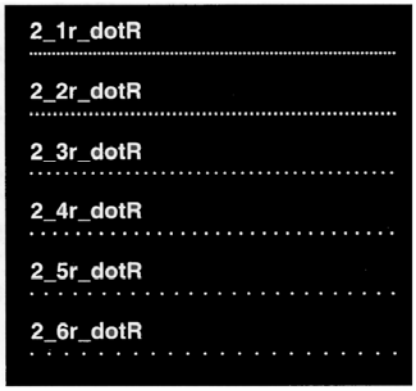
dotR1.pat

50d rule	10d on 10d off	1_1_dotR
50d rule	20d on 20d off	1_2_dotR
50d rule	30d on 30d off	1_3_dotR
50d rule	40d on 40d off	1_4_dotR
50d rule	50d on 50d off	1_5_dotR
50d rule	60d on 60d off	1_6_dotR



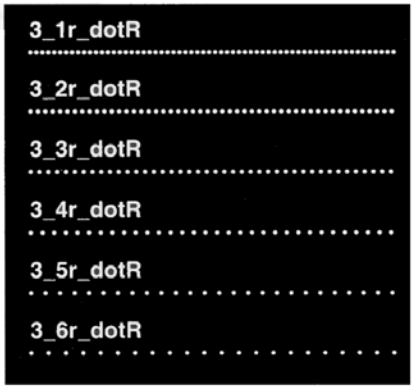
dotR2.pat

100d rule	10d on 10d off	2_1_dotR
100d rule	20d on 20d off	2_2_dotR
100d rule	30d on 30d off	2_3_dotR
100d rule	40d on 40d off	2_4_dotR
100d rule	50d on 50d off	2_5_dotR
100d rule	60d on 60d off	2_6_dotR



dotR3.pat

150d rule	10d on 10d off	3_1_dotR
150d rule	20d on 20d off	3_2_dotR
150d rule	30d on 30d off	3_3_dotR
150d rule	40d on 40d off	3_4_dotR
150d rule	50d on 50d off	3_5_dotR
150d rule	60d on 60d off	3_6_dotR

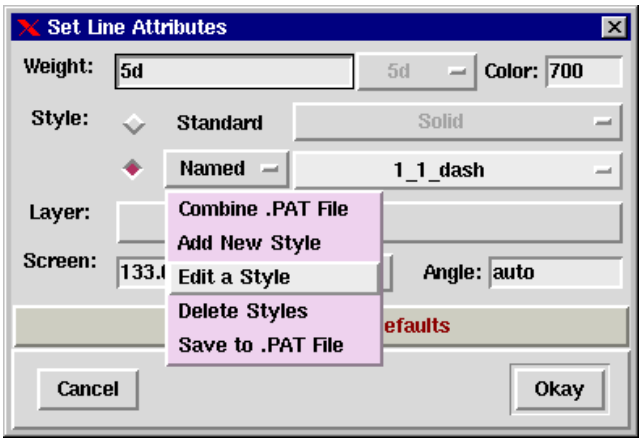


Square Dot Patterns

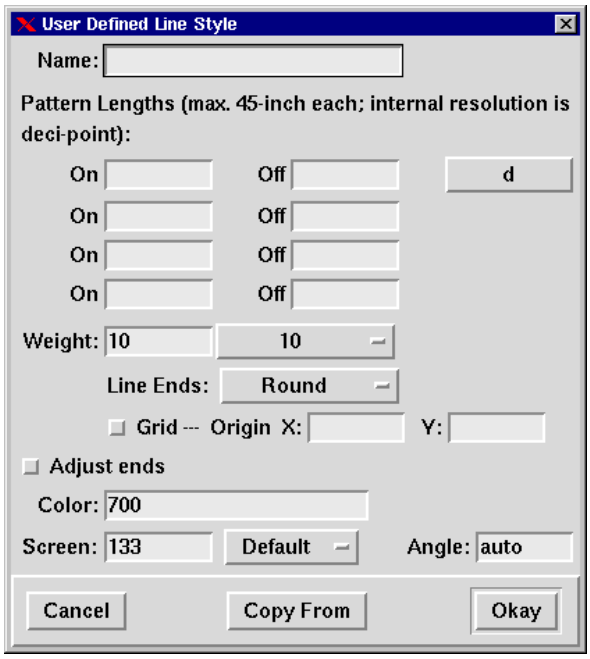
The Square Dot Patterns are the same values as the round above, but the dots are made of little squares. Use the pattern filename with the “dots” to get squares instead.

Linking the Immediate \FILL Command to a Line Style

Go to [Line] tool's {Set Line Attributes} dialog. Pointing to the [Named] Button will drop down a list of options for creating and maintaining User Defined Line Styles. Select the **Edit Line Style** option.



This will bring up a list of all line styles in the file. Choose the line style you wish to edit and [Okay]. This will bring up the attributes for that line style. Change the name to the FILL command number you wish it associated.



The name of the line style is very specific, it must be in the following format starting with an underscore character: **_FILLP##** *(with ## being the number).*

This will copy the attributes into the new style name and at the same time link it to the FILL command for that number. For more information on using the FILL command within your text, see *Volume 3: Batch Composition, Chapter 5 – Immediate Commands.*

Be aware, you are only changing this particular file. If needed elsewhere, you will want to save the line style into a pattern file. For management purposes, when editing a line style that exists in a pattern file, it is best to start with a blank window, combine in the pattern file, edit the line style, and then save back the pattern file. Then when inside of an existing drawing that needs updated, just combine in the updated pattern file. Since line styles are referenced by name, the previous line pattern will be overwritten with the new values at the time of combine.

Chapter 3: The [Box] Tool

Drawing Boxes

The **[Box]** function is designed primarily for business forms composition. It allows you to draw a rectangle or square shape with additional attributes such as rounded corners and screened areas to be included automatically as part of the attributes of the box.

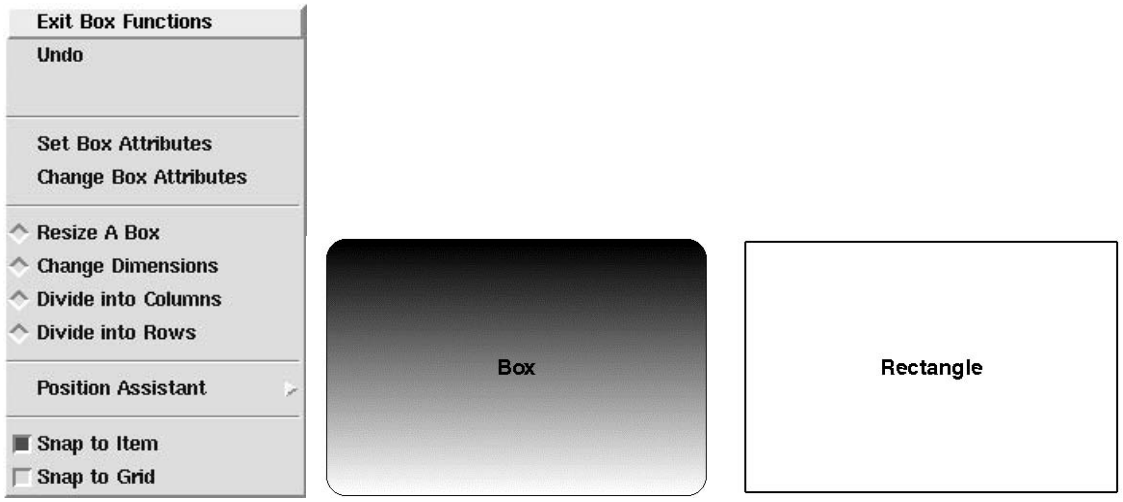


Figure 3-1: The Box Menu and Examples of a Box vs. Rectangle (Drawn with Lines)

Defaults:

All default settings are, stored in the file named, */etc/default/stdgraph.std.*

Prompts:

Pick first box corner, Pick second box corner

You should use the **[Box]** function if you are working on rectangular shapes that may change, since sizing boxes is easy. The **[Box]** function is ideal where the form consists of boxed areas that contain reverses, tints, or screens.

Differences Between Rectangles and Boxes

Rectangles drawn from lines are not as easy to size. Each line must be moved or modified individually where the Box Component can be resized and modified as a whole.

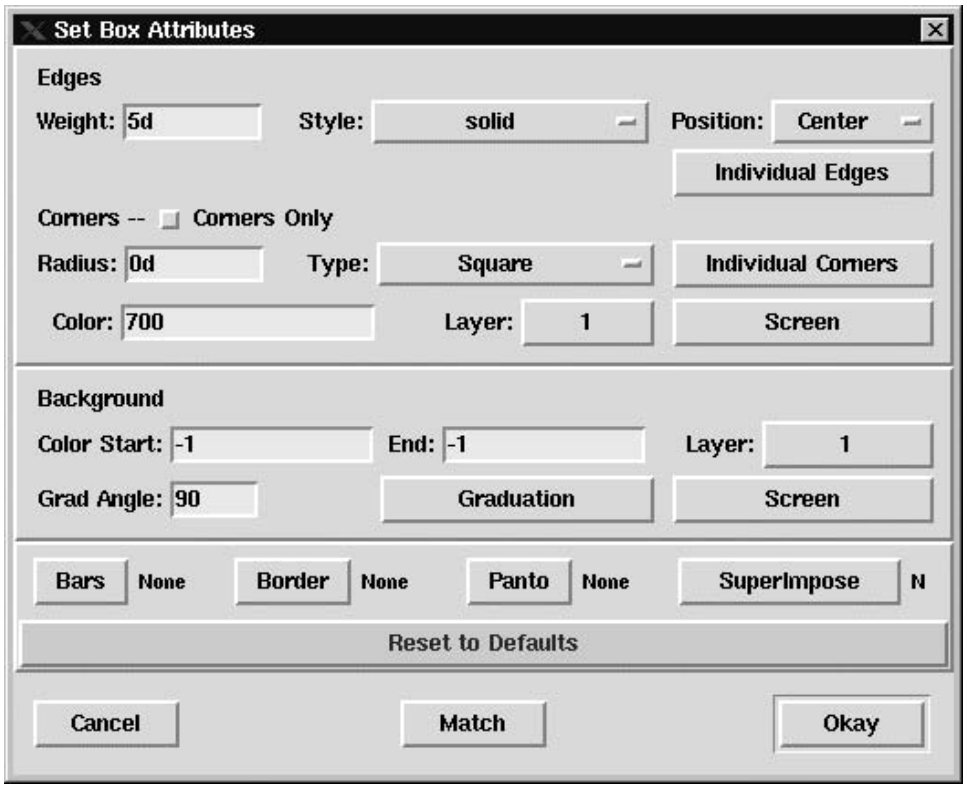
Boxes can be altered by using the **{Resize Box}, {Change Dimensions},** and **{Change Box Attrib.}** functions. Boxes can be moved, copied, group selected, and deleted. Boxes can be mirrored only along a vertical or horizontal axis. Boxes can be scaled and rotated, but the rotation must be in 90-degree increments.

A **[Box]** is drawn by designating two diagonal corners. The prompt will read "Pick 1st box corner," move to anywhere in the Window Area, and pick the first corner. The prompt, "pick 2nd box corner" will immediately appear, so move the cursor away. You will see a *box, which* will expand, contract, and move around to follow the cursor's movement. Picking again will define the box, which will be drawn according to the current attributes. At this point, the function starts over again and the prompt will read "Pick 1st box corner."

When corners are specified as rounded, they will be drawn that way upon completion of the box. If the box is to be filled with a screen, it will be part of the box. Screens can only be seen with [Window]'s *Color Mode* options of *Spot Color* or *Process Color*.

{Set Box Attributes}

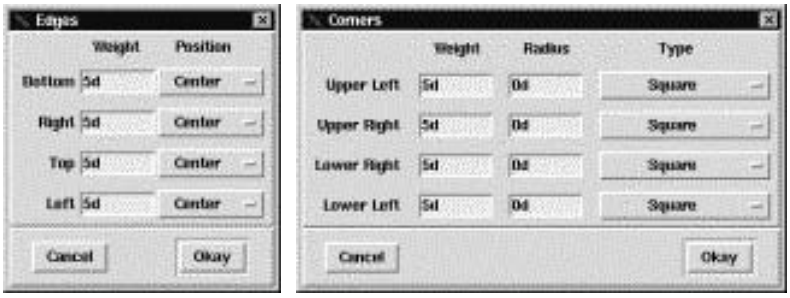
Boxes have many attributes useful for business forms composition. These attributes control the following: Edges, Corners, Inside Area, Bars, Borders, and Pantographs.



The "graphic look" of a Box is controlled through the Box Attributes Menu. The menu provides a method of defining the Edge and Corner characteristics of a box, as well as the Inside treatment. Once these attributes are set, a box of any size can be drawn, and the graphic attributes will be applied automatically. Box sizing can be controlled through the MECCA position menu functions, or through typed coordinates and dimensions, or visually constructed the same as done with rectangles. You may move the cursor through the various fields with the [Tab] key. The [spacebar] opens up button pull-down menus.

Edges and Corners

The *edges* of a box refer to the horizontal and vertical rules, which make a box "look like a box." The edges are typically solid rules of a nominal thickness such as 1 point. The edges can also be invisible or turned off altogether. Individual edge attributes are controlled by clicking on the {Individual Edges} button.



The *corners* of a box are the location where the edges terminate, and the corner begins. They can be *square, rounded,* or *inverted rounds.* The corners can be the same line weight and style as the edges, or they can be different or invisible. Corners can be printed without edges by clicking the box for "Corners Only". The size of any corner(s) in a box is controlled through radius field. Individual corners can be controlled by clicking the {Individual Corners} button.

The edges and corners attributes are Weight, Style, Color, Screen, and Layer. The **Weight** can be any value, such as "1p" for 1 point. The **Style** can be SOLID, DOT, or DASH. The *Color* can be any value in the color table, such as "630" for 30% gray. The *Screen* lineage can be any value from 40-150 lines per inch. The *Layer* can be any layer one through thirty-two. The entries for weight of edges and corners will set all four edges and corners with the same rule thickness. Use the {Individual} buttons to vary the thickness of the four edges or corners independently.

Saying "Yes" to Corners printing only will cause the edges to be completely ignored. This option requires that you have a size for the corner entered in the field.

Edges and Corners Position is where a rule falls from the pick. Outside places the bottom of the rule on top of the grid, Center places the rule centered on the grid, and Inside positions the top of the rule on the grid. See Figure 3-2. Default is Center.

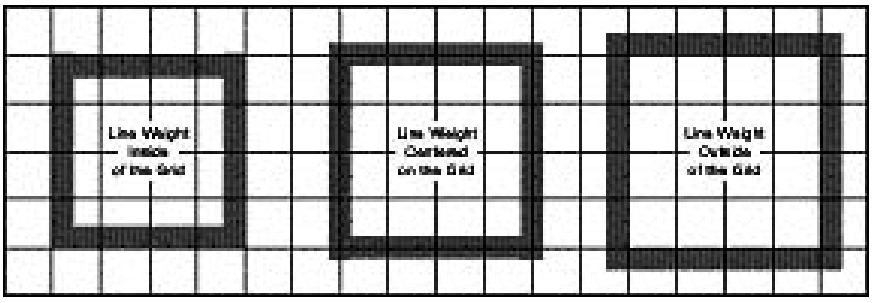


Figure 3-2: Examples of Outside, Centered and Inside Rules

All boxes have four corner controls. The corner type can be Square, Rounded, or Inverted Rounded. The corner size can be any value, such as ".25i" for one-quarter inch. Corners can vary if desired, for example, the upper right and upper left corners can be rounded, and the two lowers can be square. It is recommended that Square corners have a size of 0, with one exception. If you have corners printing only as "Yes" and the corners are square, you must indicate the length of the corner through the corner size field.

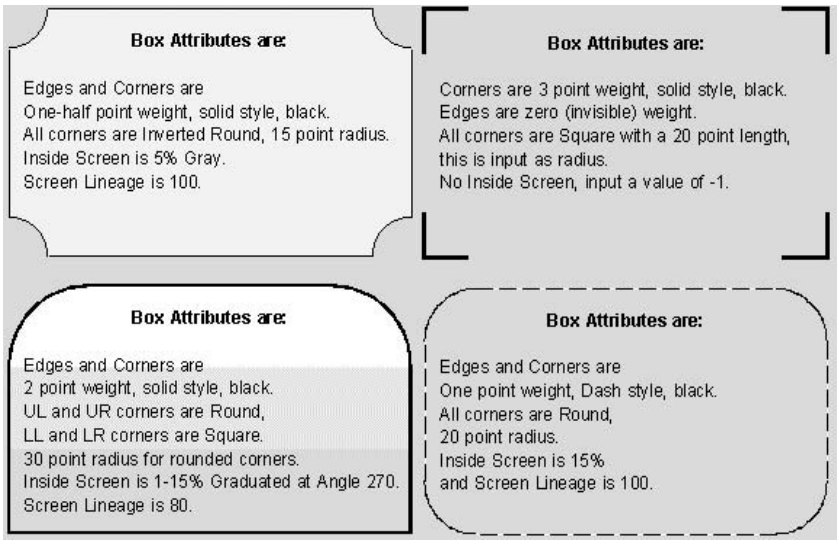


Figure 3-3: Box Styles are Created Through the Box Attributes

Drawing Boxes with Tapered Round Corners

To create a box with tapered round or square corners, you need to Choose {Individual} Edges under {Set Box Attributes}. The individual edges bottom, top, left and right can be controlled independently for line weight and line position only. Corner line weight setups are ignored unless Corners Printing Only is "Y". Rounded corners can be added by using the corner type and size setups; also inside area fills, bars and pantographs can be used with tapered corner boxes. This option also allows for the individual edges and corners positioning of rule weights, outside, centered, or inside the pick position.

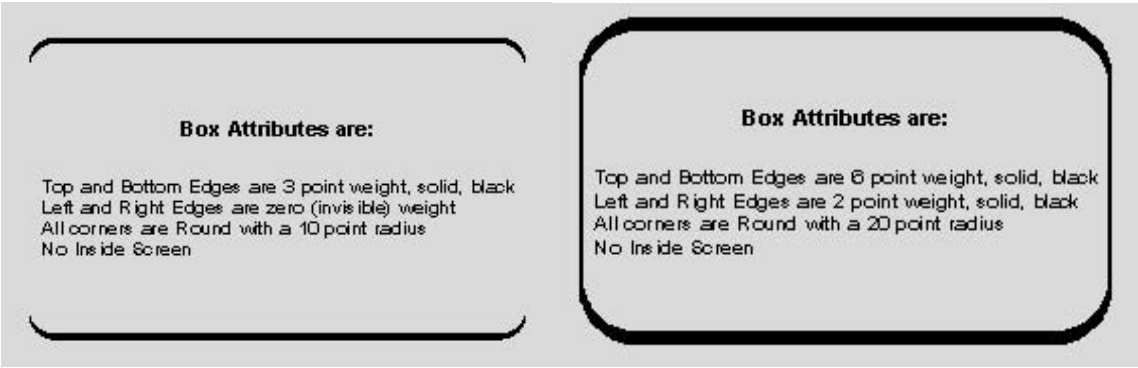
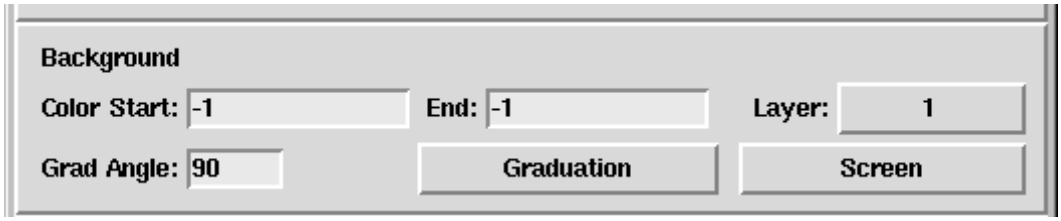


Figure 3-4: Creating Boxes with Rounded Tapered Corners

Background



The **background** of a box is its insides. It can be tinted by indicating the desired Start Color and End Color. If these are valid color numbers a tinted area will fill the box. **Enter a "-1" for the start and end color to make the box empty** or transparent. The background of a box will be grouped if its layer is turned on, even when transparent. Use color 600 White on both start and end, if you need it to knockout anything behind it.

Start Color is a number that is defined in a color table. (For a more detailed explanation on color tables, see Spot Color Tables). The default color number is 0 (which means 100% Black). Gray screens are produced through the six hundred series of numbers 601 through 699. 600 is White and 700 is Black. A 10% gray screen is the color number 610. A 30% gray screen is 630. If the Start Color is different than the End Color then the Graduation Angle comes into play, and also the Progression.

End Color is needed at all times in a box. If the end color is different than the start color the inside area will be graduated. Again, you should type in a valid color number from an already established color table. If you do not want an area with color shifts, then you must input the same end color as the start color. In a Directional graduation, the End Color travel is controlled by the “Grad Angle”. See Figure 3-5.

Grad Angle controls the direction of graduated screens color shift. Type in the angle, (0 through 360), controlling the graduation from the Start Color to the End Color, with zero degree meaning left-to-right. See Figure 3-5.

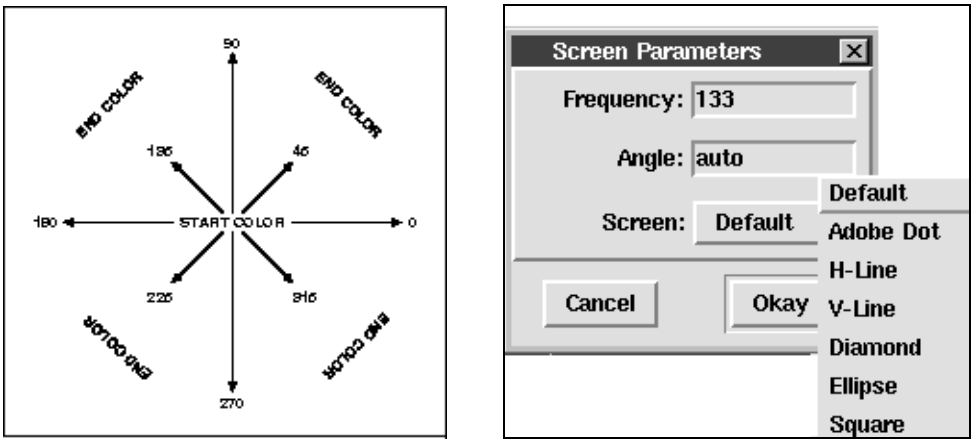


Figure 3-5: Grad Angle Directions and Screen Parameters

Layer and Screen are the same as on any other attribute menu. Layer separation of a box with different layer settings must be output using the [Parts] option. See Figure 3-6.

The Graduation Options

There are two graduation types: *Directional and Radial.* Directional follows the graduation angle, Radial does not, it graduates from the center. *Progression* controls the color shift of the graduation. There are four types: Linear, Log, Reverse Log and Custom.

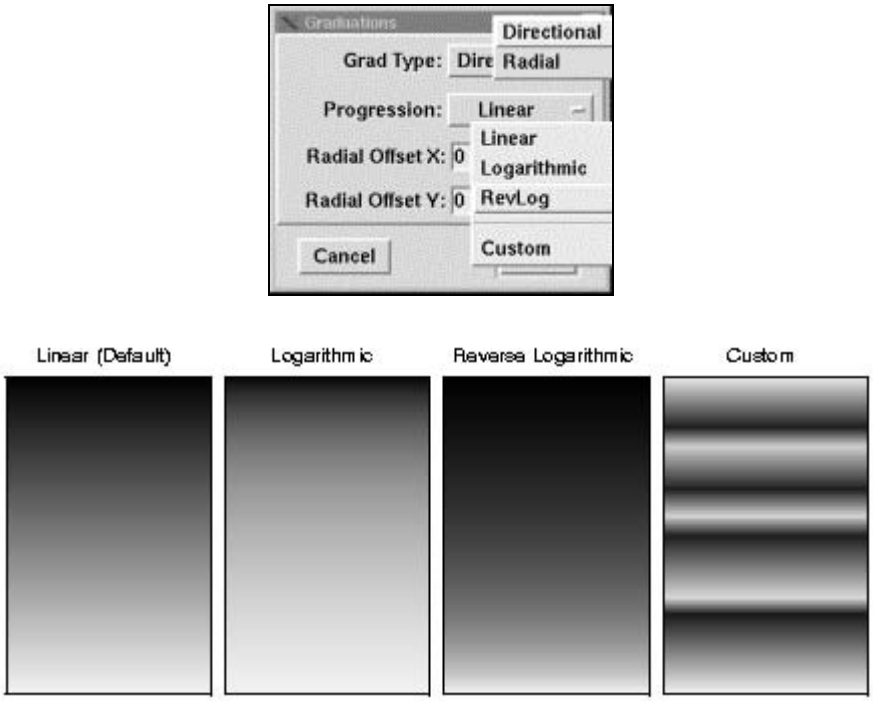


Figure 3-6: Graduation Dialog and Examples of Directional Progressions

Custom Graduation Progression

Defining a Custom Graduation Progression is a new addition to color graduation progression types. This allows the color shift to flow back and forth.

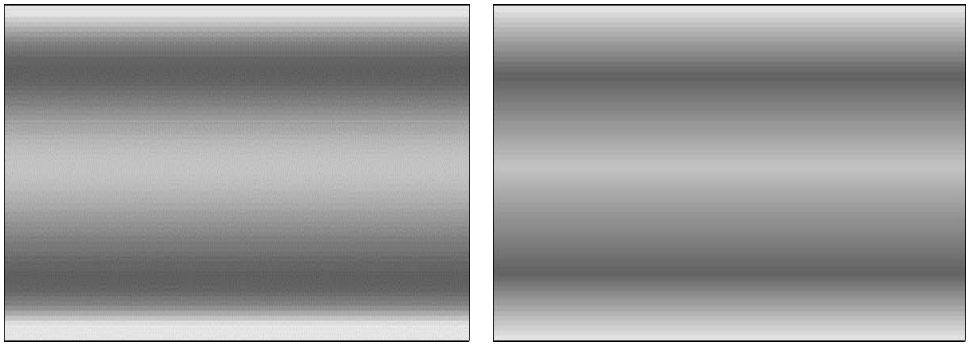


Figure 3-7: Examples of Graduation Progressions

It is controlled through a Graduation Progression Map (gmap) dialog.

When the user is "Setting Attributes" where color graduation is applicable (area, box, or b/w raster image), the graduation progression type menu includes a "Custom" entry. Selecting it will generate one of two actions:

1. If there is currently no defined gmap (as is the case after starting MECCA, or after a "New Graphic"), the gmap designer dialog will be displayed.
2. Otherwise, a dialog will show current gmaps known to the program, giving users a chance to select an existing gmap to use, or create a new gmap.

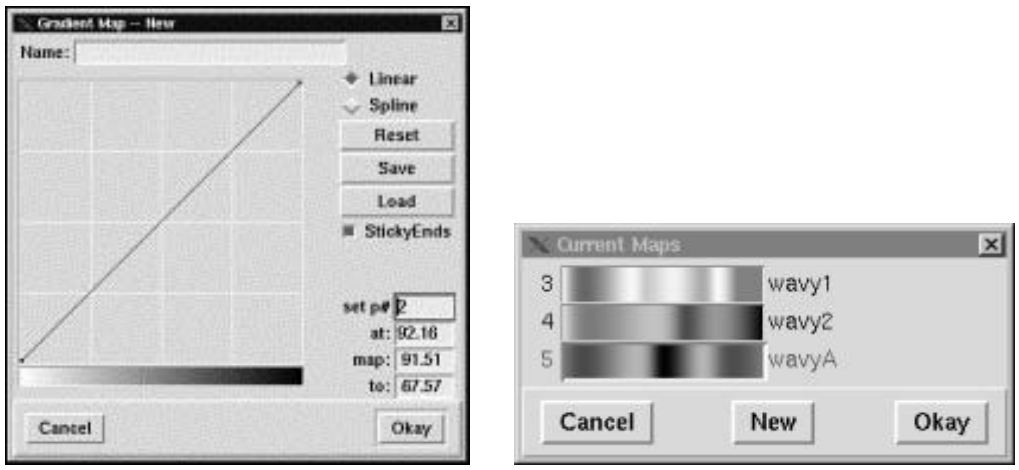


Figure 3-8: Custom Graduation Progress Map Dialogs

The Graduation Map dialog contains a large square, which represents the graduation progression on its two sides:

Horizontally: The left edge is the physical position where the Start Color will be, and right edge is where the End Color will be. From left to right, the axis represents the "physical travel", in percentage: 0 is left, 100 at the right.

Vertically: Going up, the axis represents the color/density transition from Start Color (at the bottom), to End Color (at the top). This axis also has a range of 0 to 100, representing the color difference between End and Start color (100 is at the top, where the difference is at maximum).

You can click-and-drag anywhere on the line to insert a point to move/adjust. Or, right-click over an existing point on the line to delete it (except first or last point).

Options Available:

A. Choice of either Linear or Spline shape.

B. Reset control button that lets you start over with a straight line.

C. Save and Load control buttons. You can Save the existing gmap data into a separate ".gmap" file; and then Load this external ".gmap" file when needed.

D. Whether the map ends are "sticky" or not. With Sticky on, the two ends of your line/curve will stick to the edges. Sticky off, those two end points can float.

E. A set of precise controls over points on your line/curve, where the points are numbered from 1 and up, with point #1 being the left most point:

1. The "map:" box lets you type in any horizontal value between 0 and 100; and the "to:" box lets you type in a value between 0 and 100 for the vertical placement

corresponding to the "map:" box value. Please use the Enter key in the "to:" box to instruct the dialog to act on your data.

2. You can type in a point number into "set p#" box, followed by where you want it to be horizontally, in the "at:" box; press Enter key in the "at:" box informs the dialog to act on your input.

   When you do, you'll see the dialog sets the "map:" value to exactly what your "at:" value is, and waits for your "to:" value. Simply do what is described in E-1 above about your "to:" value input.

   Map Values: Both "at:" and "map:" values are of the same sense: a location on the horizontal axis. The "map:" and "to:" boxes also show read-outs as your mouse pointer moves in the Design Square; whereas "at:" is tied to a point's horizontal location: it changes only when:

   a. you type in your desired value; or

   b. you click on an existing point in the graduation map dialog.

F. Directly beneath this square, is a narrow band showing gray. It is a visual sample of your progression: white represents Start Color, and black the End Color -- of course, this does not mean your graduation must always start with white and end with black, the use of black and white in this dialog is to assist in representation of the color shift.

G. Above the square, you can assign a name label for the custom graduation. This name is restricted to 15 characters maximum.

When you Okay out of the Graduation Map Designer dialog, your map will be assigned a number, which will be shown as something like "Cust. #1" in the Progression list.

Miscellaneous Notes:

1. When you query/match a component using a custom progression gmap, you will see the Progression menu containing another entry: "--edit map". Clicking it will take you to the Graduation Map Designer with the custom gmap loaded for you to modify.

   In that case, whenever you Okay out of the Gmap Designer, the progression gmap data is updated immediately, even though you haven't actually carried out the "Change" to the component. Once you Okay the edits, that gmap design has been updated and all components using that gmap design will be changed in appearance when you cause the drawing to refresh.

   This is similar to our user defined line style feature. Also like editing user defined line styles, once you Okay the edits, there is no undo to "get the old gmap data back". This is why it is recommended to “Save” gmap data into external “.gmap” files.

2. Custom progression map numbers within a file start from 3, and can go up to 255. This is a limit imposed at all times: including the case where you combine other graphic/drawing files that contain additional custom progressions. The total at any given time is limited to 253 (from 3 to 255 inclusive) per file.

3. Because of the above, every time you save/print a drawing with custom progressions, the numbers will be resequenced in the list. This number is not linked to the gmap name, it just shows how many are listed in the current file.

Again, due to limited resource space for the gmap numbers, any unused gmap will have its slot recycled as soon as possible. This also can happen when you combine in external drawing files which were saved with their gmaps: those gmap numbers may change after combine.

The gmap names are not acted upon by MECCA: when combining, MECCA does a "similarity check" for each of the gmaps in the external drawing file; this is based on the gmap type, number of points in the gmap, and point locations. So two gmaps with everything the same except their names, are considered identical.

Because gmap numbers may change frequently, we suggest you take the effort to name your gmaps by giving them name labels meaningful to you. Also, make use of the Save function in the Gmap Designer dialog to save your gmaps into external files which you can readily identify and use (via Load in the Gmap Designer).

Note: Graduation Custom Progression Maps are only support by MECCA 2000 and not by Amgraf's OneForm Designer Plus software.

Setting a Radial Graduation

You can specify a radial graduation within the box by choosing {Graduation}, {Grad Type} and selecting {Radial}. The *Radial Center* is controlled by X and Y coordinates measuring from the center of the box. The default placement of the radial center is X=0 Y=0, which is the center of the box.

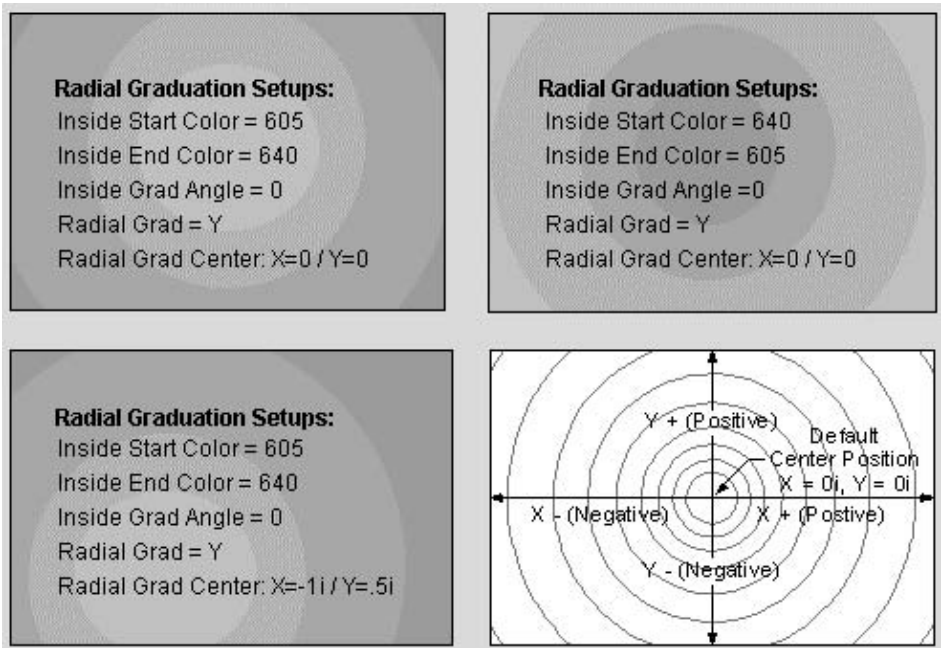
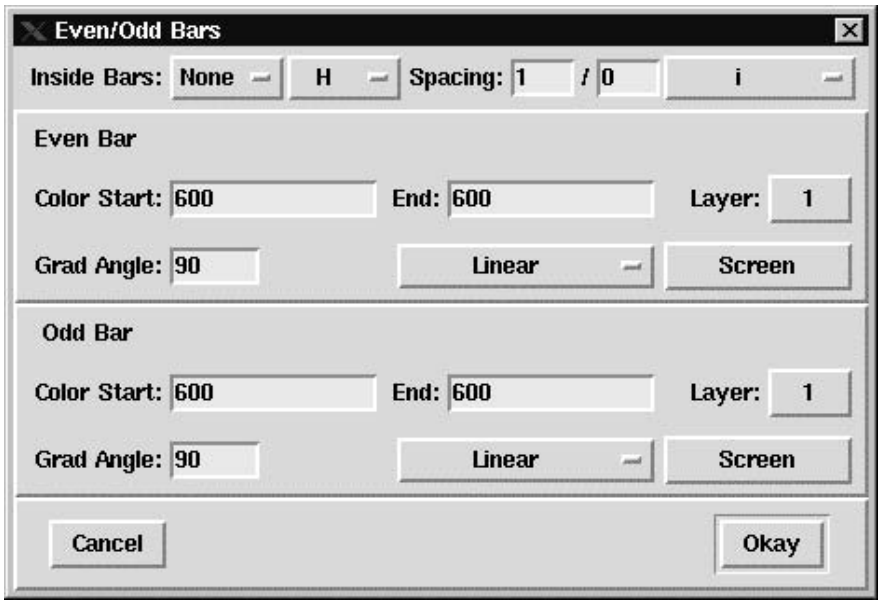


Figure 3-9: Specifying Different Types of Radial Graduations

Bars

Bars are produced by subdividing the inside area into equally spaced repeating bars, drawn horizontal or vertical. Each bar can have its own tint or screen value, and just the even or odd numbered bars can be tinted if desired.



Using the Bars Option in the Box Attributes Menu

In many situations, it is desirable to have rows or columns within a business form identified with a screen tint. See Figure 3-10. This graphic effect can be created using the various line drawing, shading, copy, and step-and-repeat functions in MECCA, or you can use the Box Attributes Menu.

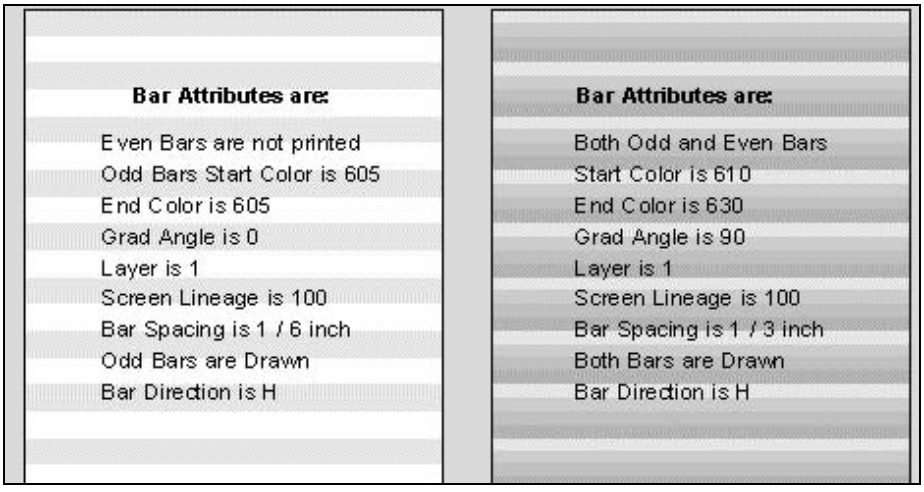


Figure 3-10: Bar Attributes Add Shaded Bars to a Box

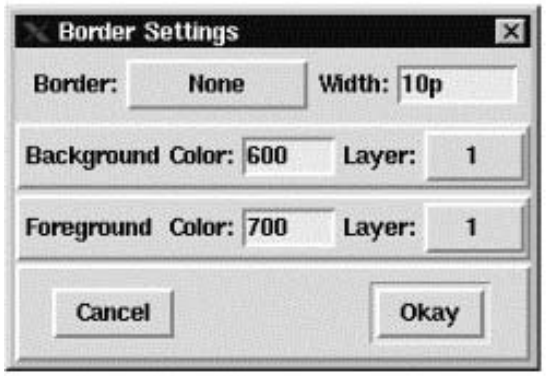
To add shaded bars to a box, make all the "Inside" color values -1, and use the Odd Bars and/or Even Bars settings to create a repeating tint pattern. Just specify the desired tint values, and then indicate which bars to draw. These commands will create equally spaced bars inside a large box.

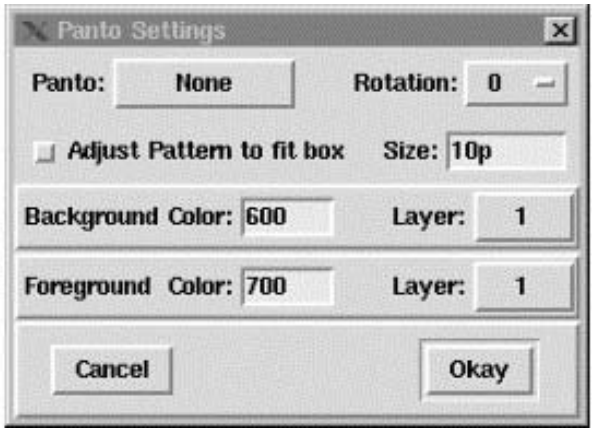
The Bar Spacing controls the thickness of each bar, and is always shown as a fraction, such as "1 / 6 i" for one sixth of an inch. To draw tints only on the odd bars, indicate "O" in the Draw Bar field. Likewise, use "E" for only the even bars, "B" for both even and odd bars, and "N" for no bars. Choose your direction horizontal or vertical from the pull-down menu.

Using Borders and Pantographs

A *Border* and *Pantograph* can be assigned to a box. This is done by selecting a number that corresponds to the border and pantograph designs. The Library starts on page 85.

At the bottom of {Set Box Attributes} menu are two options for Borders and Pantographs. Selecting *Border* or *Panto* will bring up the following menus:





As you can see the border and panto menus are similar. Choose a design from the stock borders or pantographs and type in the associated number.

Using Borders

Assigning Background and Foreground Colors allow you to put white on black or black on white, with their respective layers. All borders are created with two characters: a background character and a foreground character. Swapping the colors of these characters usually makes a completely different look. That is why our library shows the border and its reverse image.

All Borders are automatically adjusted to fit around a box by slightly scaling the individual border font characters. They are fonts in the sense that controlling the size is

through point size. To determine the size of the border needed, measure the width of the border wanted and input that into the WIDTH field on the dialog box.

The border menu will default in points to the width of the character creating the side (on MECCA this was always considered 10-point). If you are trying to match MECCA's 10-point, just leave in the default WIDTH.

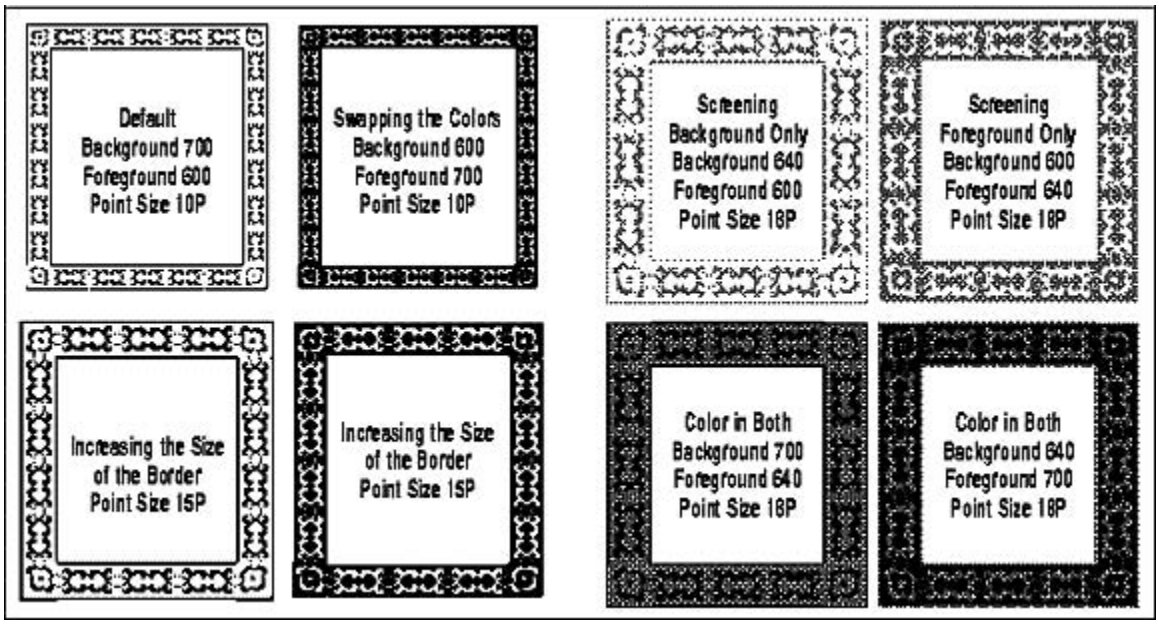
Even though we have some borders designed with a rounded look to the corner, all borders follow a rectangular shape and will not round or invert with the box attributes.

During [Window]'s *Type Color* display, borders will be represented by their background character. The color attributes will be shown with *Spot Color* and *Process Color* displays.

There are 67 borders and each can change in point size and color to make many looks. Reversing the border many times gives you an entirely different border.

The Many Faces of Border #026

Looking at Border #026 you can see the wide variety of graphic effects, which can be accomplished just by changing the point size and colors.



Borders Can Take on Different Looks

Using Pantographs

Pantographs give you a wider variety of graphic effects than borders because the *Background* attribute of the box also plays a part in the look and the pantograph can be rotated in 90-degree increments. There are four types of Pantographs:

Type A - These allow the most dramatic effects to the accomplished through the variables of background, foreground, insides, and superimposition. They are created with one character, which then allows the Background of the box to become the background of the pantograph and show through the design. The foreground character is not used. Only Type A pantographs will allow superimposing of text in the pattern.

Type B - These pantographs are made of two characters: both the foreground and background. These characters are such that they have holes in them, which allow the Background Color to show through allowing some variety.

Type C - Here we again have two characters, but they are complete characters, which mask over the entire background of the box.

Type D - These are EPS files which are ten inch square scans of non-repeatable patterns such as linen, wood grain, etc. These varied patterns are scanned images output as EPS files. Due to the size of the EPS files you cannot use the spec files step-and-repeat capability with an EPS based pantograph.

> **Note:** EPS panto screen displays are not representative of the actual panto. They will always display as the linen pattern 066, but will print as the true pattern. When in doubt, you may {Query} the panto to determine the number assigned and then look up the pattern.

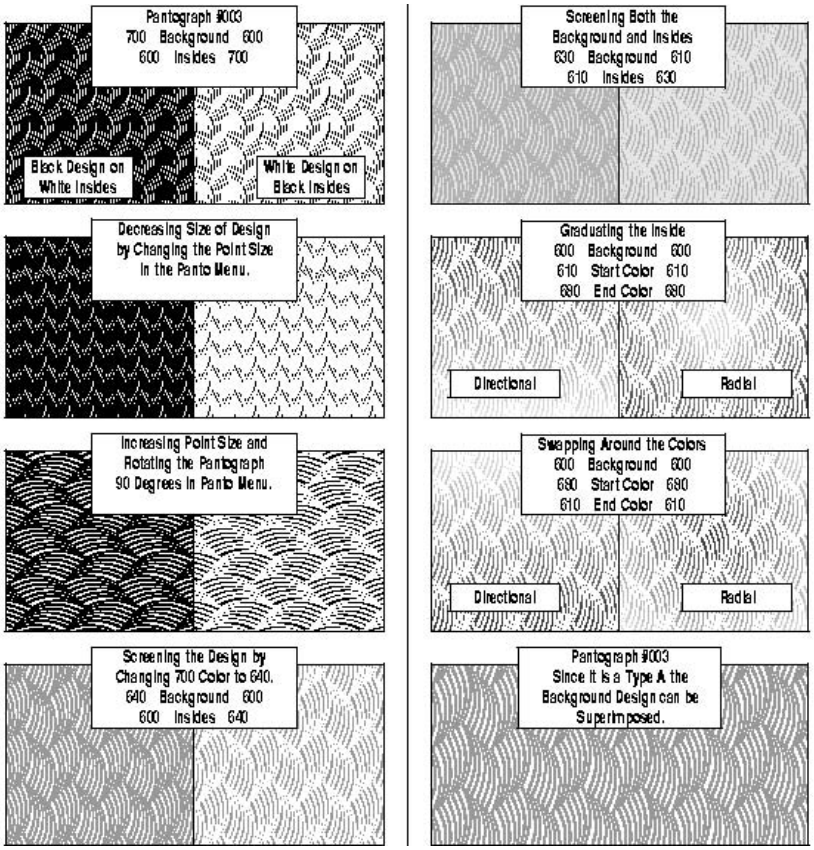
Using a pantograph is as easy as picking a design out of the library and putting in the number.

The Many Faces of the Type A Pantograph

Below are effects used on the Type A Pantograph #003. This type allows the superimpose effect to be used on the "background" design where you have a black design printing on a white or transparent insides.

You can create many designs from the same pantograph using a variety of the following:

- Point Sizes - The default point size of the pantograph character will be reported in the dialog, (on MECCA III this was considered 10-point). If you are trying to match a printed sample, measure the width of the stepped character and input this in the Size field.
- Rotation - Pantographs can be rotated 4 directions: 0, 90, 180, and 270.
- Percentages of Color
- Directional and Radial Graduations
- Superimpose Text Effect



Adjusting the Pantograph Pattern

The pantograph control called *Adjust Pattern to Fit Box* allows you to force a pantograph pattern to exactly fill the box up to the edges, with perfect symmetry. See Figure 3-11. Keep in mind that this adjustment is made on a box-by-box basis, and if you have several pantograph-filled boxes side-by-side on your page, the patterns might not be aligned with each other. So, in most cases, you should only use the Adjust Pattern = Y feature when a single filled box appears on the page. If you leave the Adjust Pattern feature in the default (= N) state, the pantograph pattern will be "page" oriented, and boxes can be placed anywhere on the page with the pattern alignment automatically made consistent.

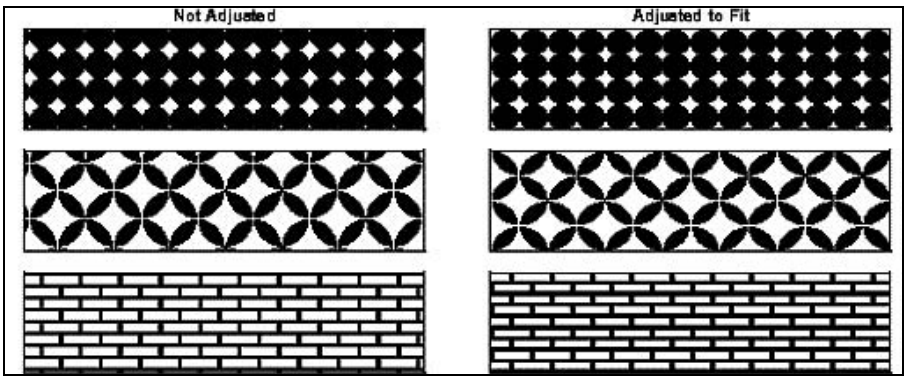


Figure 3-11: Notice the Pattern Fits Nicely in the Box After Adjusted

SuperImpose

The [SuperImpose] button is used to superimpose text (must be a font) or areas into a pantograph. The following discusses the basic concepts of superimpose using the "Text Only" method. The text will blend into the pattern and contain the pattern being used. It is done by creating a graphic file with the text placement and then merging it into the pantograph file during printing. See Figure 3-12. The steps for accomplishing a "Text Only" superimpose follow:

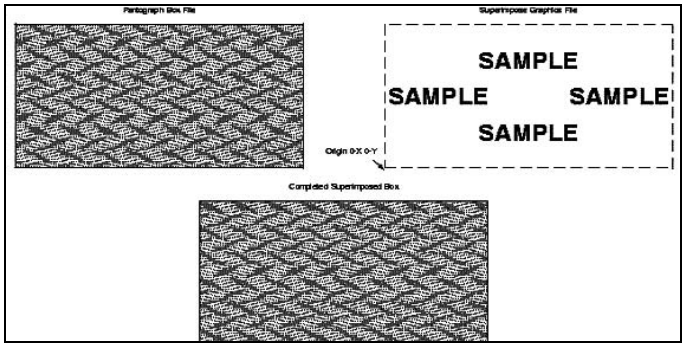


Figure 3-12: Superimpose Pantograph Box and Graphics File

Step 1:

Create a 0 weight rectangle the largest size you will ever use for the superimpose pattern.

Step 2:

Move the lower left corner of the rectangle to X,Y coordinates 0, 0.

Step 3:

Place color 700 text inside the rectangle creating the pattern to be hidden within the check area. You may have the text overlap outside the rectangle if you want it to appear to bleed out of the panto. There is no restriction to font and style.

If the font needs to download to your printer during output, you must have a piece of it inside the original form file. This can be placed in 1-point white outside your trim marks, but must be there to activate the download process. The graphic (text placement) file will not activate a download.

Step 4:

Make sure the text pattern is on the same layer and that the active layer color table is reading the same color as that of the pantograph. This is necessary for color proofs.

Step 5:

Save the drawing with a ".g" extension in an appropriate directory.

Step 6:

Using the Box Attributes create a pantograph needed for your job. Assign the color information for the pantograph. The screen lineage of the pantograph is controlled through the boxes *Inside* entry for *Screen.* The control for using a dot screen or line screen is controlled by using the *Screen* button.

Step 7:

Using the *Superimpose* function in the {Box Attributes} menu, type in the complete pathname, and name of your text graphic, (i.e. /usr/amgraf/sampletext.g).

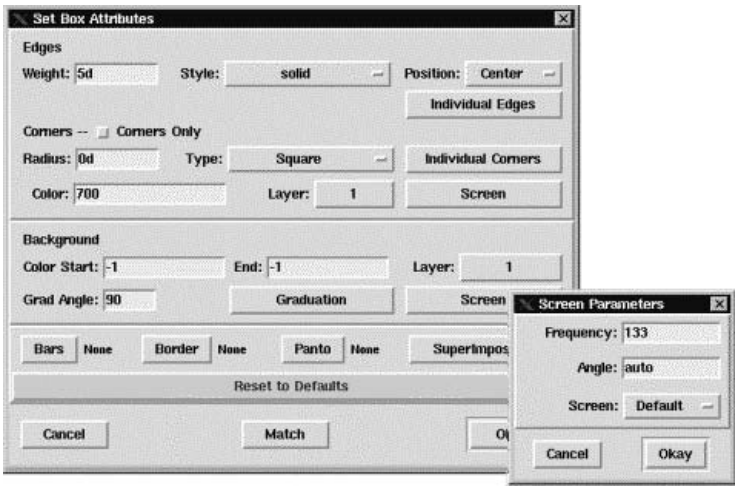
Step 8:

If the text pattern needs to move up/down or left/right, input the distance (points, picas, inches, etc.) in the Image Offset area. The first entry is left/right and the second entry is up/down. Refer to Figure 3-12 for the movement origins. Using the default X,Y coordinates of 0, 0 will cause the text patterns lower left corner to match up to the boxes lower left corner.

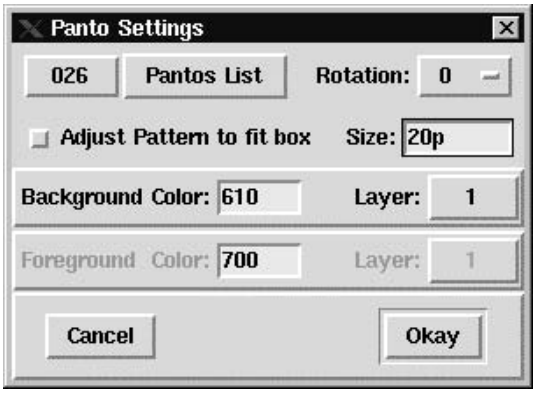
Step 9:

Input the desired Screening Information for a "Text Only" superimpose. The following is only an example:

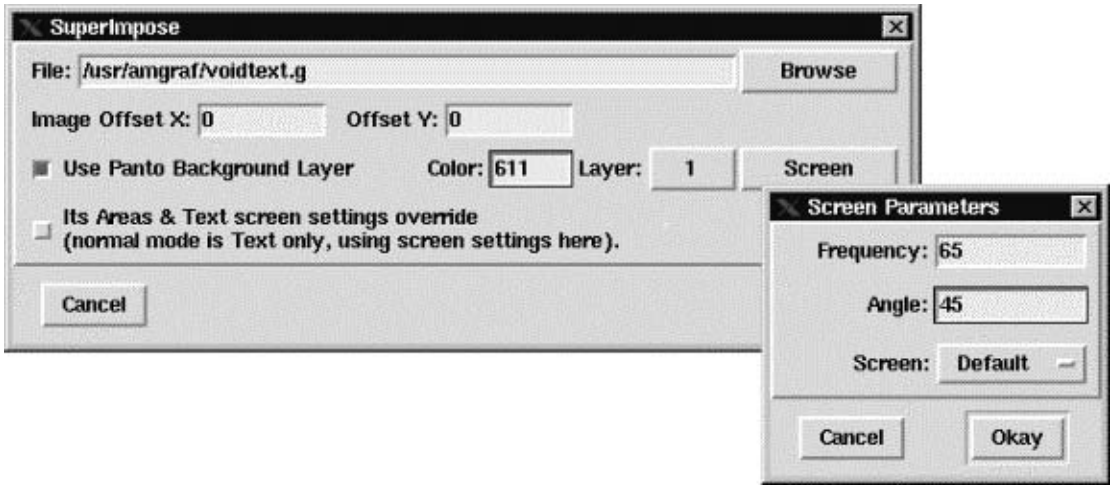
Setups for the Box Background: We are going to take out the background color with a "-1" and set the screen value to 133. This will become the screen value of the pantograph.



Setups for the Pantograph menu: Select a pantograph that only has a background color (the foreground must be ignored). Make the background color the density you need, we are using 610 for a 10%. Remember the screen lineage is coming from the prior background screen value (133).



Setups for the Superimpose menu: Locate the "Text Only" graphic file. Then check "Use Panto Background Layer". The superimpose dialog allows you to adjust the screen density (color) and the screen lineage. We are adjusting the color just little (611) but increasing the size of the dots by changing the screen lineage to 65.



Step 10:

Draw your box in the correct position and size. **You will not see any display of the hidden text.** It is important that before creating any other boxes that you remove all setups for the hidden text, otherwise all following boxes will have those attributes. Also, on output you will see an increase (sometimes considerable) in print time, due to the superimposing of the pattern.

Each pantograph will give different results as far as how well the text pattern is hidden. You may have to experiment with different screen values to create the right effect. Any pantograph that has large amounts of white space within the pattern will probably not work well for the superimpose feature. Your screen density, ink color, paper stock, pressmen, etc. all play part in how well the results of the superimpose will be on the finished product.

Step 11:

Adjusting the screen lineage, dot, and angle to get the best results is the key. Also make sure your pattern itself has enough black in it to work. Those patterns with

too much white will need to be used at a smaller point size to get enough black to allow the superimpose.

Limitations:

There are some usage limitations when creating the text pattern to be superimposed into the background and which pantographs can be used.

- You may only superimpose text into the pantograph. No vectors, splines, circles, areas, or scanned images are allowed. Rotated text is allowed.
- The text cannot contain any Immediate Commands or Special Characters.
- Pantographs that use the Foreground Color will not work. Only those listed in the documentation as "Type A" can contain a superimpose. You will be putting the percentage of color (i.e., 610 color number) in the pantograph's "Background" always. (Superimpose does not work on reversed pantographs: those with 600 in the Background and color in the Inside).
- EPS Based Pantos cannot be superimposed.

Areas and Text Screen Settings Override

The option "Its Areas and Text Screen Settings Override" when turned on, will ignore the screen value in the superimpose menu and look at the merged voidtext.g file instead.

Be aware that certain techniques of superimposing images into pantographs have been patented and that it is up to all manufacturers to check out patent infringements before printing. Specifically, The Wicker Group, has a patent on using multiple screen values with line screens.

{Set to Match}

This option sets your attributes to match an existing box simply by picking the item to match.

Prompt:

Pick box to match

Resize Box

This function lets you easily change the size of a box that has already been created.

When the **{Resize Box}** function is selected, the prompt will read, "Pick box to resize." Move the cursor to the desired box edge and pick it. The color display will then show a white outline around the selected box, and inside the outline will be *handles.* There are handles on each side. By picking a handle to select the appropriate side to modify, you can now reposition that side.

As you move the cursor, you will see the white box edge change positions. You can modify more than one side at a time if needed. When you have moved the cursor to the correct location for the new size of the box, click left mouse button to complete, then click right mouse button to bring up the options and select {Done}. The image of the box will be erased and redisplayed.

You may utilize all of the position functions to precisely control a box's size or type in a coordinate and press an arrow key.

Change Dimension

This option will allow you to change the overall box size by typing in a new "Width" and "Height." The box is then redrawn from its original lower left corner.

Divide Box in Columns and Rows

This function lets you take a large box and divide it into many smaller various-sized boxes. The divisions can be along the "X" axis to represent columns and along the "Y" axis to represent rows. Once a box is divided, each piece has its own attributes (the attributes are copied from the original box) and can then be further changed by using the **{Change Box Attrib.}** function.

When you select the **{Divide Box in Columns}** function, the prompt will read, "Pick box to divide." Move the cursor to the desired box and pick. The prompt will then read, "Pick new position." Now move the cursor to a location within the box where a division is to occur. Pick and a new box with its edge at that position will be displayed.

At the point of the division, the only corner style that will be created is *Square.* If you need rounded or inverted rounded corners on the newly divided box, use the **{Change Box Attrib.}** function.

The **{Divide Box in Rows}** function works just like the **{Divide Box in Columns}** function. Use this function to divide a large box into unequal rows.

You may utilize all of the position functions to precisely control box divisions. **See Figure 3-13.**

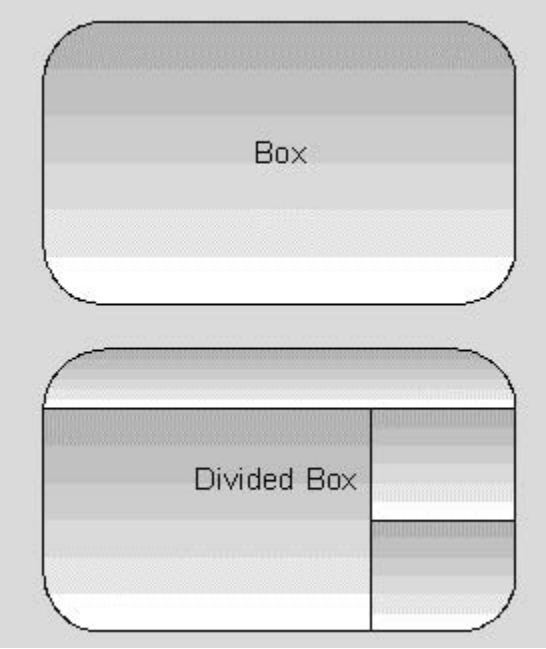


Figure 3-13: A Box that has been Divided in X and Y

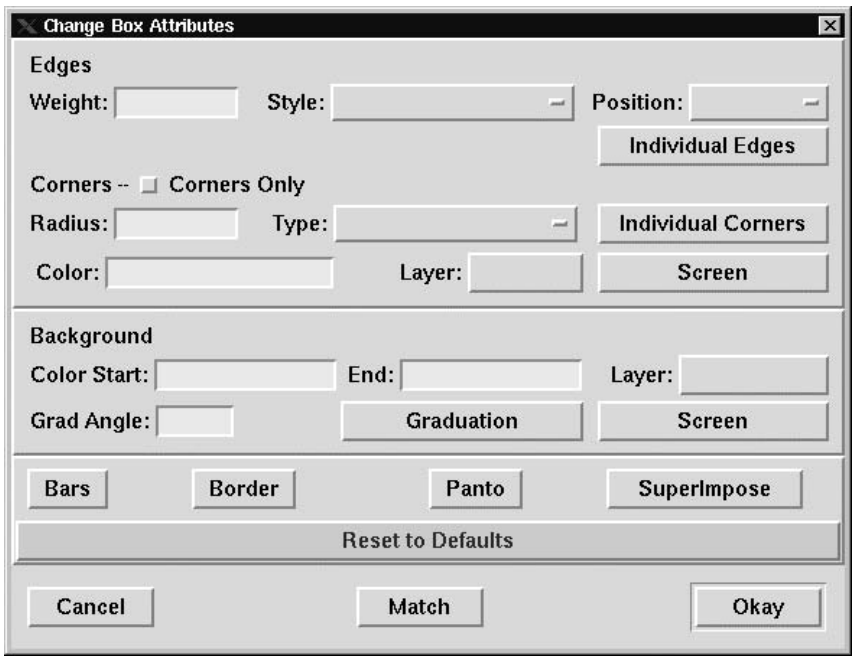
{Change Box Attrib.}

This function allows you to change all attributes of a box that has already been drawn. When selected, a pop-up menu will appear with no values given. Select [Match], and then click on the box you want to change. Now the {Change Box Attributes} menu will contain the values of the box you picked. You can now make your changes in the menu.

You may use the [Tab] key to move the cursor through the menu. Either type in your selection or press the [Spacebar] (if applicable) to see a menu of choices. When the changes are complete, select [Okay] to accept your changes. Now again pick the box you want to change.

Use [Group] to Change Multiple Boxes

Multiple boxes can be changed by first grouping the desired boxes, then go to {Change Box Attributes}. Pick one of the boxes in the group and make the change needed. All of the grouped boxes will be updated with the new change. Be careful when changing an attribute because it will change the entire group of boxes.



It is important to note that when applying changes to a box using {Change Box Attributes} that you are only affecting boxes that currently exist. Any modifications made to the box menus using {Change Box Attributes} is not reflected in the {Set Box Attributes} menus.

The Borders and Pantographs Library

Borders and pantographs are accessed through the [Box], {Set Box Attributes} and {Change Box Attrib.} functions. There is a large library of stock borders and pantographs to choose from.

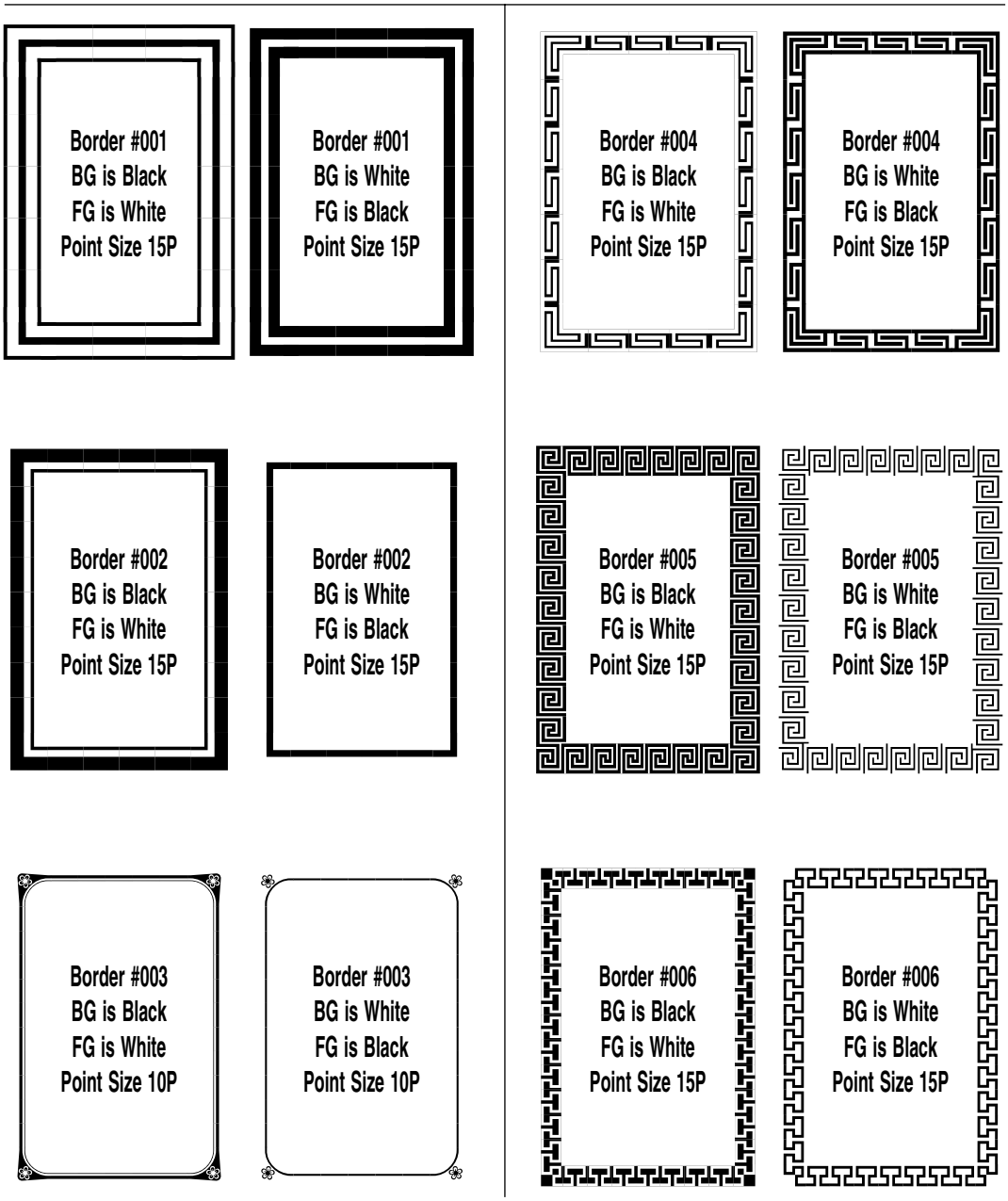
Although the library contains 140 basic border/pantograph designs, the software allows you to manipulate these designs in such a variety of ways that the end result is unlimited.

For both borders and pantographs, just reversing the color numbers creates different effects; and since they are fonts, changing the point size to reduce or enlarge the design, creates different looks.

It is also possible to have custom Borders and Pantographs created as a service by Amgraf and placed on your system, or receive advanced training for this purpose. Contact Amgraf, Inc. for more information if you are interested in custom Borders and Pantographs.

Border Library

There are 67 stock borders which can be used with the {Box} option. Each one of these borders is reversible, which many times gives you another unique look. Side-by-side is the standard border and its reverse. With a few of them, reversing the colors simply makes the design white, in this instance we show it on top of a black box so that it appears.




Border #007
BG is Black
FG is White
Point Size 10P


Border #007
BG is White
FG is Black
Point Size 10P


Border #011
BG is Black
FG is White
Point Size 23P


Border #011
BG is White
FG is Black
Point Size 23P


PRINTS WHITE
Border #008
BG is Black
FG is White
Point Size 15P


Border #008
BG is White
FG is Black
Point Size 15P


Border #012
BG is Black
FG is White
Point Size 30P

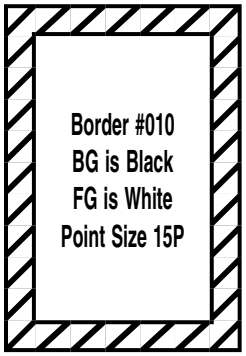

Border #012
BG is White
FG is Black
Point Size 30P


Border #009
BG is Black
FG is White
Point Size 24p


Border #009
BG is White
FG is Black
Point Size 24P

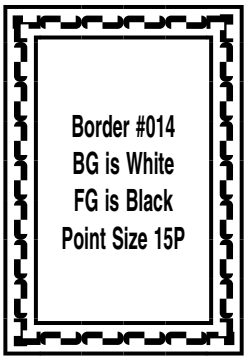

Border #013
BG is Black
FG is White
Point Size 24P

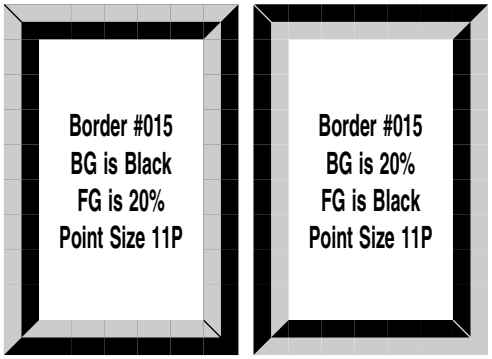

Border #013
BG is White
FG is Black
Point Size 24P

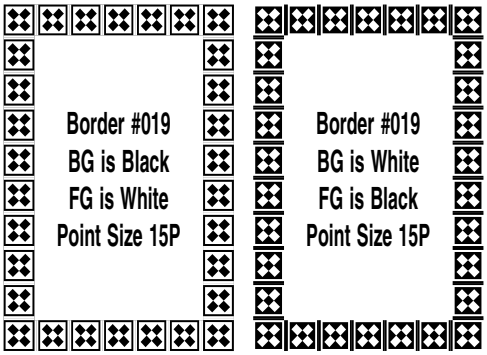

Border #010
BG is Black
FG is White
Point Size 15P

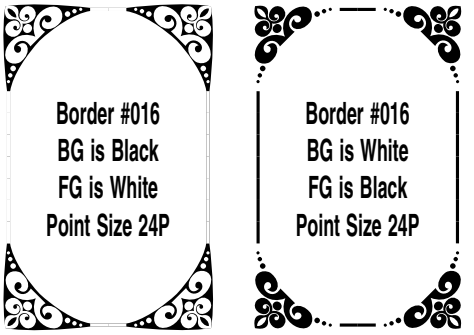

Border #010
BG is White
FG is Black
Point Size 15P

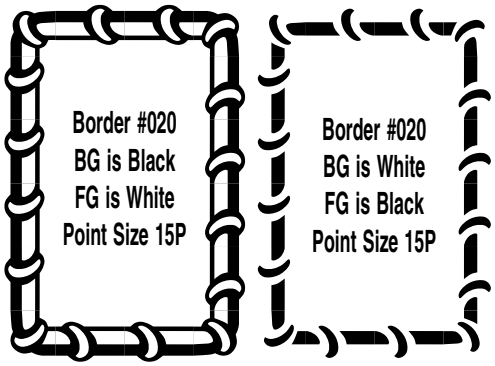

Border #014
BG is Black
FG is White
Point Size 15P

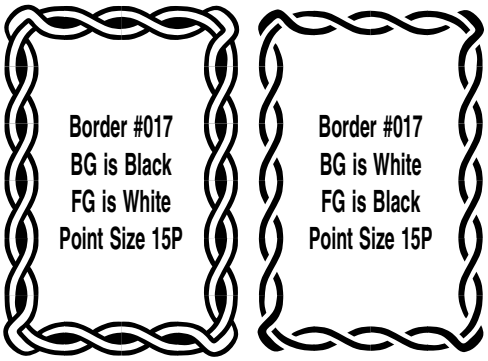

Border #014
BG is White
FG is Black
Point Size 15P

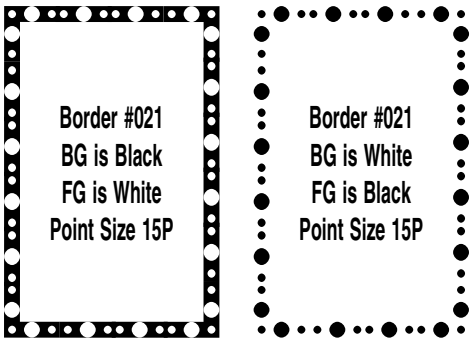

Border #015
BG is Black
FG is 20%
Point Size 11P
Border #015
BG is 20%
FG is Black
Point Size 11P

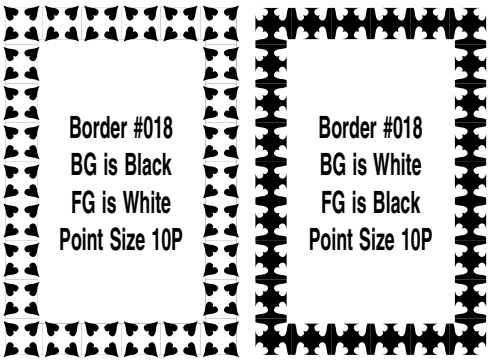

Border #019
BG is Black
FG is White
Point Size 15P
Border #019
BG is White
FG is Black
Point Size 15P


Border #016
BG is Black
FG is White
Point Size 24P
Border #016
BG is White
FG is Black
Point Size 24P

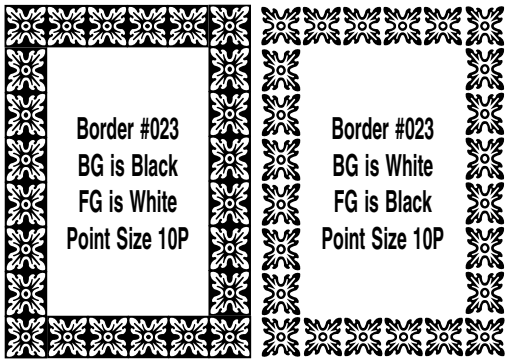

Border #020
BG is Black
FG is White
Point Size 15P
Border #020
BG is White
FG is Black
Point Size 15P

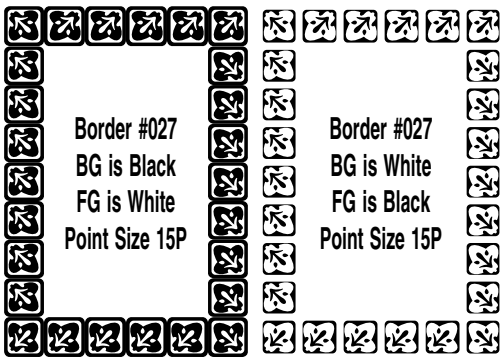

Border #017
BG is Black
FG is White
Point Size 15P
Border #017
BG is White
FG is Black
Point Size 15P

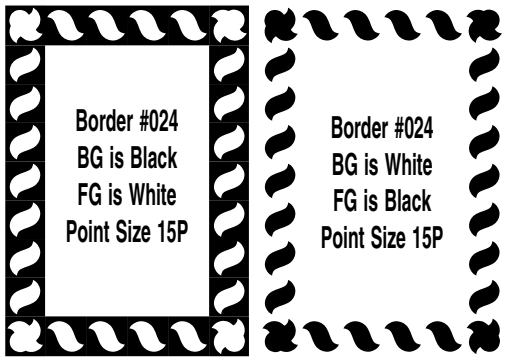

Border #021
BG is Black
FG is White
Point Size 15P
Border #021
BG is White
FG is Black
Point Size 15P

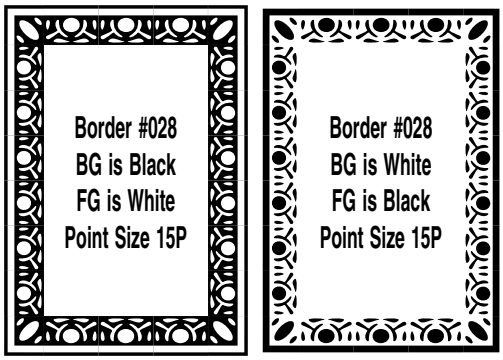

Border #018
BG is Black
FG is White
Point Size 10P
Border #018
BG is White
FG is Black
Point Size 10P

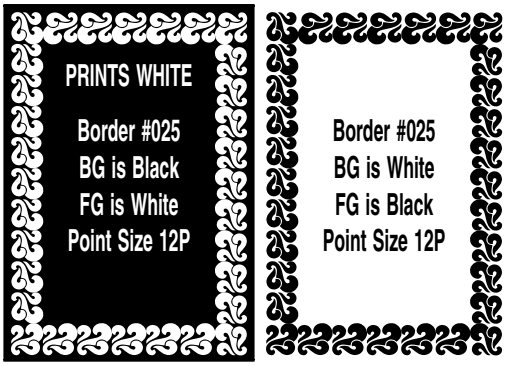

PRINTS WHITE
Border #022
BG is Black
FG is White
Point Size 12P
Border #022
BG is White
FG is Black
Point Size 12P

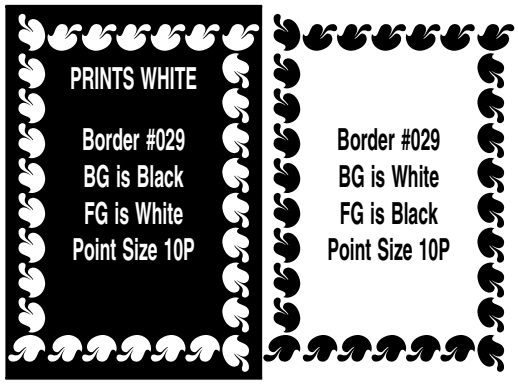

Border #023
BG is Black
FG is White
Point Size 10P
Border #023
BG is White
FG is Black
Point Size 10P

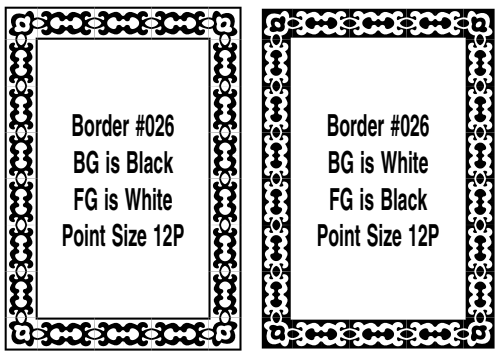

Border #027
BG is Black
FG is White
Point Size 15P
Border #027
BG is White
FG is Black
Point Size 15P

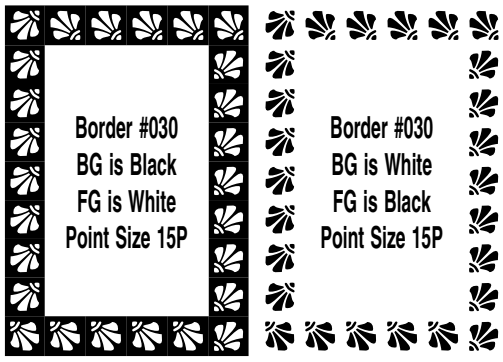

Border #024
BG is Black
FG is White
Point Size 15P
Border #024
BG is White
FG is Black
Point Size 15P


Border #028
BG is Black
FG is White
Point Size 15P
Border #028
BG is White
FG is Black
Point Size 15P


PRINTS WHITE
Border #025
BG is Black
FG is White
Point Size 12P
Border #025
BG is White
FG is Black
Point Size 12P

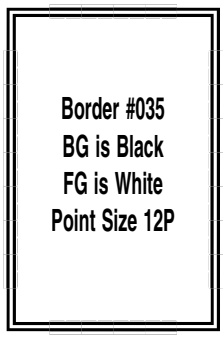

PRINTS WHITE
Border #029
BG is Black
FG is White
Point Size 10P
Border #029
BG is White
FG is Black
Point Size 10P

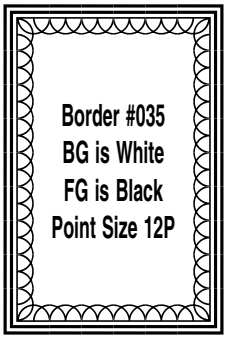

Border #026
BG is Black
FG is White
Point Size 12P
Border #026
BG is White
FG is Black
Point Size 12P

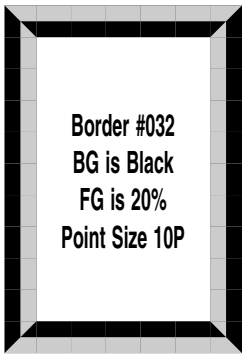

Border #030
BG is Black
FG is White
Point Size 15P
Border #030
BG is White
FG is Black
Point Size 15P

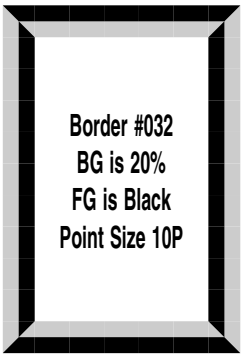

Border #031
BG is Black
FG is White
Point Size 15P


Border #031
BG is White
FG is Black
Point Size 15P


Border #035
BG is Black
FG is White
Point Size 12P


Border #035
BG is White
FG is Black
Point Size 12P

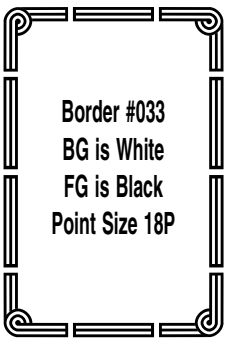

Border #032
BG is Black
FG is 20%
Point Size 10P


Border #032
BG is 20%
FG is Black
Point Size 10P

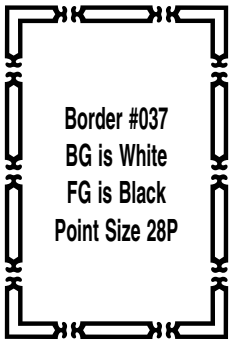

Border #036
BG is Black
FG is White
Point Size 10P


Border #036
BG is White
FG is Black
Point Size 10P


Border #033
BG is Black
FG is White
Point Size 18P


Border #033
BG is White
FG is Black
Point Size 18P


Border #037
BG is Black
FG is White
Point Size 28P


Border #037
BG is White
FG is Black
Point Size 28P


Border #034
BG is Black
FG is White
Point Size 18P

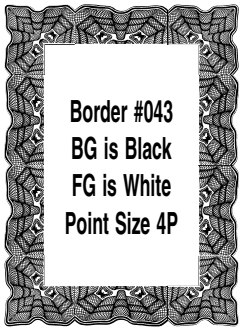

Border #034
BG is White
FG is Black
Point Size 18P

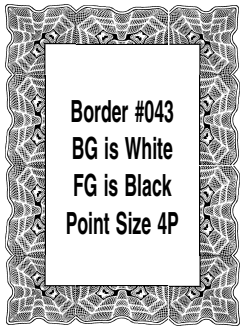

Border #038
BG is Black
FG is White
Point Size 24P


Border #038
BG is White
FG is Black
Point Size 24P


Border #039
BG is Black
FG is White
Point Size 4P


Border #039
BG is White
FG is Black
Point Size 4p


Border #043
BG is Black
FG is White
Point Size 4P


Border #043
BG is White
FG is Black
Point Size 4P


Border #040
BG is Black
FG is White
Point Size 5P


Border #040
BG is White
FG is Black
Point Size 5P


Border #044
BG is Black
FG is White
Point Size 4P


Border #044
BG is White
FG is Black
Point Size 4P


Border #041
BG is Black
FG is White
Point Size 8p


Border #041
BG is White
FG is Black
Point Size 8P


Border #045
BG is Black
FG is White
Point Size 5P


Border #045
BG is White
FG is Black
Point Size 5P


Border #042
BG is Black
FG is White
Point Size 5P


Border #042
BG is White
FG is Black
Point Size 5P


Border #046
BG is Black
FG is White
Point Size 4P


Border #046
BG is White
FG is Black
Point Size 4P


Border #047
BG is Black
FG is White
Point Size 4P


Border #047
BG is White
FG is Black
Point Size 4P


Border #051
BG is Black
FG is White
Point Size 10P


Border #051
BG is White
FG is Black
Point Size 10P

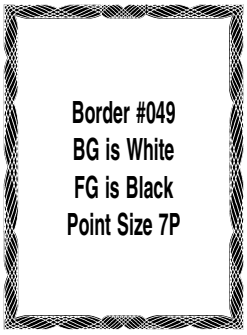

Border #048
BG is Black
FG is White
Point Size 5P


Border #048
BG is White
FG is Black
Point Size 5P


Border #052
BG is Black
FG is White
Point Size 10P


Border #052
BG is White
FG is Black
Point Size 10P


Border #049
BG is Black
FG is White
Point Size 7P


Border #049
BG is White
FG is Black
Point Size 7P


Border #053
BG is Black
FG is White
Point Size 12P


Border #053
BG is White
FG is Black
Point Size 12P


Border #050
BG is Black
FG is White
Point Size 7P


Border #050
BG is White
FG is Black
Point Size 7P


Border #054
BG is Black
FG is White
Point Size 12P


Border #054
BG is White
FG is Black
Point Size 12P


Border #055
BG is Black
FG is White
Point Size 7P


Border #055
BG is White
FG is Black
Point Size 7P


Border #059
BG is Black
FG is White
Point Size 8P

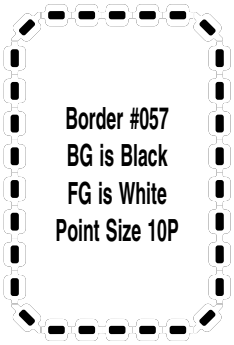

Border #059
BG is White
FG is Black
Point Size 8P


Border #056
BG is Black
FG is White
Point Size 10P


Border #056
BG is White
FG is Black
Point Size 10P

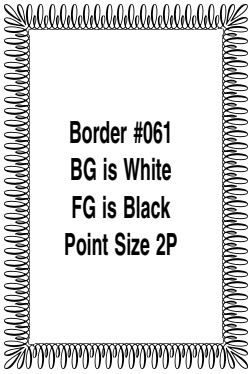

Border #060
BG is Black
FG is White
Point Size 6P


Border #060
BG is White
FG is Black
Point Size 6P


Border #057
BG is Black
FG is White
Point Size 10P


Border #057
BG is White
FG is Black
Point Size 10P


Border #061
BG is Black
FG is White
Point Size 2P


Border #061
BG is White
FG is Black
Point Size 2P


Border #058
BG is Black
FG is White
Point Size 6P


Border #058
BG is White
FG is Black
Point Size 6P


Border #062
BG is Black
FG is White
Point Size 6P


Border #062
BG is White
FG is Black
Point Size 6P


Border #063
BG is Black
FG is White
Point Size 8P


Border #063
BG is White
FG is Black
Point Size 8P


Border #067
BG is Black
FG is White
Point Size 2P


Border #067
BG is White
FG is Black
Point Size 2P


Border #064
BG is Black
FG is White
Point Size 4P


Border #064
BG is White
BG is Black
Point Size 4P


Border #065
BG is Black
FG is White
Point Size 6P

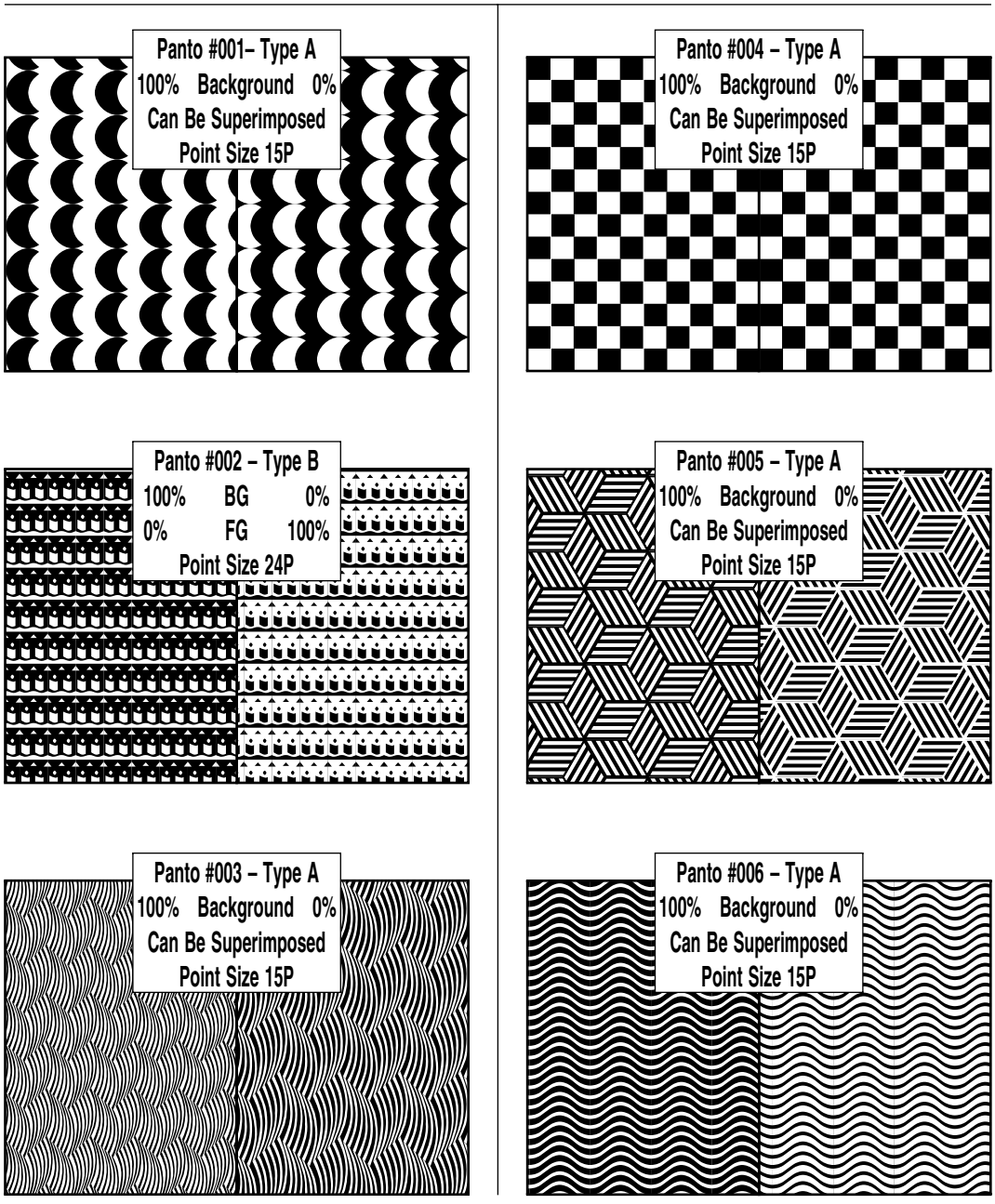

Border #065
BG is White
FG is Black
Point Size 6P

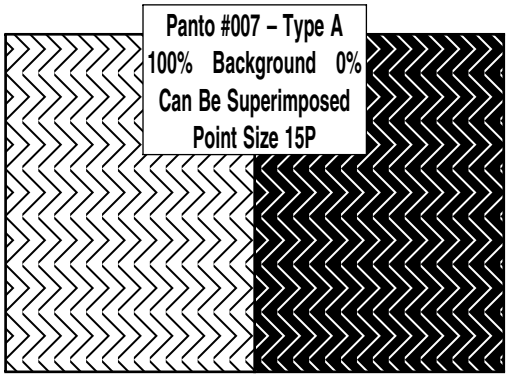

Border #066
BG is Black
FG is White
Point Size 10P

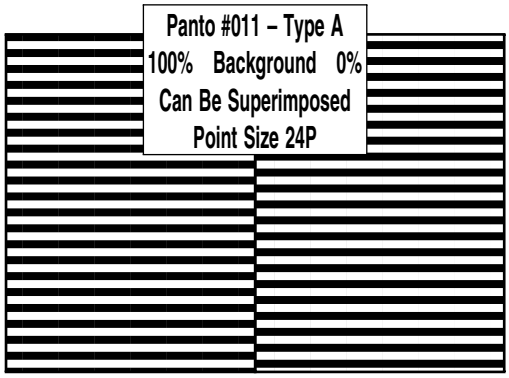

Border #066
BG is White
FG is Black
Point Size 10P

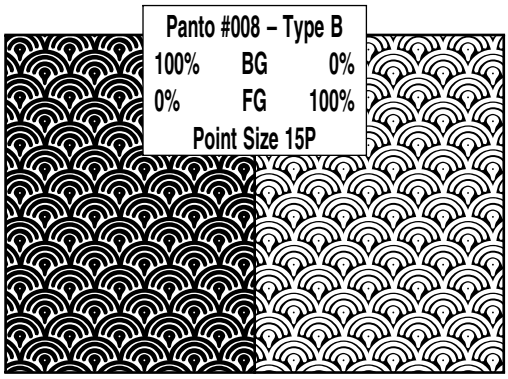
Pantograph Library

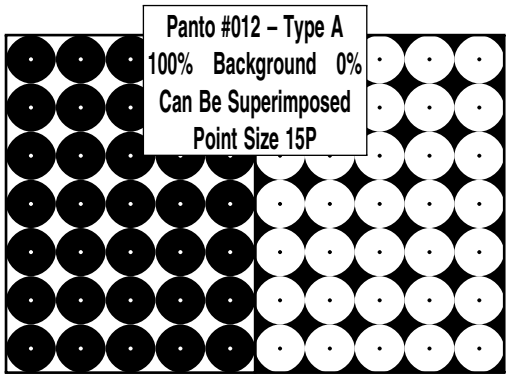
There are 73 stock pantographs which can be used with the {Box} option. Each one of these is reversible, which many times gives you another unique look. Side-by-side is the standard panto and its reverse. Those that can be superimposed are marked. EPS pantos are unique designs throughout, to see the entire design output a 10-inch square with that pantograph.

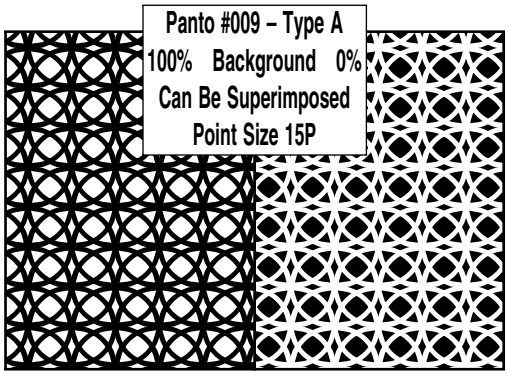


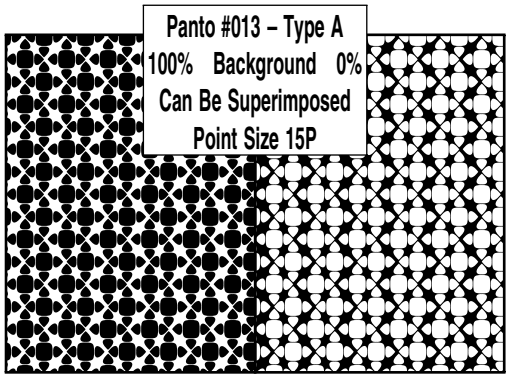

Panto #007 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P

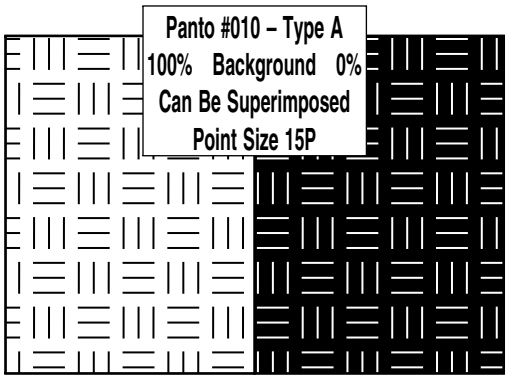

Panto #011 – Type A
100% Background 0%
Can Be Superimposed
Point Size 24P


Panto #008 – Type B
100% BG 0%
0% FG 100%
Point Size 15P


Panto #012 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #009 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #013 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #010 – Type A
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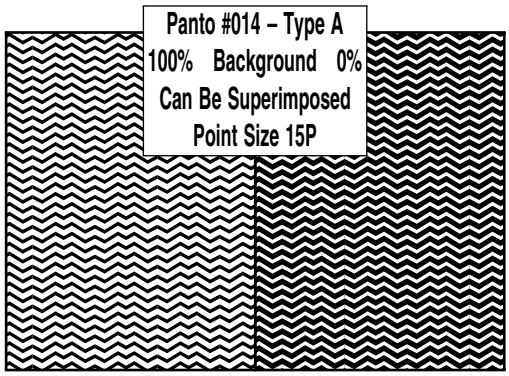
Can Be Superimposed
Point Size 15P


Panto #014 – Type A
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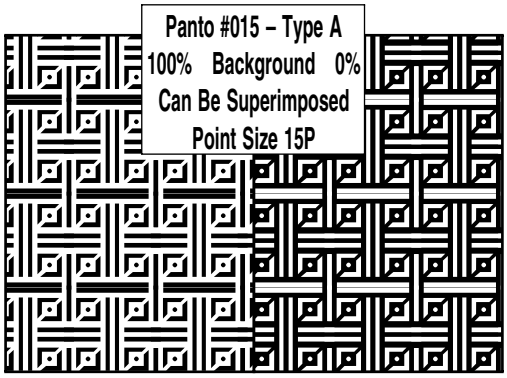
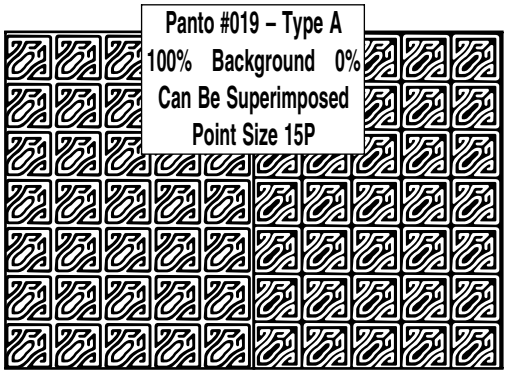
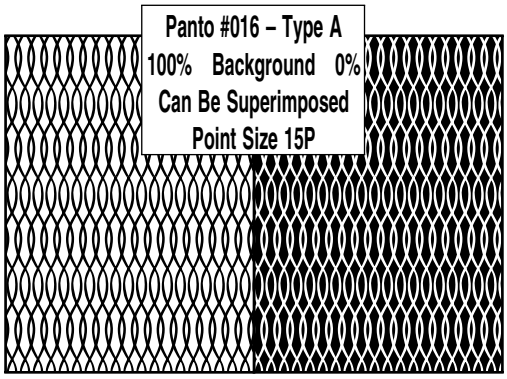
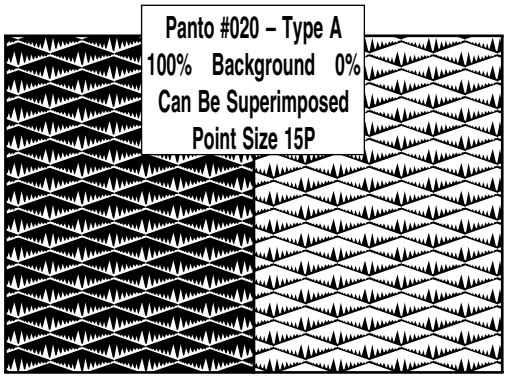
Can Be Superimposed
Point Size 15P


Panto #015 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #019 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #016 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #020 – Type A
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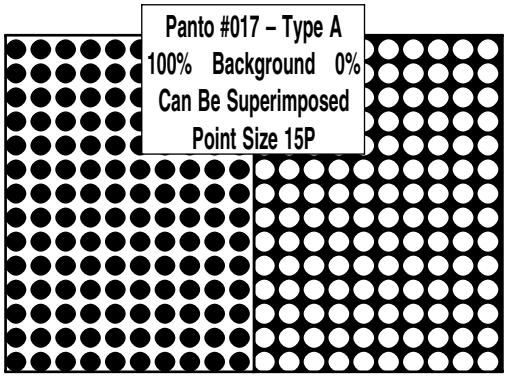
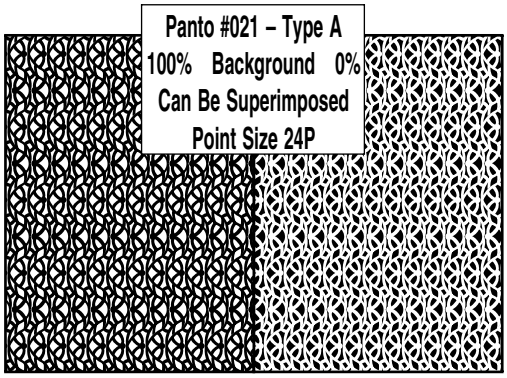
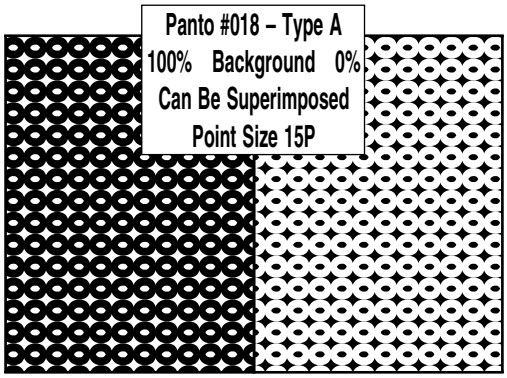
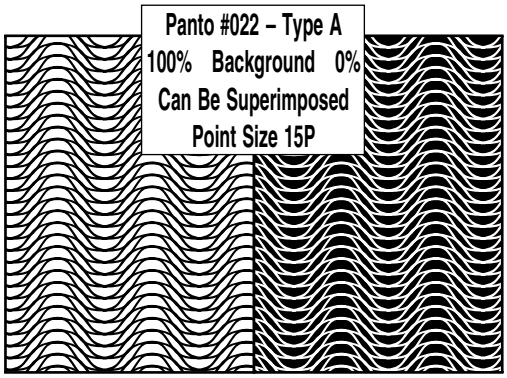
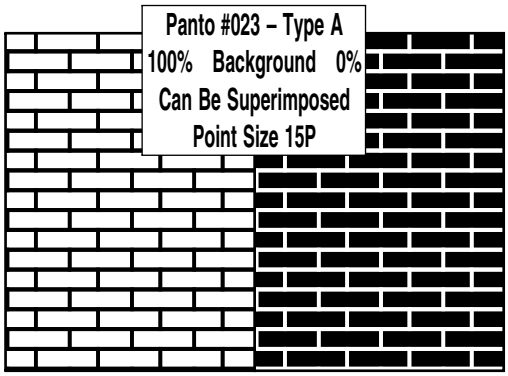
Can Be Superimposed
Point Size 15P


Panto #017 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #021 – Type A
100% Background 0%
Can Be Superimposed
Point Size 24P


Panto #018 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #022 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #023 – Type A
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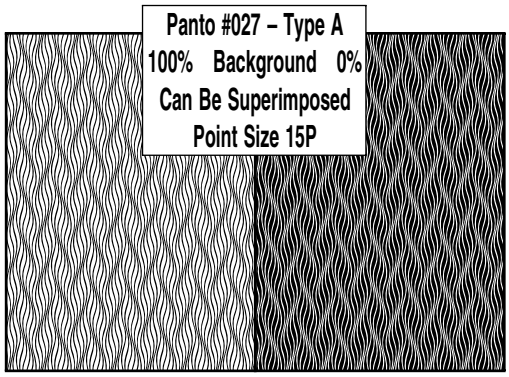
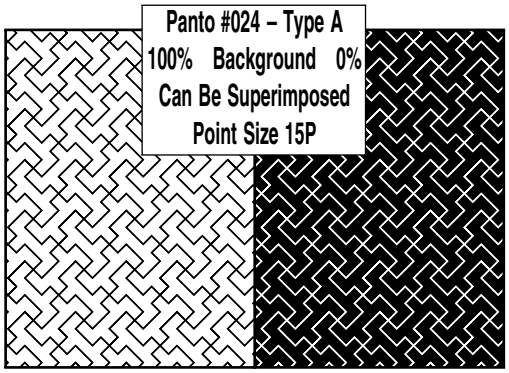
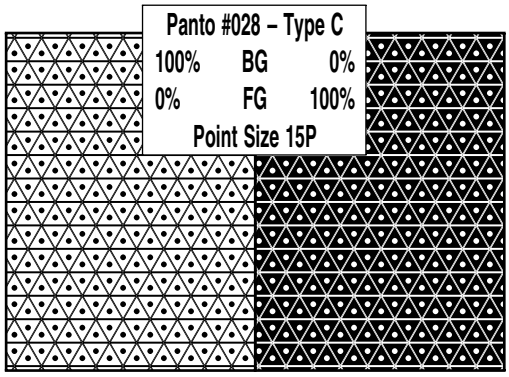
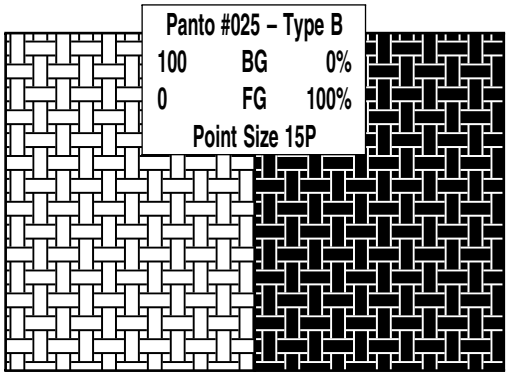
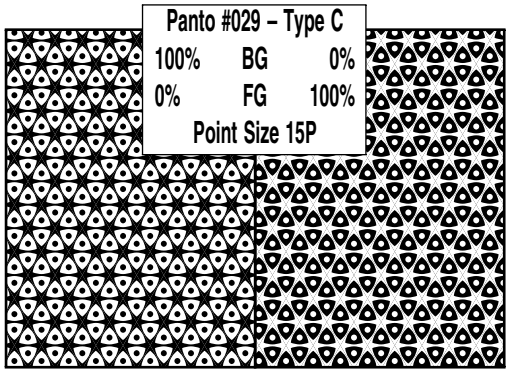
Can Be Superimposed
Point Size 15P

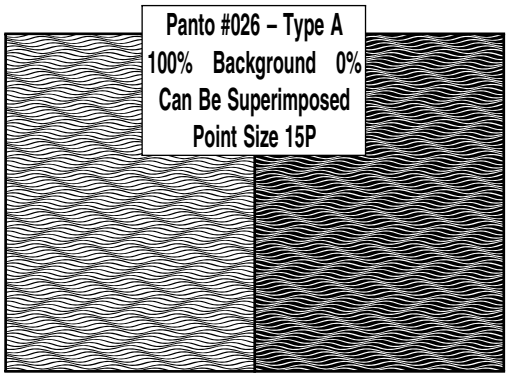

Panto #027 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P

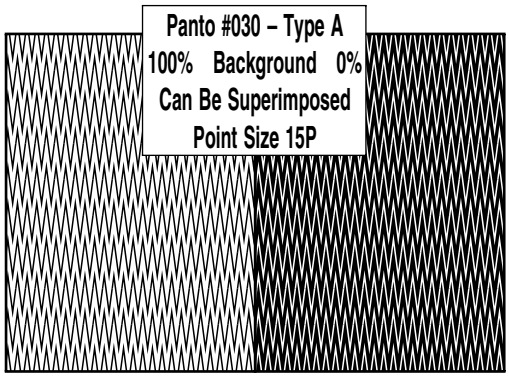

Panto #024 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P

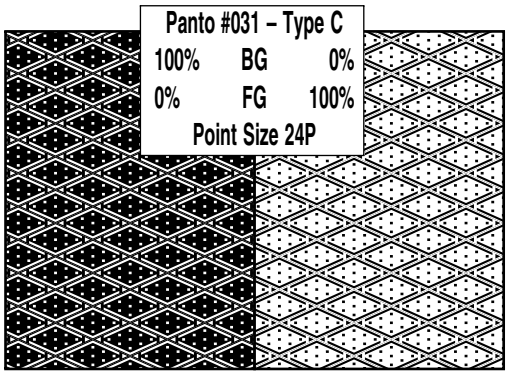

Panto #028 – Type C
100% BG 0%
0% FG 100%
Point Size 15P

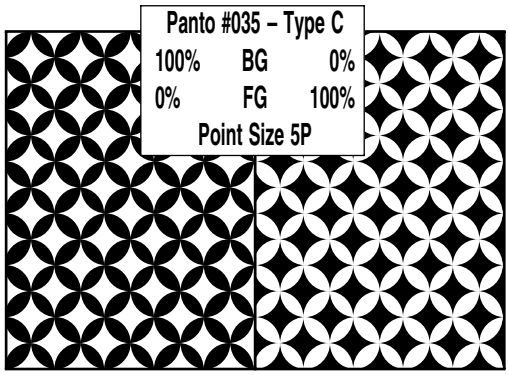

Panto #025 – Type B
100 BG 0%
0 FG 100%
Point Size 15P

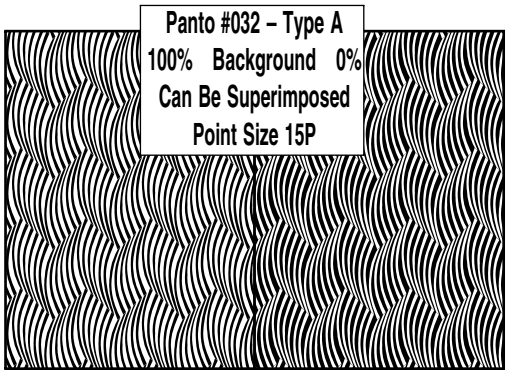

Panto #029 – Type C
100% BG 0%
0% FG 100%
Point Size 15P

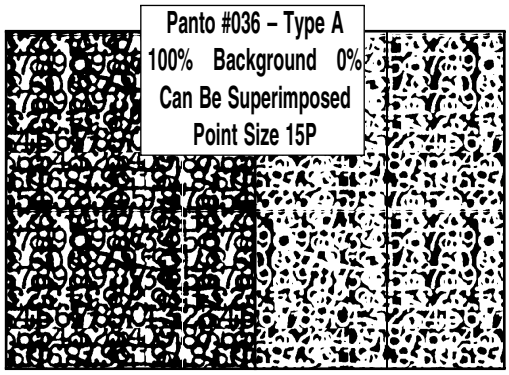

Panto #026 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P

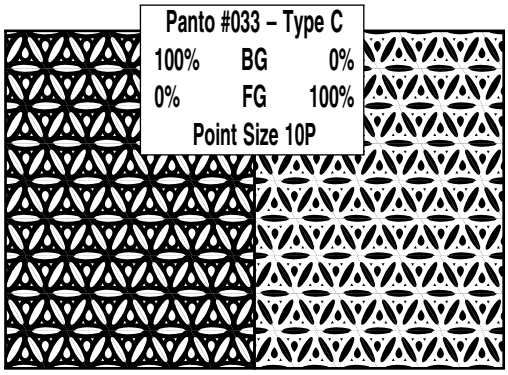

Panto #030 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P

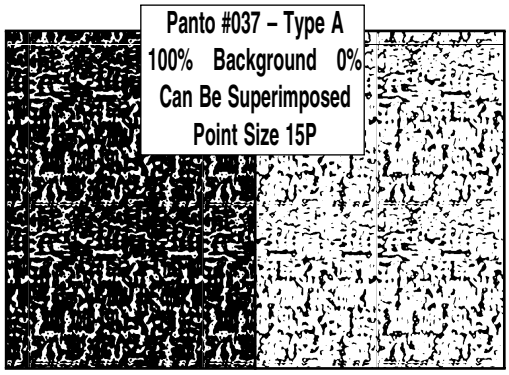

Panto #031 – Type C
100% BG 0%
0% FG 100%
Point Size 24P

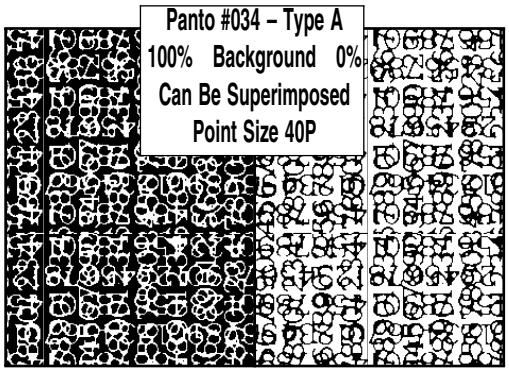

Panto #035 – Type C
100% BG 0%
0% FG 100%
Point Size 5P


Panto #032 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #036 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P


Panto #033 – Type C
100% BG 0%
0% FG 100%
Point Size 10P


Panto #037 – Type A
100% Background 0%
Can Be Superimposed
Point Size 15P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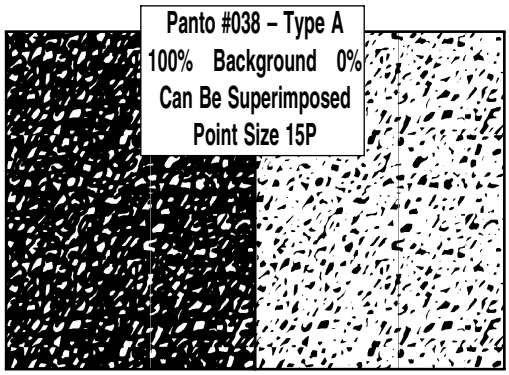
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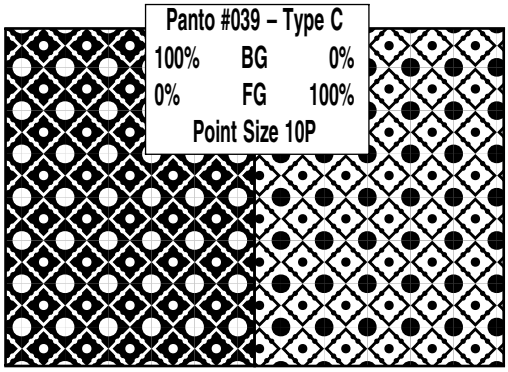

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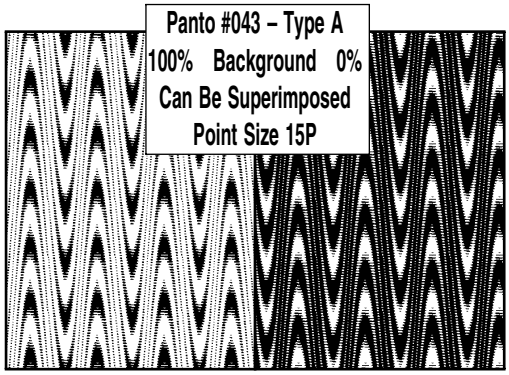

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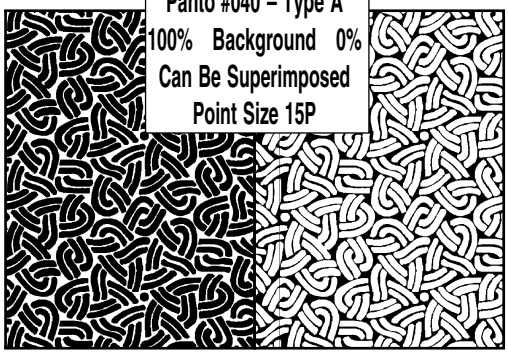

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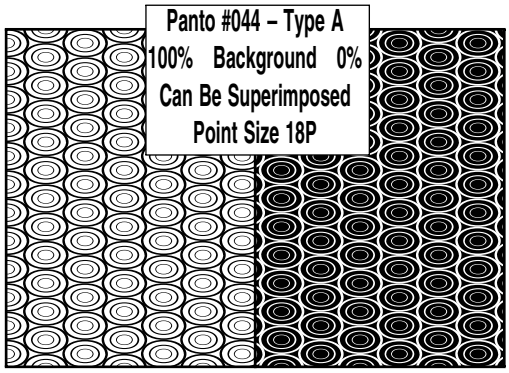

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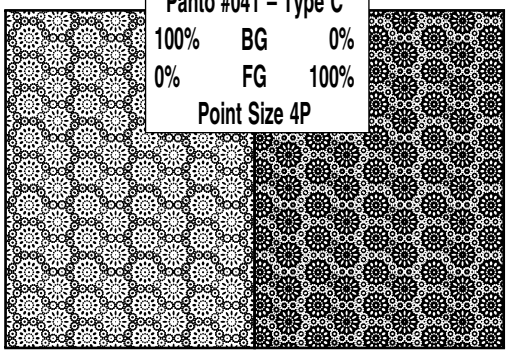

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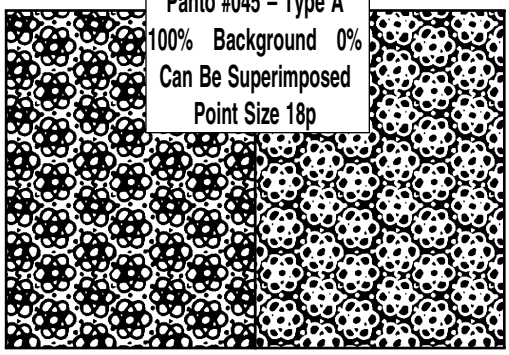

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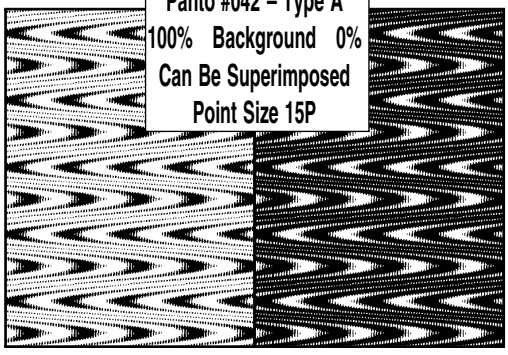

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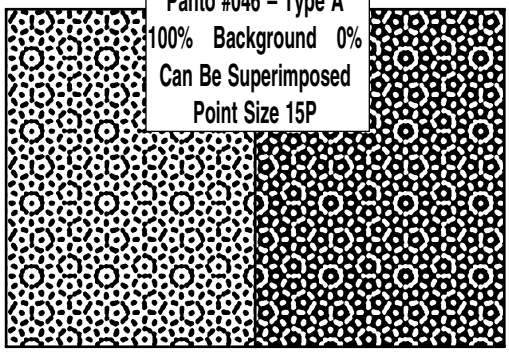

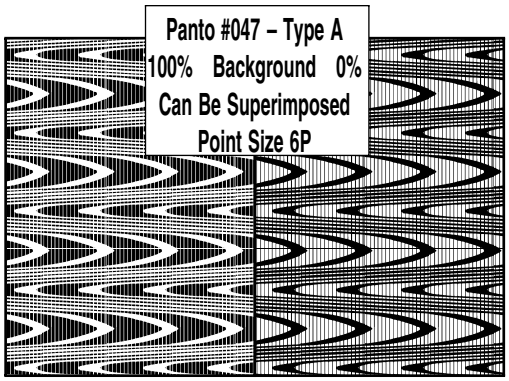
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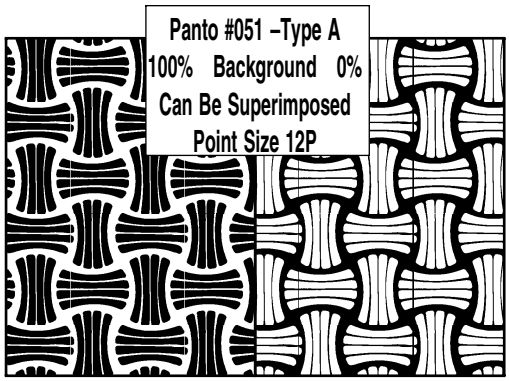
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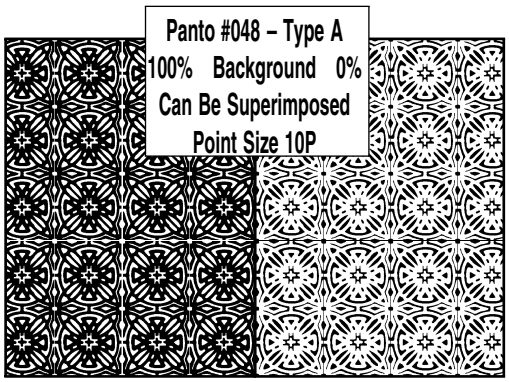
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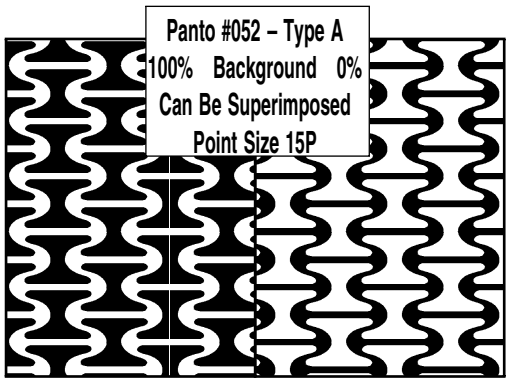
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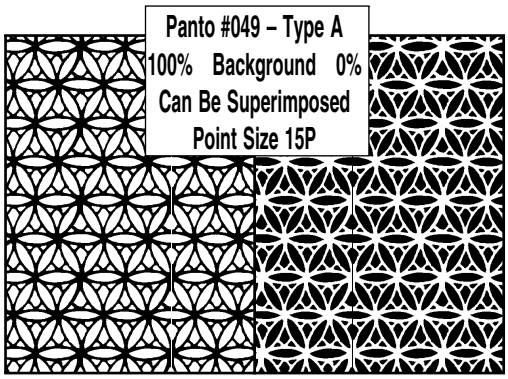
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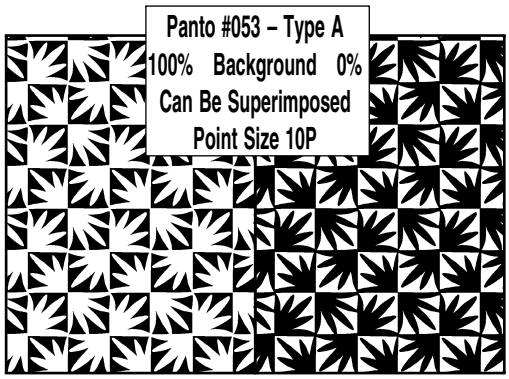
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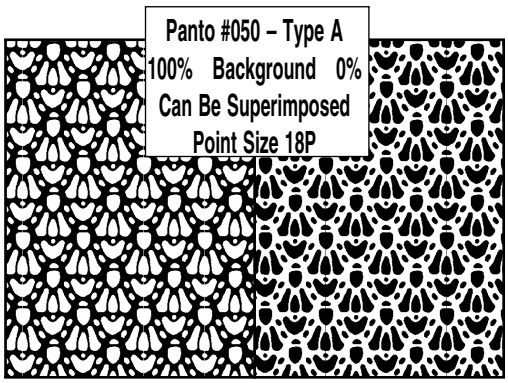
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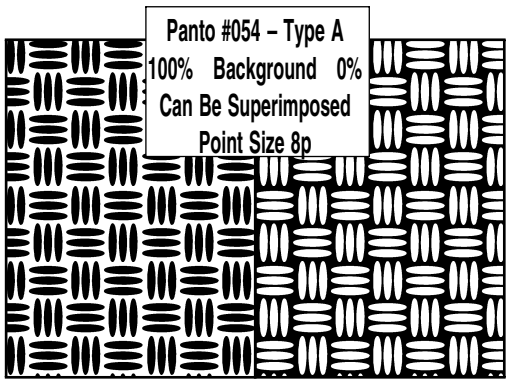
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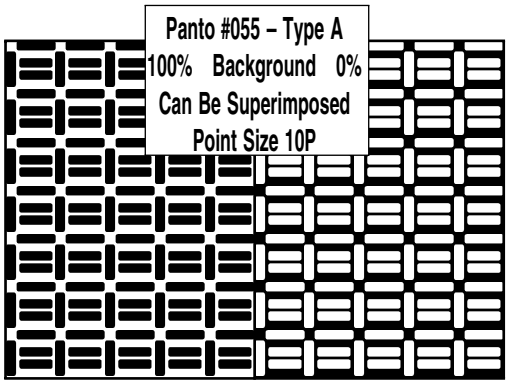
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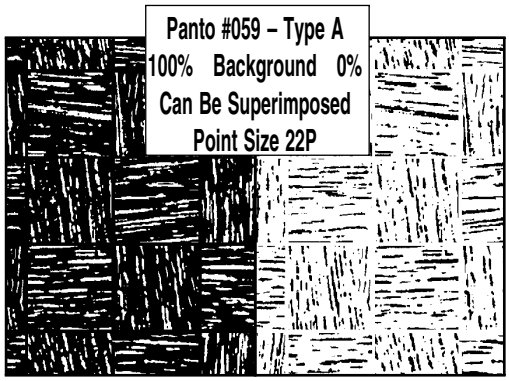
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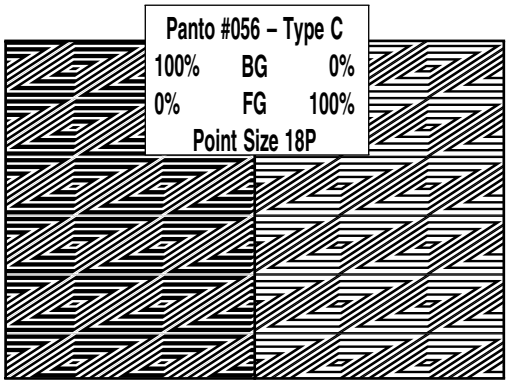
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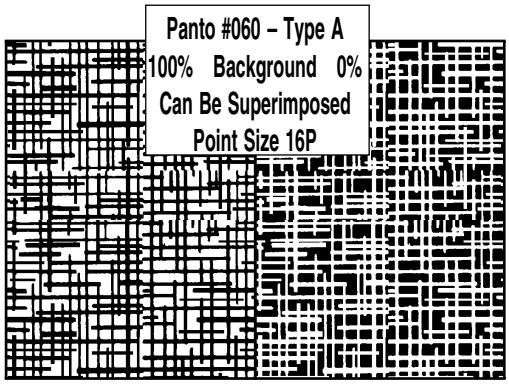
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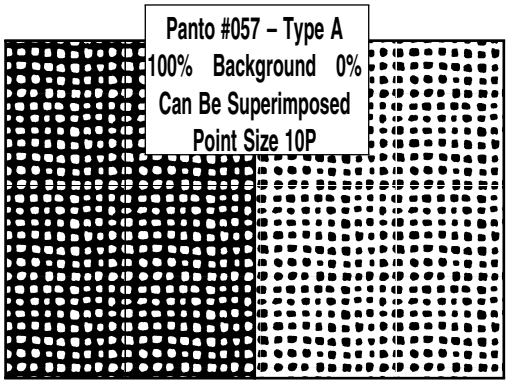
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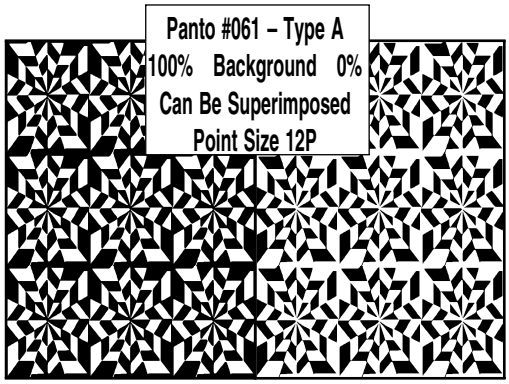
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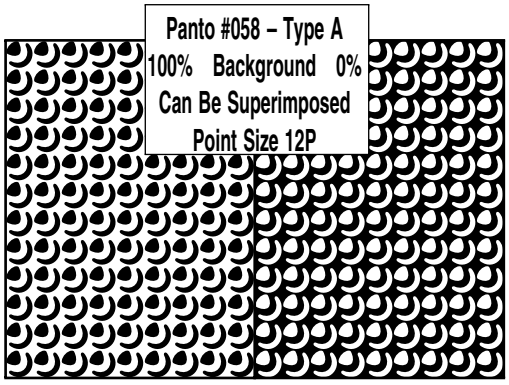
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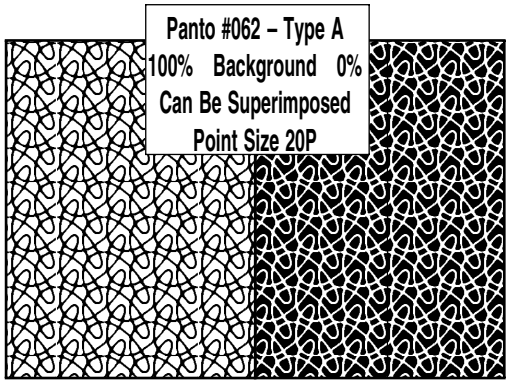
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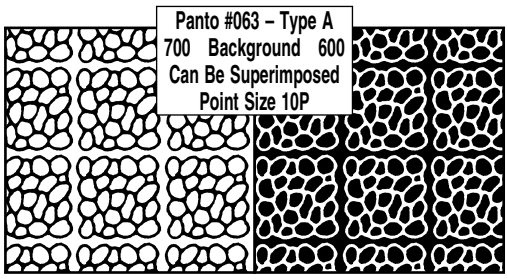
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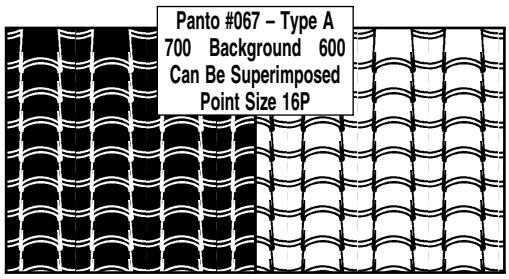
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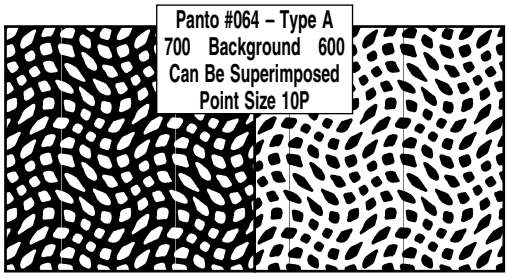
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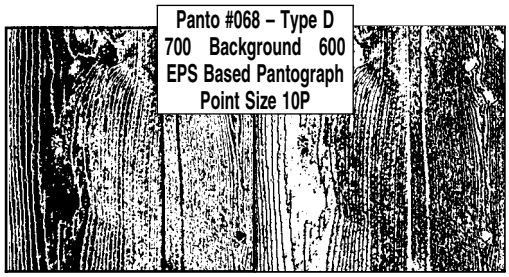
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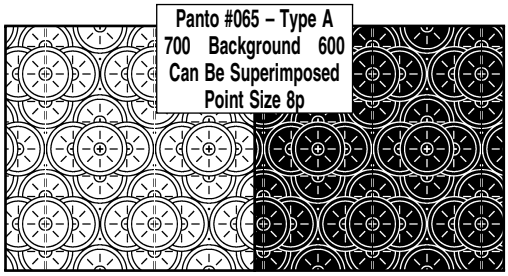
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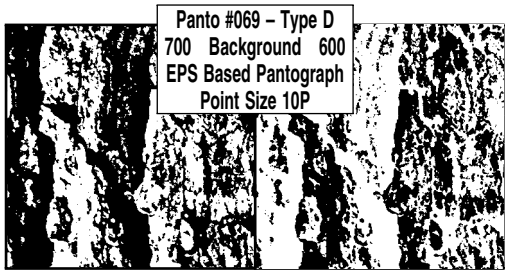
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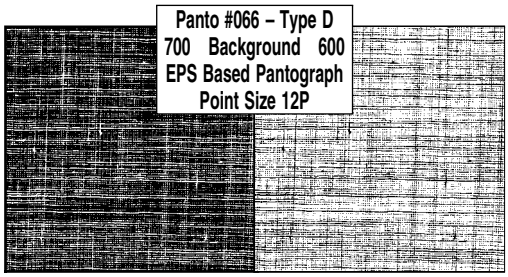
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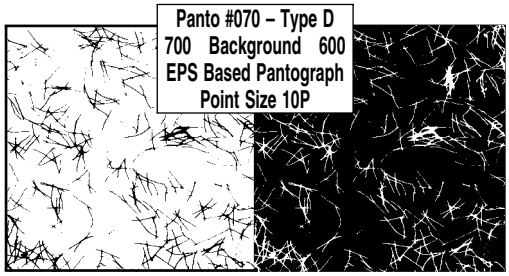
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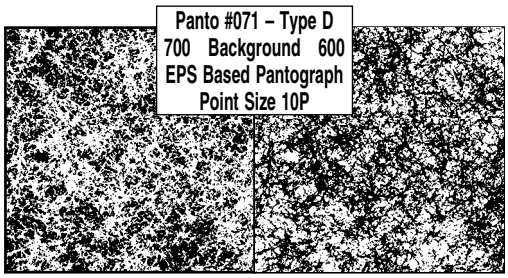
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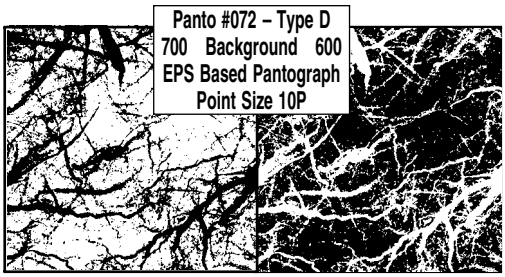
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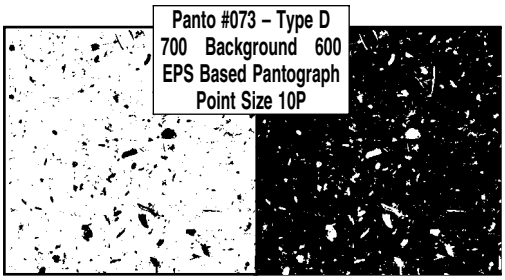
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Chapter 4: The [Arc] Tool

Drawing Arcs and Circles

As with the [Line] and [Box] Menus, you don't have to select any of the options in order to start drawing circles. The "pick circle center" prompt will appear, move the cursor to anywhere in the Window Area that you want the center of your circle to be. Pick crosshairs will appear there. When the "pick circle tangent" prompt shows up, move the cursor away slowly. This time a "rubber band circle" will appear on screen, centered on the crosshairs, and will expand and contract to follow the cursor's movement. Picking again will define the circle corresponding to the default values of a solid 1-point line in Layer 1. The "pick circle center" prompt will return.

Defaults:

Line Weight = (10 decipoints), Line Style = Solid, Line Layer = 1,
Color = 0 (Black),
Screen Lineage = 133, Screen Dot = Dot, Dot Angle = 45 degrees,
Mode = Center/Tangent,

Prompts:

Pick circle center, Pick circle tangent

To produce a circle with a predetermined size, say two inches across (one inch radius), follow these steps, shown in Figure 4-1.

Step 1:

Pick a spot to be the center of the circle. You'll see the crosshairs appear and the prompt will change to "pick tangent point".

Step 2:

Go to the keyboard and type **1i [arrow]**. A circle two inches in diameter will appear.

Step 3:

Press **[Enter]** to accept the circle and turn it into whatever color matches your current setup. The Prompt Area will say, "pick circle center" once again.

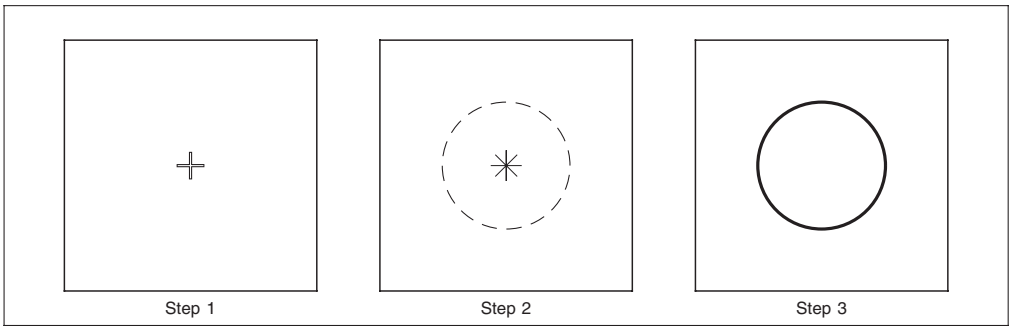


Figure 4-1: Creating a Measured Circle

What you're doing with this process is deciding the distance and direction from the center to the tangent point. Press any [arrow] key since all points on a circle are equally tangential.

Drawing an Ellipse

Under the **[Arc]** option there are two menus for drawing an ellipse. Both options allow you to draw an ellipse with two picks.

{Ellipse - Center/Corner}
{Ellipse - Corner/Corner}

The center/corner option is wanting you to decide on the center position first then pick one of the corners of an imaginary rectangle and it will draw an ellipse within the boundary.

With the corner/corner option you are picking two diagonal corners of the imaginary rectangle and it then draws the ellipse.

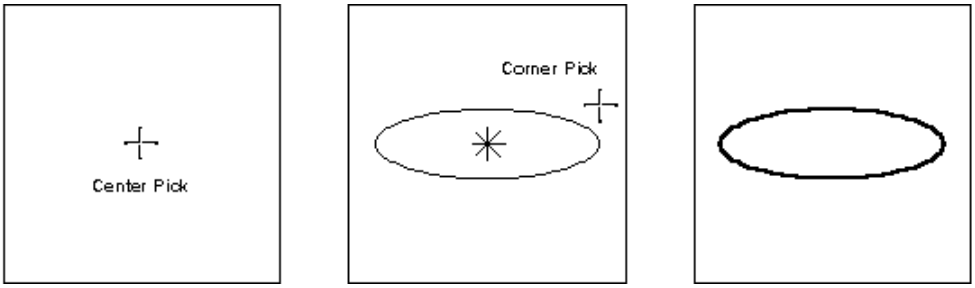
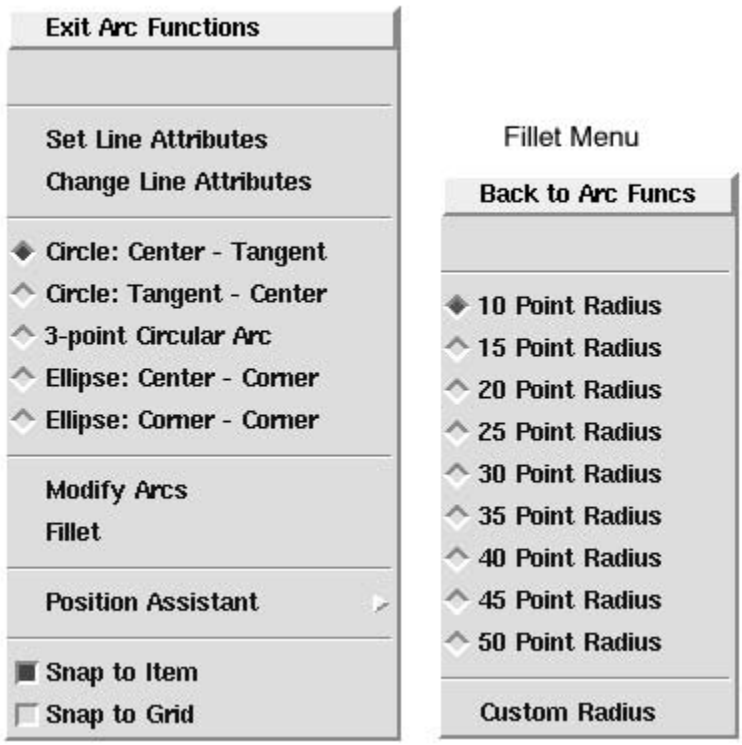


Figure 4-2: Drawing an Ellipse using Center/Corner Picks

The Arc Sub-Menus

Choosing **[Arc]** will give you access to the suboptions menu. The {Set Line Attributes} work exactly as before.



{Tangent/Center}

This option on the [Arc] Menu is essentially the opposite of the default setting. Rather than picking a center first and then a tangent, with this option you decide on a tangent point first and *then* a center. Try this exercise, shown in Figure 4-3:

Prompts:

Pick circle tangent, Pick circle center

Step 1:

Choose **{Tangent/Center}**. The prompt "pick circle tangent" will appear. Pick a spot to be on the edge of the circle. The crosshairs will mark the spot. The prompt will change to "pick circle center".

Step 2:

Go back to the keyboard and type **1i [up arrow]**.

Step 3:

Press **[Enter]** to accept the circle. The prompt will go back to "pick circle tangent".

Step 4:

Pick another spot well below your current circle. The crosshairs will come back there.

Step 5:

Since your prompt now says, "pick circle center" again, type **1i [right arrow], [Enter]**. Another two-inch circle will appear, this time to the right of the spot you made the tangent point.

Step 6:

The "pick circle tangent" prompt will pop up again.

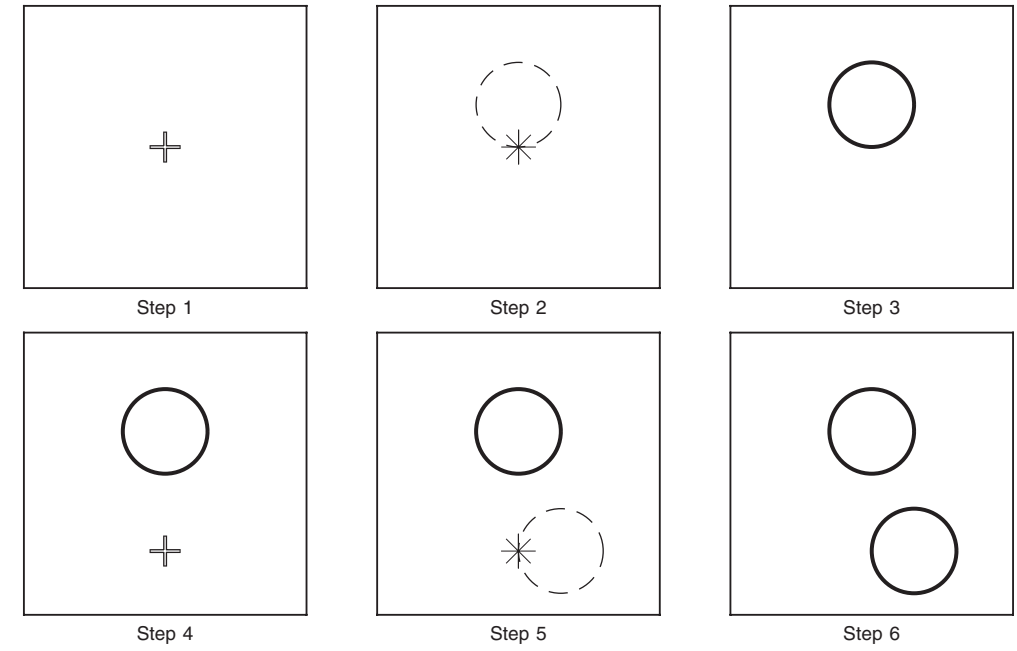


Figure 4-3: Using {Tangent/Center}

So you can see that with this option, the [arrow] key you use (if any) makes a big difference in where your circle shows up. You can also, of course, just pick a tangent point, then move the center point around with the cursor until you like what you see on screen, and then pick to define the circle.

If you like, you can use the suboptions to set the Line Weight, Style or Layer.

{3-Point Circular Arc}

This option on the [Arc] Menu lets you create full or partial circles (arcs) by picking three points along the curve you want. Try these exercises, shown in Figure 4-4:

Prompts:

Pick 1st endpoint, Pick 2nd endpoint, Pick tangent point

Step 1:

Choose **{3-Points Circular Arc}** on the [Arc] Menu. At the prompt, "pick 1st endpoint", pick a spot about a third of the way in from the left-hand edge, and a third of the way down from the top of the Window Area.

Step 2:

You've got your crosshairs for the first endpoint now, so at the prompt, "pick 2nd endpoint", pick another spot a third of the way in from the right-hand edge, and on roughly the same level as the first spot. Crosshairs will arrive there as well.

Step 3:

At the prompt, "pick tangent point", pick a third spot an inch or so above the first two. Watch a curved line (an "arc") appear, beginning at the right hand spot and connecting all three of the points you picked.

Step 4:

Repeat the process. This time make the first spot on the right and the second spot on the left. When you pick the third spot an inch or so above them, the arc is drawn as before, from the right side up and to the left.

Step 5:

Repeat the process. Put the two arc endpoints a couple of inches apart near the center of the Window Area, and the third spot near the bottom. This time you'll get the major part of a circle drawn, beginning at the left side spot!

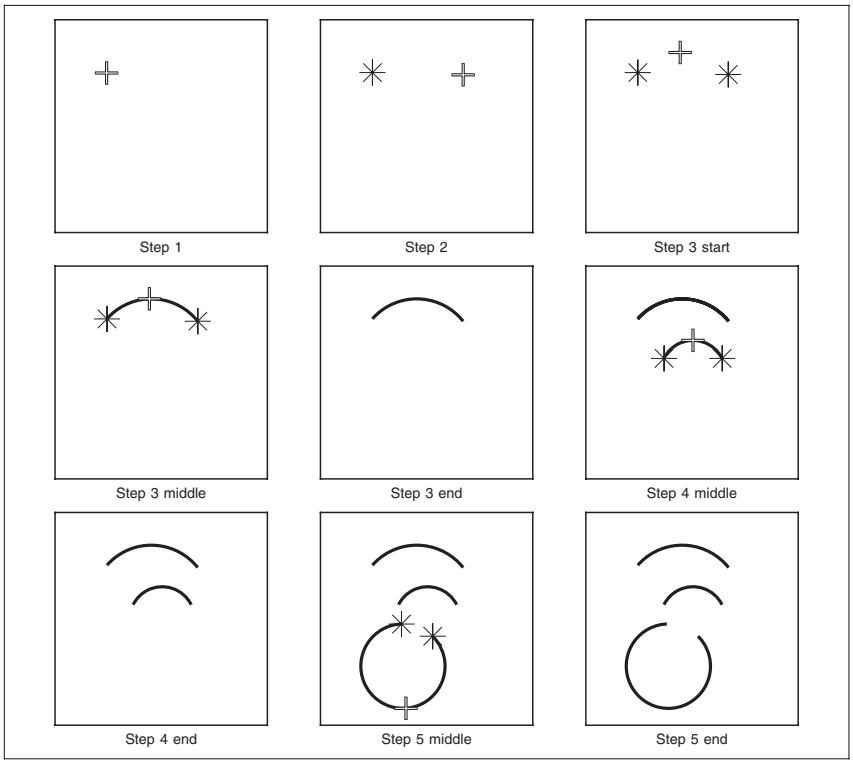


Figure 4-4: Using {3 Points}

What do these exercises show? That *arcs are always drawn in a counterclockwise fashion,* regardless of which endpoint is selected first.

{Modify Arcs}

This option on the [Arc] Menu enables you to change how much will remain visible of an arc or circle you've already drawn. Another way to put it, is that it lets you do to circles and curves what {Trim Line} and {Break Line} do to lines. Here's another exercise, shown in Figure 4-5:

Prompts:

Pick arc to modify., Pick new starting position, or enter starting angle, Pick new ending position, or enter ending angle

Step 1:

Draw six circles, using the regular [Arc] mode, more or less in two vertical lines, going down the sides of the Window Area.

Step 2:

Choose **{Modify Arcs}**. At the prompt "pick arc to modify", pick the top left circle, anywhere on its circumference.

Step 3:

At the prompt "pick new starting position...", pick a spot on the same circle, roughly equivalent to 10 o'clock on a normal clock face.

Step 4:

At the prompt "pick new ending position...", pick a spot on the same circle, roughly equivalent to 8 o'clock on a normal clock face. Most of the circle will vanish, except for the curve from 10 o'clock down to 8 o'clock.

Step 5:

Repeat the process. This time pick the middle left circle, and pick spots near 2 o'clock and 4 o'clock. Most of the circle will remain, and the segment from 4 o'clock up to 2 o'clock will vanish.

Step 6:

Repeat the process on the bottom left circle. This time pick spots near 12 o'clock and 6 o'clock. The right half of the circle will vanish.

Step 7:

Do Steps 2, 3 and 4 over, working on the top right circle. Only pick your endpoints in the opposite order, 8 o'clock first, then 10 o'clock. Most of the circle will remain, except for the curve from 10 o'clock down to 8 o'clock.

Step 8:

Now do a reverse repeat of Step 5. Pick the middle right circle, and pick spots near 4 o'clock and 2 o'clock (in that order). Most of the circle will vanish, and the segment from 4 o'clock up to 2 o'clock will remain.

Step 9:

Do one more reverse repeat, this time on the bottom right circle. This time pick 6 o'clock first, and then 12 o'clock. The left half of the circle will vanish.

Step 10:

{Cancel Modify Arcs} back to the [Arc] Menu. The "pick circle center" prompt will return.

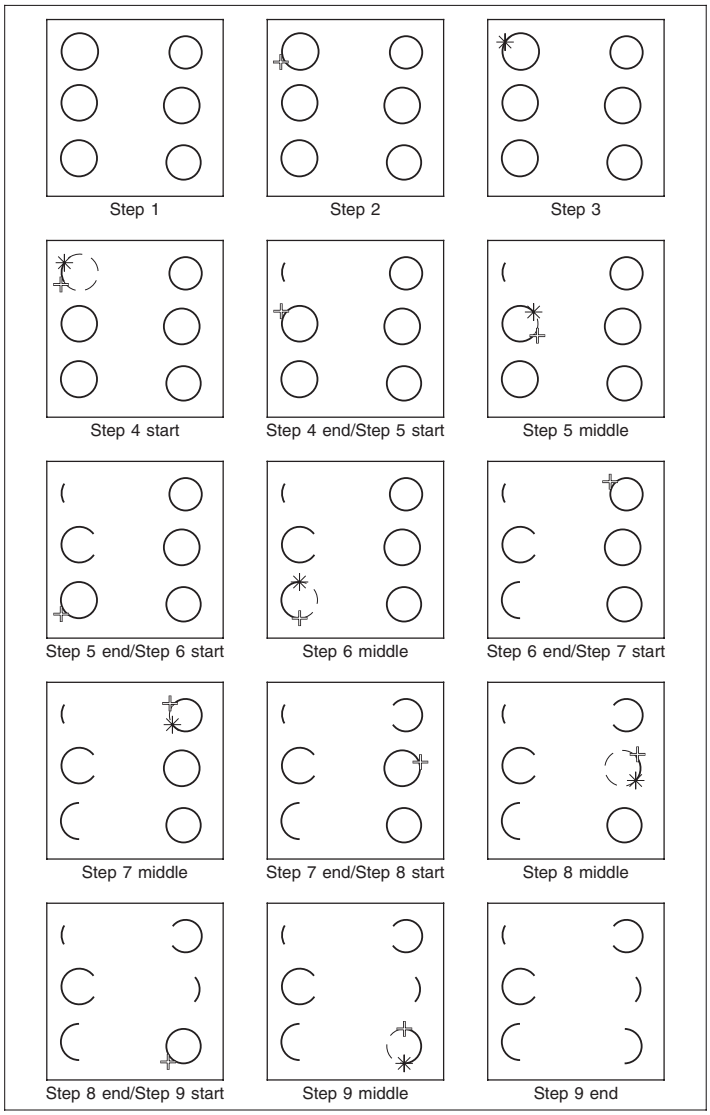


Figure 4-5: Using {Modify Arc}

This exercise illustrates that when modifying an arc, a *counterclockwise* curve will be drawn (or kept) between the two defined endpoints, *beginning at the first endpoint you pick and ending at the second one,* while the rest of the arc or circle being modified will disappear. As was obvious from the results in Steps 7, 8 and 9, the order in which you select those endpoints makes a big difference.

{Fillet}

This option on the {Arc} Menu is used when you want to round-off corners on rectangles or otherwise insert a curve between two nonparallel lines. Figure 4-6 shows examples of fillets, all done on matching rectangles 100 points wide and 50 points high. The rectangle in the upper left, labeled "10 Point Radius", shows how an imaginary circle of that radius is placed tangent to the two lines. The part of the circle between the tangent points becomes the fillet curve. Since these are rectangles, a 90-degree segment of the circle gets used.

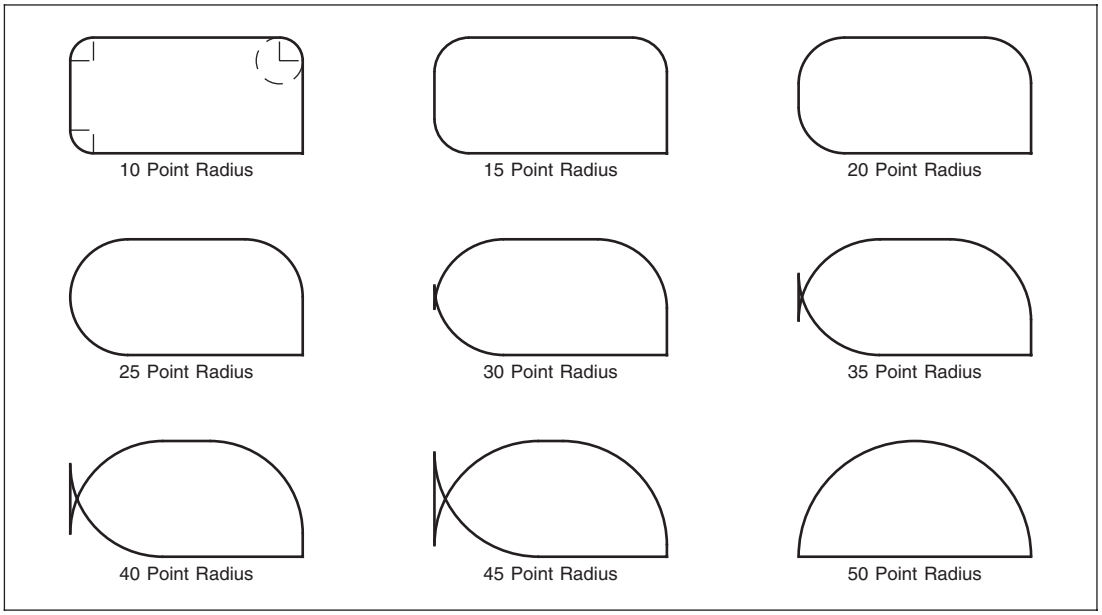


Figure 4-6: Sample Rectangles with Different {Fillet} Radiuses

Default:
10 Point Radius

Prompts:
Pick 1st fillet line, Pick 2nd fillet line.

Submenu:
10 Point Radius *through* 50 Point Radius *(in steps of 5)*

Also, as you can see starting with the "30 Point Radius" there is a fishtail. This is caused by asking for a radius that is too large - it is more than half of the depth of the rectangle.

{Fillet}ing with Rectangles

Using {Fillet} is remarkably easy. Select or type in a radius and then pick the two lines making up the intersection. The following exercise (shown in Figure 4-7) will demonstrate:

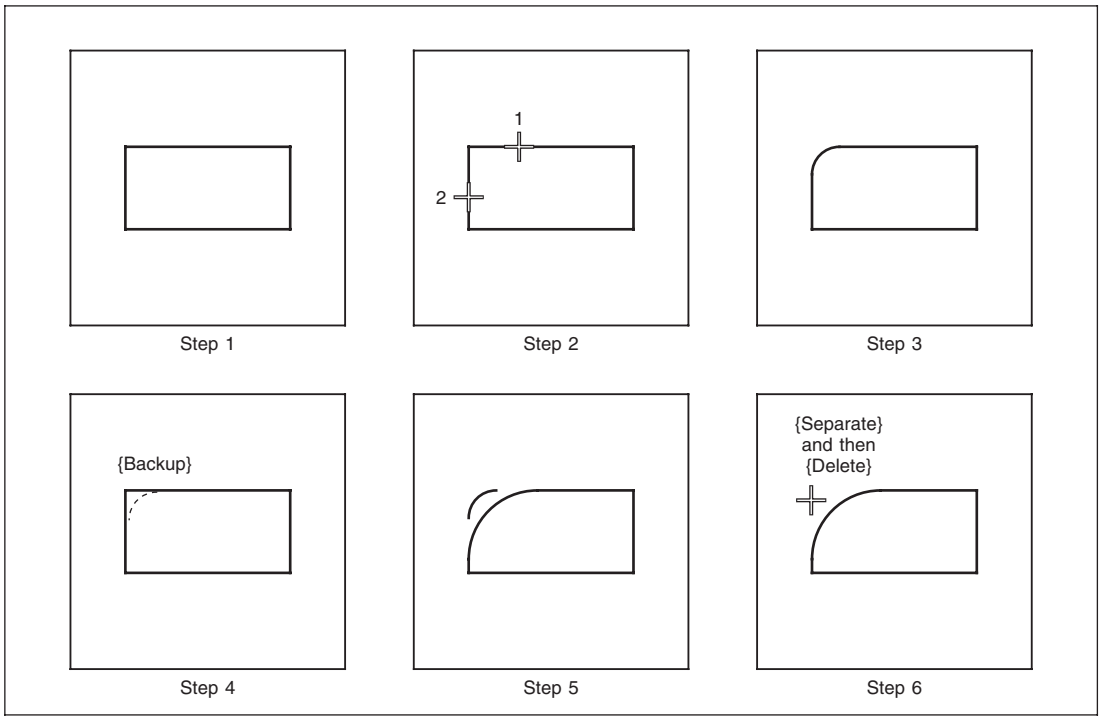


Figure 4-7

Step 1:

Draw an ordinary Rectangle, using {Line}, {Prorate Rules}.

Step 2:

Choose {Fillet}. You'll be prompted to "pick 1st fillet line", so **pick the top** line. At the "pick 2nd fillet line" prompt, **pick one of the sides.** If you picked the bottom, you'd get the error message of "parallel components" letting you know there is no intersection.

Step 3:

A fillet curve of 10 points radius (the default value) will appear and the corner will vanish. The "pick 1st fillet line" prompt will reappear. If you want all four corners to be filleted, keep repeating Step 2 on each corner.

Step 4:

Draw another rectangle. Repeat Step 2 and **fillet the top left-hand corner.** Let's assume though that we have made a mistake in the radius, immediately select **{Undo}.** The corner will reappear and the fillet will be removed.

Step 5:

Fillet the corner with a **15 point radius** and then again with a **25 point radius.** Both fillets will show. They are combined with the original rectangle.

{Fillet}ing Intersections with Different Line Weights

The order in which you pick the lines *does* make a difference when the lines are of different weights, since the fillet curve always matches the line weight of the first line picked. Also, the fillet will not be combined with either line, but will be a stand-a-lone piece. You can experiment with this by following the exercises in Figure 4-8.

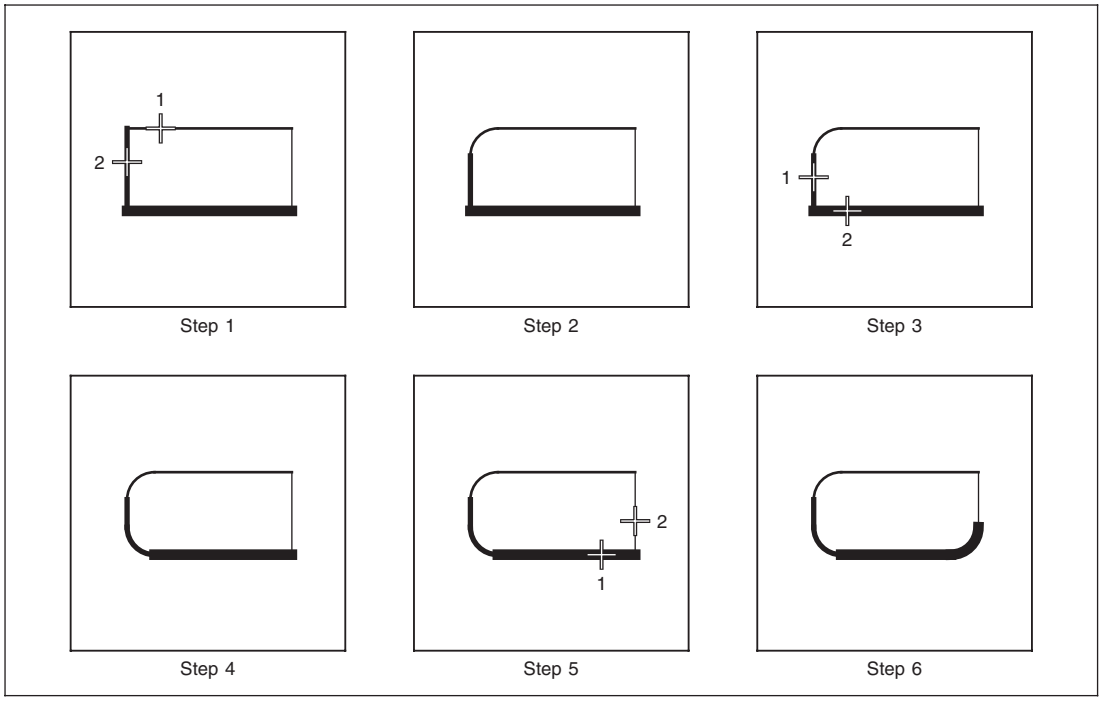


Figure 4-8

Step 1:

This time using the **{Line}** option **{Eight Directions} draw a rectangle** with **each side having a different weight.** In our example we made the right side a half-point, the top a one-point, the left a two-point, and the bottom a three-point.

Choose {Fillet}. You'll be prompted to "pick 1st fillet line", so **pick the top.** At the "pick 2nd fillet line" prompt, **pick the left side.**

Step 2:

A 10-point radius fillet curve will appear, in the 1-point line weight that the top of the box is in.

Step 3:

The "pick 1st fillet line" prompt is back, so **pick the left side** below the fillet curve. At the "pick 2nd fillet line" prompt, **pick the bottom** line of the rectangle.

Step 4:

The same size fillet curve will appear, this time at a line weight of 2 points (matching the side).

Step 5:

Let's do it one more time **picking first the bottom,** and then the **right side.**

Step 6:

The fillet curve will be 4 points in weight, matching the bottom line. Each fillet is separate and can be deleted if needed.

Filleting Lines That Are Not Right Angles

What happens when the lines aren't at right angles, but rather at acute (sharp) or obtuse (wide) angles to each other? Or when they don't actually intersect? Do the next exercise in Figure 4-9.

Step 1:

Draw two pairs of connecting lines, one above the other, with the top pair meeting in an obtuse (more than 90 degrees) angle, and the bottom pair meeting at an acute (less than 90 degrees) angle.

Step 2:

Choose {Fillet}. Let's change the radius. Ignore the prompt of "pick fillet line 1", and instead choose **{20 Point Radius}**. The prompt will come right back again. **Pick the two lines in the top pair.** The fillet curve will immediately appear. Now you can **pick the two lines in the bottom pair.**

Step 3:

Notice how differently the two curves appear. The second pair of lines had to shorten themselves to fillet with a 20-point radius.

Step 4:

Using **{Line}** again, **make another two pairs of lines,** the top one of which comes close to intersecting, and the bottom of which has a wide distance separating the two lines (see Figure 4-9).

Step 5:

Choose {Fillet}. At the prompts, **pick the two top lines.** The space between them will be bridged by the fillet curve. **Now pick the two bottom lines.**

Step 6:

If the distance between the two closest endpoints is larger than the diameter of the circle defined by the current Fillet Radius, the lines will be extended until they reach positions where they are close enough to bridge the gap. This is the opposite of what happened in Step 3.

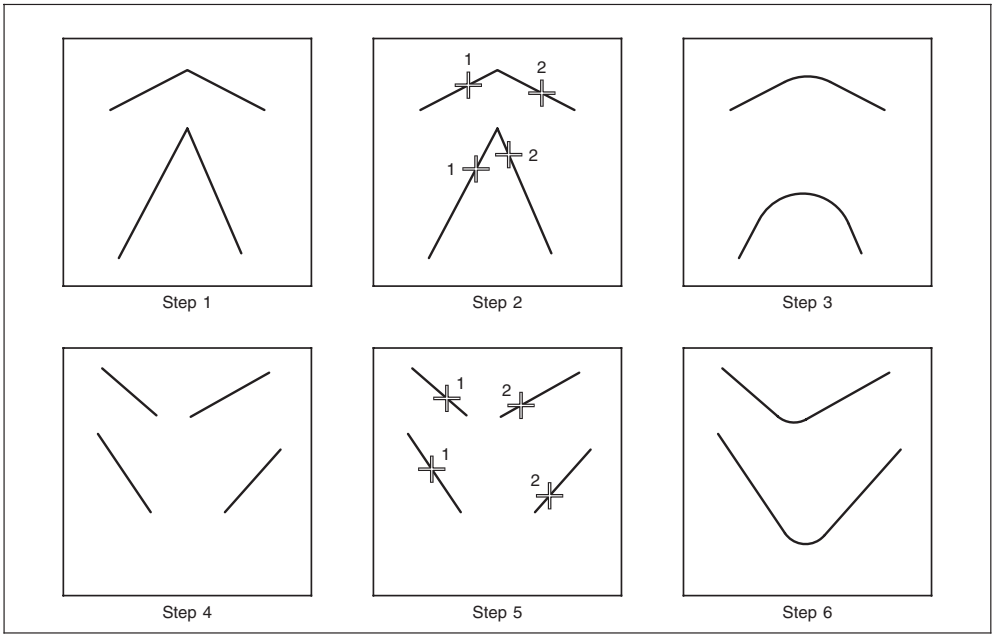


Figure 4-9:

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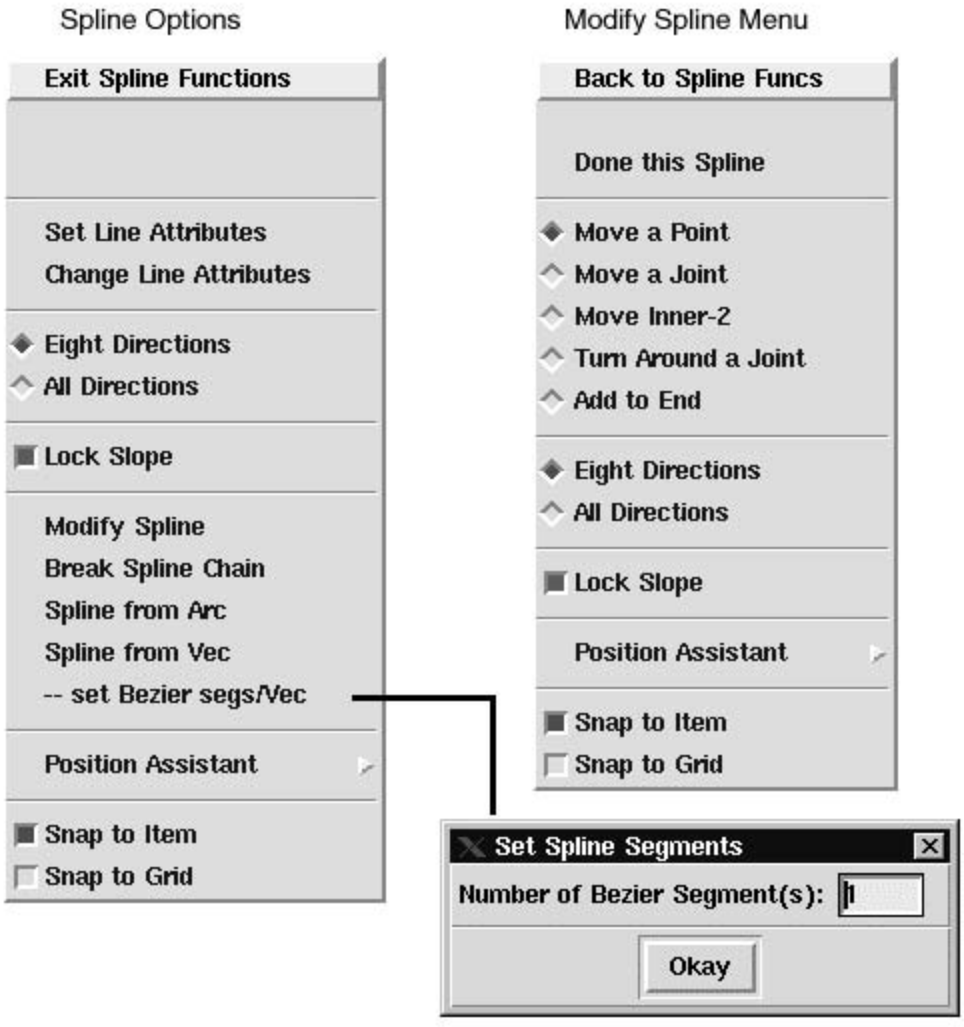
Chapter 5: The [Spline] Tool

This option allows the creation of variably curved lines within your graphics. [Spline] has two basic areas, creation and modification of splines. Using these tools, you can create the compound curved lines many graphics demand. The [Spline] tool allows you to draw a Bezier Spline by drawing lines through a series of plotted points and the computer will calculate a curve that will fall on these points. You achieve a very smooth curve, but not always as close fitting as you might like. Once created you can modify the spline by adding to the ends or moving points or joints along its curve.



After selecting [Spline] a prompt asking you to "Pick 1st Control Point" will appear. A "right" mouse click shows the options available. The common Set Line Attributes, and whether you want Eight or All Directions movement while picking are available.

Using the Spline Functions

To create a new spline, select **[Spline].** You will be prompted to "Pick 1st Control Point." Select where you want your line to start, and pick the point. You will be prompted to "Pick Next Control Point" By using the mouse, plot a series of points along the imaginary line you want your curve to follow. A construction line will appear connecting the dots as you pick them. When you are ready to end the line, select {Done}. The construction lines will disappear and a smooth curve will appear in its place.

After you have created a spline, you may want to modify its curve. Select **{Modify Spline}.** You will be asked to "pick spline to modify." Select the spline you wish to modify, and then click the "right" mouse button to see the options listed. Decide which operation you desire, and select it. The construction lines have reappeared on screen to help in the modification of the spline.

If you find you need to add to the length of the spline, select **{Add to End}.** You will be prompted to "Pick which end." Select the end of the spline you wish to modify, and a new prompt will appear asking "Pick Next Control Point." Select a new ending point, and the spline will redraw reflecting the new endpoint.

You can further modify the spline, by moving your pick points along the curves. Select **{Move a point},** or **{Move a Joint}** and a prompt asks you to "pick point to move." Your construction lines are back, so select a point and move the point to a new position. After selecting the new point, the spline will redraw reflecting the changed position.

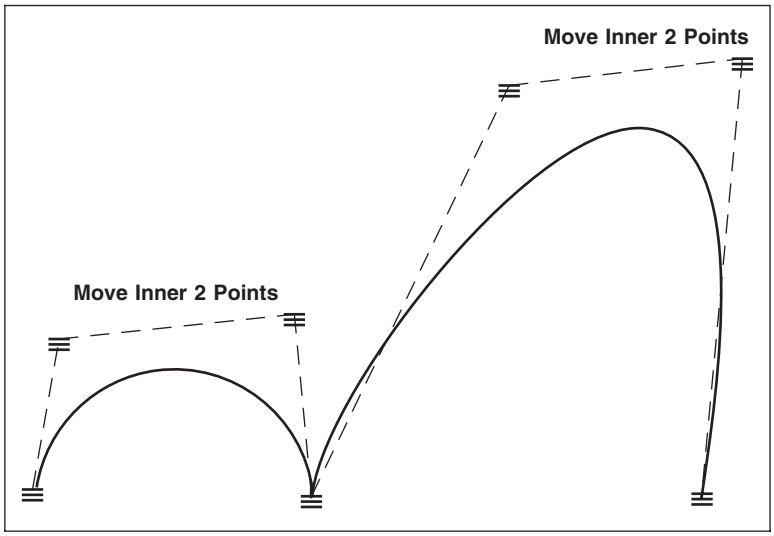
You can undo the LAST Change by immediately selecting **{Backup}.**

{Lock Slope}
This option, when checked, will lock the angle of the joints of each segment being modified (or created) so that the slope of the segment stays in a linear alignment with the existing end-point.

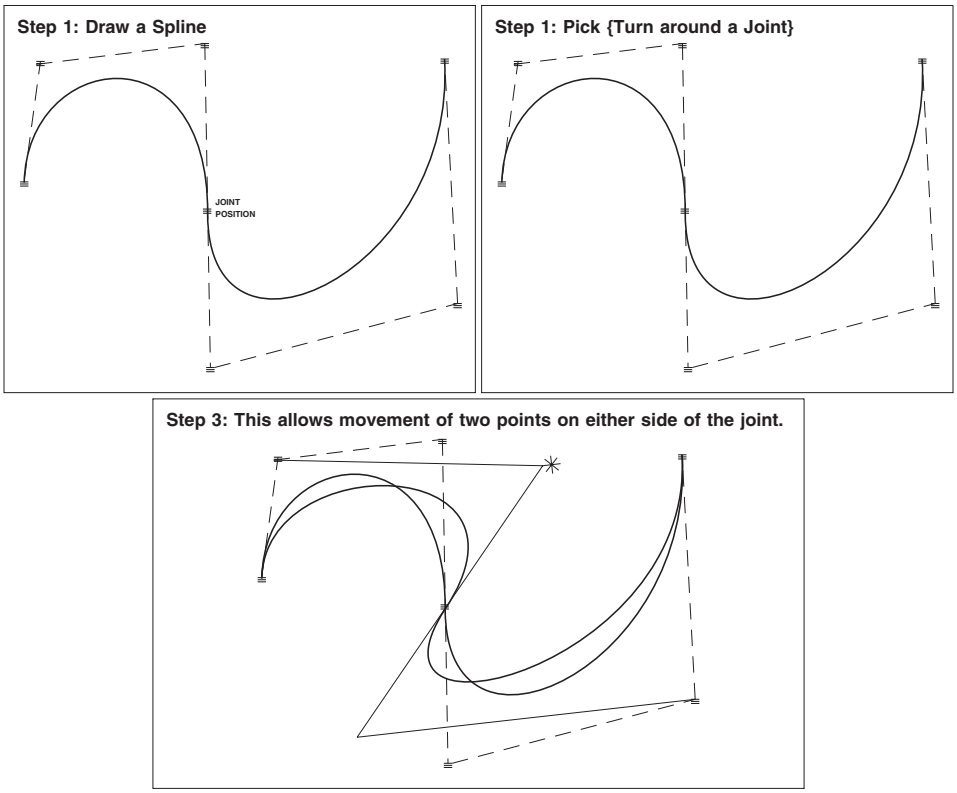
{Spine from Arc} and {Spline from Vector}
{Spline from Arc} converts arcs and circles to Bezier splines. Pick the arc to convert and it will become a Bezier spline. After it is a Bezier spline, you can modify it through the modify spline options. {Spline from Vec} converts a vector into a spline. You have the option of specifying how many spline segments you may need. Again, once converted into a spline, you can use modify spline.

{Break Spline Chain}
Here you can break linked Bezier splines apart. Be aware that every Bezier spline needs four points.

{Move Inner 2}
As shown in example below, this option will move the inner 2 points, which make up the curve controls of the 4-point spline.



{Turn Around a Joint}
This allows you to move the two points surrounding a spline joint.



{Add to End}: This modify option allows you to add new segments to the original spline. Pick which end you are adding to and then the new points.

Background Information Concerning Spline Generation

In general, there are two categories of spline generation: interpolation and approximation. These differ in their goals and methods used to produce the spline. Approximation here refers to operations such as sketch-smoothing, where the goal is to generate a smooth curve that lies closest to the original set of given points yet eliminates the jagged "bumps." Interpolation, on the other hand, does not have this restriction and is primarily used when it is desired to generate a smooth curve by supplying as little amount of information as possible. Splines in MECCA belong to the interpolation category. They are not approximated curves.

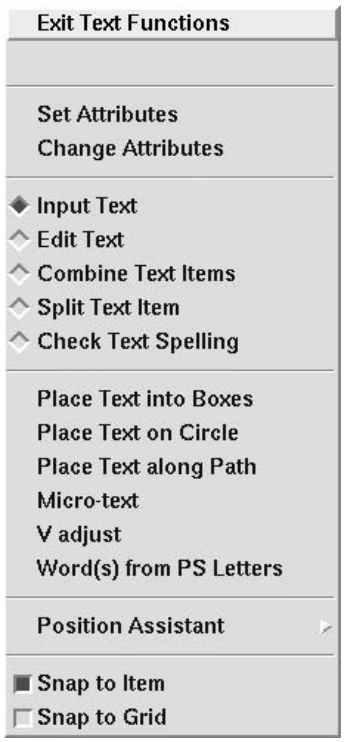
A spline is generated by defining a polygon; the polygon vertices control the shape of the spline (these vertices cannot be collinear). In this regard, these vertices are called "control points." By looking at the positions of control points (with respect to each other), and the distance between them, an imaginary curved path forms the spline.

The Bezier spline requires 4 non-collinear control points, if 5 is supplied the last will be lost. The fourth point will always be counted as the first point of a continuous series of Bezier splines. Two continuous Bezier splines need 7 control points; three splines need 10 control points, etc. When modifying a Bezier spline you are restricted to moving points or joints. Since Bezier splines require a specific number of control points, deleting or adding control points is not possible.

Chapter 6: The [Text] Tool

Introduction

The [Text] button is where anything to do with text (fonts) setting, inputting, editing, changing, etc., is done. There are many menus and submenus that give you various options while working with your text.



{Set Attributes}

With {Set Attributes} you have control over every aspect of your type during creation, such as font, style, size, leading, kerning, letter spacing, word spacing, etc. It really is very simple to use, fill out your menu choices and then [Okay] to accept.

{Set Attributes} is used to set the attributes for {Input Text}, and {Place Text into Boxes}. If you want to use any other attributes than the system defaults (usually

Helvetica, Normal, 10-point) you will have to set those attributes *before* selecting {Input Text}. The following steps are the basics of {Set Attributes}:

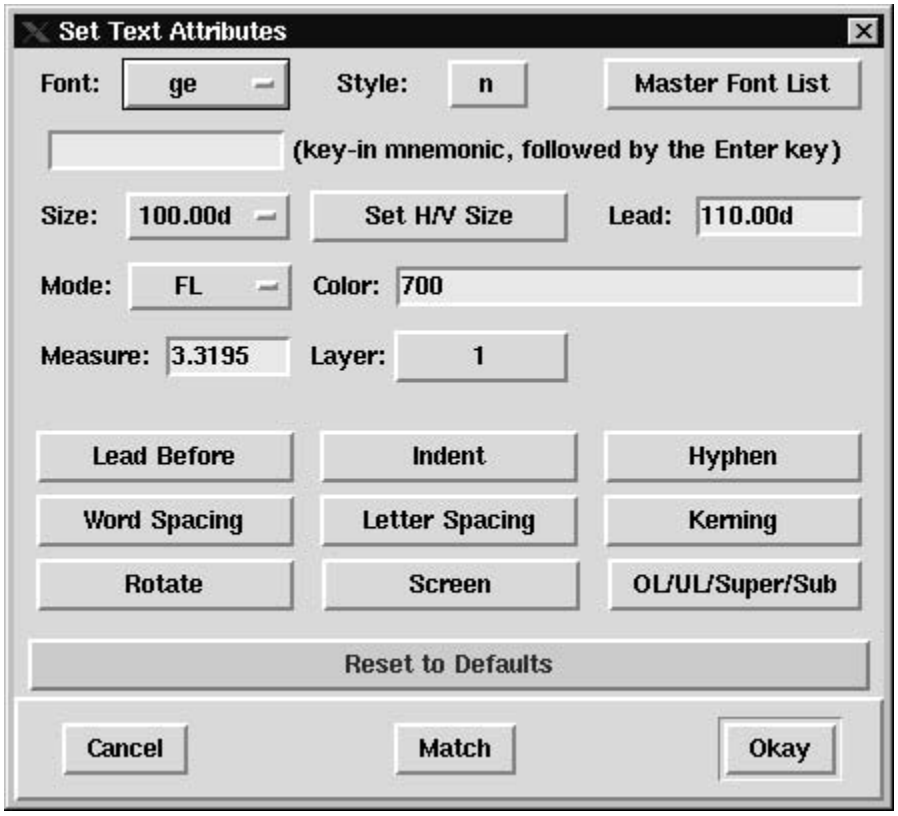
Step 1:

First select **{Set Attributes}** and the "dialog window" will appear, now you can enter the attribute(s) value that you wish to set or choose a selection from the various "pull-down" menus. (i.e., Set Font; Set Style).

Step 2:

As soon as you make your selections and choose **[Okay]** you are prompted to "pick where to place new text". Pick a position on your Window Display. The Editor will automatically open up. After you have entered your text data and [Okay]ed the text will be display with the attributes you chose.

If you end up in submenu, use [Okay] to save your choices and backout of the menu. Using [Cancel] will close the menu without saving the choice.



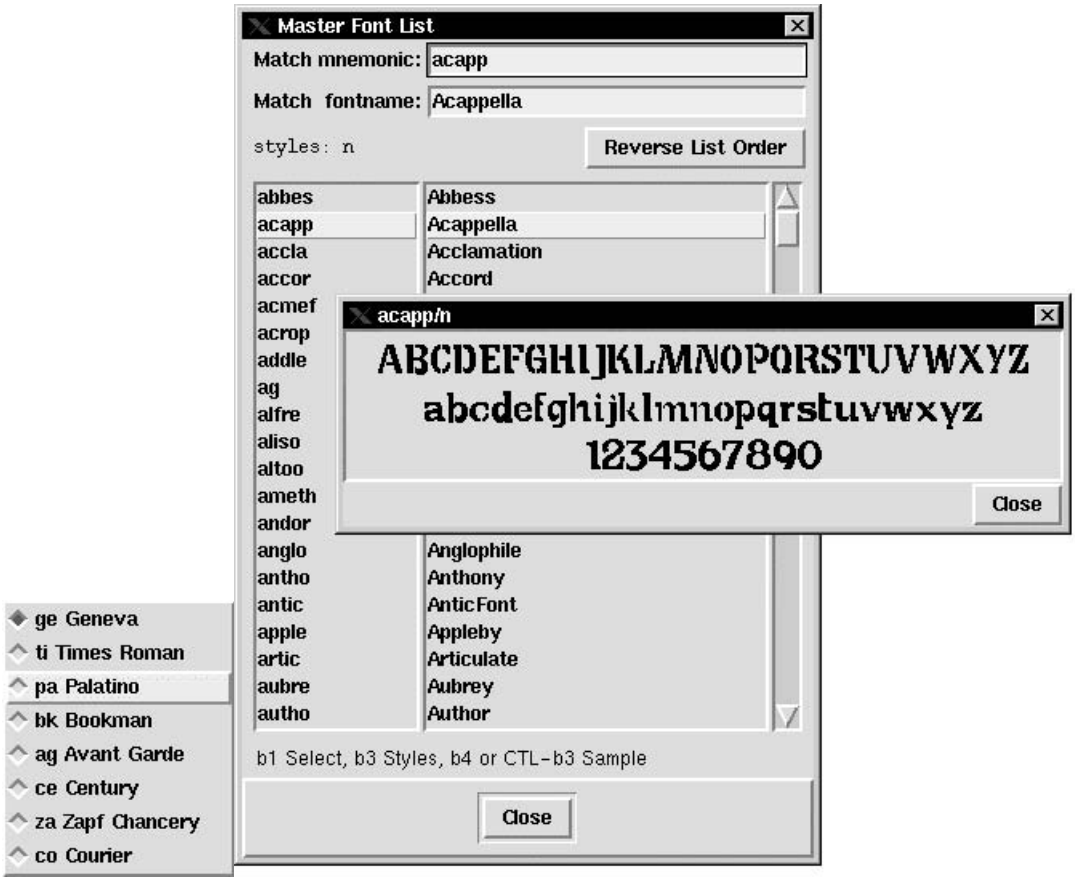
Choosing a Font

The *Font* option allows you to select the typeface of the text you are about to create. Fonts are dependent on availability of that particular font on your system. There are several ways to choose a font. The short list holds eight of the most commonly used fonts. To see the entire font selection, choose *Master Font List*.

You also can key-in the font mnemonic, if you know it, and press [Enter.]

Default:

Geneva (Helvetica)



Displaying Font Samples

While in the Master Font List you can display a visual *Font Sample*. Do this by highlighting the font with [Ctrl]-[Button-3]. (Button-3 on a right-handed mouse is the right-most button.) A small pop-up window will display showing a sample of text rendered in that font. The window does not need closed until you locate the font needed.

Also, highlighting a font-name or mnemonic and pressing [Button-3] will display a list of styles available with the font.

Text images of the Basic-35 fonts are supplied as part of the Version 2.10 Update in the form of pre-built bitmaps. All other fonts are rendered dynamically using the font's PFB file. So, if you don't see a new font being displayed, chances are good the font isn't one of the Basic-35, or you don't have a PFB for it. This condition warrants a check of the font data, as it suggests the PFB is missing.

Selecting a Style

This option allows you to set the style of your font. The styles of type are dependent on the availability of that style belonging to the *Font* you have selected.

Default:
Normal

Setting the Point Size with {Size} and {Set H/V Size}

Default:
10-point/11-point lead

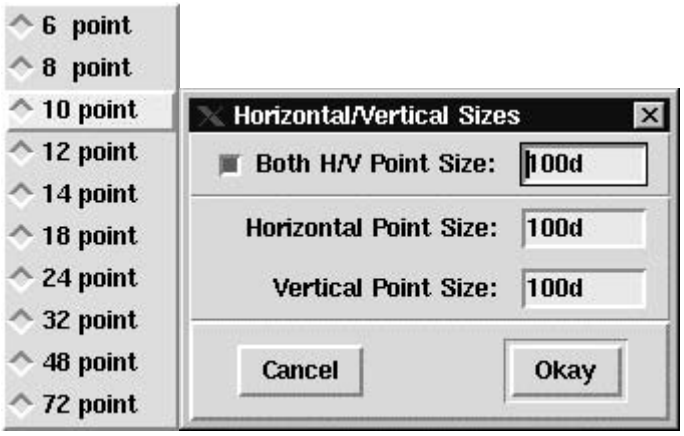
Prompt:
Choose option to set

Suboptions:
Can be User Defined, Standard Menu: 6 - 72 points

{Size} With this option you are given the ability to set the point size (both horizontal and vertical size) of the type. You can either select a size from the "pull-down" menu or key in your own by selecting {Set H/V Size}. If keying in your own, you can specify the size in tenth of point increments.

With the **{Set H/V Size}** option you can independently set your Horizontal and Vertical size. This enables the user to create condensed or expanded type. To create a condensed type style, make the horizontal size value less than the vertical size. To create an expanded type style, make the value of the horizontal size greater than the vertical size.

Once you select a point size it is displayed in the input area to the left.



Setting the Leading

Default:
10-point/11-point lead

Here you have the ability to control the *Line Leading*, (line-to-line vertical spacing within a paragraph). Default is 11-point (110d). Normally you will want to have the leading 1-point greater than the vertical size. Type in what is needed.

Composition Mode

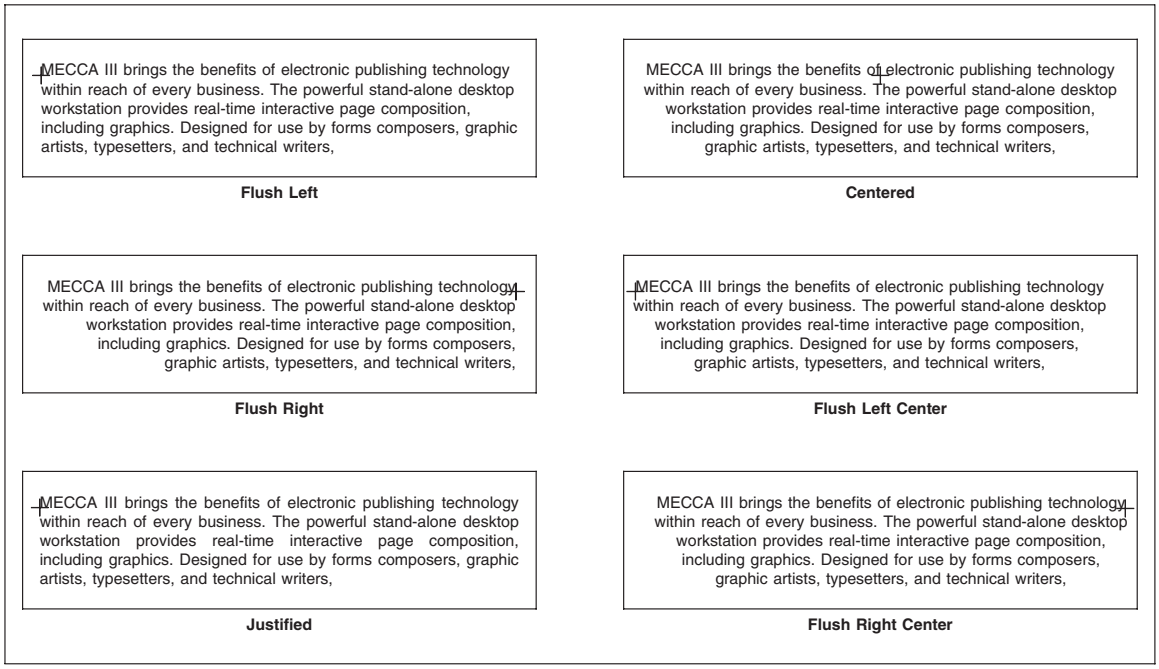
The *Mode* feature lets you determine how your text will fall on its determined position. Such as, falling with either its right or left endpoints at the selected position, or centered at this position. "Justified" means that all lines of a particular paragraph will have the same length except for the last line.

The position that you pick (when in flush left), is the left edge of the Measure. If you change the text to be flush right, it will move to the right edge of the Measure from where it is currently sitting.

NOTE: There are two different text position menus *Mode* and *Vert*. {Mode} the one we are discussing now, only shows up under [Text], {Set Attributes} and only works with {Input Text}. The second one is found under {Place Text into Boxes}, {Set Text Attributes}. This *Mode* works in conjunction with *Vert* and works only with {Place Text into Boxes}.

Default:

Flush Left



Six Different Composition Modes with Pick Positions

Setting the Column Measure

Measure is the maximum length that a text line will run before it wraps to a new line of text. Type in the measure that you want.

Default:

2400 decipoints = 3.32 inches

The position that you pick (when in flush left) is the left edge of the measure. If you change the text to be flush right, it will move to the right edge of the measure from where it is currently sitting.

Stacking Text Vertically: This procedure allows you to create vertically stacked text as simply as setting or changing the measure of the text to 0 (Zero). The program is looking for keyboard input of 0.

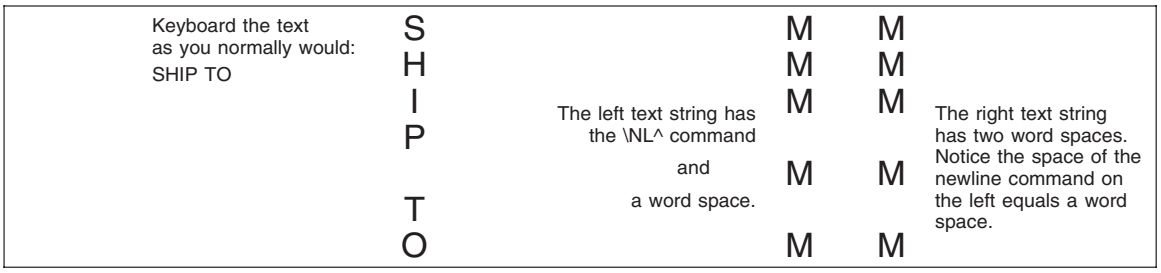


Figure 6-1: Examples of Vertically Stacked Text

When the measure equals zero, the text will stack itself vertically centering the letters. You cannot have multiple line text items, such as a paragraph. It will be seen as one long line. The \NL (New Line) command will be seen as a word space.

The display of the text in the text editor will appear as standard words. It is no longer necessary to force line breaks to create stacked text. To stop the stacking effect, change the measure of the text to any value other than 0.

Color

You must type in a number that is defined in your color table.

Default:

700 (100% Black)

See Also:

{Process Color},
Which Displays Items By Their Color Number

The color number you choose to input must be in your color table. All MECCA systems have the colors 600 (white) through 700 (Black), with the gray colors found in the six hundred series of numbers. They are percentages of gray from 1-percent to 99-percent. The number 605 will give you a 5-percent gray screen. The number 630 will give you a 30-percent gray screen, etc.

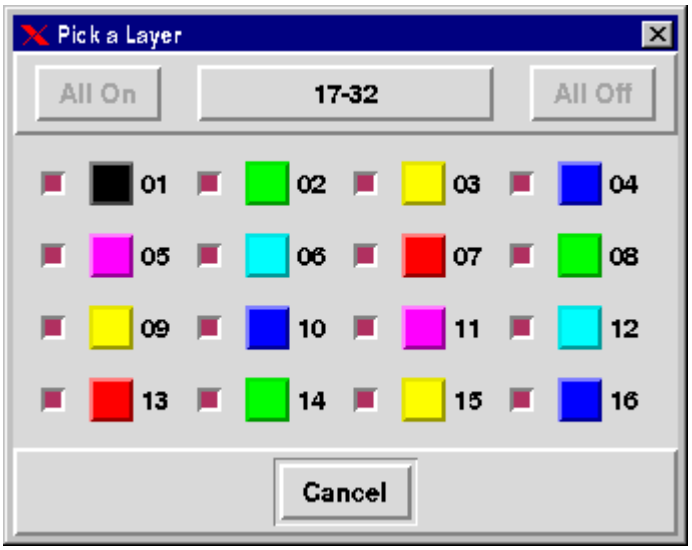
Do not use -1 as a color number with text. It will make it disappear and not print properly.

If the display is Process Color, then you can input FCP color numbers.

Setting the Layer

The layer option in text works just as it does with all other components. You have the ability to set text on one of thirty-two separate levels. This is necessary if color separation is needed for printing.

Default:
Layer 1



[Match]

This option sets your variables to match an existing piece of text simply by selecting [Match] then picking that text item. The {Set Attributes} menu will then display the attributes of the existing text item.

Prompt:
Pick text to match

[Lead Before]

Here you have the ability to control the *Lead Before*, which controls the vertical space between multiple paragraphs when creating more than one text item through {Input Text}. This is the space between the baseline of the preceding paragraph and the baseline of the first line of the following paragraph.

{Edit Text Item} does not allow more than one text item, so *Lead Before* does not apply in this situation.

For more information, see "How to Measure Leading".

See also {Input Text} for instructions on how to key in multiple paragraphs.

Defaults:

Uses the value of the line lead as the Lead Before.

Outline Controls

Outline Size enables the user to define the weight of an outlined character when using the Immediate command \OL. The value used is a percentage of the current vertical size. Cancel the outline command with \XOL.

Default:

2 percent of the current vertical size

Underline Controls

Underline Size and *Underline Offset* enables the user to define the weight and position the baseline of an underline recalled by the UNDERLINE START Immediate Command \US. Ending an underline is the \UE.

Both values are percentages of the current set point size. A negative value input for the *Underline Offset* percentage will place the line under the baseline; a positive value will cause an overstrike to occur by placing the line above the baseline.

Defaults:

Size is 10 percent, Position is -20 percent

Superscript/Subscript Size and Offset

Enables the user to define the size and position the baseline of a Super/Subscript recalled by the UP FOR SUPERSCRIPT and DOWN FOR SUBSCRIPT Immediate Commands \U^ and \D^. Resetting a Super/Subscript requires the use of the \R^ to RESET TO PREVIOUS POINTSIZE.

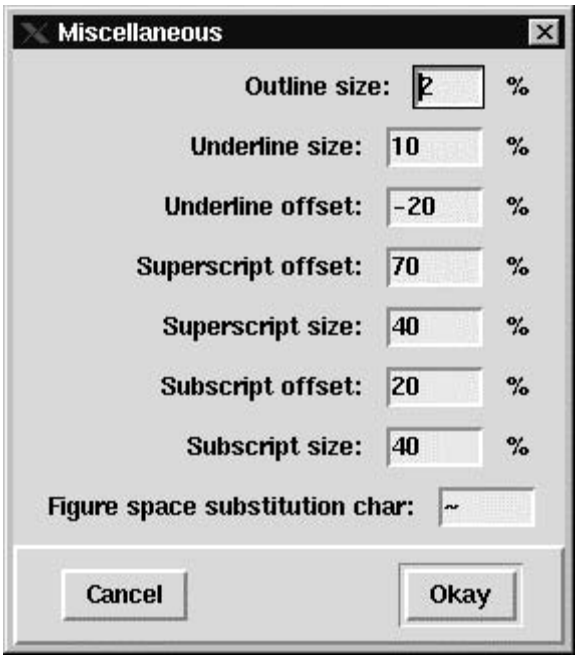
Both values are percentages of the current set point size.

Figure Space Substitution Character

The tilde character (~) is used in MECCA as a "do not print", but hold space of the character input. For the tilde to be an Em-dash, set the tilde to the character "M". For an En-dash, set the tilde to the character "N".

Default:

Figure Space - The character 0.

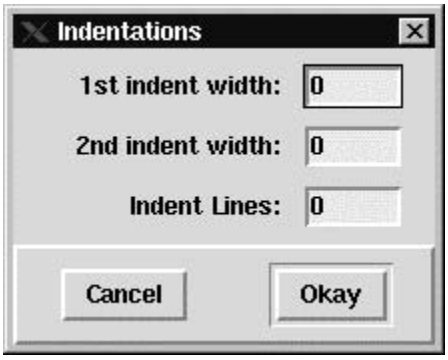


Setting Indents

1st Indent Width is the amount you wish to indent a line of a paragraph from its left margin.

2nd Indent Width gives you a second indention value to create a hanging paragraph effect.

Indent Lines is how many lines of the paragraph are to be indented using the {1st Indent Width} Value. The rest of the paragraph (all other lines) will read *2nd Indent Width*.



Step 1:

Select **[Indent]**. In the field for *1st Indent Width* type in the amount of space you want your lines to indent.

Step 2:

In the field for *2nd Indent Width* type 0, unless you are setting up a hanging paragraph.

Step 3:

For *Indent Lines* type in the number of lines that are to indent using the value shown in *1st Indent Width*.

Creating Enumerations Graphically

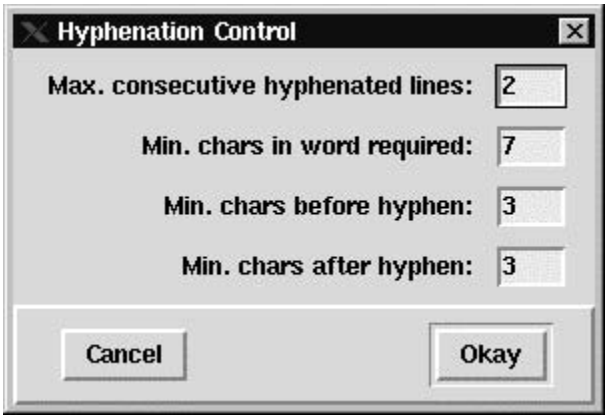
Creating an enumerated looking paragraph (an outline style) can be done by the following: *1st Indent Width*= 0, *2nd Indent Width* = amount to be indented, *Indent Lines* = 1. Then when typing in the text, insert the immediate command \HSPA with the same value used for *2nd Indent Width*, in between the number and the text.

Hyphenation Controls

[Hyphen] allows you to control hyphenation. The "Min. chars in word required" option will turn hyphenation off by setting it to a large number of characters, such as 25. The other controls adjust the look of the hyphenation.

Defaults:

Consecutive = 2, Chars Before = 3, Chars After = 3, Min Word Size = 7



"Max. consecutive hyphenated lines" will control the amount of lines that will consecutively hyphenate.

Min. chars in word required will control whether the hyphenation will take place or not. The word must contain as many characters as the value entered before hyphenation will be considered.

Min. chars before hyphen controls the amount of characters that must fall before a hyphen is set. The word must have the minimum number of characters as the value entered fall before the hyphen in order for the word to hyphenate.

Min. chars after hyphen controls the amount of characters that must fall after a hyphen is set. The word must have the minimum number of characters as the value entered fall after the hyphen in order for the word to hyphenate.

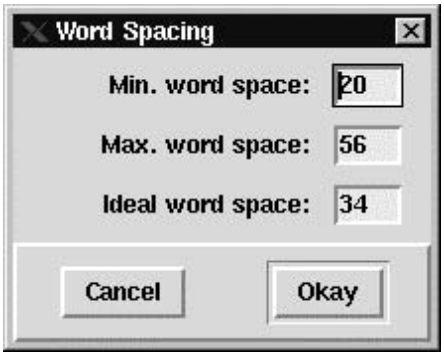
[Word Spacing]

[Word Spacing] is a relative unit (in relation to the point size), and is used when the system needs to justify lines of copy. The maximum space is the most it can spread, the ideal is what you would like, and the minimum is the smallest amount between words. It is easy to use, select the option, and input the values.

The formulas for figuring word spacing:

Maximum Word Space = 56 x Point Size / 100
Ideal Word Space = 34 x Point Size / 100
Minimum Word Space = 20 x Point Size / 100

Defaults:
Min Word Spc = 20, Ideal Word Spc = 34, Max Word Spc = 56



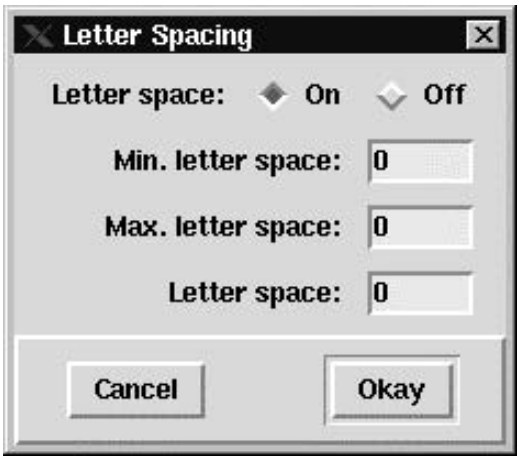
[Letter Spacing]

Letter spacing is the normal amount of letter spacing in relative units. As the point size increases, the actual letter space value increases. Use a negative number to tighten letter spacing and a positive number to open up letter spacing.

Default:

Normal Letter Spacing = 0

First enter the value and then turn it on. When using justified type, you may want to set the minimum and maximum also. They control how tight and how loose the spacing can be to achieve justification.

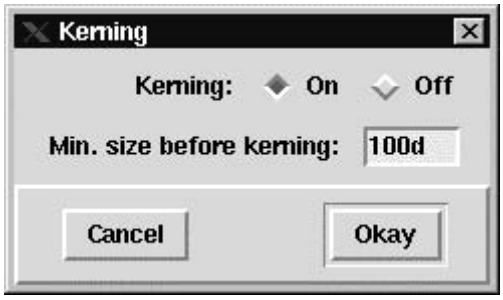


[Kerning]

This option turns Kerning "on" and "off". It will cause kerning to start at the point size specified by the {Min. size before kerning}.

Defaults:

Kerning Minimum Size is 16 points. Kerning is off.



Kerning is the adjustment of the space between letter pairs so that part of one extends into the space of another. Look at the letter pairs below.

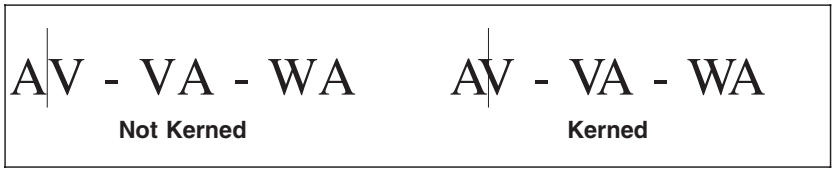
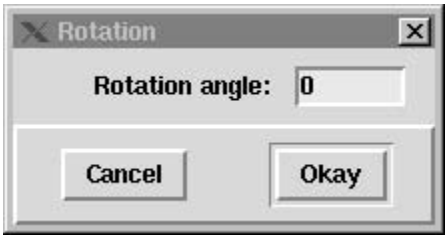


Figure 6-2: Notice the Kerned Letters Overlap

[Rotate]

You can set the text items angle of rotation during creation. Select [Rotate], and then enter the angle in the input area provided.



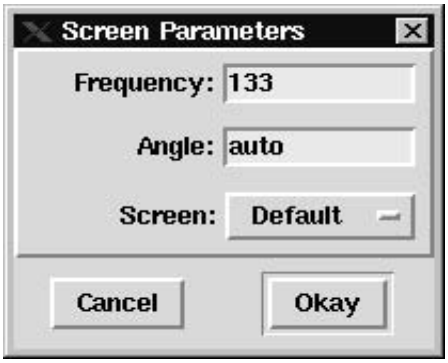
[Screen]

Input your wanted lineage value.

Default:

133 (This is for high resolution.)

The number of dots in a row is referred to as lineage (also known as screen frequency, gauge, or ruling). The screen lineage value controls the number of dots to be used in a linear inch when asking for a screen, which is used for gray percentage colors or FCP colors



The default value for lineage is set at 133. This is correct for high-resolution imagesetters and when sending to a proof printer it is automatically adjusted upon output. For final artwork on low resolution printers the values between 40 and 60 are better. If a lineage is set too high for the output device, the screens will appear to be darker than they should.

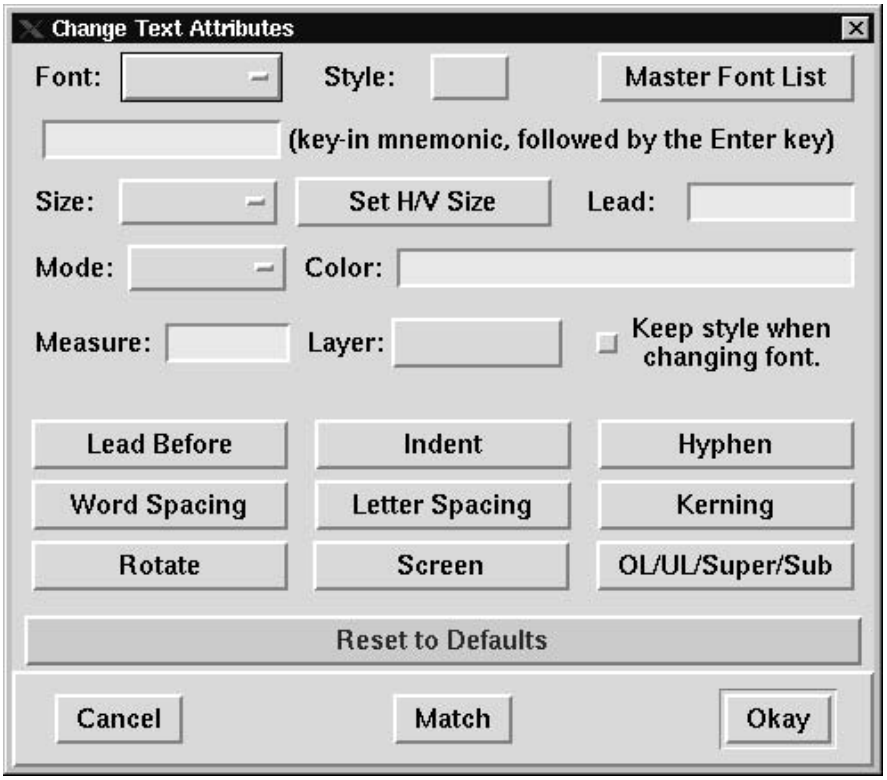
What type of output device the artwork is output on and also the press that is printing the job normally determines the proper screen lineage.

{Dot} and **{Angle}:** Here you can set the screen dot type and dot angle at the time of creating screened text.

The Change Text Attributes Options

{Change Attributes}: This is a duplication of the set menu, but is for changing text attributes of already composed existing text.

MECCA 2000 gives you the ability to instantly change the attributes that you originally set by choosing {Change Attributes}. You can see that these menus correspond closely to the {Set Attributes} menu.



The basic difference between the two is that {Set Attributes} is used to create new text, and {Change Attributes} is used to change already existing text. Because {Set} and {Change Attributes} are so alike and work the same way, you can refer to {Set Attributes} for the options that you need explained.

Standard usage is to fill in the attribute, which needs changed, select Okay and then pick the text component(s) to apply the change. Only those attributes, which are entered into the Change dialog, will be affected. If you want only the FONT to change and not the STYLE, check the **"Keep Style When Changing Font"** option.

Using Change Attributes

Step 1:

Select all of the changes that you want to make, such as changing the style from normal to bold, or the font from Geneva to Times Roman, etc., the status area will show the current change setups. Change Attributes remembers all changes until you {Quit} out or {restore last set}.

Step 2:

Then select the item you want to change. You will always be prompted to "pick item to change". You may select options or pick items to change at any time. If you go into any change attribute submenus, under {--change others--}, then after your menu selections, choose {Okay} in the green menu area to get back to the Change Attributes opening menu, then select the text to change.

{Input Text}

{Input Text}: Again we get to create text, but are placed into the default text editor. The attributes of the text to be input will come from the previous {Set Attributes}. Even when using the text editor there are text limits, but these are so extreme that most operators never reach them. They are discussed in detail under this function.

Before you use {Input Text} you will first want to use {Set Attributes} and setup the attributes.

Defaults:

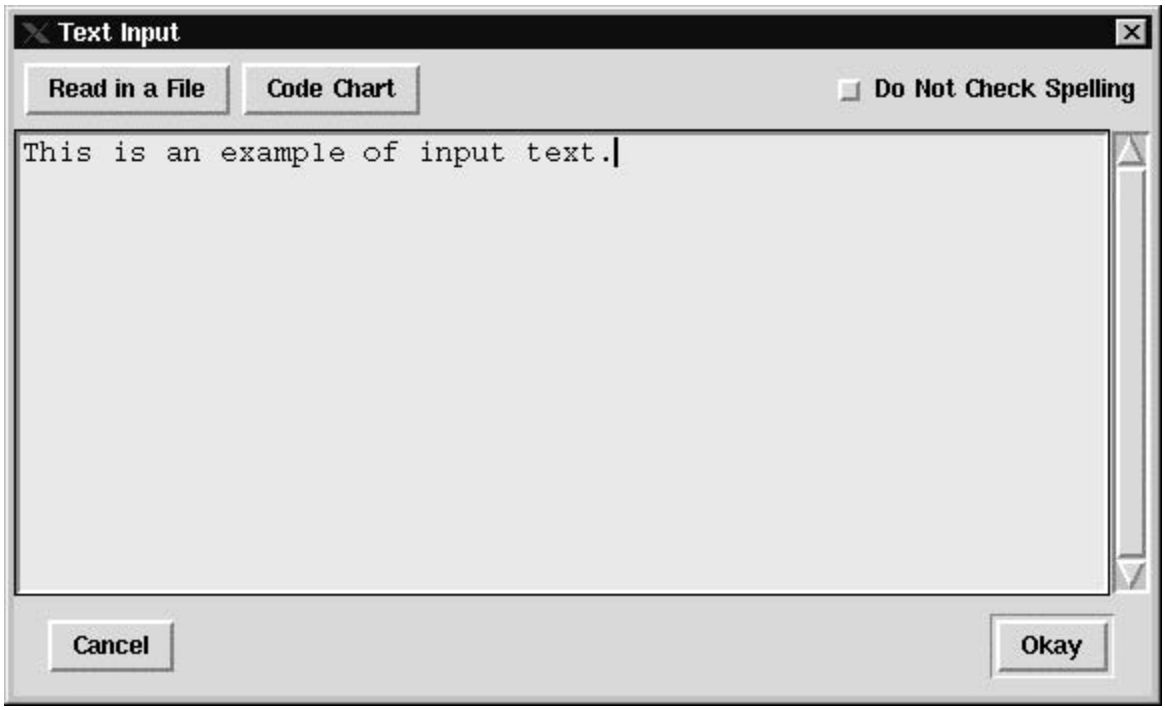
Font: Geneva (Helvetica), Style: Normal, Point Size: 10-point, Lead: 11-point, Justification: Flush Left

Prompts:

Pick where to place new text
Input text data

Choose **{Input Text}** and you will be prompted to "pick where to place new text". Pick the spot where you want the text to appear, remembering that it will be centered, flush left, etc., on the spot that you pick, according to how you set the attribute composition mode.

Then the "Simple Text Input" window will appear.



Now you can begin to key in your text. After you have entered the text, click [Okay] and the composed text will appear.

Spelling Checker

The {Input Text} editor also contains {Check Text Spelling}. By default everything is automatically check spelled. Click the button to turn off check spelling. For more information see {Check Text Spelling}.

Miscellaneous Information

The "Simple Text Input" box has copy, and paste controls:

```
CTRL-c means "Copy"
CTRL-v means "Paste"
```

Following are additional commands, but these commands will only work as lower-case, and both the [Num Lock] and [Caps Lock] keys must be off.

```
CTRL-/ means "Select All"
CTRL-\ means "Unselect All"
CTRL-c means "Copy"
CTRL-v means "Paste"
CTRL-x means "Cut and Copy"
```

For text editing features such as search-and-replace or find, it is recommended that you open up a text editor and prepare the text there. Afterwards, you can either [Read in a File] or copy and paste the text into the "Simple Text Input" box.

It is important to know that each paragraph that you input is considered one separate item, even when input as multiple paragraphs. When you {Edit Text Item}, only that picked paragraph will be edited. This also goes for all other functions such as delete, move, etc.

You may key in multiple paragraphs using {Input Text} by placing a blank line between each. A blank line is read as a line lead vertically. For every blank line encountered in the file, the next paragraph will be moved down that many line leads.

The white vertical space between two paragraphs is controlled by the {Lead Before} option. You may also key in multiple paragraphs within {Input Text} by spacing the second text paragraph one character over from the left.

```
This is paragraph one.
 This is paragraph two.
  This is paragraph three.
```

The composer will make three separate paragraphs from the above lines. The spacing between the items will be controlled by the "Lead Before" value.

Using the [Code Chart] Button

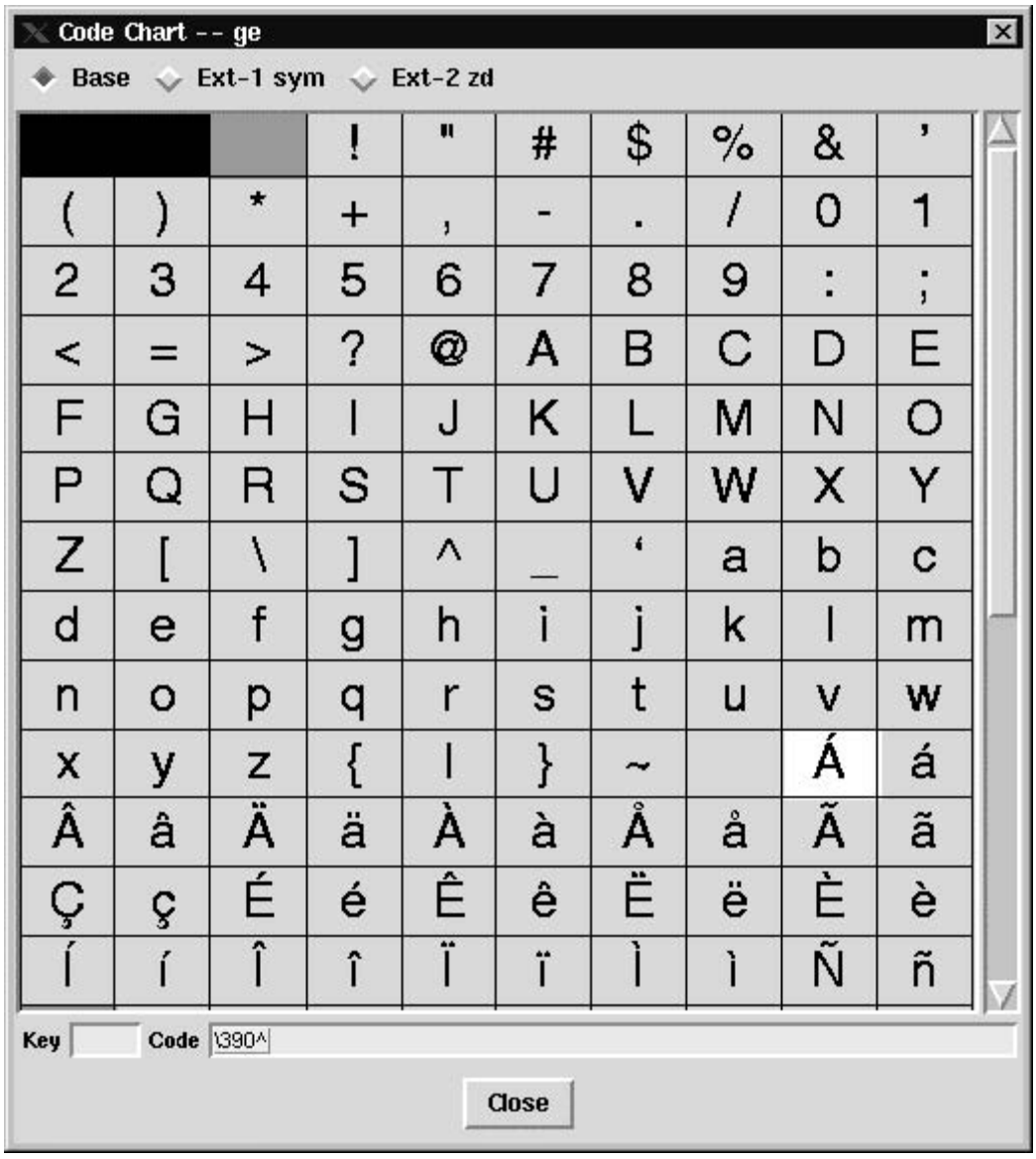
Clicking on the button [Code Chart] brings up the Master Font List by which you select the font wanted. Picking the characters in the chart will produce its MECCA special character backslash code, and/or the key (if it happens to have a keyboard key).

Note that the code chart is not to be used to see how the font looks, but does represent the correct font character layout. (A visual display of the font is now represented through the *Font Sample* feature.

The chart will show available characters (as dictated by its translate table), arranged in sequence from 32 to 255. Depending on your M_POSTSCRIPT/laser.spec contents, you

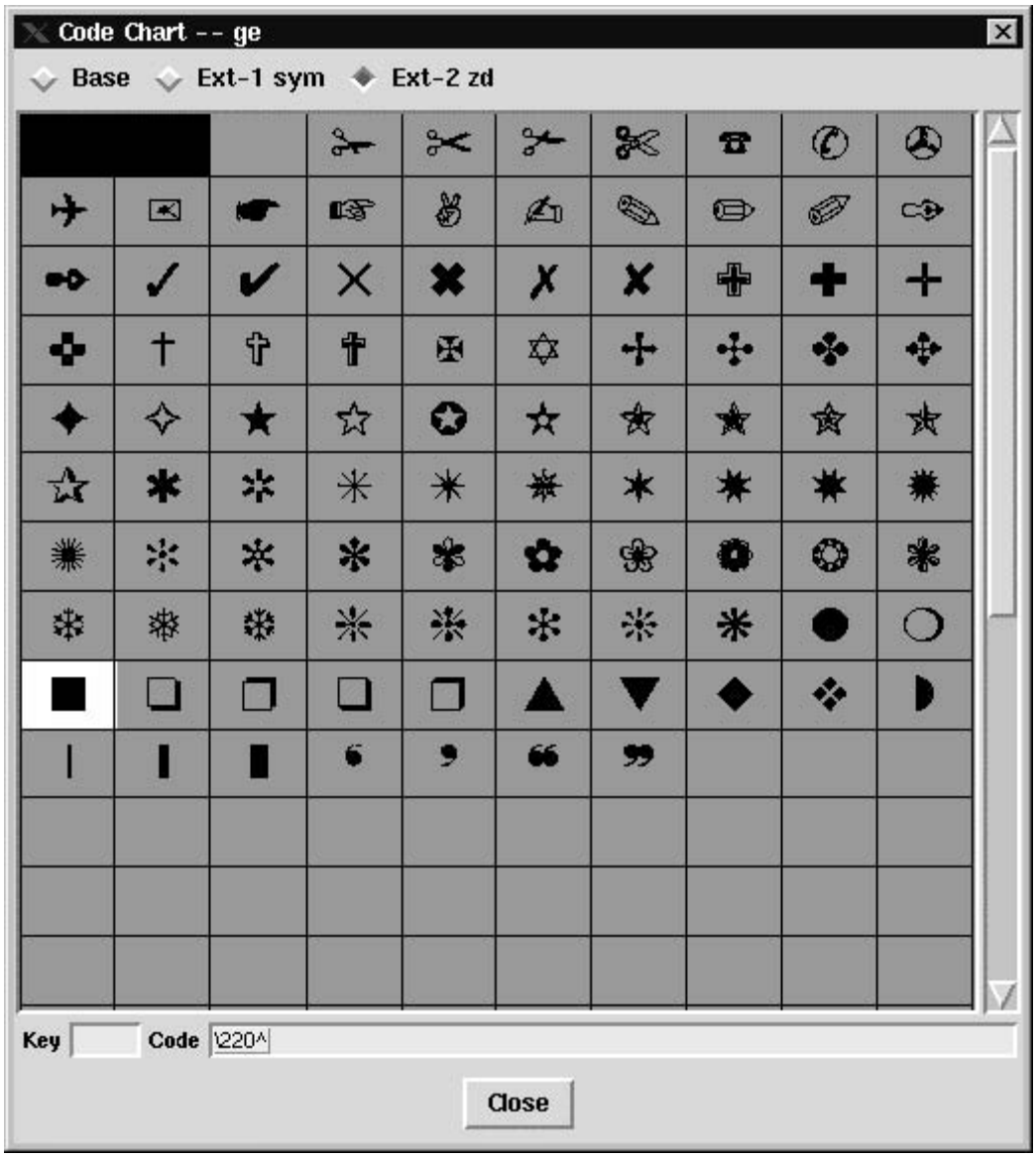
typically have two more charts: Symbol as extended-1 and ZapfDingbats as extended-2. If they are not available the options will be grayed out.

Code charts are built as part of the Version 2.10 Update process, as a step in the Type-1 Font Installation.



The Base Font Chart

Extended Chart 1

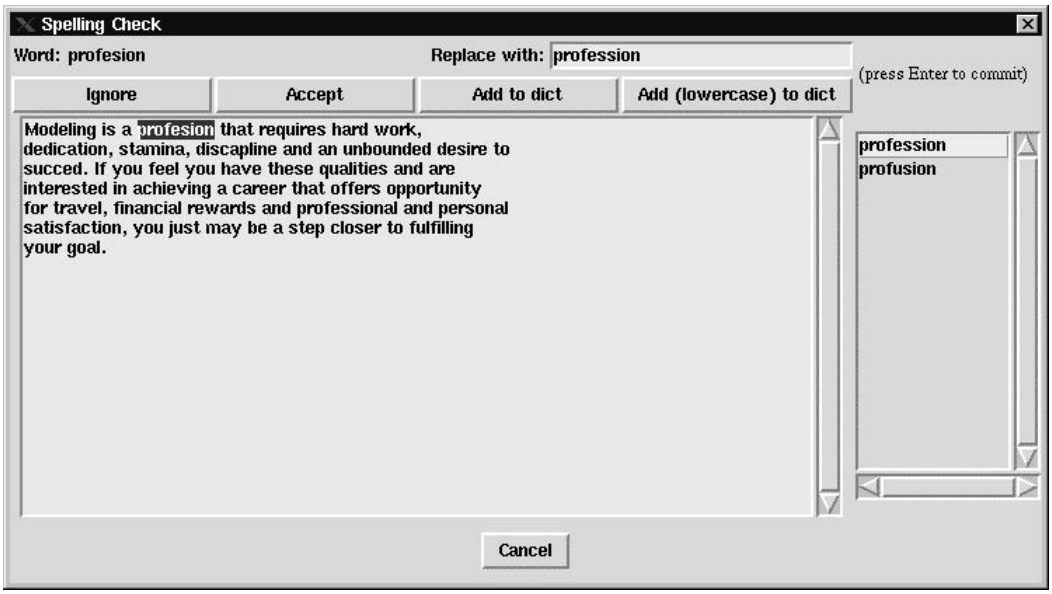


Extended Chart 2

{Check Text Spelling}

{Check Text Spelling} utilizes a new utility: \usr\bin\amgraf\m2k_chkspell, as of Version 2.42.

The program 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 listed. As well as "near misses", and other guesses at ways to make the word from a known root. You have the option of typing in your own word, or choosing one of the suggested words. Pressing [Enter] accepts your choice.



Using the Check Spell Dialog

When using {Check Text Spelling} you are first prompted with "Pick single or grouped text items to check." You can at this point select individual items or a group of paragraphs. When the check speller has gone through a selected item, the "Pick text to check" prompt will return.

When a possible spelling error occurs the {Check Spelling} window will appear showing the possible error highlighted. At this point you have the following options:

Replace With: The program will display each word, which does not appear in the dictionary at the top of the screen and allow you to change it. Words that differ by only a single letter, a missing or extra letter, etc., are also listed. You have the option of typing

in your own word, or choosing one of the suggested words. **Pressing [Enter] accepts your choice.**

[Ignore] This will cause the program to accept this word for the one time only and go on to the next misspelled word.

[Accept] Means to accept the word for the rest of this check spell session. It doesn't however add it to the dictionary.

[Add to dict] 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.

[Add (lowercase) to dict] Accept the word, and adds an uncapitalized (actually, all lower-case) version to the private dictionary. This is *ispell_english* found in your home directory.

[Cancel] Will exit the spelling window without saving any changes made.

Please Note the Following:

In the spelling check dialog, raw text shown in the window cannot be edited. Thusly, selecting part of the text then using the Control-c key to copy does not work. However, importing selected text into another window by mouse button-2 (the middle button of a 3-button mouse) works as usual.

Highlighted "bad word" may have embedded mark-up commands; the replacement must also include embedded mark-up commands if those commands are to be retained.

Combining and Splitting Text Items

A paragraph is considered one text component. It can hold many words or sentences, but is considered one flowing component. Split allows a component to be split into two, and Combine will bring text components together into one paragraph.

{Split Text Item}

{Split Text Item} is used to break large paragraphs into unrelated groups of one or more lines of text. It will split the paragraph into two paragraphs at the line that you pick. These two paragraphs can then be moved, copied, deleted, etc., without affecting the other lines they used to be associated with.

Prompt:

Pick the text line from which new text item will be made.

When using {Split Text Item}, pick the line in the paragraph that you wish to separate. All the lines above the one you picked become separate from the line you picked and whatever line(s) might be below.

Please Note: Paragraphs with the composition modes of Flush Left Centered (FLC) or Flush Right Centered (FRC) cannot be split.

{Combine Text Item}

With this option you can pull two paragraphs into one.

Prompts:

Pick stationary text item, Pick other text items to combine with the 1st.

Select **{Combine Text Item}** a prompt "pick stationary text item" will appear. Pick the first paragraph and then the second. It will always pick up the attributes of the first paragraph picked. When editing the text, there is now only one text component, not two.

For those who are working with converted EPS files and pulling paragraphs back together with the combine text, the Immediate command \NL (New Line) is inserted at the end of each text line to keep the line breaks the same as they were.

{Edit Text}

The {Edit Text} option gives you the ability to change a string of text that already exists. When a piece of text is edited, it will appear in the "Simple Text Input" window. Once there you have the ability to insert, delete or correct the words.

Prompts:

Pick text to edit

Step 1:

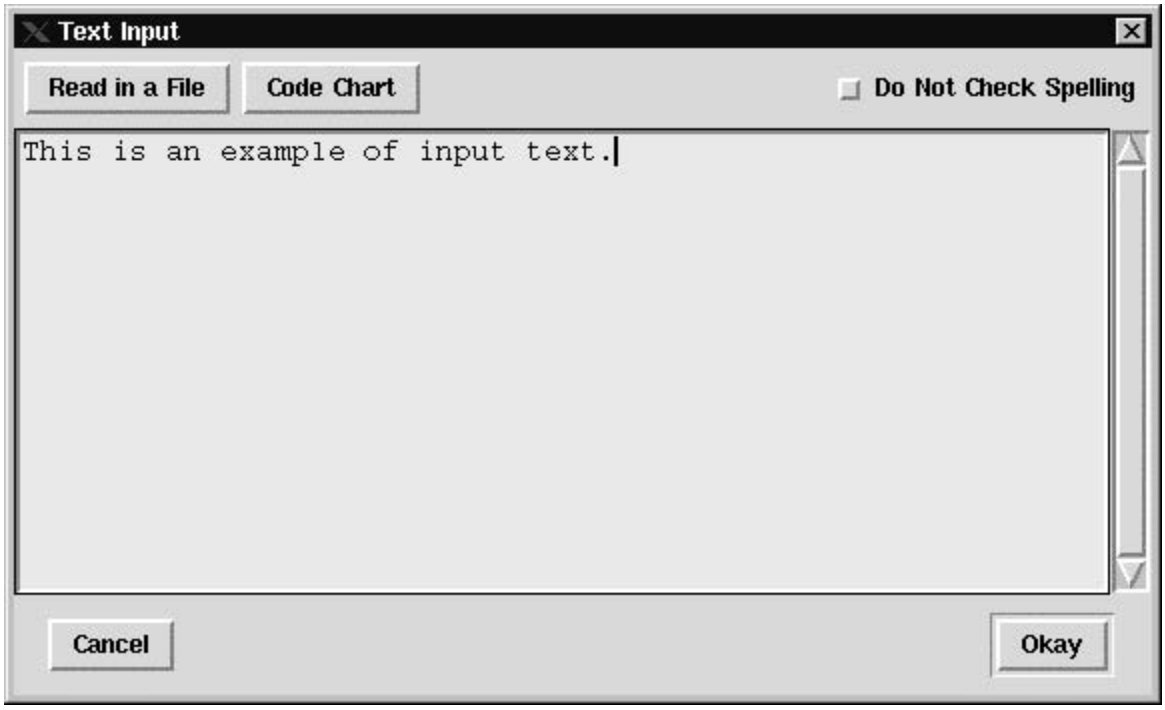
Choose **{Edit Text},** the prompt "Pick text to edit" will appear.

Step 2:

Use the cursor to select the piece of text you wish to change, a simple text input window will appear, consisting of the text that you just picked to edit.

Step 3:

Make whatever edits to the text that you want to make and then {Okay} out of the text input window. The changes will appear on the screen.



{Place Text into Boxes}

This function is devised to assist in the placement of text items into pre-drawn boxes usually found in business forms, tables, floor plans, etc.

Forms production can be greatly increased by splitting the text input portion of a job from the graphic portion. Typists can keyboard text, while a skilled MECCA operator can rule the design and layout. After the layout is complete, the text is "streamed" into position using the {Place Text into Boxes} function.

How to Use It

When selected the prompt "Pick First Corner..." is presented. The order of menu items has no significance in terms of the sequence of steps that the user must perform; rather they have been placed this way based on their frequencies.

Normally, the entire process can be broken down into three major parts:

Step 1:

Create boxes.

Step 2:

Set controls for placement and text attributes;

Step 3:

Paste text into boxes.

Steps 1 and 2 do not necessarily have to be in that order, but they must precede Step 3.

Background Concept

In forms and tables, horizontal and vertical rules often divide the body of the form into individual rectangular boxes. Each box serves to provide a horizontal measure for composing text, and a vertical measure to position text.

Hence, if text data has been prepared in a separate file (by using an ordinary text editor), and there exists some means for the user to describe a chain of boxes, then a computer program can repeatedly perform the following:

"Take a text item from the file, compose it and place it in the box." This way, a great reduction in time can be achieved in composing text into forms.

A small exercise can be found in Volume 1: Getting Started, Chapter 4, page 93, Using {Place Text into Boxes}.

Defining Boxes for Text Placement

Two functions exist to let you set up boxes for text placement: {Define Boxes to Use} and {Modify Defined Boxes}.

{Define Boxes to Use}

This function prompts you to use the dynamic rectangle method (the same as used with [Zoom] and [Group]) to provide two corners of a region within which box(es) may be constructed.

Once you give the 2nd corner, the software attempts to find horizontal and vertical rules inside (or intersected by) the rectangle you gave; and from these rules one or more non-overlapping boxes are built. The program determines the direction (i.e., from left to right or from top to bottom) to construct boxes, based on the aspect of the rectangle that you provided. If you drew a horizontal rectangle, boxes will go from left to right; if your rectangle is vertically longer than its horizontal side, then boxes will go from top to bottom.

Multiple boxes, of course, can be built only if multiple rules exist within your dynamic rectangle to provide information for boundary positions.

To identify a box, there should be at least 4 existing rules that can define a rectangular box. However, if the program cannot find enough horizontal and vertical rules, it will use your dynamic rectangle. So, you can at least define one box without having any existing rules at all.

You should note that the program would build at most "one strip" of boxes, per direction. For example, you have a grid that looks like Figure 6-3, and you give a horizontal dynamic rectangle covering the entire region, only the top row of 4 boxes will be built. The program does not go back to the left side and advance down to the next row.

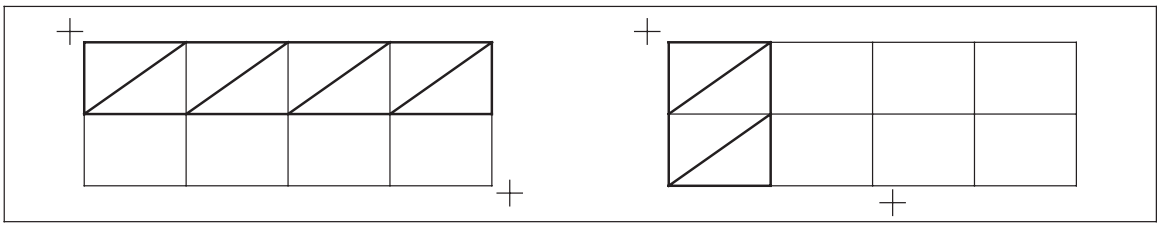


Figure 6-3: Whether the Box Strip is Horizontal of Vertical, Depends on the Dynamic Rectangle Drawn

In all situations, remember that the program uses the aspect of your dynamic rectangle at all times. Hence, in the above example, you have drawn a dynamic rectangle that is vertically longer, only the left-most column of two boxes are built.

The boxes will be visually displayed on screen in white color, each having its diagonal line drawn. The diagonal line has a purpose, as you will see later.

You may build a chain of boxes by repeated use of {Define Boxes to Use}; the new "strip" will be connected to the end of last strip, and so on. You should note the importance of the order of these boxes in the chain, since later on, when you paste text items into your boxes, the boxes are used in the sequential order as they occur in the chain.

{Modify Defined Boxes}

Although the software attempts to do a good job in using existing rules to build boxes, at times it may build a box that you do not want, or perhaps a box is built wrong. You can use the {Modify Defined Boxes} function to change one or more boxes. Once you entered this function, it prompts you to pick the item (the box) for modification. See Figure 6-4.

There are two kinds of modifications possible:

Delete a Box - you pick on the diagonal line of the box you wish to remove.

Merging two adjacent boxes into one - you do this by picking on the shared edge between the two boxes. The term "adjacent" here means that the two boxes must be next to each other in the box chain, even though they may not geometrically connect (i.e., actually share one edge). For example, if you have a strip of 4 horizontal boxes, and you have deleted the 3rd box, now if you pick on the right side of box 3, you'll see it merges with the original box 2, thus becoming a large box covering the area previously occupied by boxes 2 and 3.

In either case, if you made a mistake, you can immediately pick {Undo} to restore the last change introduced.

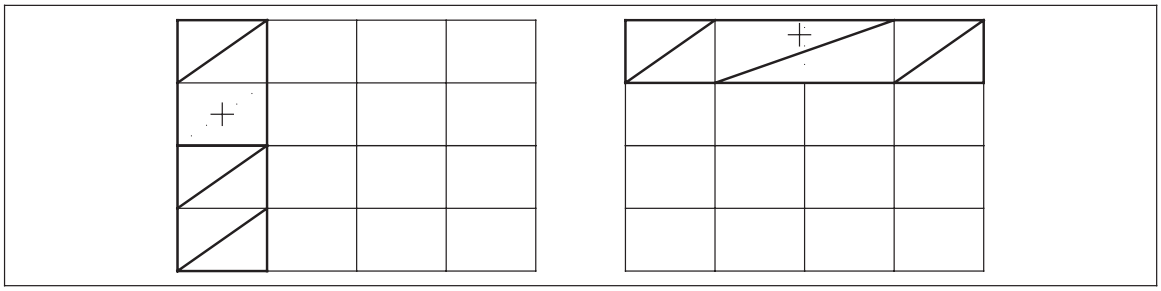


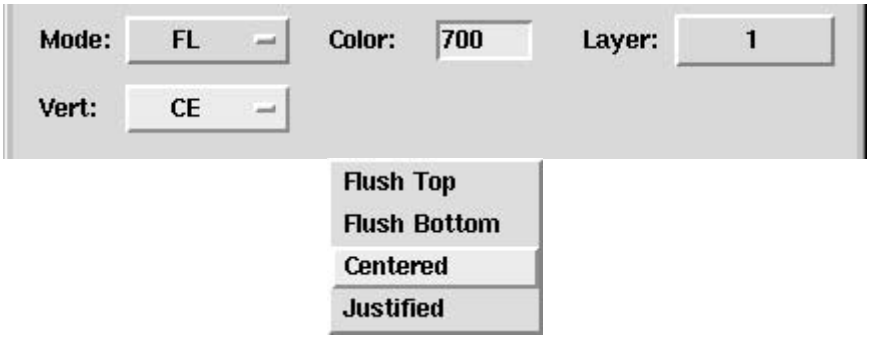
Figure 6-4: {Edit Selected Boxes} – Deleting a Box and Merging Two Boxes

{Set Gutters}

A Gutter is the amount of space between the text item and the edge of the box area. To keep text items from sitting on the very edge we assign a gutter value. Within a box you may set gutter values for all 4 sides. The gutters are then used in calculating true horizontal and vertical measures.

Mode, Vert for {Place Text into Boxes}

The *Mode* feature lets you determine how your text will fall "Horizontally" on its determined position. Such as, falling with either its right or left endpoints at the selected position, or centered at this position. "Justified" means that all lines of a particular paragraph will have the same length except for the last line. *Vert* controls the "Vertical" positioning of text inside the boxed area.

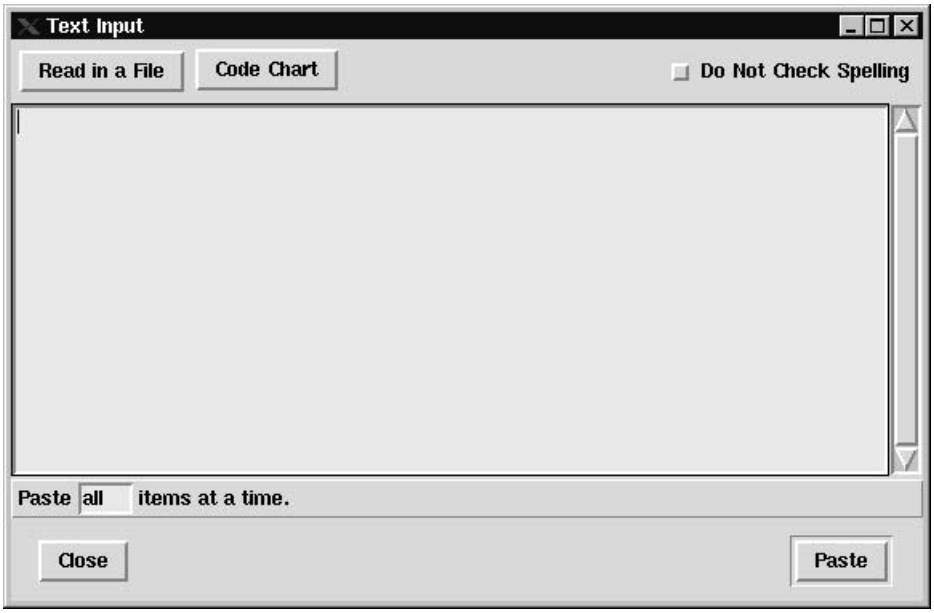


{Prepare Text to Paste}

Before text items can be composed and positioned into boxes, a number of controlling attributes must be set, such as {Set Attributes} and {Gutters}. Please note that attribute settings have been provided default values, and that you are really not required to set them every time before you paste text items. But if you desire settings different from the default, or different from those used in the last paste, you should change them before performing the next paste operation.

Once you have set your attributes and defined your boxes, click {Prepare Text to Paste}. This will immediately open a "Text Input" window. Here you can type in your text or "Read in a File" any pre-keyed data file.

When keying in your text for {Place Text into Boxes} you can use the "Immediate Commands" if desired. These commands if used will override any current text attribute. You must also place a blank line between each text item entry to signify when text should go to the next box.



{Paste # of items at a time}

After you have entered all your data, by default the paste operation will attempt to use all the boxes that exist. If you do not wish this to happen, you can set a value here to limit the number of boxes to use for the next paste.

Usually, you will enter a positive integer for this value, greater than zero and less than the number of boxes currently available. A special value, zero, tells the program to use all available boxes. This is useful after you have set this count to some value and later wish the program to resume using all available boxes.

Once you are finished select [Paste]. You will then see your text items flow into the boxes in the order they were defined. You can do an immediate {Undo} if something should fall in the wrong place. This {Undo} will undo the entire paste and place it back in the editor window.

If you have remaining text in your paste file and are still inside the {Place Text into Box} function, if you select {Prepare Text to Paste} again, the remaining data will return. If you leave {Place Text into Boxes} then the remaining data is lost.

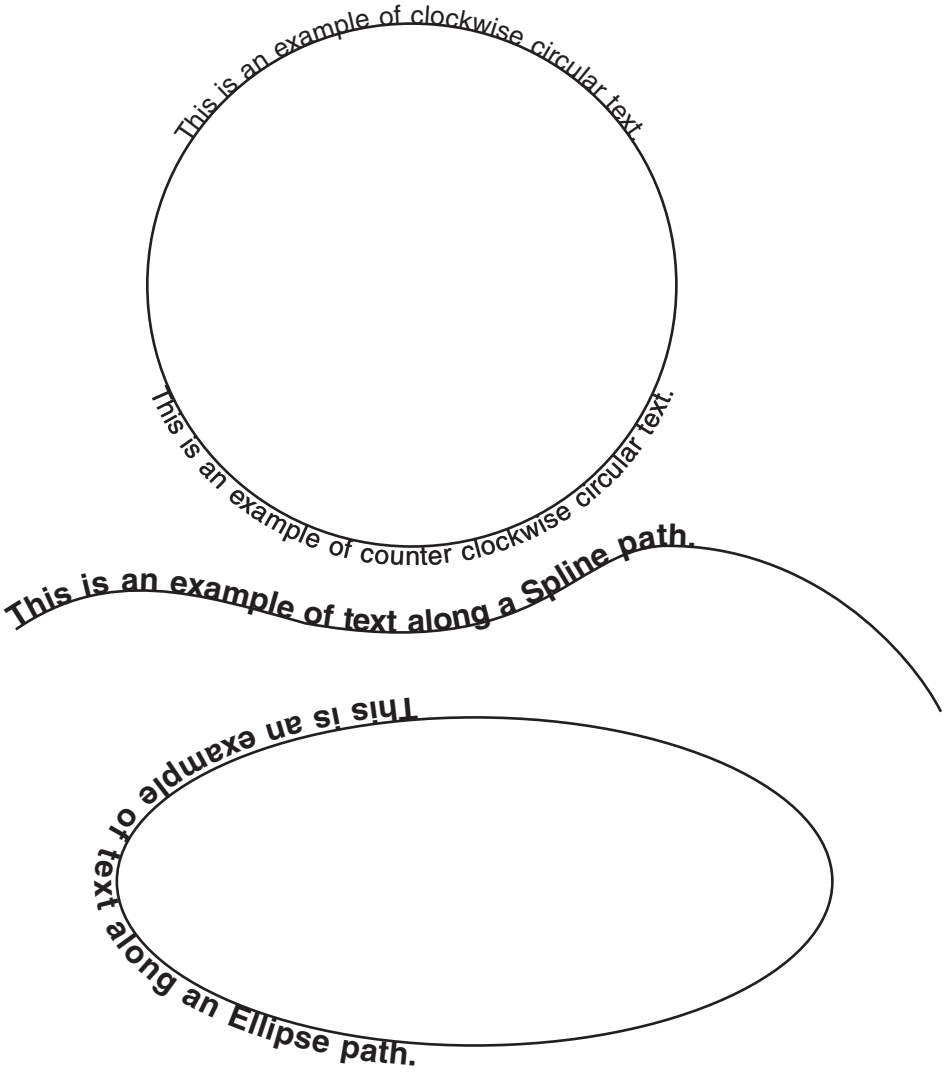
Using {Undo}

After a paste, you may immediately pick on {Undo} to (unpaste) the text items just processed. This results in text removed and boxes redrawn. Note that this undo is only allowed immediately after a Paste Text operation.

You should remember that this {Undo} drops all text paragraphs just pasted, not just the "last paragraph". So unless you really want to, don't use it lightly.

{Placing Text on Circle} and {Place Text along Path}

These options are dedicated to creating specialty items in which the baseline of the text follows a circle, ellipse, arc, or path. The path being made up of vectors or splines.



Examples of Circle Text and Text Along a Path

How Its Done

Step 1:

First **draw a circle.** This circle is the baseline of where "Outside" text sits and the top of "Inside" text.

Step 2:

Now, go to the **[Text]** option, select **{Place Text on Circle}.**

1. Right click to see the **Circle Text** options
2. **{Set Text Attributes}, [Okay]**
3. Choose whether you want your text to be **{Inside Placement}** or **{Outside Placement}.**
4. Now choose **{Pick Circle}** and pick anywhere on your circle. This will bring up the **Input Editor.** Type in your text, and then select [Okay]. Your text will now display running along the circle.

Regenerating Previous Text

If the text is input wrong, it can be regenerated as long as you have not exited out of the Circle Text function. Select {Undo}. You can now reselect your positioning, reset the text attributes, and/or edit the input text.

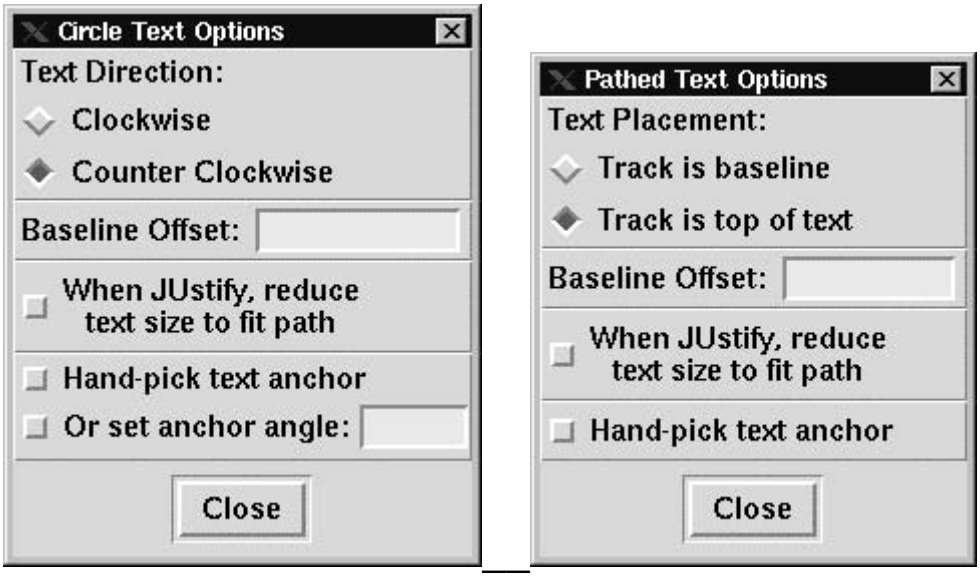
Miscellaneous Information

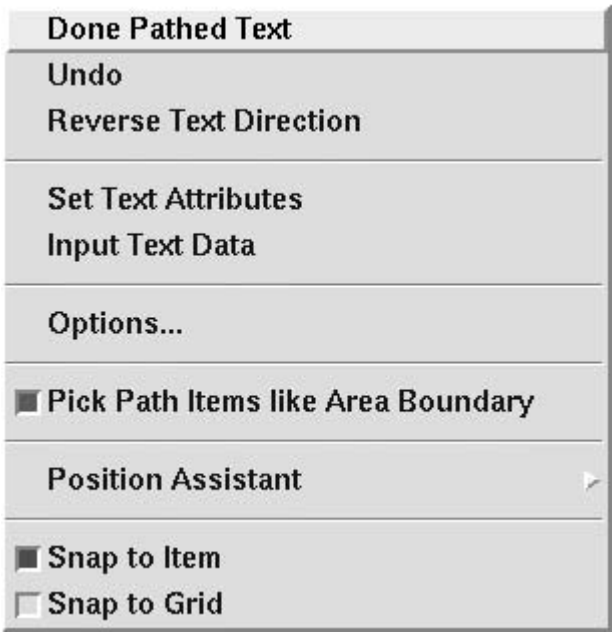
HR, US, and FILL immediate commands are not supported with Text Along a Path. If you input more text than the path will allow, it will hang out. For Circle Text, if you input more text than the diameter can hold, it will continue along the diameter creating an overset.

Edits cannot be made to the text once you have left the Circle Text or Along a Path options. It is individual letters, not words or sentences.

The horizontal size controls the baseline positioning of the text. If you need to change the point size, letter spacing, or word spacing, delete the old text and recreate the circle text.

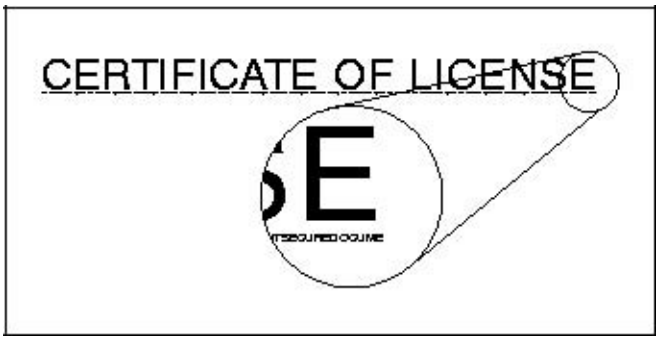
Condensing type can be accomplished by using the horizontal size as the point size. Then in the graphics menu, change the [Vertical Size] to what is needed.





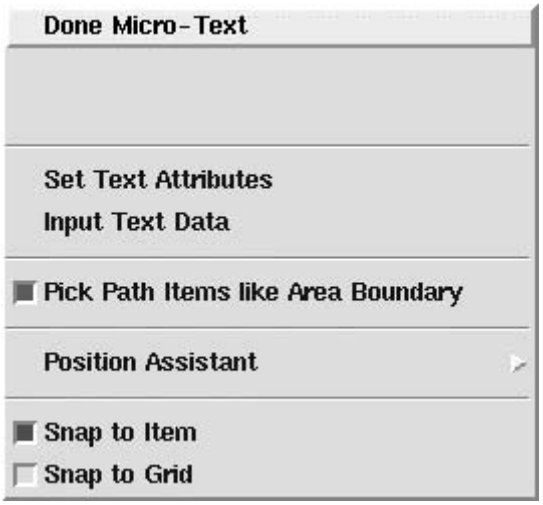
Micro-Text

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 can be read when magnified.



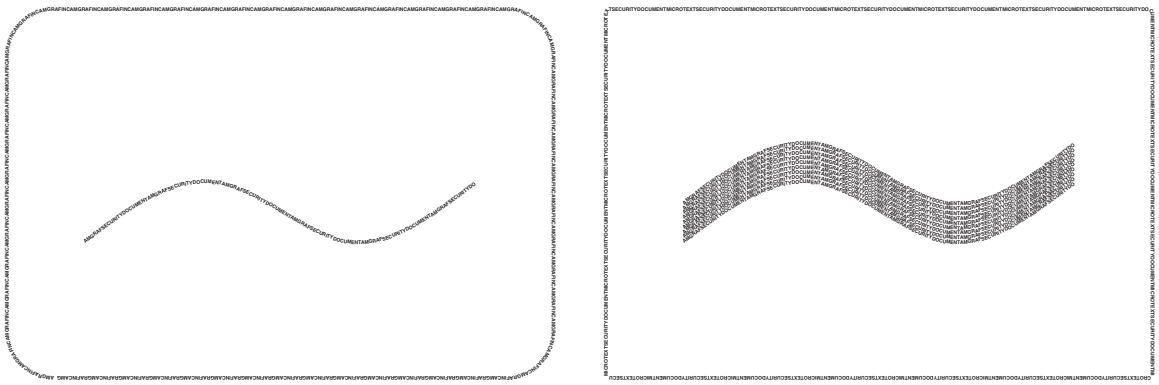
Suboptions:

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



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.

Below is an example of micro-text along vectors, splines, and boxes.



Creating Micro-Text

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 block out 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

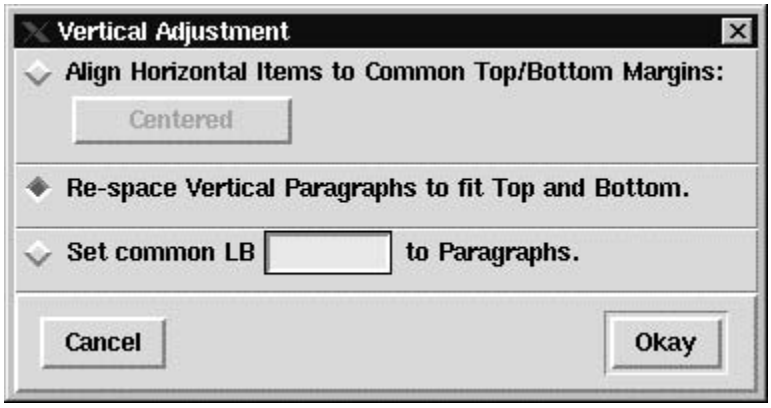
The micro-text input is being stepped to fill the path length. It will cut off at any character once it fills the length. If the vector path makes a drastic angle change, it does its best to achieve a smooth transition. Placement of the micro-text is centered vertically along the vector, spline, or box 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 the {Pick Path Items like an Area 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.

Vertically Adjust Text Positions

Text positions can be vertically adjusted using this option. Selecting the V adjust option brings up the following dialog box:



You have two options to choose from: Align Horizontal Items or Vertically Respace Paragraphs.

Align Horizontal Items: This option has been added to MECCA to allow for easier vertical positioning (leveling) of horizontal form headers, which have the wrong vertical position due to resizing or editing.

The four placement modes are mutually exclusive, at any time only one of them can be selected: Flush Top, Center, Flush Bottom, Justify

Group the horizontal column text headers and then indicate the top and bottom of the area by picking immediately at the prompts or using the options {Set Top} and {Set Bottom}, respectively.

Once the placement mode, plus top and bottom limits are known, the program will prompt you to "pick the text item(s) to vadjust". You may put the text items you want to change in a group only if they are horizontal from each other (such as column heads) and do the vertical position changes at one time. Do not group together two paragraphs (one above the other) and try to vertically position them both. They will be placed at the same vertical position, which will put them on top of each other. Note that this function only changes text position, not components such as lines, circles, etc.

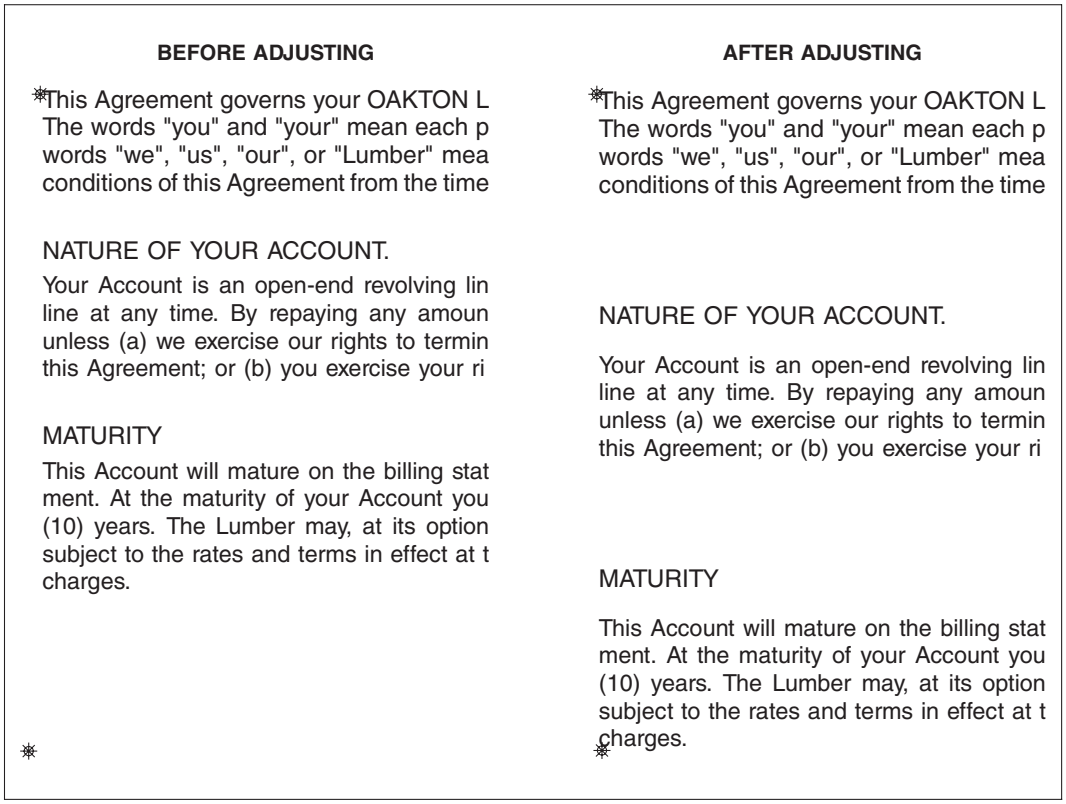
Important Notes

The {Justify} mode changes the line spacing between the text lines in the repositioned paragraph. To change it back, or change it further, you would have to use the {Change Leading} function under {Change Text Attributes}.

The {Flush Bottom} mode moves the baseline of the last text line in the paragraph to the bottom limit provided. There is no provision made to account for any descenders that may be in this text line.

At any time you may go back to the menu to change the placement mode, or one of the limits.

Vertically Respace Paragraphs: The text items to be adjusted must be grouped. This option retains the respective relationship between items and then adjusts them accordingly between a top and bottom pick



Set Common Lead Before to Paragraphs: This option also requires the paragraphs to be grouped. Type in the new lead before amount, click okay and pick the group. The first paragraph will remain in the same location; all others will be spaced vertically according to the lead before value.

Word(s) from PS Letters

This text option is used for cleaning up text from converted PostScript files, which have broken up words and lines of text into individual letters.

Group the text to be assembled first, and then select **{Word(s) from PS Letters}.** Its dialog contains three parameters:

Baseline Tolerance: This sets a tolerance of what text will be deemed on the same line.

Wordspace Multiplier: A group of letters will be collected into words if its horizontal distance is less than twice its wordspace value.

Minimum Text Size: This allows you to control the point size at which you want text to start collecting.

As text is collected it will remove all trailing and stand-alone HSA values encountered, and insert any appropriate immediate commands for the following conditions which change: horizontal size, vertical size, point size, font, style, composition mode, color, and layer. Any other attribute will cause the collection for that word/line to stop.

{Get Text Outlines} and {Areas from Text}

There is an option for getting outlines of text found under the [Area] tool. The Get Text Outlines function outlines text with splines. Group the text to be outlined and then select the {Get Text Outlines} option.

Use the {Set Line Attributes} menu for the outline attributes. It is recommended to place the outlines on a layer other than the text layer.

The {Areas from Text} option is also under the [Area] tool and works with grouped text. The {Areas from Text} does just that, makes area components that look like the text picked. It is recommended to place the new pieces on a layer other than the text layer.

Note: These options use .olg pre-processed font outline files.

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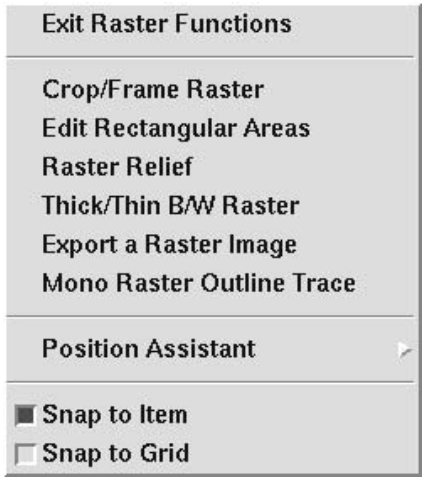
Chapter 7: The [Raster] Tool

What are Rasters?

Raster files are a collection of pixels (patterns of on and off squares) giving the illusion of being lines, circles, and text. Although they appear to be valid text or lines, they are not and can only be edited through the [Raster] option. For black-and-white scans there is an option for pixel editing called {Edit Rectangular Areas}.



The actual creation of a raster component is not covered here. See the *Scanning* chapter, which discusses creating the raster by scanning the image.

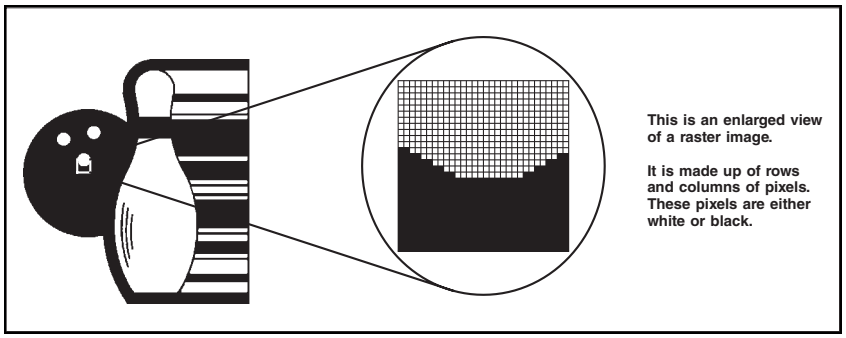


Figure 7-1: Enlarged View of the Raster Image

Using Raster Images

Raster files are great for graphic images, such as clip-art, logos, and labels. The scanner captures these images automatically from paper artwork and converts them into an electronic file. The technique is similar to that used by photocopiers and facsimile machines. Once the image is captured, it can be combined into illustrations or merged into paginated documents.

Usually the image captured is not exactly what is wanted. It needs cleaned up, enhanced, or colorized. We recommend that you use GIMP (GNU Image Manipulation Program), a full-featured pixel-editing program. GIMP can be accessed from the [Start] menu.

MECCA 2000's Raster tool allows you to crop photographs, halftones, and black-and-white images. It also has features for editing black-and-white images, such as: add edges, edit rectangular regions of the raster, and thicken or thin the raster for chokes and spreads.

A Raster Image is made up of rows and columns of pixels. Its “resolution” is how many pixels are considered one inch. See Figure 7-2. Through the [Query] option, you can find out information about the raster.

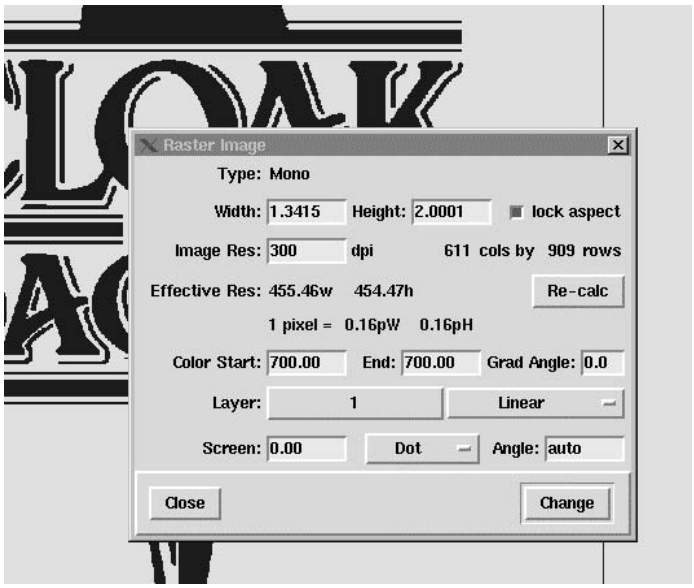


Figure 7-2: Raster Information as shown through [Query]

The dialog box will tell you its original scan resolution and the effective resolution. It can be different from the original scan resolution if the image has been scaled. When in the [Query] dialog, if you make any changes to the size or resolution, click onto the [Re-calc] button. It will report the new pixel info in the dialog box.

Despite the simplicity of using a raster file, there are some very serious drawbacks in using them. Raster files use tremendous amounts of data-storage space. The pixel values have to be stored for every point on the scanned image. It will take up to 10 times longer

to output a raster image than a regular vector image because the output device must address each individual point.

Graduating a Mono (Black-and-White) Raster

Raster images, which are just “black-and-white”, can have a directional graduation applied. To graduate such an image, use the [Query] tool. Only when you [Query] the raster component will you have available the Color Start and Color End attributes.

Graduating a raster will output 8- or 12-bit PS gray values for each “black pixel” in the image, depending on the RIP PostScript level. When outputting to a color printer or color EPS file, then each pixel becomes 32- or 48-bit. Be aware the time it takes to generate the PS file will be considerably longer and the resulting PS file will be much larger.

The Query dialog will report a rough estimate about the image PS size since the files created during printing will be large. Graduating rasters will not increase the drawing file; only the printer file size is dramatically increased.

Checklist for Logo Clean-Up

Before you start cleaning up your logo, make sure you have the best scan possible. This may require scanning it more than once, possibly changing the Brightness Levels and/or the Resolution. It will be faster to scan several times for the best image, than it would to clean up a poorly scanned image.

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.

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.

A decision at this time needs to be made on whether you should work with the raster image or have it outline traced and work with vectors and splines. This is based on the type of logo. If the logo has a lot of detail, raster image is best. When scanned it may come in looking good, leave it as a raster and do the minute detailed pixel editing through GIMP before bringing it into MECCA.

Once you have the best image, and have made all of the detailed pixel cleanup through GIMP, then you are ready for MECCA 2000's editing options.

The functions listed are in the order in which they are found on the menu. This is not necessarily the order in which you would use them.

Crop the Raster Image - Even though you may have scanned only the logo you need, there will always be either white pixels around the outside, or interference in the scan. Cropping will leave only the logo area needed.

Trim Blank Frame - When cropping, it is easier to just crop around the item and then use this function to do the tight frame cropping. It will drop out all blank pixels.

Edit Raster File, Fill Pixels or Clear Pixels - This is clean up on any obvious larger blemishes. Using the dynamic rectangle to fill or remove any unwanted area.

Save the Raster and Print to Proof Printer - At this point you are ready to see how it will print. It is hard to judge (especially for new operators) by looking at it on the display only.

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.

{Crop/Frame}

The following sub-options deal with the outside boundary or "frame" of the raster image. It allows you to cut edges off through the crop and trim options or add pixels if you find you need an edge.

Options:

> {Crop Raster Image}, {Trim Blank Frame}, {Add Solid Edge}, {Add Clear Edge},

All of these options use a white rectangle to display the raster frame. As soon as the image is picked, a white rectangle with handles in all four corners and in the middle of each side will appear. This is the exact size of the raster. Picking any one of the corners will allow you to adjust the image diagonally. Picking a handle in the middle of a side, will allow you to adjust that particular side only.

If you make a mistake while using any of these framing options you can select **{Restore}** to recover the last change made.

{Crop Raster Image}

Cropping means to "trim" or "cut-off" the outside edges of the raster image. The scanner will capture any data seen whether it is desired or not. This means that fingerprints, wrinkles, paper imperfections, and parts of the logo not wanted, will be part of the scanned image. Cropping allows you to cut-off these extra image pixels and reduces the frame and file size to a manageable size.

Prompts:

> Pick Item to Crop, Pick Where

Select the **{Crop Raster Image}** function. The prompt states **"Pick item to crop",** do this. As soon as the image is picked, a rectangle with handles in all four corners and in the middle of each side will appear. This is the exact size of the raster. Picking any one of

the corners will allow you to cut the image diagonally. This way you can crop the image easily by picking first the top left corner and then the bottom right corner.

Pick the top left corner of the raster image displayed in the window. **Move the cursor diagonally toward the center.** The box will shrink down and to the right. When you feel the area inside the box is what you want, **select the new location.** The image will clear and be redrawn, reflecting the change you have made. Repeat the same process, using the lower right hand corner.

You can also crop only one side of the image by selecting the middle of the image's side. Just like when choosing a corner, the white box will appear, but only the side selected will move.

Since cropping only allows you to work with rectangular images, you may then need to use {Edit Rectangular Areas} to remove pixels that are still within the cropped image.

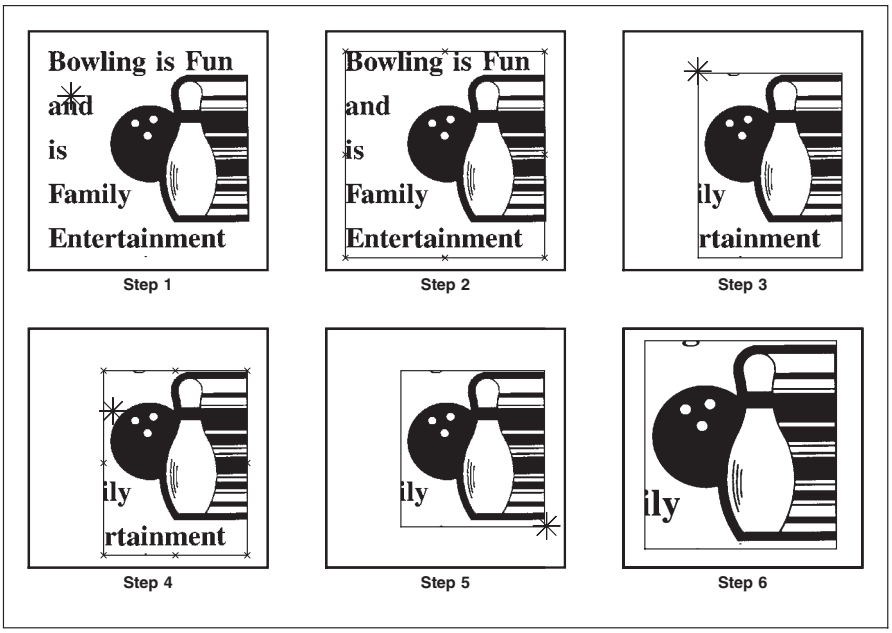


Figure 7-3: Cropping Out the Unwanted Portion Makes the File Smaller

{Trim Blank Frame}

This function crops an image automatically down to its tightest frame possible. The frame becomes just large enough to enclose all black pixels. After trimming, always go back to crop and check the frame. You may need to crop off a smudge or black pixel and then trim again.

Prompt:

Pick Item to Trim

Note: Use Trim after {Edit Rectangular Areas}, {Clear Area} to make your raster image the most efficient for data storage and printing.

{Add Solid Edge} {Add Clear Edge}

It is sometimes desirable to add pixels around an image for additional editing. These functions work the reverse of cropping. They allow the addition of a Solid or Clear-(Invisible) edge to be placed on the sides of the scanned image. You will be expanding the actual file size with these commands.

Prompts:

Pick Item to Expand, Pick Where

Select your raster image, then **pick the upper top middle handle** and move up. The white rectangle will show you where your new edge will be. **Select the new point** and the image will be redrawn reflecting the additional solid pixels or clear space.

If you need all edges to have the same width, you can use {Hold Pos} from the handle and type in a thickness.

{Edit Rectangular Areas}

This feature allows you to selectively change rectangular areas of a black-and-white raster image. You will use a dynamic rectangle to mark the area, which is to be effected. The pixels inside the rectangle and the ones intersected by the edge of the rectangle will be modified. The window will immediately redisplay showing the new results.

Using **Edit Rectangular Region** you can fill a region, clear a region, or reverse a rectangular region.

You can use the [Zoom] functions to greatly magnify the raster image. This will allow you to change small details.

Pick **{Edit Rectangular Areas}** then **pick the first corner** of a dynamic rectangle defining the area to be modified on the raster image. Rubber band the rectangle outward and **select the second corner.** This defines the region to be changed. If you haven't selected an option, you will get **Fill a Rectangular Region** with black pixels. This is the default. If you make a mistake, you can select {Undo} to discard the last change made. All of the options work in the same manner. An option will stay selected until you pick another one or quit.

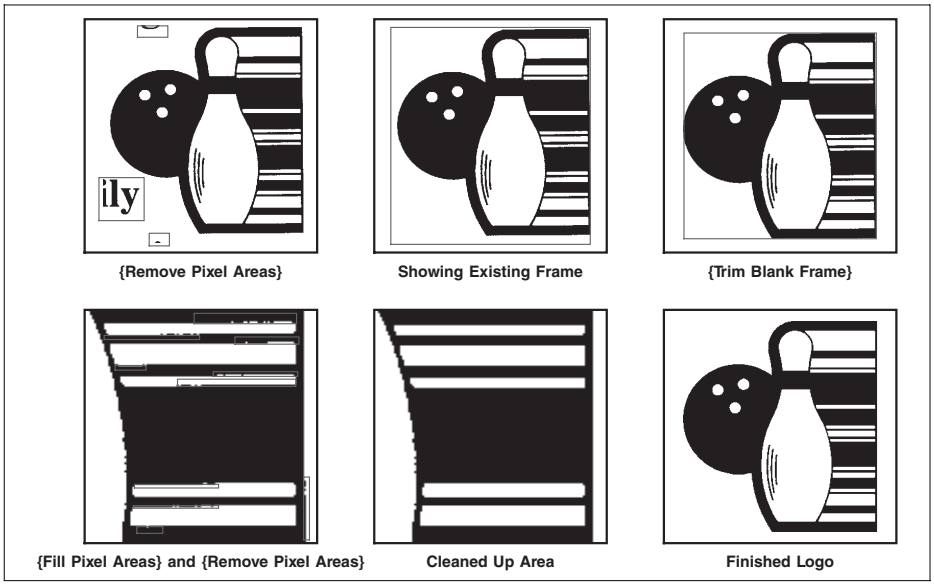


Figure 7-4: Cleaning Up a Logo Using {Edit Rectangular Areas}

{Fill/Remove Pixels}

This function looks for "holes" in the raster, then fills or removes them. Filling a hole turns a clear pixel black. Removing a hole turns a black pixel clear. A hole is a square region, whose pixel size is controlled by the {Set Min Size} option.

This option should not be confused with the previous {Edit Rectangular Areas}'s {Fill Area} or {Remove Area}. They have no similarities. The difference being this option searches through the entire raster image looking for square regions matching the {Set Size} stipulation and when finding a match, does the operation. It is recommended that most raster images use the default {Fill/Remove} one pixel. This will get rid of any singe pixel "holes" automatically. These single pixel areas are usually not wanted. Making the {Set Min Size} any larger will start to distort the original image.

Options:

{Set Min Size}, {Fill In Pixels}, {Remove Pixels}, {Use Previous Raster}

Prompt:

Pick Raster Item

Defaults:

{Set Size} $N = 1$, {Fill In Pixels} and, {Remove Pixels} are both ON.

{Set Min Size} lets the user indicate what N will be (type an integer from keyboard). A "hole" is a square region in the raster, whose size is N by N pixels; default $N = 1$.

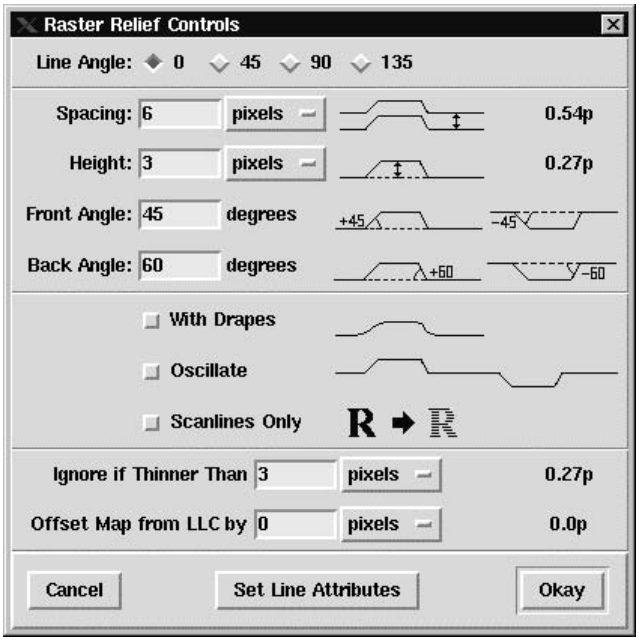
{Fill In Pixels} and {Remove Pixels} are toggle switches that indicate what actions will be performed when looking for holes. Upon entering {Fill/Remove Pixels}, both are turned on (default); but the user can select only one action (either fill or remove) at any time prior to picking a raster - of course, if both Fill and Remove are turned off, no action will be performed and the software won't do anything; in this particular case, the prompt changes to "Choose option or quit."

{Reverse Area}

This option will reverse (white-to-black, black-to-white) the area within the defined rectangle only.

{Raster Relief}

Relief is used to create an embossing effect with any scanned image. It makes the image look raised by drawing fine lines, which lift over the black portion of the image. It is especially useful for security documents because it cannot be easily copied.



Using the relief option is easy. Pick **[Raster], {Relief Raster}** and then **pick on your scanned image.** Picking on the raster will cause the Relief Raster dialog box to appear. MECCA will do the relief according to the defaults already in the system if you select [Okay]. The Line Attributes usually need to be set to a fine line weight, (possibly .003i).

Set Line Attributes: This dialog to set the weight, style, and layer of the relief lines.

You can change the characteristics of your relief by modifying the sub-options located on the **{Raster Relief} dialog.**

Line Angle: The default for the {Line Angle} is 0, so the lines appear straight across. By selecting a new angle you can alter the direction the image appears to be going.

Spacing: Pixel spacing sets the amount of pixels the program will skip in between the lines of the relief. The smaller the number entered, the smaller the space in between the lines.

Ignore if Thinner Than: This is the smallest number of pixels you want the relief to recognize when it is going across the image. The default value is two so the program recognizes all parts of the image that are more than two pixels across. If a higher number is entered your relief will appear to have more gaps in it.

Offset Map by LLC: This option moves the origin of the relief by pixels from the lower-left corner. Changing the default will cause the relief to move further into the image when it is drawn. The dimensions of the relief can be more pronounced if the origin is offset.

Height: The depth of the relief is what gives the image its 3 dimensional quality. If you would like the image to appear more raised the depth should be higher. The lower the depth the smaller the incline of the image.

Scanlines Only: If you choose this mode the relief lines will only appear on the parts of your image that are black.

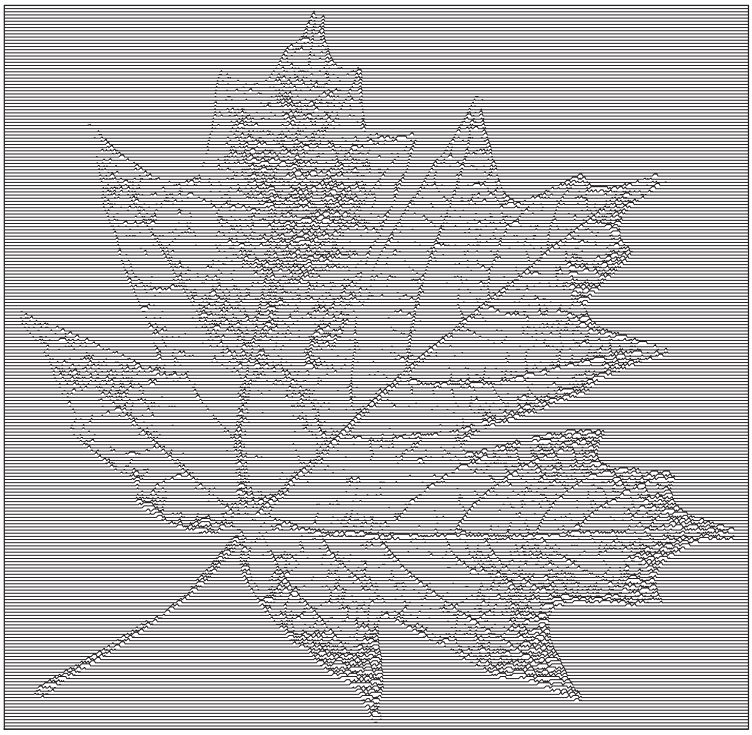


Figure 7-5: Example of Relief Background

> **Note:** *Relief can only be used with scanned images. If you are using relief on text the text must be scanned in first. Also, the raster should be full size during the relief process. If scaling is necessary, scale after the relief process is finished.*

Your image will need a white edge around the outside of the scan. You can use Raster's {Add Clear Edge} option if you have cropped to close. The distance between the edge and the scan must be equal or greater than the depth of the relief.

When the relief is created by the system it is combined. The lines will move, scale, and change as a group.

An interesting effect can be created when one relief is put over another. As an example, start your first relief with the {Line Angle} at 0. Then reset your draw angle to 45 and do the relief again.

{Thick/Thin B/W Raster}

This function traces the outer edges of all black pixels and then either adds a row of pixels (thickening) or removes a row of pixels (thinning). See *Figure 7-5.* This function is used to trap color-separated rasters. Use thicken to spread the lighter color.

Options:

{Set Pixel Width}, {Thicker}, {Thinner}

Prompt:

Pick Raster Item,

Default:

Thicker

{Set Pixel Width} lets the user type in the number of pixels to add/subtract.

{Thicker} and {Thinner} are mode switches indicating desired action to perform, they are mutually exclusive.

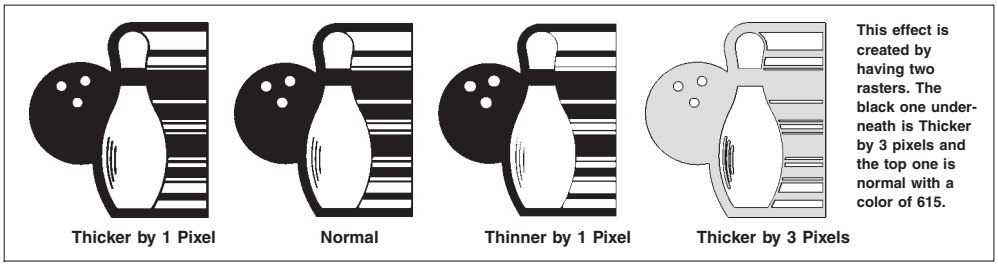


Figure 7-6: Using Thick/Thin Raster

{Export Raster Image}

This option allows you to export a single raw raster image as a ".bmp" file. If you have raster's [Combined] it will only export the first raster picked. Also, if your raster has been colorized, grayscaled or had any density corrections made to it, those changes will also ***not*** be exported.

Prompts:

Pick raster item to export

{Mono Raster Trace Outline}

Mono Raster Trace Outline is used to create an areas and/or splines from a Black-and-White scanned image. It makes the new components by looking at the black portion of the image.

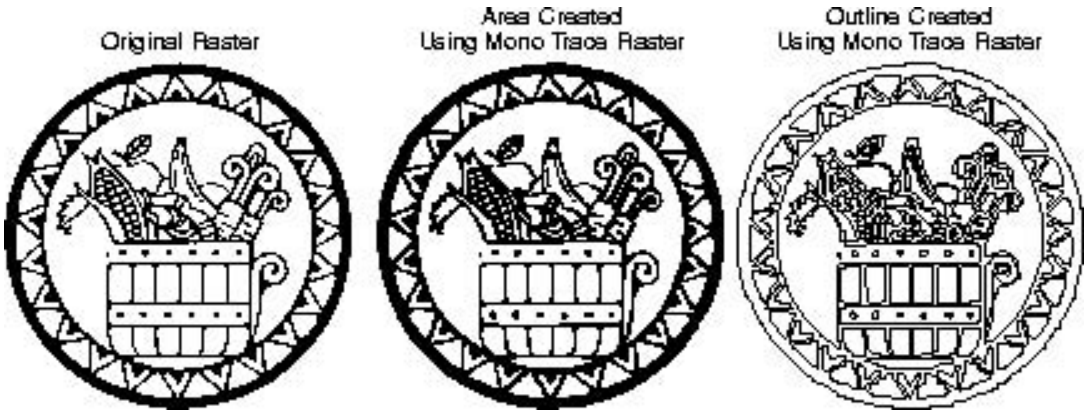
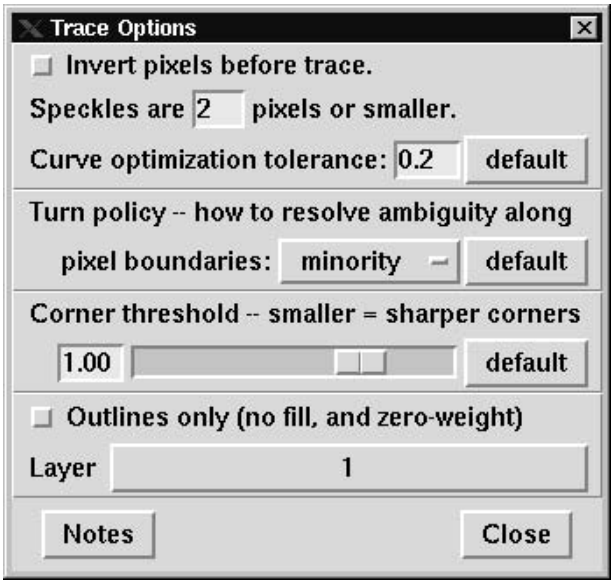


Figure 7-7: Examples of a Traced Raster

Using the raster trace option is easy. Pick **[Raster], {Mono Raster Trace Outline}** and then **pick on your scanned image.** Picking on the raster will cause the Trace Options dialog box to appear. MECCA will do the trace according to the defaults already in the system if you select [Okay]. Which is an Area on Layer 1. The new components are grouped.



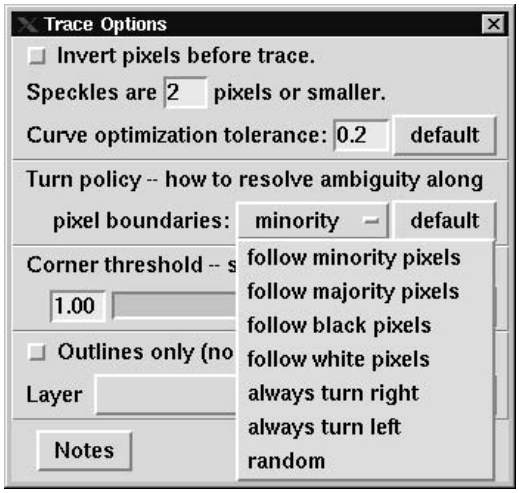
You can change the characteristics of your trace by modifying the sub-options located on the **{Trace Options} dialog.**

I**nvert Pixels:** Checking this will cause the option to look at the white pixels, giving you a reversed effect.

Speckles: The default is to ignore pixel groups of 2 because they are usually unwanted.

Curve Optimization Tolerance: How close does the outline trace around curves.

Turn Policy: This option has controls for how to turn along pixel boundaries. The default is “minority”.



Corner Threshold: This is a slider bar which controls how sharp a corner is seen.

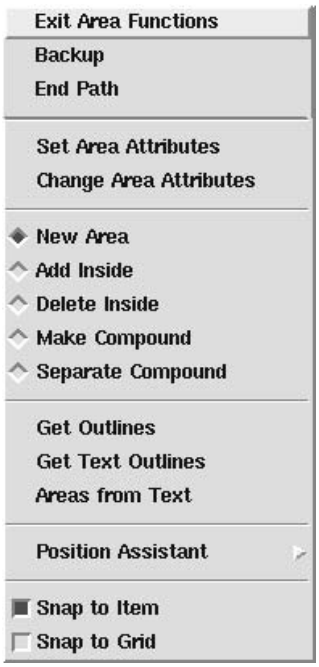
Outlines Only: If you choose this mode the trace is made up of zero-weight lines and splines that will appear on the Layer chosen.

Notes: This is an interface to an open-source program “potrace” a freebsd3 package.

Chapter 8: The [Area] Tool

An "area" is created by filling a closed boundary with a color. This area can have any valid color assignment from the gray series of numbers. An area component will show the "Area Attributes" when using [Query].

The set of menus found under the [Area] button allows you to create new areas and modify existing areas. There is also a function, which allows outlines to be traced around existing areas.



Information on Defining Area Boundaries

A path used for the boundary of an area can be made up of lines, circles, arcs, ellipses, and splines. An area needs a closed boundary to determine where the fill should be placed. This boundary is picked by the user, in a clockwise fashion, one component at a time. As the component of the boundary is selected, it will display white. There are some considerations in picking the boundary.

Special Considerations

Circles: A circle in itself is a closed boundary, so when a stand-alone circle is picked, it will automatically fill. If the circle has any components intersecting it, then the boundary is not so obvious and the area fill is not automatic. If you really only want the circle, select {End Path}. If you need the boundary to include the intersected component, pick it next, and then select {End Path}.

Using part of a circle (or spline) only requires that you pick on that desired section of the circle that is to be included in the outline.

Connectivity of Boundary Components

After you pick the very first outline component, subsequent components must connect one after the other. If a newly picked component does not match the endpoint of the previously picked component, an intersection is made (whether it is a true intersection, or a projected one) to maintain the connectivity of the outline path. Only when a parallel or collinear relationship is found, will the newly pick component be rejected.

You should bear this in mind when you deliberately pick a non-connecting component, as the result may not be what you expect. Furthermore, you should be aware of your current window scale factor. Large window dimensions may cause components a few points away from each other to appear as touching, thus, causing you to think that they are connected.

The software also attempts to identify if the latest picked component touches or crosses the very first component in the outline path. If either occurs, a closed area is formed immediately.

As you keep picking the outline components, the software attempts to detect whether a closed area can be formed based on the order and direction of the picked components. As soon as a closed area is identified, all the outline components will revert back to their normal color and the colored area will display. Sometimes, you may have picked all of the outline items, but the software still prompts, "Pick border item;" at this point select {End Path} to force a closure. This happens because the last item you picked does not actually meet the very first item picked on the outline route (although they may seem to).

When you get unwanted results, check for a boundary, which crosses itself. No boundary can cross itself, such as a "figure-eight". When needing this type of area, break the boundary into two sections first, and then fill individually.

Seeing Areas on the Screen

The [Window]'s *Color Mode* of *Spot* and *Process* will display areas. To revert back to construction lines only, use the *Color Mode* of *Type*.

Creating a New Area

Creating an area requires several basic picks. The area attributes are controlled by the current setups and are setup through the Set Area Attributes. Once an area is created, if an attribute change is necessary this would be accomplished through the {Change Area Attributes}.

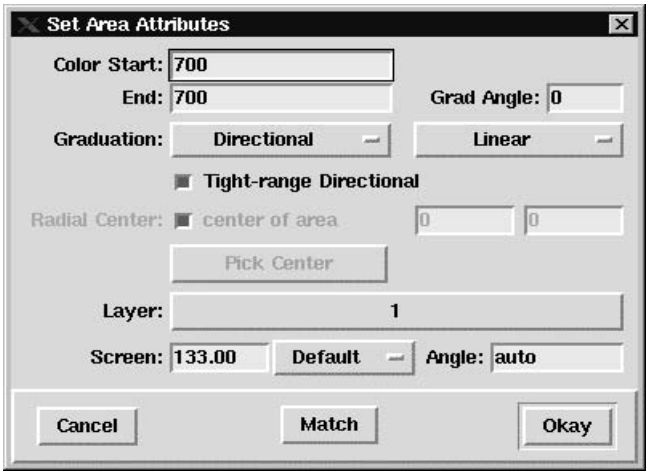
Changing the inside boundary of an area can be accomplished through the {Add Inside}, {Delete Inside} options.

{Set Area Attributes}

This menu is very similar to the standard {Set Line Attributes}. There are a few additions though, which are discussed below:

Defaults:

Layer = 1, Color = 0 (Black), Screen Lineage = 133, Screen Dot = Dot, Dot Angle = 45 degrees, Graduation = Off



Color Start option when selected will prompt for a color number. You must type in a number that is defined in a color table. The default color number for Color Start is 0 (which means 100-percent Black).

The ability to shade areas with white, black, and gray screens is part of the standard MECCA 2000 software. The ability to access all other colors in the rainbow requires the *Full Color Process Software* option.

Color End Select this option to input an ending color number, which is necessary to create graduated areas. Again, you must type in a color number from an already established color table. If you do not want an area with color shifts, then you do not need to explicitly set an end color.

Grad Angle lets you type in the angle (in degrees) for the direction of graduation from the *Color Start* to the *Color End*, with zero degree meaning left-to-right. See Figure 8-1. The start color is always in the center of the compass and the end color is at the end of the direction requested. Default graduation angle is 0 degrees.

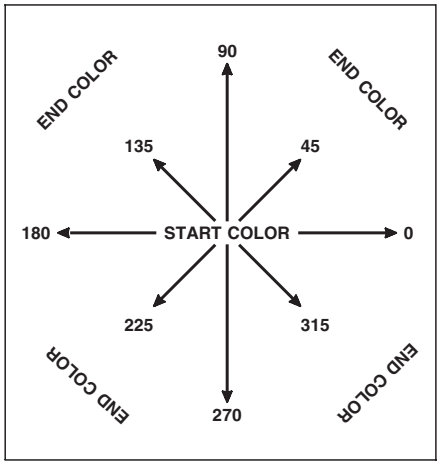


Figure 8-1: Direction Compass for Graduated Screens

Graduated option lets you control the graduation to be performed, whether it will be *Directional* or *Radial*. See Figure 8-2.

Linear splits the span of color into equal steps.
Logarithmic has more of the starting value span through the area.
Reverse Logarithmic Has more of the ending value span through the area.
Custom This allows the color shift to flow back and forth. It is controlled through a Graduation Progression Map (gmap) dialog.

For complete details on graduation usage, see *Chapter 3: The Box Tool, page 70.*

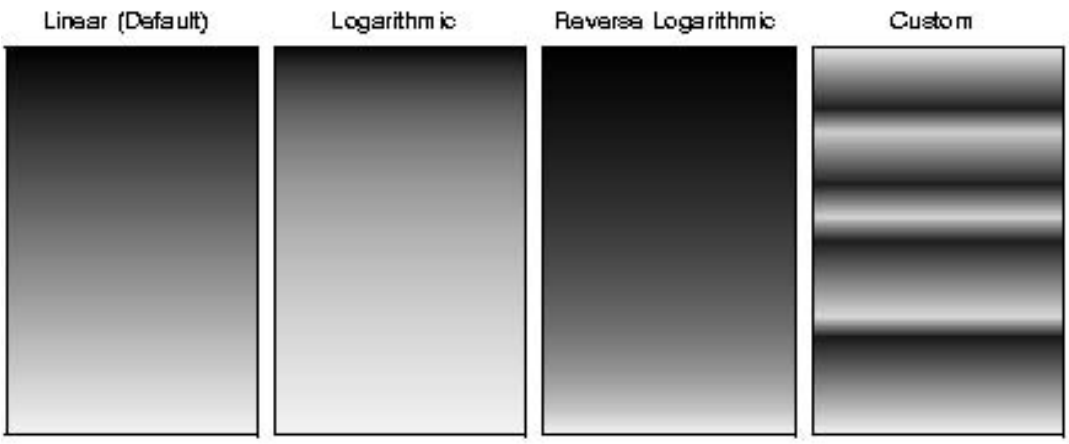


Figure 8-2: Examples of Graduation Types

If choosing *Radial* graduation, you then have an option of picking where you want the center of the graduation to be. See Figure 8-3.

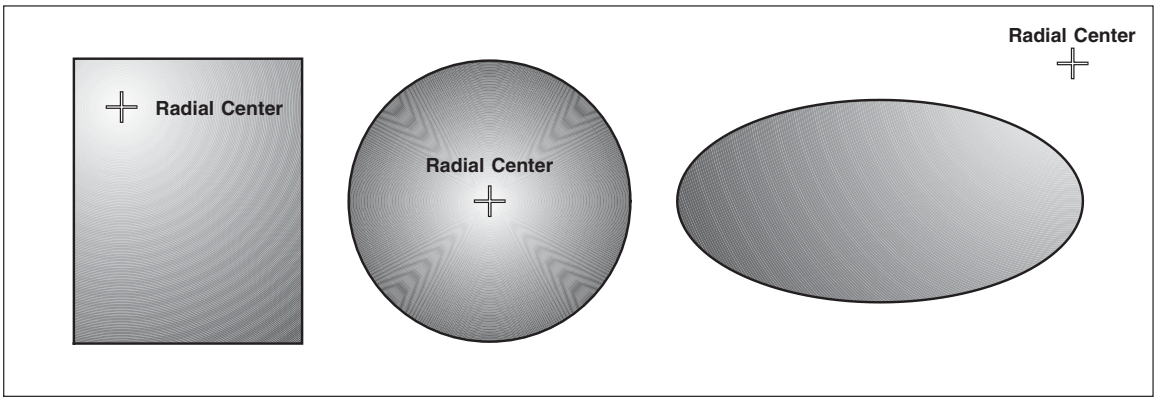


Figure 8-3: Different Radial Center Points

Layer Controls what layer the area will reside in.

For directional color/density graduation, MECCA III and MECCA 2000 always ran the full range through the bounding box of the component; thusly whenever the component is turned (rotated), the graduation range becomes too large.

Version 2.42 introduces **"Tight-range Directional"** to address that problem. This new choice is a checkbox in the dialog, applicable when "Directional Graduation" has been chosen.

{Add Inside}, {Delete Inside}

Add Inside will let you add a hole to an area. Once selected the prompt will say, "Pick area to add inside:" select the area to change. Then you will be prompted to "Pick boundary item for new area:" Then select {End Path} and the inside of the new area will disappear. When you are through adding your insides, select {Exit Area Functions}.

> **Note:** Compounded areas must be separated before you can use {Add Inside Paths} or {Delete Inside Paths}.

{Delete Inside} will take out inside paths. Once selected the prompt will say, "Pick area to delete inside." Select the area to change. Then you will be prompted to "Pick inside to delete", just select in the center of the inside path and it will be returned to a solid area.

{Make Compound}

The Make Compound option will let you take two separate areas and combine them into one area. See Figure 8-4. To achieve this, group the areas needed to be linked. Then select Make Compound this will join the two together. This is necessary when the graduation colors should span both areas. Once compounded they behave as if one item. It will pick up the first color value in the drawing list, if this is not desirable, then select {Change Attributes}.

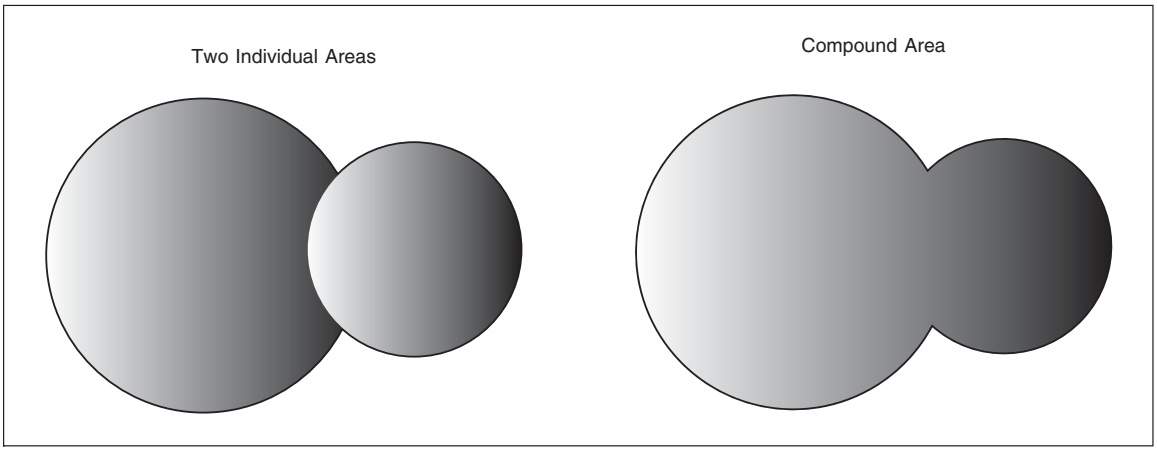


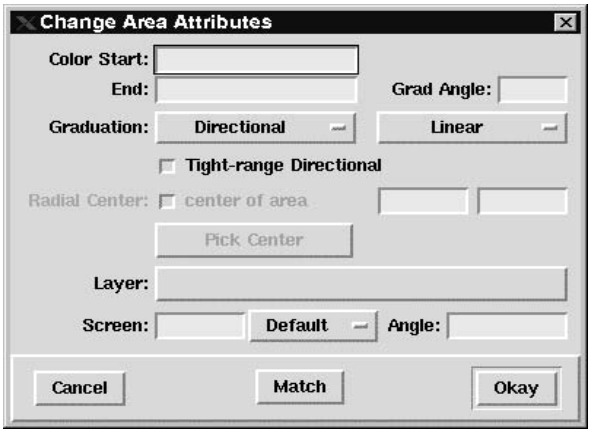
Figure 8-4: Graduation Spans Compound Areas

{Separate Compound}

The Separate Compound Area will separate compounded areas into individual areas again. When separating the color value of the compounded area will be copied to all individual pieces.

{Change Area Attributes}

This option lets you change your mind about the areas you have already drawn. Choosing this option will bring up a "dialog window" similar to the {Set Area Attributes} option. Make your necessary changes the select [Okay], and then pick the area to change.



{Get Outlines}, {Get Text Outlines}, {Areas from Text}

The Get Outlines function will trace an area and outline it with splines. Pick the area to trace or a group of areas. Use the {Set Line Attributes} menu for the outline attributes.

The {Get Text Outlines} option will outline text with splines. It also works with grouped text. The {Areas from Text} does just that, makes area components, which look like the text picked. It is recommended to place the new pieces on a layer other than the text layer.

Note: This option uses .olg pre-processed font outline files.

Areas from Rasters

Under the Raster Function is an option called Mono Raster Outline Trace. This option will trace the black pixels of the raster image to create an area-filled image. This area can then be altered with the Change Area Functions.

For more details see *Chapter 7: Raster Tool.*

"Simple" Areas Exercise

This exercise will help us to understand how the [Area] tools work. We will be creating the drawing in Figure 8-5.

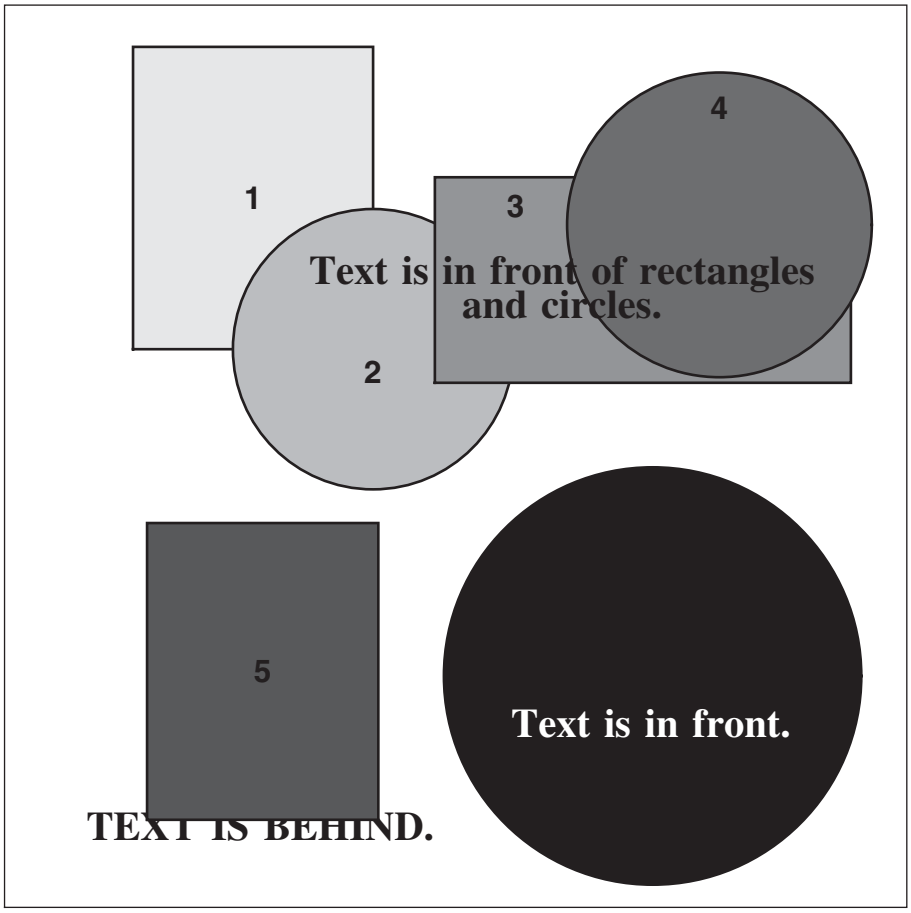


Figure 8-5: The Finished Product of this Exercise

We will be using the gray color numbers; you may use other colors if you wish. The gray colors are found in the six hundred series of numbers. They are percentages of gray with 600 being white, and 700 being 100-percent black. The number 630 will give you a gray 30-percent screen. The number 605 will give you a gray 5-percent screen.

Step 1:

Start MECCA 2000, this will establish defaults. Draw a Rectangle by using [Line]'s {Prorate Rules}, 33.5 picas square, with a 1-point line weight, and solid square ends. Now, **[win-fit].** This will be our working area.

Looking at Figure 8-6, **draw the rectangles and circles in the order that they are numbered - 1 through 6.** This is the drawing order. When drawing be sure the circles and rectangles overlap each other, like the example. What you will notice once we have created areas, is that circle-2 was drawn on top of rectangle-1. The circle-2 area will block out the bottom right corner of the rectangle. Simply put, the circle is in front of the rectangle.

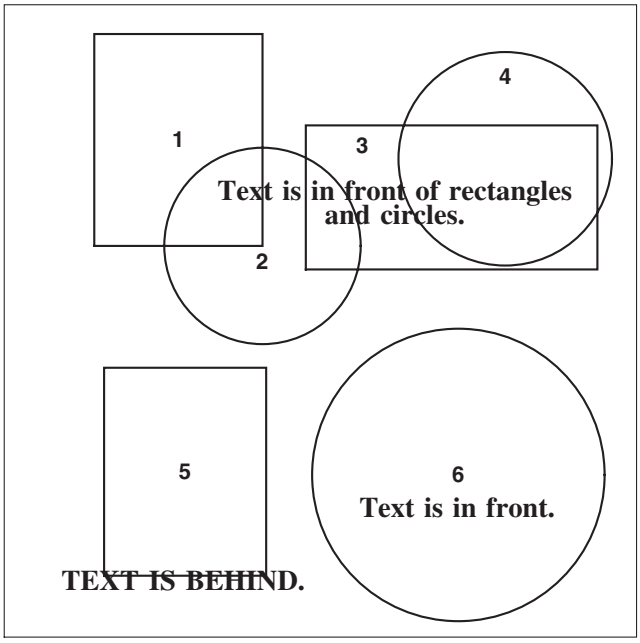


Figure 8-6: Building the Foundation of the Drawing

Now, **place in the text.** We used Times Roman, Bold, 18-point type for the sentences, and Geneva, Bold, 14-point for the numbers.

[Query] one of the rectangles. Within [Query]'s dialog window you will see *Color=700* and *Scrn=133*. This tells you the color of the rectangle is number 700, and the screen lineage is 133. Color number 700 is defaulting to 100-percent (solid) black. The screen lineage of 133 is also default and has no bearing when using 100-percent black.

Now, pick **[Window],** and then click *Process* for color mode. Once you select **[Okay],** We are ready to create areas.

Step 2:

1. **Select [Area]**

2. **{Set Area Attributes}**

3. For **Color Start and End**
   Type in: **610** - This is a 10-percent gray.

4. For **Screen**
   Type in: **40** - This is a good lineage for 300dpi printers.

5. **[Okay]** the setups –

6. Select **{New Area}** You will be prompted to "Pick boundary item for new area".

The four individual lines that make up the number 1 rectangle are the borders for the area within the rectangle. Starting at the top, in a clockwise fashion, define the area by consecutively picking each individual line. See Figure 8-7. As each line is chosen, a crosshair will appear, accepting the pick. When a closed area has been defined, by picking the last line on the left, right mouse click and select {End Path}, then the area will be filled with a gray screen.

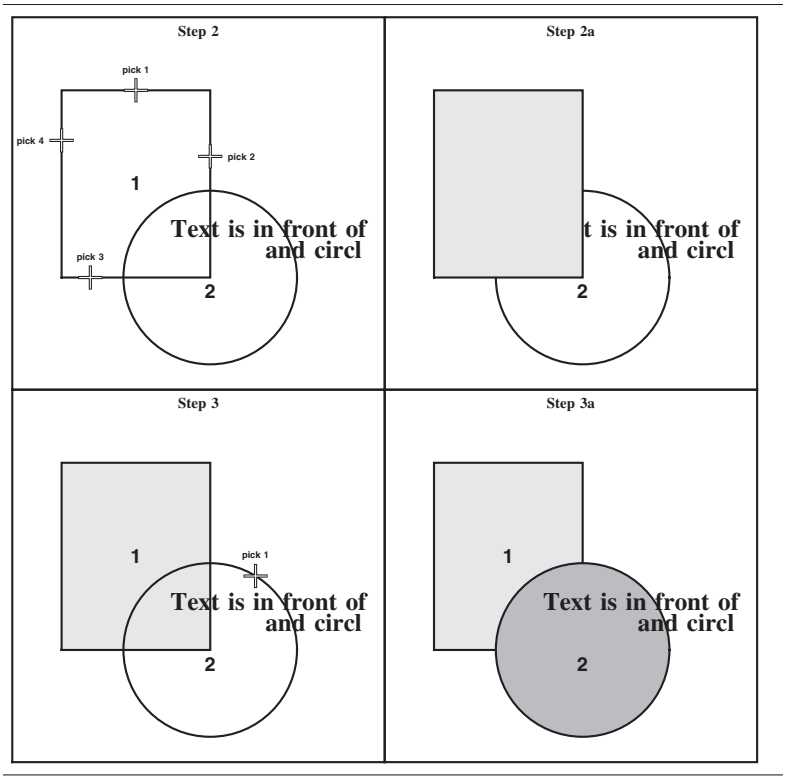


Figure 8-7: Picking Border Items and Redisplaying the Window

At this time the drawing order is established and the circle is shown in front of the rectangle. Areas are automatically dropped behind their respective outlines and text because of the {Change Depth Order} default {Send to Back} option.

Step 3:

1. **{Set Area Attributes}**

2. For **Color Start and End**
   Type in: **630 [Enter]** - This is a 30-percent gray.

3. **[Okay]** to keep the setups. - You will be prompted to "Pick boundary item for new area"

   Here we are going to pick circle-2. Since it is an enclosed area only one pick is required. A crosshair will appear then right mouse click and select {End Path}.

Step 4:

Create areas for the other pieces with the following colors: rectangle-3 with the color number 650, circle-4 with the color 670, rectangle-5 with 680, and circle-6 with 700. Do this in the same fashion as you did previously.

Step 5:

You have probably noticed that our text for rectangle-5 is not behind the rectangle as it says. Since the text was input last, it is on top of everything else. To match our example, we will need to change the "depth order" of the display.

1. **[Change]**

2. **{Depth Order}**

3. **{Send to Back}** - You will be prompted, "pick item to re-arrange."

Select the text. The screen will repaint with the text being the first one displayed. It has been put at the very back of the drawing, meaning it will lay down first and the rectangle will be on top of it.

Step 6:

Again looking at our text, we have mysteriously lost the text inside circle-6. The text is really there. It is the same color as the circle, so we cannot see it. We need to change it to be white.

1. **[Window]**

2. Select **Type** for Color Mode. This will cause areas not to display, but the text will.
3. **[Quit]** - Our screen is now displaying the vectors and text only, no areas. This eases picking of items within areas, such as the hidden text.

4. Quit out of {Depth Order} and [Change].

5. **[Text], {Change Attributes}**

6. Change the **Color** to 600. Type in: **600** - This is the number for the color white.

   You will be prompted to "pick text item to change," select the pieces of text in circle-6.

Step 7:

Your drawing is complete. Display it on the screen in *Process* Color Mode. The text can now be seen.

Chapter 9: The [Barcode] Tool

A barcode is a group of printed width varying patterned bars, cells and/or modules intermixed with empty spaces, designed to be scanned and read by computer assisted devices for the retrieval of information or identification for the object it labels. Often the numerals (human-readable) are printed along with the barcode.

MECCA 2000 has composer software supporting twelve types of barcodes: Codabar, Code 3 of 9, Postal ZIP Code, Postal FIM, UPC A&E, Interleaved 2 of 5, Code 128, EAN-8, EAN-13, Intelligent Mail, and 2D Data Matrix. Each of these barcodes have their own distinct qualities, but there are general rules to follow (which we will discuss first) on creating any barcode.

Figure 9-1: Different Barcode Types

Barcodes are a component type, which have their own menus during creation, but you must use [Query] to make any changes to an existing barcode. When picking on a barcode do so within the bars area of the barcode.

General Information

Barcodes are completely menu driven such that all attributes are input to generate the barcode. In the menu, height and characters per inch (density) control the size of the barcode. You will notice in the menus the default units of measure is mils (t = thousands of an inch).

Barcodes are broken down into three main parts: the barcode, the background, and human-readable numbers. The menus we have mentioned assist in assigning attributes.

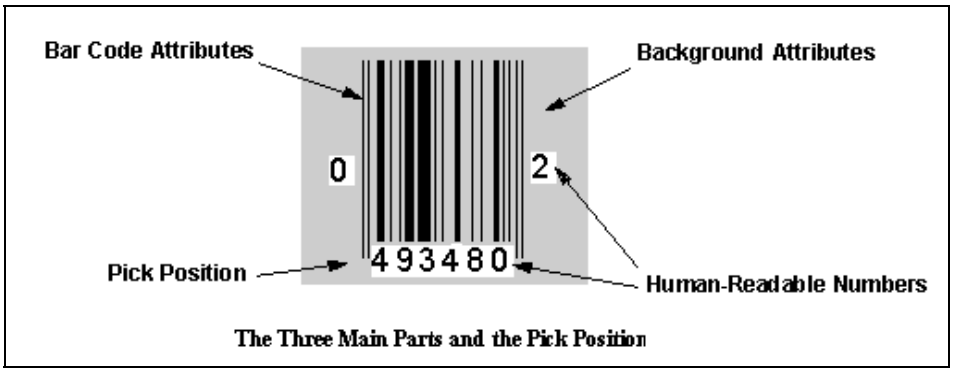
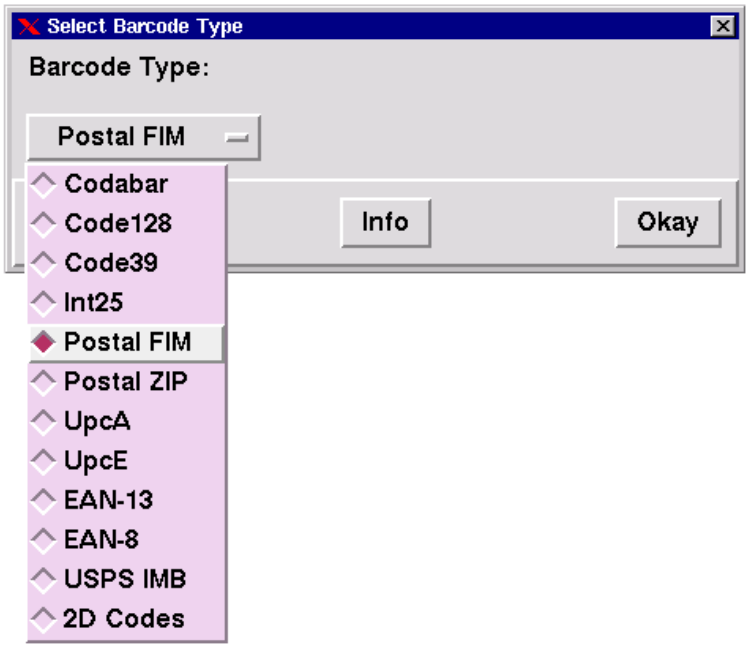
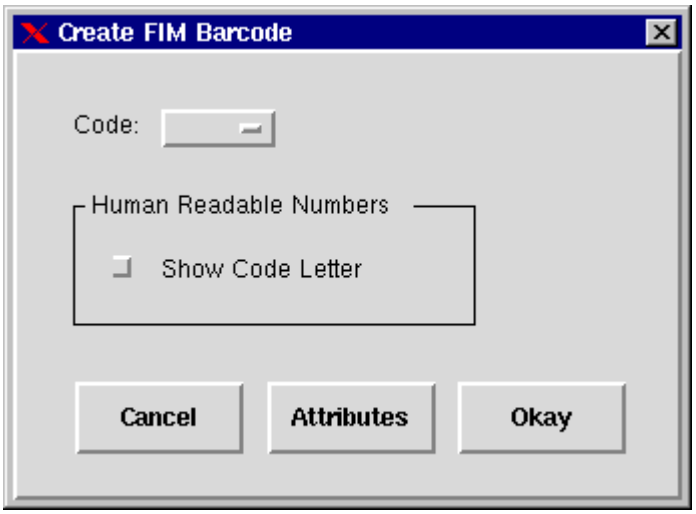


Figure 9-2: Three Main Parts and the Pick Position

To get into the barcode menu, select **[Barcode].** You will be prompted to "Select code type for new barcode". Choose a Barcode by selecting from the "pull down" menu.



Click **[Okay]** to accept the choice. This will bring up the "Create Barcode" dialog window.



Setting the Attributes

Code: The first item is the code number for the bars. Naturally this is a unique field per code, but for all types the code number can be typed in manually or (if creating an existing label) scanned with a barcode reader. If scanning with a barcode reader, make any changes to the menu first, then scan. A return is usually scanned at the end of the code and it closes the menu immediately after scanning. *Note:* If scanning a Code 3 of 9 with a barcode reader, be aware that a space (even though a valid character) cannot be scanned by the reader into our menu. In this case the code number must be typed in manually.

All items have their own color, screen and layer options to allow you ability to assign the bars, background and printed numbers any mix of colors.

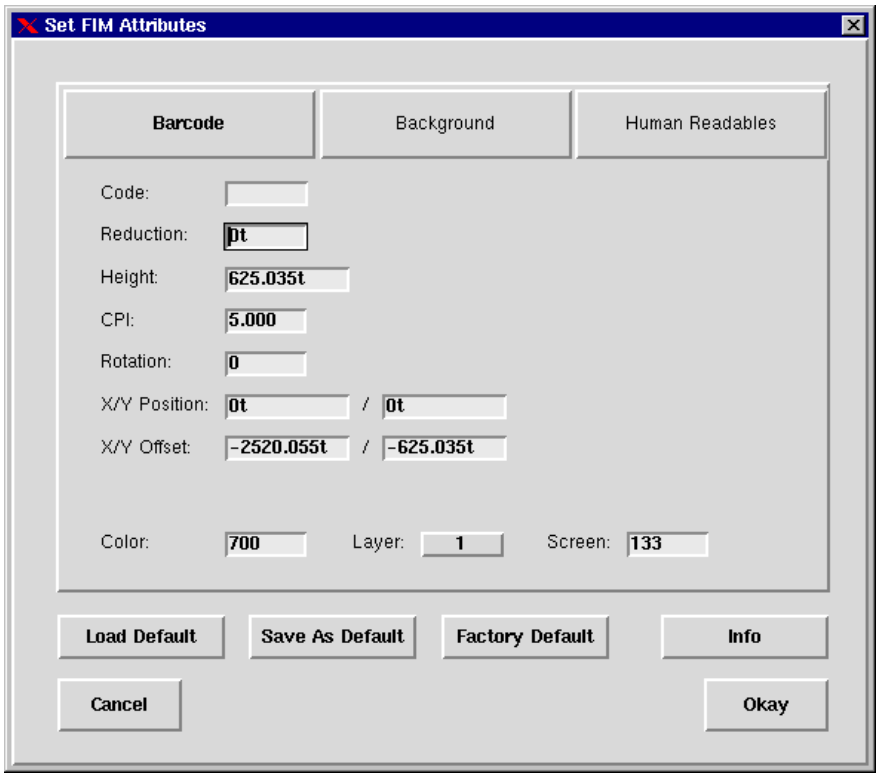
Barcode Attributes: Here we are assigning attributes to the bars themselves.

Reduction: is measured in mils (t = thousands of an inch) and is the amount of bar width reduction required to account for press expansion.

Height: is measured in mils (t = thousands of an inch).

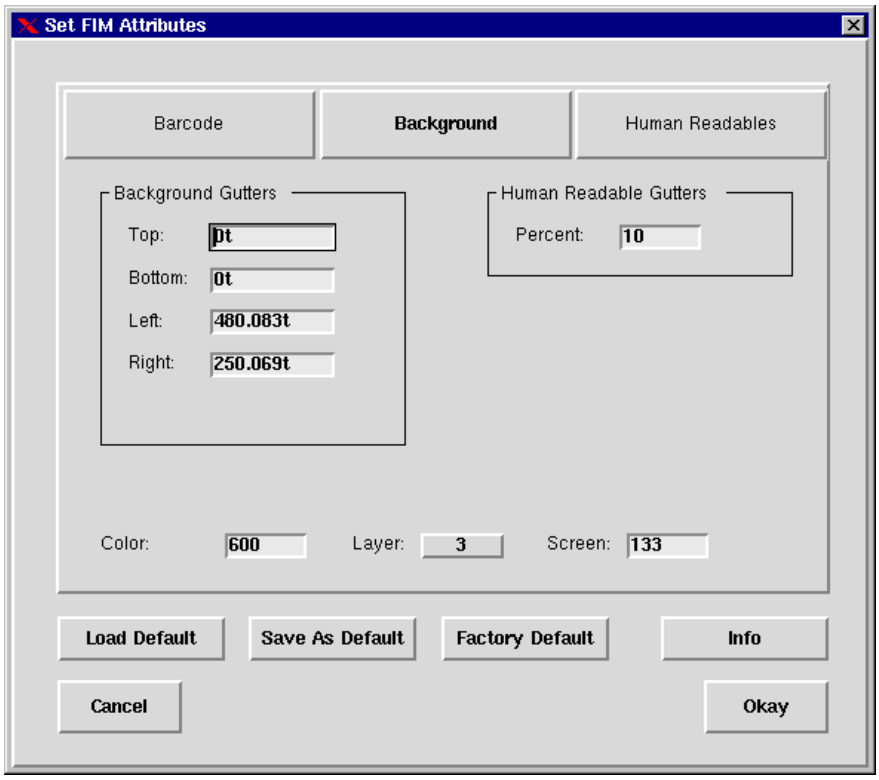
CPI: is characters per inch horizontally. This is the printed density of the bars. Each barcode has its own standards as to how many characters are recommended per inch, but be aware that the output resolution must be taken into consideration. The 2.78 cpi is necessary to produce a barcode which can output on a 300 dpi output device and be

legible. A 10 cpi barcode would be too dense for a proof printer, but would work just fine on a high resolution output device. Magnification is only available for UPC's and then only available in the following percent magnifications: 80, 85, 90, 95, 100, 105, 110, 115, and 120.

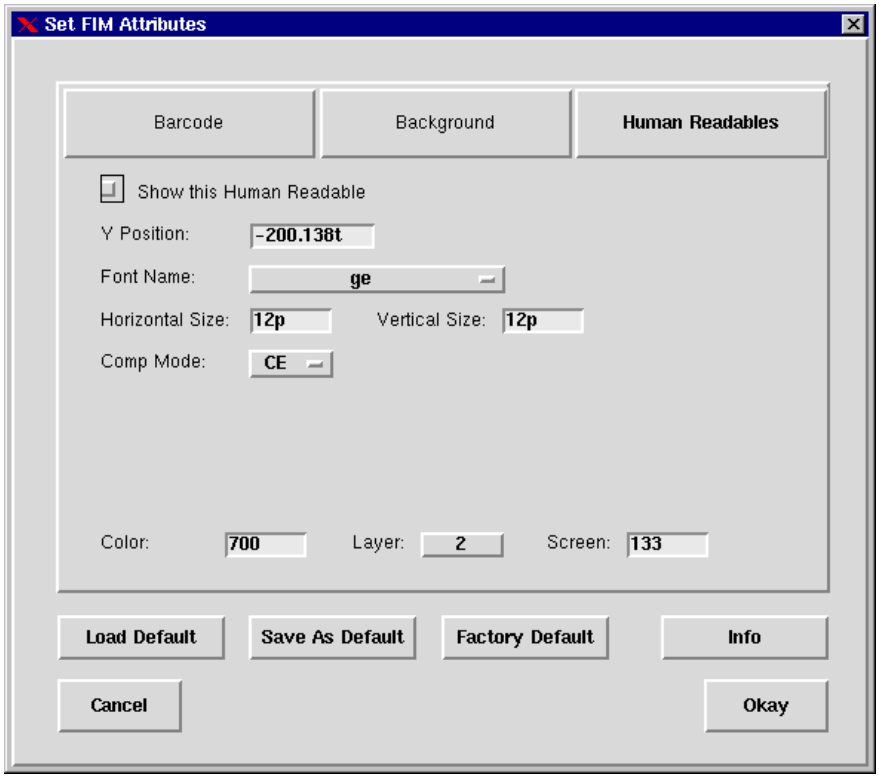


Background Attributes: This is for the rectangular background area that shows through the bars. The gutters control how much the background extends out from the bars. See Figure 9-3. Gutters are measured in mils (t) unless specified otherwise. If no background is wanted at all, type in **-1** for the color. Each of the Human-Readable Numbers have a background area of their own. This allows knockout of the bars in the case of UPC codes.

Figure 9-3: Use of Gutters and Y-Position Numbers



Human-Readable Numbers: If you want the code numbers to print click the "Show this Human Readable" toggle button. The Y-Position controls where the numbers will print. Measure from the bottom of the bar to the baseline of the numbers.



According to type of barcode there are other human-readables, such as start and stop characters, system numbers, etc. These will also print if you want them by clicking on the toggle button.

Hint: If you do not want the human-readable to print, but do need the operator to see the code numbers, it is suggested that you do one or both of two things: 1) specify an invisible color (same as background) for the numbers; or, 2) put the code numbers on a layer which is ignored or off during output.

Generating a barcode is easy. After you have selected your attributes click [Okay]. You are then prompted to "Pick Position to Place Barcode". When you pick you position the barcode will appear. If you need to make changes to the barcode select {Modify Barcode}.

Interactively you can [Group], [Move], [Copy], [Delete] or [Rotate] a barcode. They cannot be mirrored. Barcodes are a component type which have their own menus during creation, but use [Text]'s **{Edit Text}** to make any changes to the individual barcode. When picking on a barcode, only the bars are seen. Pertinent information about the barcode can be displayed with [Query].

If there is a need to change any of the menu defaults, you will need to edit the file */usr/mecca/cfg/barcodes.ini*

Adjusting Defaults

The file which controls what barcode menu is displayed when generating a barcode is called *barcodes.ini* This file is located at */usr/mecca/cfg.* If you want to make a change to this file, login as *root* and edit the file *barcodes.ini.*

> **Hint:** It is recommended that you first copy the file and rename it as *barcodes.sav.* This saves the original if needed.

Following is an example of *barcodes.ini*

```
[Barcode Attributes/Codabar/100/BAR/Main]
"Number Digits"="10"
"Start"="a"
"Stop"="b"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
```

```
[Barcode Attributes/Codabar/100/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="100.138t"
"Background Right"="100.138t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/Codabar/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Codabar/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Codabar/100/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Codabar/100/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Codabar/100/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Codabar/100/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Codabar/BAR/Color]
"Spot Color Density"="700"
[Barcode Attributes/Codabar/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Codabar/GTR/Color]
"Spot Color Density"="600"
[Barcode Attributes/Codabar/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Codabar/HR1/Color]
"Spot Color Density"="700"
[Barcode Attributes/Codabar/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

```
[Barcode Attributes/Codabar/HR2/Color]
"Spot Color Density"="700"
[Barcode Attributes/Codabar/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Codabar/HR3/Color]
"Spot Color Density"="700"
[Barcode Attributes/Codabar/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

Controls for Human-Readables

In the file *barcodes.ini* there are also fields which control the font, style, horizontal size, vertical size of the human-readables.

Throughout, the human-readables have been given the default of Geneva, Normal, 12-point. If this is not satisfactory, you can edit the *barcodes.ini* file and change the appropriate fields

```
[Barcode Attributes/Codabar/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Codabar/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"
```

As you can see there are also composition modes. The human-readable barcode number **(HR1)** is defaulted to centered within the bars. The start **(HR_2)** and stop **(HR_3)** characters are flush right and flush left relative to the barcode number. The **background percent** is the white space around the human readable text. It is a percentage of the human readable vertical size. See Figure 9-4.

The **GTR** is the inside measurement between these three fields. With the following attributes set this would mean there should be no space between the start character and the barcode number and the stop character and the barcode number and the gutter around the human readable is 10% of the vertical size.

```
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"
```

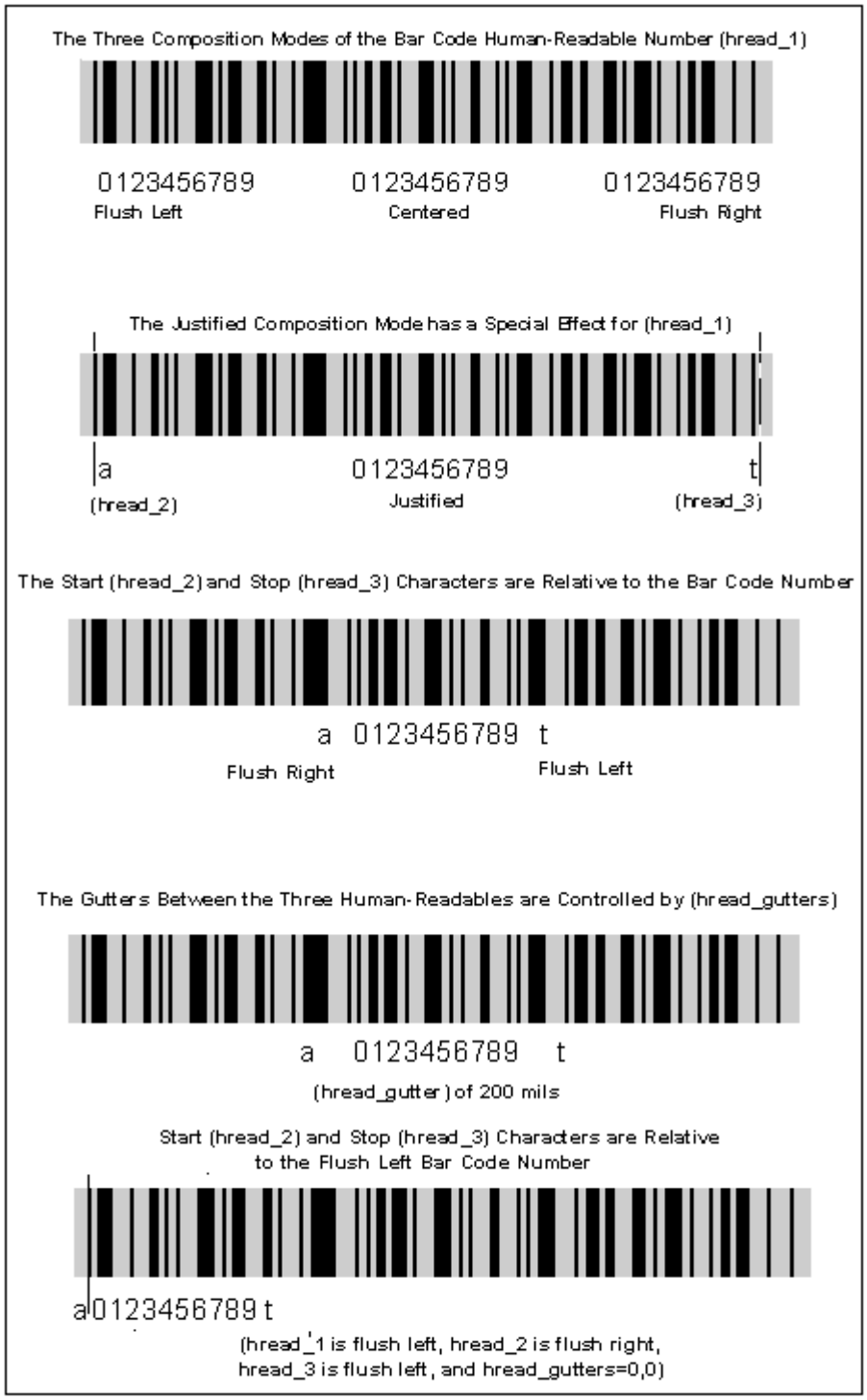


Figure 9-4:Composition Modes of the Human Readables

Codabar

Generating a Codabar barcode requires you to input the 10-digit **Codabarcode.**

This barcode is typically a 10 digit code plus Start and Stop characters. The start and stop characters are generated automatically. The "Number of Digits" is a check against not typing in the right amount of digits.

Once you have input the Code Number, clicking **[Okay]** will generate a barcode with given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Start and Stop characters. See Figure 9-5. If you want them to print, click the toggle button "Show this Human Readable".

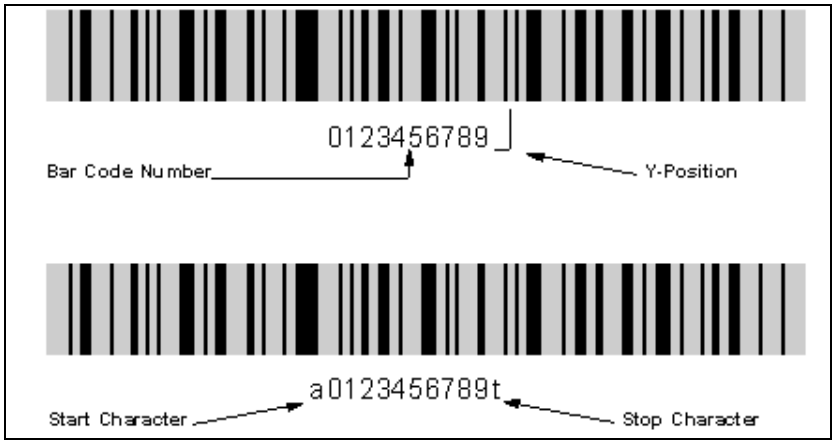


Figure 9-5: Default Codabar and with Start and Stop Characters

Codabar Facts

Font Name:	cd
Style:	n
Start:	a, b, c, d
Stop:	t, n, *, e
X/Y Offset:	0,0
Minimum Digits:	1
Maximum Digits:	16
Valid Characters:	[0-9], -, $, :, /, +
Height:	500 mils (Approx. Vertical Size = 36 point)
CPI:	2.78 (Approx. Horizontal Size = 36 point)

Changing Defaults in the Codabar Menu

Any of the default attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/Codabar/100/BAR/Main]
"Number Digits"="10"
"Start"="a"
"Stop"="b"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/Codabar/100/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="100.138t"
"Background Right"="100.138t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/Codabar/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Codabar/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Codabar/100/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Codabar/100/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Codabar/100/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
```

```
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Codabar/100/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Codabar/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/Codabar/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Codabar/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/Codabar/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Codabar/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/Codabar/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Codabar/HR2/Color]
"Spot Color Density"="700"

[Barcode Attributes/Codabar/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Codabar/HR3/Color]
"Spot Color Density"="700

[Barcode Attributes/Codabar/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

Code 3 of 9

Generating a Code 3 of 9 barcode requires you to input only the **Code 3 of 9 Code** and then decide whether you want a **Check Digit** or not.

> **Note: A space is a valid character, but the menu will not accept it. To generate a space use our tilde (~) character.**

Check Digit: The check digit is calculated from the code through various mathematical steps, and is a second verification that the correct code was read when scanned. If you want the Check Digit click the toggle button "Add Check Digit". This will add one character to your code automatically.

Once you have input the Code Number, clicking [Okay] will generate a barcode with given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Start and Stop characters. See Figure 9-6. If you want them to print, click the toggle button "Show this Human Readable".

Figure 9-6: Default Code 3 of 9 Showing Check Digit and Start/Stop Characters

Code 3 of 9 Facts

```
       Font Name:  ctn
           Style:  n
           Start:  *
            Stop:  *
      X/Y Offset:  0,0
  Minimum Digits:  1
  Maximum Digits:  16
Valid Characters:  [0-9], [A-Z], space, -, ., $, /, + ,%
          Height:  500 mils (Approx. Vertical Size = 36 point)
             CPI:  2.78 (Approx. Horizontal Size = 36 point)
```

Changing Defaults in the Code 3 of 9 Menu

Any of the default attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/Code39/100/BAR/Main]
"Check Digit"="N"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/Code39/100/GTR/Main]
"Background Top"="250.069t"
"Background Bottom"="250.069t"
"Background Left"="250.069t"
"Background Right"="250.069t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/Code39/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/100/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/100/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
```

```
[Barcode Attributes/Code39/100/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/100/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/BAR/Color]
"Spot Color Density"="700"
[Barcode Attributes/Code39/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Code39/GTR/Color]
"Spot Color Density"="600"
[Barcode Attributes/Code39/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Code39/HR1/Color]
"Spot Color Density"="700"
[Barcode Attributes/Code39/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Code39/HR2/Color]
"Spot Color Density"="700"
[Barcode Attributes/Code39/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Code39/HR3/Color]
"Spot Color Density"="700"
[Barcode Attributes/Code39/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/Code39/105/BAR/Main]
"Check Digit"="N"
"Angle"="0"
"CPI"="6.25"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/Code39/105/GTR/Main]
"Background Top"="250.069t"
"Background Bottom"="250.069t"
"Background Left"="250.069t"
"Background Right"="250.069t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/Code39/105/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
```

```
"Vertical Size"="12p"
[Barcode Attributes/Code39/105/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/105/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/105/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/105/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/105/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/110/BAR/Main]
"Check Digit"="N"
"Angle"="0"
"CPI"="6.25"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/Code39/110/GTR/Main]
"Background Top"="250.069t"
"Background Bottom"="250.069t"
"Background Left"="250.069t"
"Background Right"="250.069t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/Code39/110/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/110/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"
[Barcode Attributes/Code39/110/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/110/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
```

```
[Barcode Attributes/Code39/110/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/Code39/110/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
```

Although there are only 43 data characters in Code 3 of 9's character set, it is possible to encode all 128 ASCII characters using Code 3 of 9's Full ASCII feature. If a reader is in its Full ASCII mode, the symbols $ / % and + are used as precedence codes with the 26 letters as shown in Figure 9-7.

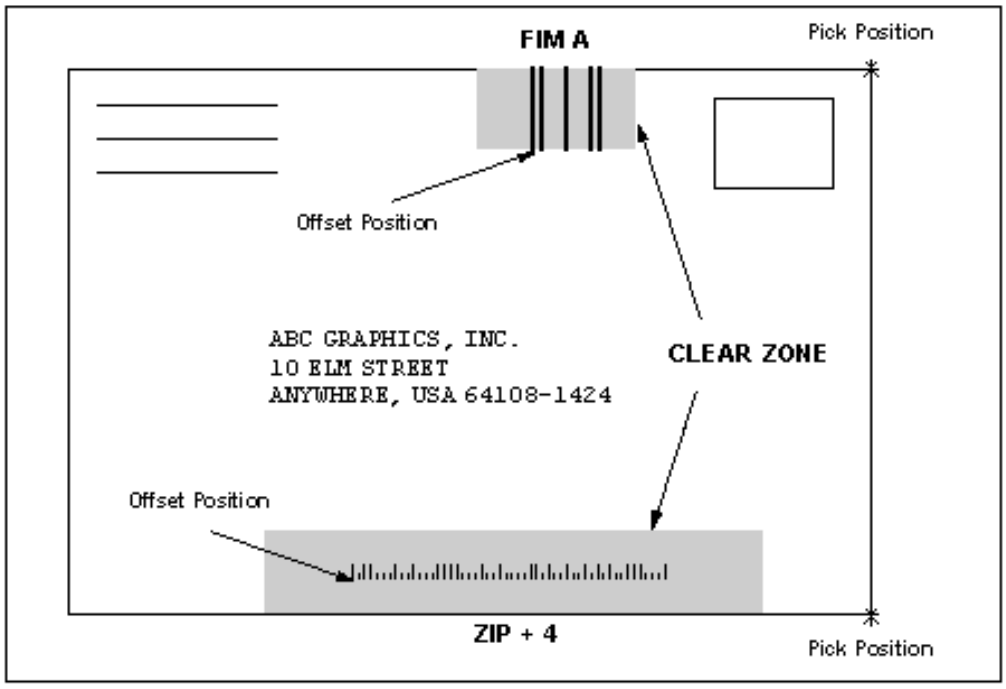
ASCII	CODE 39	ASCII	CODE 39	ASCII	CODE 39	ASCII	CODE 39
NUL	%U	SP	Space	@	%V		%W
SOH	$A	!	/A	A	A	a	+A
STX	$B	"	/B	B	B	b	+B
ETX	$C	#	/C	C	C	c	+C
EOT	$D	$	/D	D	D	d	+D
ENQ	$E	%	/E	E	E	e	+E
ACK	$F	&	/F	F	F	f	+F
BEL	$G	!	/G	G	G	g	+G
BS	$H	(	/H	H	H	h	+H
HT	$I	)	/I	I	I	i	+I
LF	$J	*	/J	J	J	j	+J
VT	$K	+	/K	K	K	k	+K
FF	$L	’	/L	L	L	l	+L
CR	$M	-	-	M	M	m	+M
SO	$N	.	.	N	N	n	+N
SI	$O	/	/0	O	O	o	+O
DLE	$P	0	0	P	P	p	+P
DC1	$Q	1	1	Q	Q	q	+Q
DC2	$R	2	2	R	R	r	+R
DC3	$S	3	3	S	S	s	+S
DC4	$T	4	4	T	T	t	+T
NAK	$U	5	5	U	U	u	+U
SYN	$V	6	6	V	V	v	+V
ETB	$W	7	7	W	W	w	+W
CAN	$X	8	8	X	X	x	+X
EM	$Y	9	9	Y	Y	y	+Y
SUB	$Z	:	/Z	Z	Z	z	+Z
ESC	%A	;	%F	[	%K	{	%P
FS	%B	<	%G	\	%L	|	%Q
GS	%C	=	%H	]	%M	}	%R
RS	%D	>	%I	↑	%N	~	%S
US	%E	?	%G %J	—	%O	DEL	%T,%X %Y,%Z

Figure 9-7: Code 3 of 9 ASCII Chart

Postal

There are two types of Postal Codes: ZIP Code Bars (which is also referred to in the industry as POSTNET), and Facing Identification Marks (FIM) codes. See Figure 9-8.

> **Note:** You should not change the Height or CPI of either Postal Code since the U.S. Postal Service requires these dimensions. Even though you can change the background gutters, the default is regulation.
>
> An acceptable range for the Height is 125 mils through 138 mils. This is 9-point through 10-point. For further reference see *United States Postal Service, http://pe.usps.gov.*



ZIP + 4 and FIM-A Showing Pick & Offset Position with Clear Zone

Figure 9-8: Zip + 4 and FIM –A Showing Pick and Offset Position with Clear Zone

Postal - ZIP Code Bars

Generating a Zip Code bar requires you to input either the Zip code or the Zip + 4 code. (The last 2 digits are for future postal ABC implementation.)

Zip code bars require check digits, so if you request a human-readable you will always see a check digit. This check digit is calculated from the Zip code through various mathematical steps, and is a second verification that the correct code was read when scanned.

Once you have input the Zip Code, clicking [Okay] will generate a barcode. The barcode ***will not fall where you picked*** but will be offset to position it properly in reference from the corner of the envelope. See Figure 9-8.

Changing the Offset: If you want the code to fall exactly where you pick, change the X & Y Offset in this file to: *0,0.*

So, when picking the position for a Postal Zip, pick the intersection of the lower right corner of the envelope. The barcode will be offset from that position to center it within the authorized CLEAR ZONE. If this offset is not desired, please refer to *Changing Defaults* following.

HUMAN-READABLE numbers are available for ZIP even though they are never printed. This is so the operator can see the code for proofing. If you do not want them to show, place them on a layer which is not referenced during output; or, assign them an invisible color (same as the background).

ZIP Code Facts

```
         Font Name: zip
             Style: n
             Start: |
              Stop: |
        X/Y Offset: -3875t,250t
    Minimum Digits: 5
    Maximum Digits: 11 (this includes future ABC)
  Valid Characters: [0-9]
            Height: 125 mils (Approx. Vertical Size = 9 point)
               CPI: 10 (Approx. Horizontal Size = 10 point)
```

An acceptable range for the Height is 125 mils through 138 mils. This is 9-point through 10-point. For further reference see *United States Postal Service, http://pe.usps.gov.*

Changing Defaults in the Zip Code Menu

Any of the default attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/ZIP/100/BAR/Main]
"Angle"="0"
"CPI"="10"
"Height"="125.035t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="-3875.104t"
"Y Offset"="250.069t"

[Barcode Attributes/ZIP/100/GTR/Main]
"Background Top"="250.069t"
"Background Bottom"="250.069t"
"Background Left"="625.035t"
"Background Right"="625.035t"
"Background Layer"="3"
"HumanReadable Background Percent"="10"

[Barcode Attributes/ZIP/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/ZIP/100/HR1/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/ZIP/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/ZIP/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/ZIP/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/ZIP/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/ZIP/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/ZIP/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

Postal - FIM CODE

Generating a FIM Pattern only requires you to choose which one you want. There are three types A through C. Once you have input the type, clicking [Okay] will generate a FIM pattern. The code ***will not fall where you picked*** but will be offset to position it properly in reference from the corner of the envelope. See Figure 9-9.

Changing the Offset: If you want the code to fall exactly where you pick, change the X & Y Offset in this file to: *0,0.*

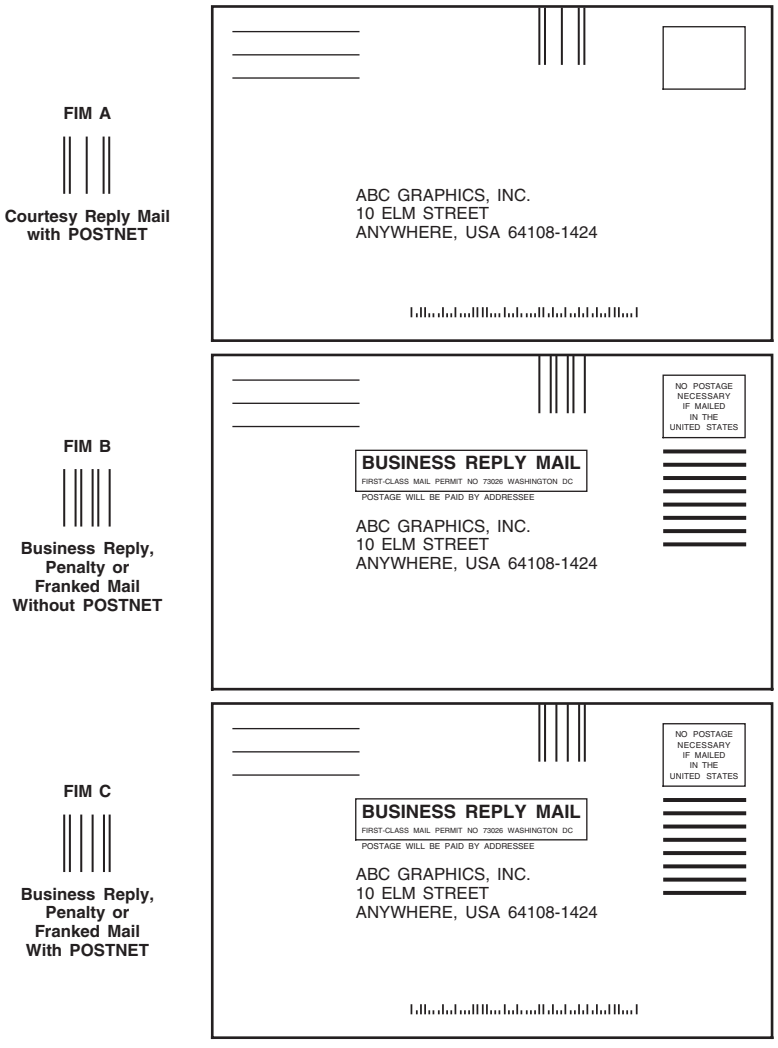


Figure 9-9: FIM Patterns A through C

So, when picking the position for a FIM, pick the intersection of the top right corner of the reply card or envelope. The code will be offset from that position to center it within the authorized CLEAR ZONE. If this offset is not desired, please refer to *Changing Defaults.*

HUMAN-READABLE letter is available for FIM even though it is never printed. This is so the operator can see the code for proofing. If you do not want it to show, place it on a layer that is not referenced during output; or, assign it an invisible color (same as the background).

FIM Pattern Facts

```
         Font Name: zip
             Style: n
             Start: none
              Stop: none
  Valid Characters: [A-C]
            Height: 625 mils (Approx. Vertical Size = 45.2 point)
               CPI: 5 (Approx. Horizontal Size = 200 point)
        X/Y Offset: -2520t,-625t
```

Changing Defaults in the FIM Pattern Menu

Any of the given attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/FIM/100/BAR/Main]
"Angle"="0"
"CPI"="5"
"Height"="625.035t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="-2520.055t"
"Y Offset"="-625.035t"

[Barcode Attributes/FIM/100/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="480.083t"
"Background Right"="250.069t"
"Background Layer"="3"
"HumanReadable Background Percent"="10"

[Barcode Attributes/FIM/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"
```

```
[Barcode Attributes/FIM/100/HR1/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/FIM/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/FIM/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/FIM/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/FIM/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/FIM/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/FIM/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

UPC Codes

There are two types of UPC Barcodes: UPC-A, and the condensed version UPC-E.

UPC-A and UPC-E Bar Codes

Figure 9-10: UPC-A and UPC-E Barcodes

UPC-A Barcodes

UPC-A Barcode: This barcode is typically a 12 digit code plus an automatically generated start, stop and center character.

The **Number System Character** is always required. Valid digits are 0-9. Each number has been assigned a specific use by the *Uniform Code Council.*

```
0 = Regular UPC Code
1 = RESERVED
2 = Random Weight Item (i.e., Meat and Produce)
3 = National Drug and Health Code
4 = Non-food Item
5 = Coupon
6 = Regular UPC Code
7 = Regular UPC Code
8 = RESERVED
9 = RESERVED
```

The **Check Digit** is a required option. This check digit is calculated from the code through various mathematical steps, and is a second verification that the correct code was read when scanned.

You will get the correct check digit no matter what you type in: an "x", leave it blank, or type in the incorrect digit. The field is really there for those who are scanning their input.

Once you have input the **Number System Character** and the **UPC-A Code,** clicking **[Okay]** will generate a barcode with the given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Number System Character, Code Number, and Check Digit. Toggle button "Show this Human Readable".

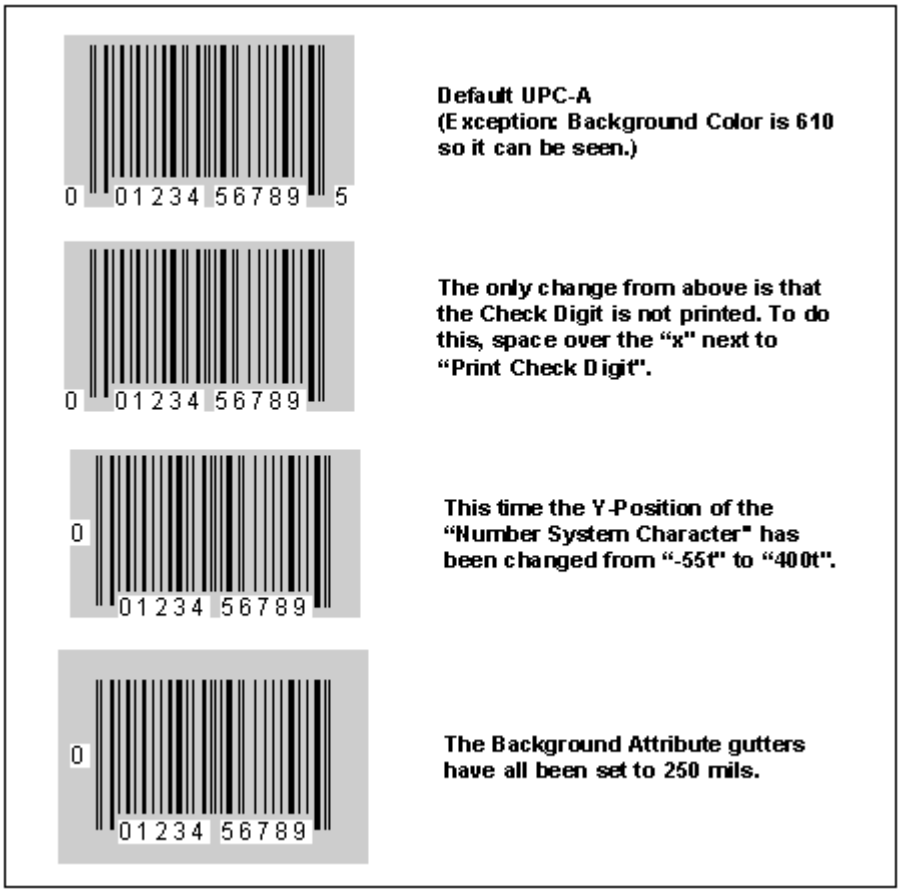


Figure 9-11: Different Varieties of UPC-A

UPC-A Facts

```
         Font Name: upca
             Style: n
       X/Y Offset: 0,0
 Valid Characters: [0-9]
           Center: +
           Height: 1000 mils (Approx. Vertical Size = 72 point)
              CPI: 8.0 (Approx. Horizontal Size = 12 point)
```

Changing Defaults in the UPC-A Barcode Menu

Any of the given attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/UPCA/080/BAR/Main]
"Angle"="0"
"CPI"="10"
"Height"="816.044t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/080/GTR/Main]
"Background Top"="60.028t"
"Background Bottom"="60.028t"
"Background Left"="148.133t"
"Background Right"="148.133t"
"Background Layer"="3"
"HumanReadable Start Char"="52.006t"
"HumanReadable Stop Char"="52.006t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/080/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"

[Barcode Attributes/UPCA/080/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-44.122t"

[Barcode Attributes/UPCA/080/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"

[Barcode Attributes/UPCA/080/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-44.122t"

[Barcode Attributes/UPCA/080/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"

[Barcode Attributes/UPCA/080/HR3/Main]
"Display"="Y"
"Layer"="2"
```

```
"Y Position"="-44.122t"

[Barcode Attributes/UPCA/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/UPCA/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/UPCA/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/UPCA/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/UPCA/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/UPCA/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/UPCA/HR2/Color]
"Spot Color Density"="700"

[Barcode Attributes/UPCA/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/UPCA/HR3/Color]
"Spot Color Density"="700"

[Barcode Attributes/UPCA/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/UPCA/085/BAR/Main]
"Angle"="0"
"CPI"="9.5"
"Height"="867.082t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/085/GTR/Main]
"Background Top"="64.039t"
"Background Bottom"="64.039t"
"Background Left"="157.123t"
"Background Right"="157.123t"
"Background Layer"="3"
"HumanReadable Start Char"="55.048t"
"HumanReadable Stop Char"="55.048t"
"HumanReadable Background Percent"="10"
```

```
[Barcode Attributes/UPCA/085/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"

[Barcode Attributes/UPCA/085/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-47.026t"

[Barcode Attributes/UPCA/085/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"

[Barcode Attributes/UPCA/085/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-47.026t"

[Barcode Attributes/UPCA/085/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"

[Barcode Attributes/UPCA/085/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-47.026t"

[Barcode Attributes/UPCA/090/BAR/Main]
"Angle"="0"
"CPI"="9"
"Height"="918.119t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/090/GTR/Main]
"Background Top"="68.05t"
"Background Bottom"="68.05t"
"Background Left"="167.082t"
"Background Right"="167.082t"
"Background Layer"="3"
"HumanReadable Start Char"="59.059t"
"HumanReadable Stop Char"="59.059t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/090/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="JU"
"Style Mnemonic"="n"
```

```
"Vertical Size"="10.81p"

[Barcode Attributes/UPCA/090/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"

[Barcode Attributes/UPCA/090/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="10.81p"

[Barcode Attributes/UPCA/090/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"

[Barcode Attributes/UPCA/090/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="10.81p"

[Barcode Attributes/UPCA/090/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"

[Barcode Attributes/UPCA/095/BAR/Main]
"Angle"="0"
"CPI"="8.5"
"Height"="969.018t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/095/GTR/Main]
"Background Top"="71.093t"
"Background Bottom"="71.093t"
"Background Left"="176.072t"
"Background Right"="176.072t"
"Background Layer"="3"
"HumanReadable Start Char"="62.102t"
"HumanReadable Stop Char"="62.102t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/095/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"
```

```
[Barcode Attributes/UPCA/095/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"

[Barcode Attributes/UPCA/095/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"

[Barcode Attributes/UPCA/095/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"

[Barcode Attributes/UPCA/095/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"

[Barcode Attributes/UPCA/095/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"

[Barcode Attributes/UPCA/100/BAR/Main]
"Angle"="0"
"CPI"="8"
"Height"="1020.055t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/100/GTR/Main]
"Background Top"="75.104t"
"Background Bottom"="75.104t"
"Background Left"="185.062t"
"Background Right"="185.062t"
"Background Layer"="3"
"HumanReadable Start Char"="65.007t"
"HumanReadable Stop Char"="65.007t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/100/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/UPCA/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"
```

```
[Barcode Attributes/UPCA/100/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/UPCA/100/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"

[Barcode Attributes/UPCA/100/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/UPCA/100/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"

[Barcode Attributes/UPCA/105/BAR/Main]
"Angle"="0"
"CPI"="7.5"
"Height"="1071.093t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/105/GTR/Main]
"Background Top"="79.115t"
"Background Bottom"="79.115t"
"Background Left"="194.053t"
"Background Right"="194.053t"
"Background Layer"="3"
"HumanReadable Start Char"="68.05t"
"HumanReadable Stop Char"="68.05t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/105/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"

[Barcode Attributes/UPCA/105/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"
[Barcode Attributes/UPCA/105/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"
```

```
[Barcode Attributes/UPCA/105/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"

[Barcode Attributes/UPCA/105/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"

[Barcode Attributes/UPCA/105/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"

[Barcode Attributes/UPCA/110/BAR/Main]
"Angle"="0"
"CPI"="7"
"Height"="1122.13t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/110/GTR/Main]
"Background Top"="82.019t"
"Background Bottom"="82.019t"
"Background Left"="204.011t"
"Background Right"="204.011t"
"Background Layer"="3"
"HumanReadable Start Char"="72.061t"
"HumanReadable Stop Char"="72.061t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/110/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.2p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"

[Barcode Attributes/UPCA/110/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"

[Barcode Attributes/UPCA/110/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.2p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"

[Barcode Attributes/UPCA/110/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"
```

```
[Barcode Attributes/UPCA/110/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.2p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"

[Barcode Attributes/UPCA/110/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"

[Barcode Attributes/UPCA/115/BAR/Main]
"Angle"="0"
"CPI"="6.5"
"Height"="1173.029t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/115/GTR/Main]
"Background Top"="86.03t"
"Background Bottom"="86.03t"
"Background Left"="213.001t"
"Background Right"="213.001t"
"Background Layer"="3"
"HumanReadable Start Char"="75.104t"
"HumanReadable Stop Char"="75.104t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/115/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"

[Barcode Attributes/UPCA/115/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"

[Barcode Attributes/UPCA/115/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"

[Barcode Attributes/UPCA/115/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"
[Barcode Attributes/UPCA/115/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"
```

```
[Barcode Attributes/UPCA/115/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"

[Barcode Attributes/UPCA/120/BAR/Main]
"Angle"="0"
"CPI"="6"
"Height"="1224.066t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCA/120/GTR/Main]
"Background Top"="90.041t"
"Background Bottom"="90.041t"
"Background Left"="222.13t"
"Background Right"="222.13t"
"Background Layer"="3"
"HumanReadable Start Char"="78.008t"
"HumanReadable Stop Char"="78.008t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCA/120/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCA/120/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"

[Barcode Attributes/UPCA/120/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCA/120/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"

[Barcode Attributes/UPCA/120/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCA/120/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"
```

UPC-E Barcodes

UPC-E Code: This barcode is typically a 6 digit code plus a start and stop character. The start and stop characters are generated automatically.

The **Number System Character** is always required to be a "0". Do not type this in as part of the barcode. It is generated automatically.

The **Check Digit** is a required option. This check digit is calculated from the code through various mathematical steps, and is a second verification that the correct code was read when scanned.

You will get the correct check digit no matter what you type in: an "x", leave it blank, or type in the incorrect digit. The field is really there for those who are scanning their input.

Once you have input the **UPC-E Code,** Clicking **[Okay]** will generate a barcode with the given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Barcode Number, Number System Character and Check Digit. If you need any of them to print, click the toggle button "Show this Human Readable".

UPC-E Facts

```
         Font Name: upce
             Style: n
Valid Characters: [0-9]
            Height: 1000 mils (Approx. Vertical Size = 72 point)
               CPI: 8.0 (Approx. Horizontal Size = 12 point)
       X/Y Offset: 0,0
```

For Your Information: Only manufacturer numbers ending with zeros and item numbers beginning with zeros are valid for UPC-E. UPC-E codes are the manufacturer number and item number encoded into a 6 digit number, (a compressed UPC-A). If you need to convert the UPC-E number into a UPC-A, at the $-prompt type:

upc_un [6-digit number].

Changing Defaults in the UPC-E Barcode Menu

Any of the given attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/UPCE/080/BAR/Main]
"Angle"="0"
"CPI"="10"
"Height"="816.044t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/080/GTR/Main]
"Background Top"="60.028t"
"Background Bottom"="60.028t"
"Background Left"="128.077t"
"Background Right"="128.077t"
"Background Layer"="3"
"HumanReadable Start Char"="31.12t"
"HumanReadable Stop Char"="31.12t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/080/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"
[Barcode Attributes/UPCE/080/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-44.122t"
[Barcode Attributes/UPCE/080/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"
[Barcode Attributes/UPCE/080/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-44.122t"
[Barcode Attributes/UPCE/080/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="9.6p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="9.6p"
[Barcode Attributes/UPCE/080/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-44.122t"
[Barcode Attributes/UPCE/BAR/Color]
"Spot Color Density"="700"
[Barcode Attributes/UPCE/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

```
[Barcode Attributes/UPCE/GTR/Color]
"Spot Color Density"="600"
[Barcode Attributes/UPCE/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/UPCE/HR1/Color]
"Spot Color Density"="700"
[Barcode Attributes/UPCE/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/UPCE/HR2/Color]
"Spot Color Density"="700"
[Barcode Attributes/UPCE/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/UPCE/HR3/Color]
"Spot Color Density"="700"
[Barcode Attributes/UPCE/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
[Barcode Attributes/UPCE/085/BAR/Main]
"Angle"="0"
"CPI"="9.5"
"Height"="867.082t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/085/GTR/Main]
"Background Top"="64.039t"
"Background Bottom"="64.039t"
"Background Left"="136.1t"
"Background Right"="136.1t"
"Background Layer"="3"
"HumanReadable Start Char"="33.057t"
"HumanReadable Stop Char"="33.057t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/085/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"
[Barcode Attributes/UPCE/085/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-47.026t"
[Barcode Attributes/UPCE/085/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"
[Barcode Attributes/UPCE/085/HR2/Main]
"Display"="Y"
"Layer"="2"
```

```
"Y Position"="-47.026t"
[Barcode Attributes/UPCE/085/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.2p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="10.2p"
[Barcode Attributes/UPCE/085/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-47.026t"
[Barcode Attributes/UPCE/090/BAR/Main]
"Angle"="0"
"CPI"="9"
"Height"="918.119t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/090/GTR/Main]
"Background Top"="68.05t"
"Background Bottom"="68.05t"
"Background Left"="144.122t"
"Background Right"="144.122t"
"Background Layer"="3"
"HumanReadable Start Char"="35.131t"
"HumanReadable Stop Char"="35.131t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/090/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="10.81p"
[Barcode Attributes/UPCE/090/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"
[Barcode Attributes/UPCE/090/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="10.81p"
[Barcode Attributes/UPCE/090/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"
[Barcode Attributes/UPCE/090/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="10.81p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="10.81p"
[Barcode Attributes/UPCE/090/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-50.069t"
[Barcode Attributes/UPCE/095/BAR/Main]
"Angle"="0"
```

```
"CPI"="8.5"
"Height"="969.018t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/095/GTR/Main]
"Background Top"="71.093t"
"Background Bottom"="71.093t"
"Background Left"="152.006t"
"Background Right"="152.006t"
"Background Layer"="3"
"HumanReadable Start Char"="37.068t"
"HumanReadable Stop Char"="37.068t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/095/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"
[Barcode Attributes/UPCE/095/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"
[Barcode Attributes/UPCE/095/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"
[Barcode Attributes/UPCE/095/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"
[Barcode Attributes/UPCE/095/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="11.41p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="11.41p"
[Barcode Attributes/UPCE/095/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-52.006t"
[Barcode Attributes/UPCE/100/BAR/Main]
"Angle"="0"
"CPI"="8"
"Height"="1020.055t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
 [Barcode Attributes/UPCE/100/GTR/Main]
"Background Top"="75.104t"
"Background Bottom"="75.104t"
"Background Left"="160.028t"
"Background Right"="160.028t"
"Background Layer"="3"
"HumanReadable Start Char"="39.004t"
```

```
"HumanReadable Stop Char"="39.004t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/100/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/UPCE/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"
[Barcode Attributes/UPCE/100/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/UPCE/100/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"
[Barcode Attributes/UPCE/100/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
[Barcode Attributes/UPCE/100/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-55.048t"
[Barcode Attributes/UPCE/105/BAR/Main]
"Angle"="0"
"CPI"="7.5"
"Height"="1071.093t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/105/GTR/Main]
"Background Top"="79.115t"
"Background Bottom"="79.115t"
"Background Left"="186.03t"
"Background Right"="186.03t"
"Background Layer"="3"
"HumanReadable Start Char"="41.079t"
"HumanReadable Stop Char"="41.079t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/105/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"
[Barcode Attributes/UPCE/105/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"
```

```
[Barcode Attributes/UPCE/105/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"
[Barcode Attributes/UPCE/105/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"
[Barcode Attributes/UPCE/105/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="12.6p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12.6p"
[Barcode Attributes/UPCE/105/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-58.091t"
[Barcode Attributes/UPCE/110/BAR/Main]
"Angle"="0"
"CPI"="7"
"Height"="1122.13t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
[Barcode Attributes/UPCE/110/GTR/Main]
"Background Top"="82.019t"
"Background Bottom"="82.019t"
"Background Left"="176.072t"
"Background Right"="176.072t"
"Background Layer"="3"
"HumanReadable Start Char"="43.015t"
"HumanReadable Stop Char"="43.015t"
"HumanReadable Background Percent"="10"
[Barcode Attributes/UPCE/110/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.2p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"
[Barcode Attributes/UPCE/110/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"
[Barcode Attributes/UPCE/110/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.2p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"
[Barcode Attributes/UPCE/110/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"

[Barcode Attributes/UPCE/110/HR3/Font]
"Font Mnemonic"="ocb"
```

```
"Horizontal Size"="13.2p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="13.2p"

[Barcode Attributes/UPCE/110/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-61.134t"

[Barcode Attributes/UPCE/115/BAR/Main]
"Angle"="0"
"CPI"="6.5"
"Height"="1173.029t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCE/115/GTR/Main]
"Background Top"="86.03t"
"Background Bottom"="86.03t"
"Background Left"="184.094t"
"Background Right"="184.094t"
"Background Layer"="3"
"HumanReadable Start Char"="45.09t"
"HumanReadable Stop Char"="45.09t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCE/115/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"

[Barcode Attributes/UPCE/115/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"

[Barcode Attributes/UPCE/115/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"

[Barcode Attributes/UPCE/115/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"

[Barcode Attributes/UPCE/115/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="13.81p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="13.81p"
```

```
[Barcode Attributes/UPCE/115/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-63.071t"

[Barcode Attributes/UPCE/120/BAR/Main]
"Angle"="0"
"CPI"="6"
"Height"="1224.066t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/UPCE/120/GTR/Main]
"Background Top"="90.041t"
"Background Bottom"="90.041t"
"Background Left"="192.116t"
"Background Right"="192.116t"
"Background Layer"="3"
"HumanReadable Start Char"="47.026t"
"HumanReadable Stop Char"="47.026t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/UPCE/120/HR1/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="JU"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCE/120/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"

[Barcode Attributes/UPCE/120/HR2/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCE/120/HR2/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"

[Barcode Attributes/UPCE/120/HR3/Font]
"Font Mnemonic"="ocb"
"Horizontal Size"="14.41p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="14.41p"

[Barcode Attributes/UPCE/120/HR3/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-66.113t"
```

Interleaved 2 of 5

Interleaved 2 of 5 Barcode: This barcode is typically a 10 digit code plus an automatically generated start and stop characters.

Figure 9-12: Interleaved 2 of 5

There are three choices of ratio. The ratio controls the width relationship of the wide and narrow bars. A ratio of 2.5 means the wide bar is 2.5 times wider than the narrow bar.

Generating the Interleaved 2 of 5 barcode requires you to input two pieces of information: **Interleaved 2 of 5 Code Number** and **Number of Digits** which make up the code.

The **Number of Digits** is a check against not typing in the right amount of digits. Since Interleaved 2 of 5 works with pairs of numbers, the number of digits **must be an even number.**

Once you have input the Code Number, clicking **[Okay]** will generate a barcode with given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Start and Stop characters. If you want them to print, click the toggle button "Show this Human Readable".

Interleaved 2 of 5 Facts

```
        Font Name: int
            Style: n
            Start: §
             Stop: ¤
       X/Y Offset: 0,0
  Minimum Digits: 2 (requires an even number of characters)
  Maximum Digits: 16
Valid Characters: [0-9]
           Height: 500 mils (Approx. Vertical Size = 36 point)
              CPI: 2.78 (Approx. Horizontal Size = 36 point)
```

Changing Defaults in the Interleaved 2 of 5 Menu

Any of the default attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/Int25/100/BAR/Main]
"Check Digit"="N"
"Number Digits"="10"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/Int25/100/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="135.131t"
"Background Right"="135.131t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/Int25/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/100/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/100/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/100/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"
```

```
[Barcode Attributes/Int25/100/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/Int25/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Int25/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/Int25/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Int25/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/Int25/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Int25/HR2/Color]
"Spot Color Density"="700"

[Barcode Attributes/Int25/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Int25/HR3/Color]
"Spot Color Density"="700"

[Barcode Attributes/Int25/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Int25/105/BAR]

[Barcode Attributes/Int25/105/BAR/Main]
"Check Digit"="N"
"Number Digits"="10"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
```

```
[Barcode Attributes/Int25/105/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="135.131t"
"Background Right"="135.131t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/Int25/105/HR1]

[Barcode Attributes/Int25/105/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/105/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/105/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/105/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/105/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/105/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/110/BAR/Main]
"Check Digit"="N"
"Number Digits"="10"
"Angle"="0"
"CPI"="2.78"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"
```

```
[Barcode Attributes/Int25/110/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="135.131t"
"Background Right"="135.131t"
"Background Layer"="3"
"HumanReadable Start Char"="0t"
"HumanReadable Stop Char"="0t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/Int25/110/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/110/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/110/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/110/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Int25/110/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Int25/110/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"
```

Code 128

Code 128 is a very high density alphanumeric symbology. It is a variable length, continuous code. Code 128 has 106 different printed characters. Each printed character can have one of three different meanings, depending on which of three different character sets is employed. Three different start characters tell the reader which of the character sets is initially being used, and three shift codes permit changing character sets inside a symbol.

Figure 9-13: Code 128

Character set C consists of the 100 two-digit pairs 00 through 99. This allows the effective density of Code 128 to be doubled when printing all numeric data. Similar to Interleaved 2 of 5.

This barcode is a full ASCII code with 4 function codes, start, check digit, and stop characters. Three code subsets are use to encode ASCII, control codes, and numeric pairs. Generating this code may require two key strokes to represent a single code (ie: ^m is CR). The items in parentheses represent the output of the code keyed in. See *Appendix G* for more details.

Minimize will create the shortest symbol length possible using rules for different combinations of start, code, shift characters. It is recommended that "minimized" be used, unless familiar with Code 128.

The MECCA 2000 implementation of the minimize function for Code 128 follows the guidelines set forth in the Uniform Symbology Specification USS-128 developed by AIM. For more information on minimize specifications see Appendix G.

Check Digit is calculated automatically. You will only see the extra numbers in the human-readable if printed.

Code 128 Facts

```
         Font Name: 128
             Style: n
             Start: §
              Stop: ¤
        X/Y Offset: 0,0
   Minimum Digits: 1 or 2
   Maximum Digits: 66
 Valid Characters: full ASCII Subsets: A, B, or C
            Height: 500 mils (Approx. Vertical Size = 36 point)
               CPI: 5.00 (Approx. Horizontal Size = 20 point)
```

Changing Defaults in the Code 128 Menu

Any of the given attributes can be typed over, but if you want to change the menu defaults permanently you must edit the file *barcodes.ini.*

```
[Barcode Attributes/Code128/100/BAR/Main]
"Subset Start Code"="B"
"Minimize Length"="Y"
"Angle"="0"
"CPI"="5"
"Height"="500.138t"
"Layer"="1"
"Reduction"="0t"
"X Offset"="0t"
"Y Offset"="0t"

[Barcode Attributes/Code128/100/GTR/Main]
"Background Top"="0t"
"Background Bottom"="0t"
"Background Left"="100.138t"
"Background Right"="100.138t"
"Background Layer"="3"
"HumanReadable Start Char"="50.069t"
"HumanReadable Stop Char"="50.069t"
"HumanReadable Background Percent"="10"

[Barcode Attributes/Code128/100/HR1/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="CE"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Code128/100/HR1/Main]
"Display"="Y"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Code128/100/HR2/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FR"
"Style Mnemonic"="n"
"Vertical Size"="12p"
```

```
[Barcode Attributes/Code128/100/HR2/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Code128/100/HR3/Font]
"Font Mnemonic"="ge"
"Horizontal Size"="12p"
"Justification"="FL"
"Style Mnemonic"="n"
"Vertical Size"="12p"

[Barcode Attributes/Code128/100/HR3/Main]
"Display"="N"
"Layer"="2"
"Y Position"="-200.138t"

[Barcode Attributes/Code128/BAR/Color]
"Spot Color Density"="700"

[Barcode Attributes/Code128/BAR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Code128/GTR/Color]
"Spot Color Density"="600"

[Barcode Attributes/Code128/GTR/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Code128/HR1/Color]
"Spot Color Density"="700"

[Barcode Attributes/Code128/HR1/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Code128/HR2/Color]
"Spot Color Density"="700"

[Barcode Attributes/Code128/HR2/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"

[Barcode Attributes/Code128/HR3/Color]
"Spot Color Density"="700"

[Barcode Attributes/Code128/HR3/Screening]
"Screen Angle"="-1"
"Screen Dot"="0"
"Screen Ruling"="133"
```

Appendix G

Code 128 encodes the full 128 character ASCII set using three character sets: A, B, & C.

CODE A	CODE B	CODE C
~(SP)	~(SP)	00
!	!	01
"	"	02
#	#	03
$	$	04
%	%	05
&	&	06
'	'	07
(	(	08
)	)	09
*	*	10
+	+	11
,	,	12
-	-	13
.	.	14
/	/	15
0	0	16
1	1	17
2	2	18
3	3	19
4	4	20
5	5	21
6	6	22
7	7	23
8	8	24
9	9	25
:	:	26
;	;	27
<	<	28
=	=	29
>	>	30
?	?	31
@	@	32
A	A	33
B	B	34
C	C	35
D	D	36
E	E	37
F	F	38
G	G	39
H	H	40
I	I	41
J	J	42
K	K	43
L	L	44
M	M	45
N	N	46
O	O	47
P	P	48
Q	Q	49
R	R	50
S	S	51

CODE A	CODE B	CODE C
T	T	52
U	U	53
V	V	54
W	W	55
X	X	56
Y	Y	57
Z	Z	58
[	[	59
\	\	60
]	]	61
^^ (^)	^^ (^)	62
^_ (_)	^_ (_)	63
^0 (NUL)	'	64
^a (SOH)	a	65
^b (STX)	b	66
^c (ETX)	c	67
^d (EOT)	d	68
^e (ENQ)	e	69
^f (ACK)	f	70
^g (BEL)	g	71
^h (BS)	h	72
^i (HT)	i	73
^j (LF)	j	74
^k (VT)	k	75
^l (FF)	l	76
^m (CR)	m	77
^n (SO)	n	78
^o (SI)	o	79
^p (DLE)	p	80
^q (DC1)	q	81
^r (DC2)	r	82
^s (DC3)	s	83
^t (DC4)	t	84
^u (NAK)	u	85
^v (SYN)	v	86
^w (ETB)	w	87
^x (CAN)	x	88
^y (EM)	y	89
^z (SUB)	z	90
^E (ESC)	{	91
^F (FS)	|	92
^G (GS)	}	93
^R (RS)	^~(~)	94
^U (US)	^D (DEL)	95
^3 (FNC 3)	^3 (FNC 3)	96
^2 (FNC 2)	^2 (FNC 2)	97
^S (SHIFT)	^S (SHIFT)	98
^C (CODE C)	^C (CODE C)	99
^B (CODE B)	^4 (FNC 4)	^B (CODE B)
^4 (FNC 4)	^A (CODE A)	^A (CODE A)
^1 (FNC 1)	^1 (FNC 1)	^1 (FNC 1)

Note 1: The column entries are "user input key codes" in their respective code sets (A, B or C). The corresponding characters coded into the barcode are shown in parentheses, when they differ from the input codes. The caret (^) shown is an ASCII character, not a Ctrl Key.

Note 2: Code C is for coding pairs of digits only.

Note 3: Controls for Switching Code Sets:
^A --- switch to Code A.
^B --- switch to Code B.
^C --- switch to Code C.
^S --- used only in Code A or B. Means switch to the other Code set for the next character, then back to current.

Use of Start, Code, and Shift Characters

The following rules for the start, code and shift characters can be followed to minimize the symbol length:

1. Determine the start character:

1a. If the data begins with 4 or more digits, use start Code C;
1b. Otherwise, if a control character occurs in the data before any lower case character, use start Code A;
1c. Otherwise, use start Code B.

2. When step 1a is followed with an odd number of digits starting the data, insert a Code A or Code B character before the last digit, following rules 1b and 1c to determine between Code A and Code B.

3. If 4 or more digits occur together when in Code A or Code B:

3a. If there are an even number of digits, insert a Code C character before the first digit to change to Code C;

3b. Otherwise, there are an odd number of digits, so insert a Code C character after the first digit to change to Code C.

4. When in Code B and a control character occurs in the data:

4a. If following that character, a lower case character occurs in the data before the occurrence of another control character, insert a shift character before the control character;

4b. Otherwise, insert a Code A character before the control character to change to Code A.

5. When in Code A and a lower case character occurs in the data:

5a. If following that character, a control character occurs in the data before the occurrence of another lower case character, insert a shift character before the lower case character;

5b. Otherwise, insert a Code B character before the lower case character to change to Code B.

6. When in Code C and a non-numeric character occurs in the data, insert a Code A or Code B character before that character, following the rules of 1b and 1c to determine either Code A or Code B.

EAN Barcodes

MECCA 2000 supports two types of EAN Barcodes: **EAN-13** and **EAN-8.** These were designed by the International Article Numbering Association (EAN) in Europe. It is an extension to UPC-A and UPC-E to include the country information.

EAN-13 - 80% EAN-8 - 80%

EAN-13 Barcode

EAN-13 Barcode: Designed by the International Article Numbering Association (EAN) in Europe. It is an extension to UPC-A to include the country information. The only difference between UPC-A and EAN-13 is that the number system in UPC-A is a single digit from 0 through 9 whereas an EAN-13 number system consists of two or three digits ranging from 000 to 999.

EAN-13 encodes 12 digits of numeric data along with a check digit, for a total of 13 digits of barcode data. It consists of Number System Characters , Manufacturer Code, and Product Code. The MC & PC make up the remaining digits as assigned by the numbering authority indicated by the NS code.

The **Number System** is the first 2- or3-digits in the EAN number to identify the country/region numbering authority.

The **Manufacturer Code** and **Product Code** make up the remaining digits as assigned by the numbering authority.

The **Check Digit** is required. This check digit is calculated from the code through various mathematical steps, and is a second verification that the correct code was read when scanned. You will get the correct check digit no matter what you type in: an "x", leave it

blank, or type in the incorrect digit. The field is really there for those who are scanning their input.

Possible magnifications are: 80, 85, 90, 95, 100, 105, 110, 115, 120.

Once you have input the numbers, clicking **[Okay]** will generate a barcode with the given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Number System Character, Code Number, and Check Digit. Click the toggle button "Show this Human Readable".

EAN-13 - 80%

EAN-13 Facts

```
         Font Name: ean
             Style: n
    Minimum Digits: 12
       Check Digit: Required
        X/Y Offset: 0,0
  Valid Characters: [0-9]
            Center: +
            Height: 1000 mils (Approx. Vertical Size = 72 point)
               CPI: 8.0 (Approx. Horizontal Size = 12 point)
```

When making a code for a book based on its ISBN, EAN-13 would be the code type to use. Enable the "Show Number System Character" option, then you can enter the code based on the type of ISBN on hand:

a. 13-digit ISBN (issued after 2006-12-31, and starts with 978 or 979):

the ISBN as is, but without dashes.

b. 10-digit ISBN (issued before 2007-01-01):

978 + ISBN (also without the dashes).

Example: the ISBN is 1-56592-286-7, so you would enter: 9781565922867.

EAN-8 Barcode

EAN-8 Barcode: Designed by the International Article Numbering Association (EAN) in Europe. This is a short EAN-13, reduced to 8-digit code, plus start, stop and center characters.

The **Number System** is the first 2- or 3-digits in the EAN number to identify the country/region numbering authority, followed by 4- or 5-digit Product Code, which is assigned by the numbering authority.

The **Check Digit** is a required option. This check digit is calculated from the code through various mathematical steps, and is a second verification that the correct code was read when scanned.

You will get the correct check digit no matter what you type in: an "x", leave it blank, or type in the incorrect digit. The field is really there for those who are scanning their input.

Once you have input the **Number System Characters** and the **EAN-8 Code,** clicking **[Okay]** will generate a barcode with the given attributes in the position that you picked.

In the HUMAN-READABLES there are references to printing the Number System Character, Code Number, and Check Digit. Click the toggle button "Show this Human Readable".

EAN-8 - 80%

EAN-8 Facts

```
        Font Name: ean
            Style: n
   Minimum Digits: 7
      Check Digit: Required
       X/Y Offset: 0,0
 Valid Characters: [0-9]
           Center: +
           Height: 1000 mils (Approx. Vertical Size = 72 point)
              CPI: 8.0 (Approx. Horizontal Size = 12 point)
```

US Postal Service Intelligent Mail Barcode

The Intelligent Mail barcode used in the USPS mailstream is also known as the USPS OneCode Solution or USPS 4-State Customer Barcode (4CB). The Intelligent Mail barcode combines routing ZIP Code information and tracking information into a single 4-state code. It effectively encodes data from POSTNET and PLANET barcodes into a single barcode.

Figure 9-14: Sample Envelope with Intelligent Mail Barcode

Intelligent Mail Facts

The Intelligent Mail barcode is a 4-state barcode that consist of 65 bars. A 4-state barcode is based on a tracker with ascenders and descenders. The four possible states are "tracker" (neither ascender nor descender), "full" (both ascender and descender), "ascender only", and "descender only". For more information, refer to the United States Postal Service website at **http://ribbs.usps.gov/OneCodeSolution/.**

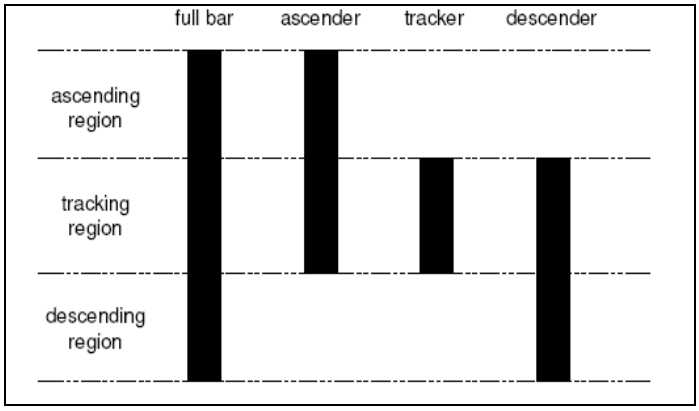
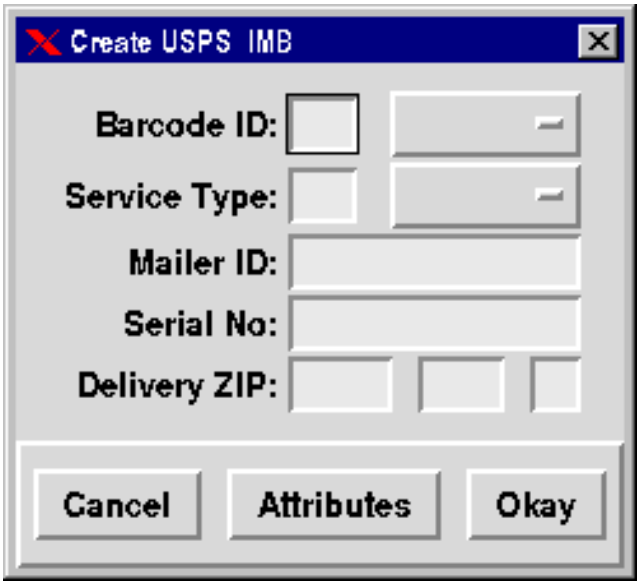


Figure 9-15: Tracker Regions

Intelligent Mail Dialog



This is a 20- to 31-digit code. All fields are required, except the Delivery ZIP.

The dialog is comprised of the following fields:

Bar Code ID: 2-digit presort code, use 00 for "none".

Service Type: 3 digits; choose one from the list, or enter code assigned by USPS.

Mailer ID: 6- or 9-digit code assigned by USPS.

Serial Number: 9- or 6-digit sequence number you assign, to identify your mail pieces.

Delivery ZIP: 5, 5+4, or 5+4+2 ZIP code.

The IMB is made up of a Tracking Code and Routing Code. The Tracking Code includes the following fields:

Barcode Identifier: This is assigned by USPS to encode the presort identification currently printed on the Optional Endorsement Line (OEL). This shall be two digits, with the second digit in the range of 0–4. OEL Description follows: 00 is Default/No OEL Information, 10 is Carrier Route (CR), Enhanced Carrier Route (ECR), and FIRM, 20 is 5-Digit/Scheme, 30 is 3-Digit/Scheme, 40 is Area Distribution Center (ADC), 50 is Mixed Area Distribution Center (MADC), Origin Mixed ADC (OMX).

Service Type Identifier: This is a 3-digit code assigned by USPS for any combination of services requested on the mailpiece. The no service choices are 700 (First Class Mail with No Services), 702 (Standard Mail with No Services), 704 (Periodicals with No Services), and 706 (Bound Printed Matter with No Services).

Mailer Identifier: This is assigned by USPS as a unique, 6 or 9 digit number that identifies a business entity.

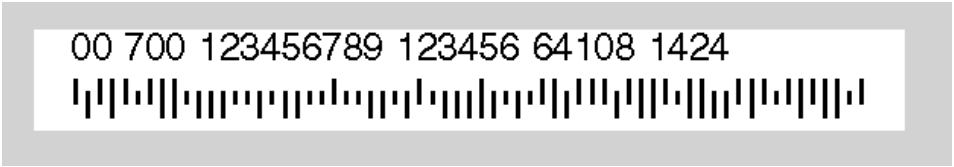
Sequence Number: This is assigned by the mailer for uniquely identifying and tracking mailpieces. The allowable encoding range shall be 000000000 – 999999999 when used with a 6 digit Mailer ID and 000000 - 999999 when used with a 9 digit Mailer ID.

The Routing Code is the **Delivery Point ZIP Code**. This is the ZIP code for routing the mailpiece. This shall replace POSTNET for routing the mailpiece to its final delivery point. The length may be 0, 5, 9, or 11 digits. Input as 5, 5+4, or 5+4+2 ZIP code.

Miscellaneous Options

You have the option of making the Human Readable visible or rotating the barcode 90 degrees. The tabs for the Background and the Human Readable are the same as all other barcodes.

Once you have input the required tracking and routing information, clicking [Okay] will generate a barcode with the given attributes in the position that you picked.



IMB Facts

```
         Font Name: uspsimb
             Style: n
    Tracking Code – 20 digits
Barcode Identifier: 2 (2nd digit must be 0-4)
Service Type Ident: 3 digits
 Mailer Identifier: 6 or 9 digits
Sequence(SerialNo): 9 (when used with 6 digit Mailer ID) or
                    6 (when used with 9 digit Mailer ID)
 Delivery ZIP Code: 5,9, or 11 digits
  Valid Characters: [0-9]
            Height: 1000 mils (Approx. Vertical Size = 72 point)
               CPI: 8.0 (Approx. Horizontal Size = 12 point)
```

2D Data Matrix Barcode

A Data Matrix code is a two-dimensional matrix barcode consisting of black and white "cells" or modules arranged in either a square or rectangular pattern. The information to be encoded can be text or raw data. Usual data size is from a few bytes up to 2 kilobytes. The length of the encoded data depends on the symbol dimension used. Error correction codes are added to increase symbol strength: even if they are partially damaged, they can still be read. A Data Matrix symbol can store up to 2,335 alphanumeric characters.

MECCA 2000 supports the 2D Data Maxrix barcode. This implementation was based on the ISO/IEC 16022:2006 standard document, however, it does not include all of what the ISO/IEC standard defined. Specifically:

1. Only ECC 200 has been implemented (which is what the standard document recommends); there is no support for ECC 000-140.

2. Structured Append -- using a group of disjoint Data Matrix symbols together to carry long/continuous data message -- is not supported.

3. Use of FNC1, 05 Macro, 06 Macro, and ECI characters per AIM specifications, are not supported.

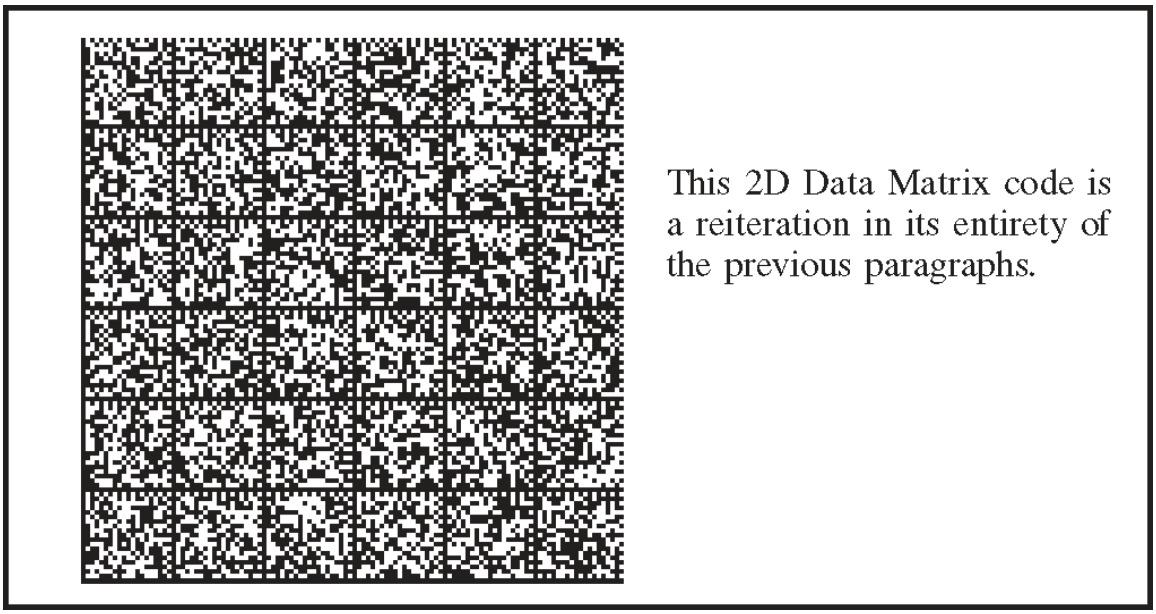


Figure 9-16: 2D Data Matrix Barcode

General Information

In a Data Matrix symbol, the smallest square represents one "bit" of the encoded information: black means 1 and white means 0 (although inverting their meaning is permitted). The physical size of such a square that represents one bit, is called "module size", or commonly the "X width".

Although the ISO/IEC standard does not specify any limits on the X width, it is normal to limit the X width to be at least 10 mils (one mil is one thousandth of an inch); for example, see GS1 documentations related to the Data Matrix code.

These "data bits", together with finder pattern (and alignment pattern, when tiled), are organized into one or more squares, which then are tiled together to form a symbol. When referring to the symbol size, e.g. 10x10, the numbers refer to how many total modules (bits) on each side.

There are 24 square, and 6 rectangular, symbols sizes specified by ECC 200.

The "Quiet Zone" for a Data Matrix symbol, is at minimum 1 X width on all four sides. In MECCA, the Quiet Zone is part of the symbol's background. The symbol dimensions, as reported under Query, include the quiet zone.

The User Interface dialog for Data Matrix

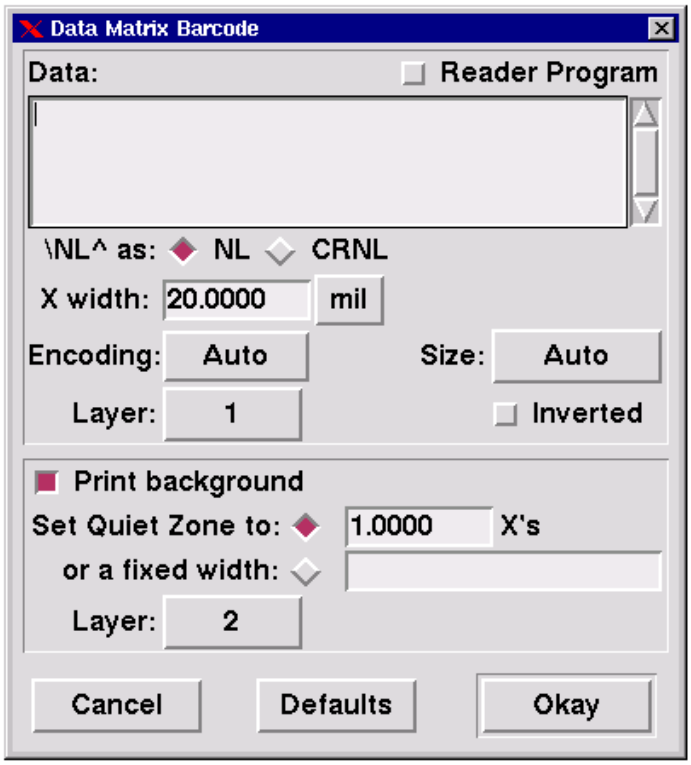


Figure 9-17: User Interface Dialog

Encoding methods

Different encoding methods are provided by the standard, each targeting a particular set of input data (termed "alphabets"):

ASCII For standard ASCII (0-127) and extended (128-255) characters; "extended" ones are ISO-8859-1 characters. This method also includes codewords for 2-digit pair combinations 00 through 99.

C40 Similar to above, but favors uppercase A-Z as base set. That is, for this encoding, the resulting symbol is smallest if data is all uppercase characters, than if data is all lowercase or mixed cases.

Text Same as C40 but favors lowercase a-z as base set.

X12 ANSI X12, limited to these characters plus space (CR below is the ASCII Carriage-Return character): CR * > 0-9 A-Z

EDIFACT ASCII characters 32 (space) to 94 (caret), inclusive. No lowercase letters in this set.

BIN Binary, all byte values as-is.

As can be inferred, the same data may be encoded differently by different encoding methods.

Usage Notes

1. Selecting "Auto" for Encoding will cause different encoding methods to be used over user data, with an objective to achieve the smallest possible symbol size for the given data. Multiple encoding methods may be used, for example, given input data:

   0123ABC

   The result will be two ASCII codewords for the 01 and 23 combinations, then switch to C40 for ABC, which can be represented by 2 codewords.

2. Selecting "Auto" for symbol size, will choose the smallest possible square size that accommodates the encoded data.

3. Data to be encoded can be typed in directly in the text input window. Use the \NNN^ special character notation for non-ASCII characters, and the \NL^ to denote a new line. No other composition command, nor the "compose keys" ("@" key sequence), are supported.

   When using \NNN^ for special characters, there will be a check that the corresponding character is an ISO-8859-1 character. For example, The trademark, \110^, does not exist in ISO-8859-1, therefore the software will flag the use of \110^ not allowed.

The \NL^ command can map to a single ASCII new-line (NL), or the 2-character CR NL combination (which adds one more character to encode). The choice depends on the scanning system used to scan the symbol.

4. For binary encoding, data can be input in groups of ASCII hex digits, separated by a space. For example:

   FF 01 aa cD

   The "cD" above is to show that letter cases are not important.

   In binary encoding, \NNN^ and \NL^ mappings are not supported.

5. The "Reader Program" check button, is to indicate whether the encoded data is for programming the code reader. If it is, a special codeword (decimal 234, hex EA) is automatically set as the first codeword, as required by the standard. Interpretation of input data is based on the encoding method user selected in the dialog, as described above.

Notice

The 144x144 symbol size is a troublesome one: it's known that, for this specific symbol size, some scanners expect the ECC data to be at positions different from what the standard document specified, without any explanation issued by the scanner makers. Such scanners won't decode any data, or may even pronounce Error, when given a 144x144 symbol produced by this implementation.

If you want to avoid creating 144x144 Data Matrix symbol completely, you can edit the config file "barcodes.ini" located in $MECCA_FILES/cfg (normally it is /usr/mecca/cfg) folder. In the section for DataMatrix/Main, set

"NO 144"="1"

Certain scanners do not to read any Data Matrix symbols in the 6x6 configuration at all (i.e., sizes 120x120, 132x132 and 144x144).

When making a new bar code, always verify the code you made. Correctness of contents aside, whether you have given enough clearance (quiet zone) around the bar code, can only be judged by the scanner used to read it.

Changing Defaults in the Data Matrix Menu

```
[Barcode Attributes/DataMatrix/Main]
"Layer"="1"
"Background Layer"="2"
"X width"="20"
"X unit"="t"
"Encoding"="Auto"
"Symbol Size"="Auto"
"QZ Width"="1X"
```

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Chapter 10: The Modify Tools

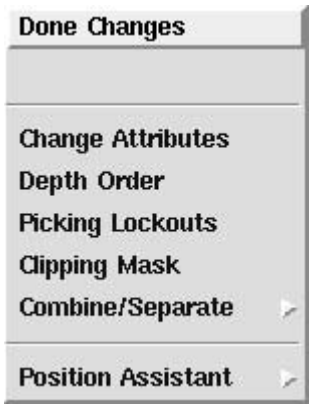
The Modify Tools consist of the [Change], [Move], [Copy] and [Transform] options. These options allow you to alter or enhance your original drawing.

The [Change] Options

With [Change] you can use the standard **{Change Attributes}** option to alter any set attributes. This option will bring up the standard {Change Line Attributes} dialog window.

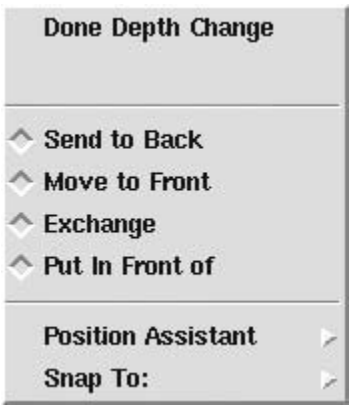
The **{Change Depth Order}** option will allow you to alter the drawing order of items.

The **{Picking Lockouts}** option allows you to individually select components to be viewed and queried only.



{Depth Order}

Sometimes the drawing order of items become disarranged and this order is very important. On output, only the displayed portions of the items are kept. When an element lays over another it actually "knocks out" that portion of the one below it. Putting the items in the correct display order is accomplished through our {Depth Order} menu.



This can best be understood by example. Go to the [Box] function. Draw a few boxes overlapping each other, with the *Background* attribute to be *700* for color with each one set on a different *Layer*.

{Exchange} This allows you to exchange the order of two items. You will be prompted to "pick 1st item" and then "pick 2nd item." Once the two items are selected their display order will flip.

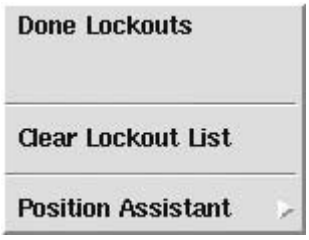
{Move to Front} When you want to send an item to the very front, this is your choice. You will be prompted to "pick item to move."

{Send to Back} This choice will send the item to the very back of the list. Again, you will be prompted to "pick item to move."

{Put in Front of} Here you want to place an item in front of another. You will be prompted to "pick item to move" and then "pick the reference item" (the one you want it in front of).

{Picking Lockouts}

The {Picking Lockouts} allows you to individually select components to be viewed and queried only. Components that are locked will not be seen by any of the Modify Tools, such as [Move], [Copy], [Delete], etc.



Selecting {Picking Lockouts} prompts you "Pick item to add to lockout." You can individually pick components or use the [Group] option to help select components to be locked. As you select items they will display as white, then select the {Done Lockouts} to get the lock to take place. The white display will disappear, but you will notice that the items cannot be edited.

{Clear Lockout List} will clear all components from being locked. When selecting {Picking Lockouts} the components, which are locked, will display white. {Clear Lockout List} will return the components to their normal display, close the option, and make the components editable again. Any component may be locked regardless of layer attribute.

{Clipping Mask}

Mask means to "hide" everything that hangs outside of a boundary. You may be familiar with masking since MECCA III had the ability to mask a raster. With MECCA 2000, mask has been expanded to allow you to mask any component. That means masking will clip off anything that hangs outside of the boundary.

The boundary can be any closed shape, which holds a simple area, or a box.

Below is an example of a drawing before and after masked. See how an effective hole has been drawn with only the image inside the hole showing.

When creating the mask, a group was used to denote which components to include in the mask. For our example we grouped everything, but this might not be the case as you are using mask. Just remember to group any component you want the program to clip if it happens to hang out of the boundary.

Clipping Mask Example

Below are a raster and an example of the output once masked. See how an effective hole has been drawn with only the image inside the hole showing. This is masking a raster. Editing the pixels out of the raster is time consuming, but using a mask is fast and easy. You can use {Crop Raster} for rectangular boundaries, but when the shape is not rectangular, then you need masking to easily block out around a shape.

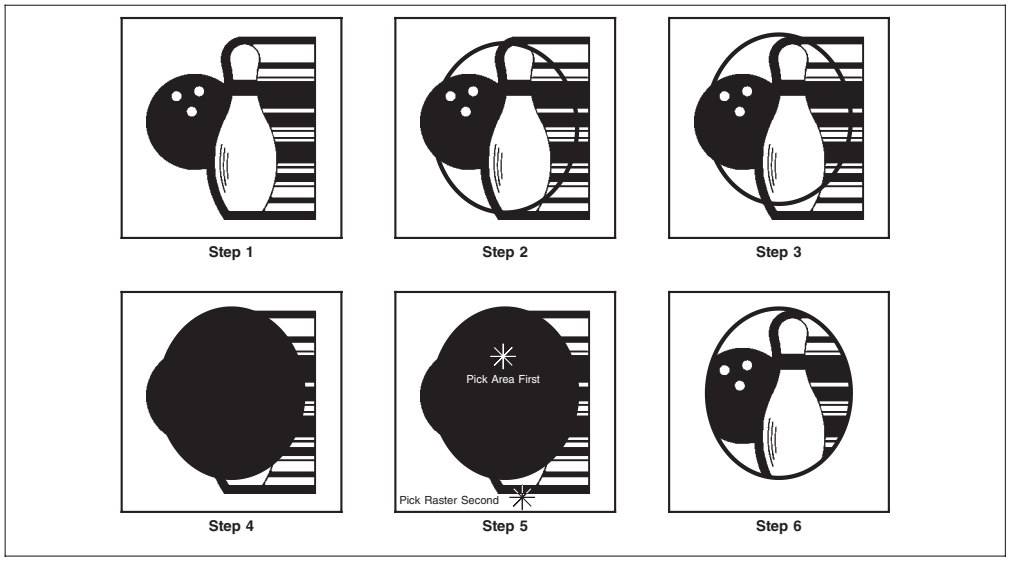


Figure 10-1: Attaching a Mask to Your Raster

Step 1:

Scan and **clean up** your raster image.

Step 2:

Draw your masking boundary. This shape can be made of vectors, splines, circle/arcs, or vector chains.

Step 3:

Move the boundary into position, judging by what is inside the boundary.

Step 4:

Fill the shape with an area using **[Area] {New Area}.** The attributes of the area are white in our example, and it must be a simple area.

Step 5:

Go to **[Change],** and **select {Clipping Mask}.** Always **pick the area** first, and then **pick the raster.**

Step 6:

Toggle off the **[Change]** button to quit out of clipping. Look at your raster, only the portion, which was under the area, is showing. It will also print in the same manner. You have successfully masked your raster image.

The complete raster is still there, so is the area. The clipping function has combined the two.

Removing the Mask

To unmask an item select [Change], {Clipping Mask} then right mouse click and choose {Clear Clipping}. Pick the area or box to undo the Mask.

Lock-In and Unlock Clipping Item

After you have created the mask, you can adjust the position of the boundary box or clipping area by using the {Lock-In Clipping Item} option. This feature allows you to lock onto the boundary box or clipping area, you can then go to [Move] and make adjustments to the position. You will see the correct clipping as it is moved. Afterwards, go back to the {Clipping Mask} options and {Unlock Clipping Item} to remove the lock from the clipping area.

{Combine/Separate}

This option enables you to define and un-define what amounts to "permanent groups". An example of a permanent group that you're already familiar with is {Prorated Rules} All lines created with the {Prorated Rules} option are tied together, just as if you had [Group]ed them. You can [Move], [Copy], [Delete], etc., all lines at once. Other examples are [Splines] and {Section Lines}.

The [Group] Functions are necessary to select what you want combined. After you have the items grouped, you select {Combine/Separate} then right mouse click and select {Combine}. This function looks for all temporarily grouped items and turns them into a permanent group. As soon as this happens the white display showing the temporary group of items will disappear.

Try the exercise shown in Figure 10-2 for a simple combine and then separate.

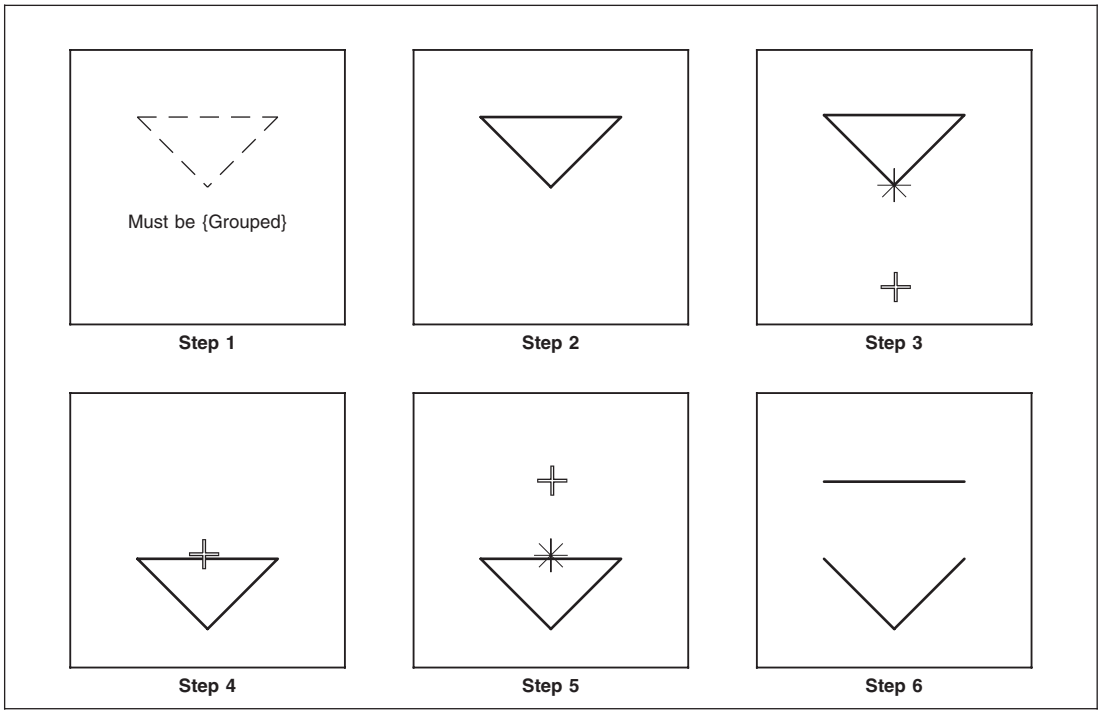


Figure 10-2: Using {Combine} and {Separate}

Step 1:

Draw a simple triangle (three lines) and **[Group] {All}.** The triangle now displays as white.

Step 2:

Choose **{Combine/Separate}**. Right mouse click and a submenu with the option {Combine} will appear. Choose **{Combine}.** Every item [Group]ed will be combined into a permanent group. Notice that they are no longer white.

Step 3:

Let's test our combine by moving. **[Move], {Move to Anywhere}**, pick the triangle anywhere, and pick a new position.

Step 4:

The entire triangle moved even though you did not group it first. This is the advantage of combine. It allows you to permanently group items that are going to always belong to one another. Go back to **[Change], {Combine/Separate},** and let's **{Separate}**. The prompt will be, "pick item to separate", so pick one of the lines of the triangle. You may notice a small twitch, but nothing really visible happens.

Step 5:

The "pick item to separate" prompt repeats, but ignore it. Go back to **[Move], {Move to Anywhere}**, pick one of the sides of the triangle, pick a new position.

Step 6:

That side (and only that side) moved. The permanent group is gone and the individual lines are separated (no longer linked) from one another.

The [Move] Tool

Choosing **[Move]** will take you to the Move Menu. Using the options here you can pick up and move any individual item (or selected group of items) to any position you like.

Moving Items

Moving items requires you to pick a handle on the item you want to move and then pick where you want that handle to go.

On vectors, you can pick any part of the vector as a handle. The same goes with areas. Circles require you to pick the outer edge, or use {Position Assistant}'s {Circle Center} to pick the center point.

Defaults:

Move Anywhere

Prompts:

Pick item to move, Pick new position

Text can be picked from the left, right, or center of the string. Each of these also can be picked from the top, middle, or baseline giving text a total of nine handles per string.

It's not always necessary to use the cursor to pick new positions for items to be moved, leveled or plumbed. You can always type a number representing the *measure* of distance you want to go to from the picked spot the item involved, and press an [arrow] key and [Enter]. The item will be moved that distance in that direction. You can also use the various Position Functions, especially {Hold Pos}, to get the same sort of precise effect.

{Move to Anywhere}

This option on the Move Menu lets you [Move] an item to anywhere you like. Try the exercises shown in Figure 10-3:

Prompts:

Pick item to move, Pick new position

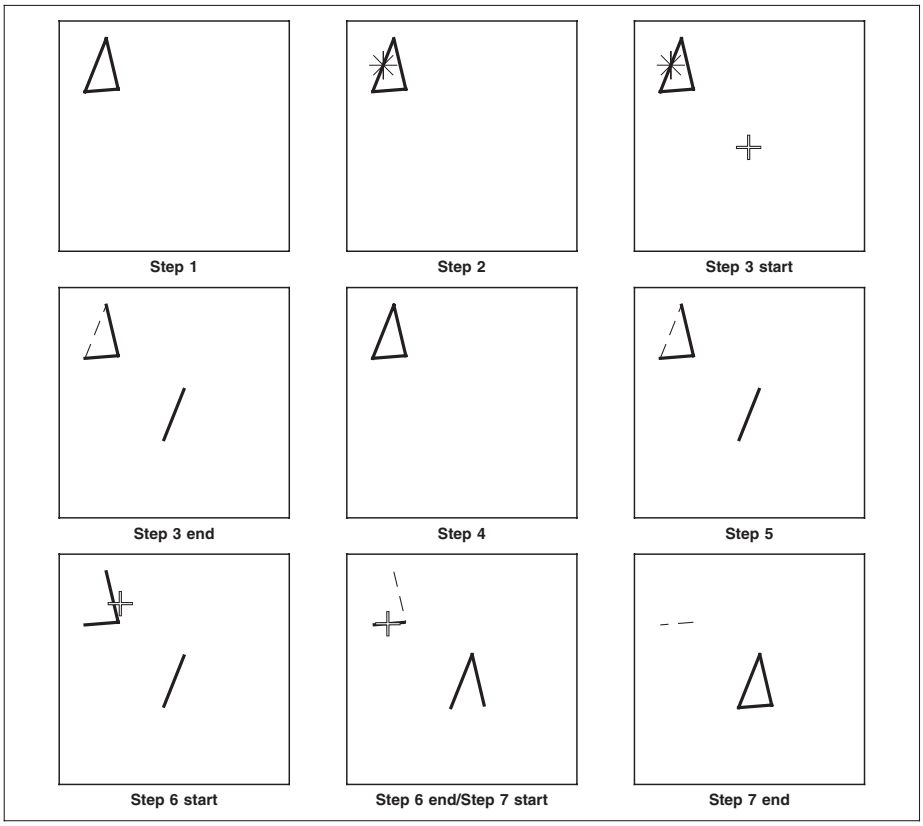


Figure 10-3: Using {Move Anywhere}

Step 1:

Choose **[Line]** and make yourself a triangle near the left top of the Window Area. **{Exit Line Functions}** out of Line.

Step 2:

Choose **[Move], {Move to Anywhere}**, then at the "pick item to move" prompt, pick a spot near the middle of the left side of the triangle. Crosshairs will appear at that location.

Step 3:

At the prompt, "pick new position", pick a spot well to the right of the triangle, and visibly up or down a bit. Pick as usual, but instead of moving the cursor away, hold it lightly in place. The left side of the triangle will appear at the new position. The location on the line where the crosshairs *were* will now be where the X-shaped cursor *is* (the place you picked at the prompt).

Step 4:

Choose the **{Reverse}** option. The line will go back to its original position.

Step 5:

Repeat Steps 1 through 3. You'll wind up with the left side of the triangle floating by itself, just as at the end of Step 3.

Step 6:

Choose the **{Bring Others}** suboption. You'll be prompted to "pick item to bring", so pick one of the remaining sides of the original triangle. It will vanish from its original position and appear next to the first side moved, *in the same relationship that the two items originally had.* Since the two lines originally met (at a corner of the triangle), they'll be reconnected now.

Step 7:

Pick the third side of the triangle, and it too will [Move] to join the others. You'll now have a complete version of the original triangle at your new location.

Step 8:

[Delete] its three sides, then **{Exit Move}**

X and Y Coordinates

In order to understand the next two options, it's necessary to realize that the MECCA 2000 software is based on dividing the graphic creation area of the computer's memory into "X and Y coordinates". This term, which you may remember from your high school geometry classes, means, in practical terms, that any given spot in the Window Area can be classified as the intersection of a vertical line going through an "X-position" and a

horizontal line going through a "Y-position". Figure 10-4 shows a highly stylized version of these concepts (the MECCA 2000 coordinate system is several thousand X's wide and Y's high).

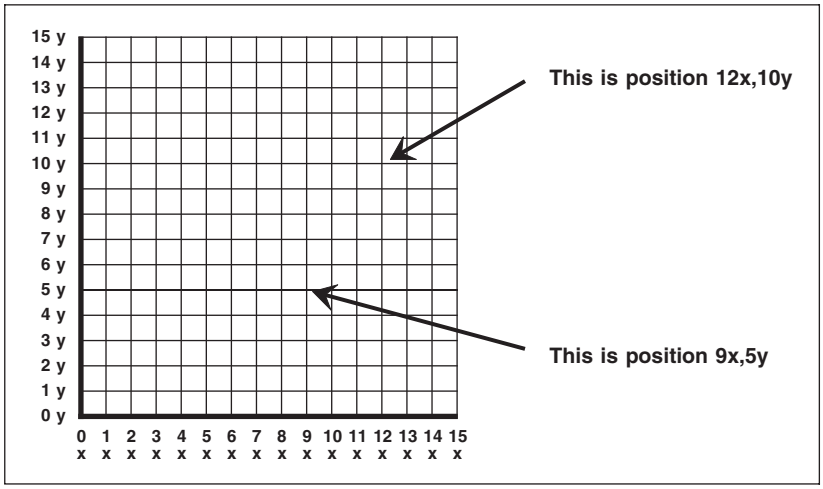


Figure 10-4: X & Y Coordinates

For the purposes of using MECCA 2000, all you need to remember is that X-positions go from side to side, while Y-positions are arranged up and down. Or to put it even more simply, just memorize this: *X means sideways; Y means up-and-down.*

{Move X}

When you choose this option on the Move Menu, the first prompt you'll get is similar to the first one you got with the {Move to Anywhere} option. But the second one is more specific, "pick new position - move X". When you pick your new X-position, what you're actually doing is choosing a new X coordinate while keeping the old Y coordinate. The result is that the item you picked moves directly sideways, to make the picked location on the item match the X-position directly above or below the new spot chosen. Try the exercises shown in Figure 10-5 to see what this looks like.

Prompts:

Pick item to move, Pick new position - move X

Step 1:

Choose the **[Arc]** option to draw three circles down the left side of the Window Area. **{Exit Arc Functions}.**

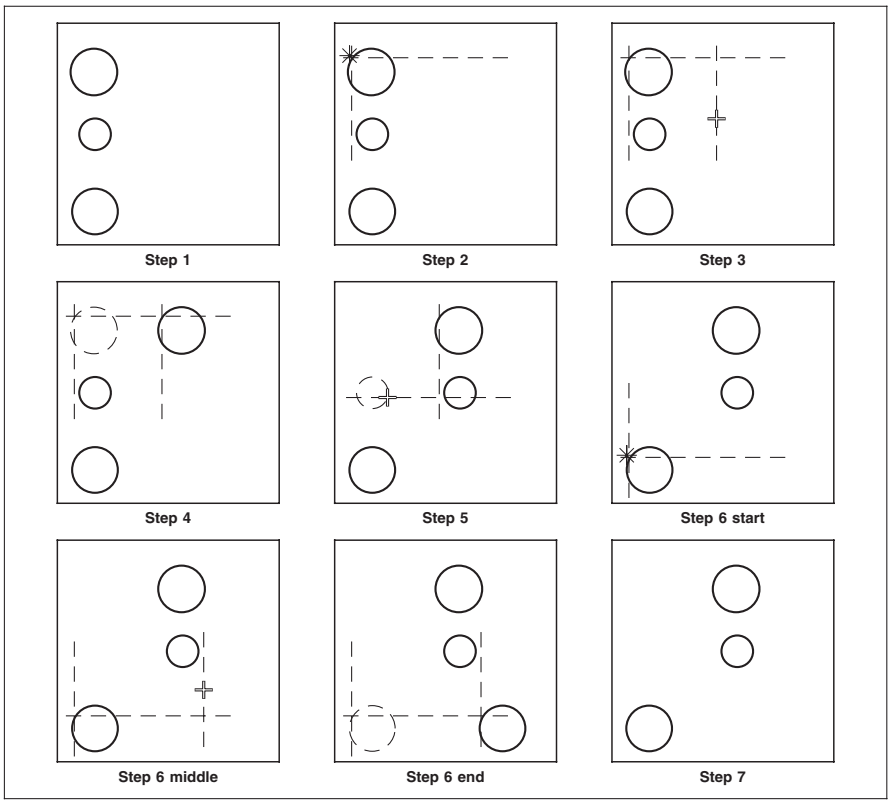


Figure 10-5: Using {Move X Direction}

Step 2:

Choose **[Move], {Move X}**, and when prompted to "pick item to move", pick the location on the top circle that corresponds to 10 o'clock. The crosshairs will appear there, defining imaginary horizontal and vertical lines.

Step 3:

When prompted to "pick new pos...", move the cursor over to the right and *below* the top circle's current bottom. Pick that spot. This defines a new imaginary vertical line.

Step 4:

The circle will [Move] to the right, with the 10 o'clock location directly *above* the spot you chose. That 10 o'clock location will also be on the intersection of the two imaginary lines (the old horizontal and the new vertical - i.e., the old Y-coordinate and the new X-coordinate).

Step 5:

Choose **{Bring Others}** and pick the second circle on the left anywhere. It will line up underneath the first one, in the same relationship that the two circles had before either was moved.

Step 6:

Repeat Steps 2 and 3 with the third circle; only pick a new X-position that's to the right and *above* the third circle's 10 o'clock location. The third circle will [Move] to the right, lining its 10 o'clock location directly *underneath* the picked new spot.

Step 7:

Choose **{Reverse}** and it will immediately jump back to it's previous position.

Step 8:

{Exit Move}.

{Move Y}

This option is the exact opposite of the one just discussed. When you choose this option on the [Move] Menu, the first prompt you'll get is a familiar looking, "pick item to move". The second one resembles the one for the previous option, "pick new position - move Y". When you pick your new Y-position, what you're actually doing is choosing a new Y coordinate while keeping the old X coordinate. The result is that the item you picked moves directly up or down, to make the picked location on the item match the Y-position directly to the right or left of the new spot chosen. Try the exercises shown in Figure 10-6 to see what this looks like.

Prompts:

Pick item to move, Pick new position - move Y

Step 1:

Use the **{Arc}** option to draw three circles across the top of the Window Area. **{Exit Arc Functions}.**

Step 2:

Choose **[Move], {Move Y}**, and when prompted to "pick item to move", pick the location on the right circle that corresponds to 1 o'clock. The crosshairs will appear there, defining imaginary vertical and horizontal lines.

Step 3:

When prompted to "pick new pos...", move the cursor down and to the *left* of the right circle's left edge. Pick that spot. Now you have the new imaginary horizontal line.

Step 4:

The circle will [Move] down, with the 1 o'clock location directly to the *left* of the spot you chose. That 1 o'clock location will also be on the intersection of the old vertical and the new horizontal imaginary lines (the old X-coordinate and the new Y-coordinate).

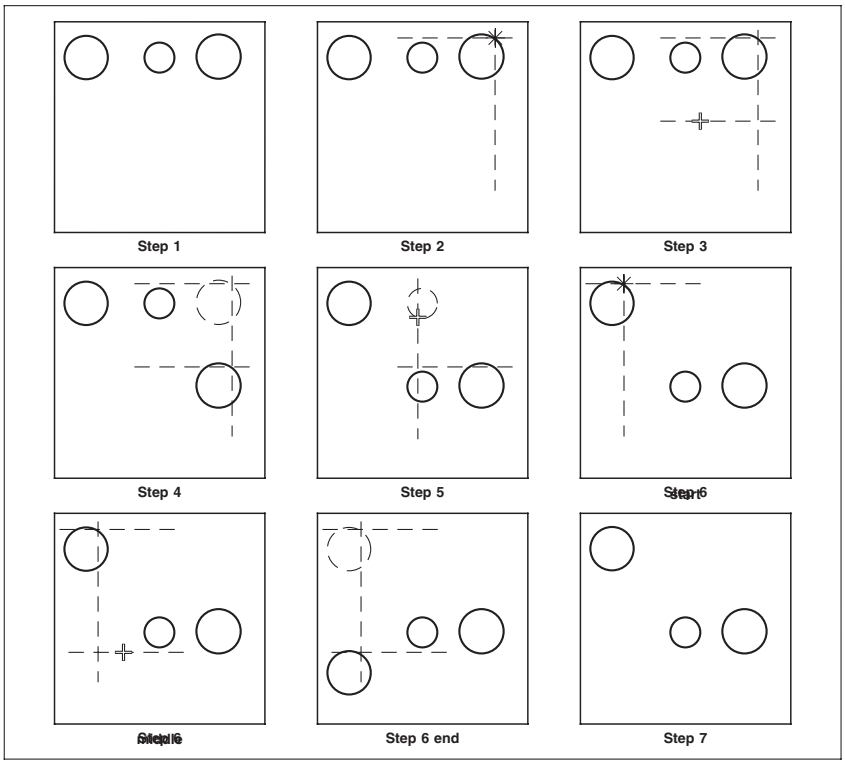


Figure 10-6: Using {Move Y Direction}

Step 5:

Choose **{Bring Others}** and pick the second (middle) circle anywhere. It will line up next to the first one, in the same relationship that the two circles had before either was moved.

Step 6:

Repeat Steps 2 and 3 with the third (left) circle; only pick a new Y-position that's down and to the *right* of the third circle's 1 o'clock location. The third circle will [Move] down, lining its 1 o'clock location directly to the *left* of the picked new spot.

Step 7:

Choose **{Reverse}** and pick the third circle anywhere around its circumference. It will immediately jump back to its previous position. Pick the second and first circles similarly. Nothing will happen.

Step 8:

{Exit Move}.

{Move to Plumb}

These exercises show that no matter how far your new spot is to the right or left of the imaginary vertical line running through the picked location on an item being moved with this option, the item will simply go up or down to match up with the imaginary horizontal line going through the new spot. It also gets obvious that the {Reverse} and {Bring Others} options work exactly the same way they did before.

Prompts:

Pick plumb line, Pick item to move

There are going to be times when you will want to line up several parts of your graphic directly above or below each other. That's when this particular option comes in handy. To see how it works, do this exercise, shown in Figure 10-7:

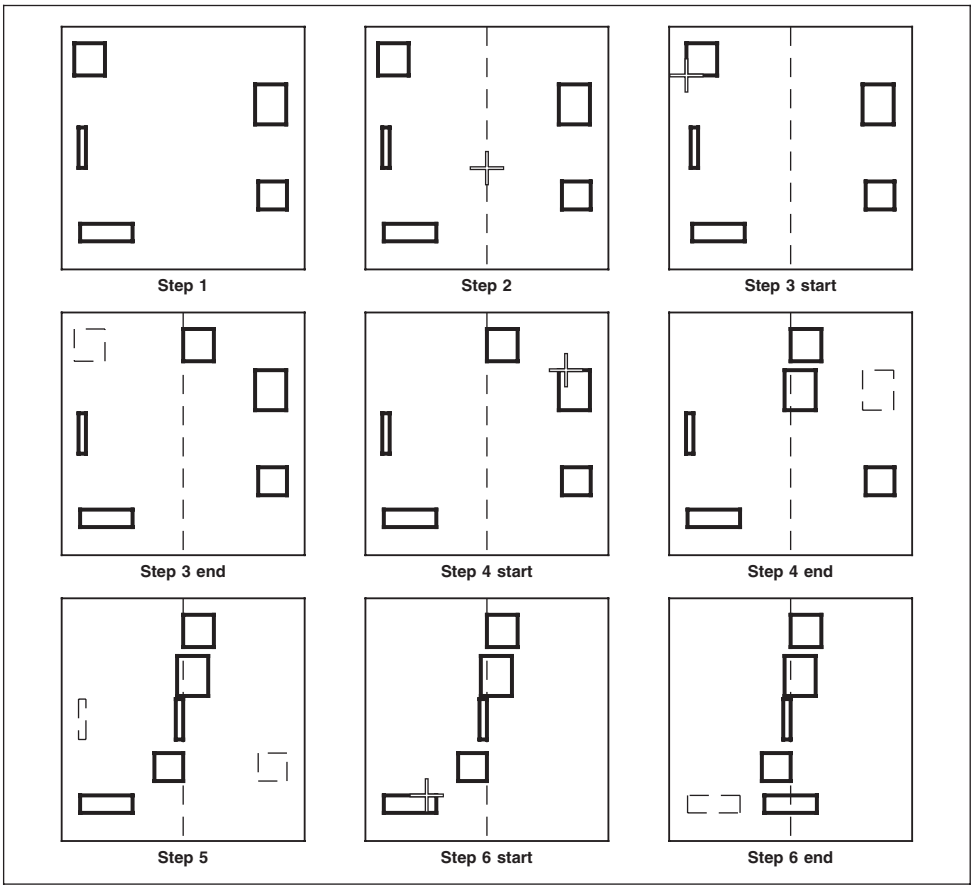


Figure 10-7: Using {Move to Plumb}

Step 1:

Use **[Line], {Prorated Rules}** to make a few rectangles down the right and left sides of the Window Area, leaving the middle clear. It would help if the top line of each were below the bottom line of the one above it, as shown. **{Exit Line Functions}.**

Step 2:

Choose **[Move], {Move to Plumb}**. You'll be immediately prompted to "pick plumb line", so pick a position anywhere near the horizontal center of the Window Area. A dashed vertical line will appear going through that spot. *This is a temporarily visible version of the imaginary vertical line you were creating before with the {Move X} option.*

Step 3:

The prompt you will now get is, "pick item to move". Starting with the top rectangle pick it somewhere, say the bottom left corner. The rectangle will immediately [Move] sideways, putting that corner (and thus the whole left side of the rectangle) precisely on the plumb line.

Step 4:

The "pick item to move" prompt will return, so pick the next rectangle somewhere, say on its top line. That rectangle will now slide sideways, lining up the location you picked with the plumb line. Remember that if you get too close to the end of one of the rectangle's sides when you do your picking, MECCA 2000 is likely to assume that you really want the corner (the endpoint).

Step 5:

Pick a couple more rectangles in the same way, and watch them slide over to the plumb line.

Step 6:

If you want to try to center one of the rectangles onto the plumb line (a very useful technique to learn), wait until the "pick item to move" prompt returns. Then choose **{Mid Line}** from the {Position Assistant} Functions. The prompt will change to "pick line", so pick a location anywhere along the length of the top or bottom of any of the rectangles. The rectangle will [Move] sideways until it is centered on the plumb line, and the "pick item to move" prompt will pop up again.

Step 7:

When you're finished plumbing all those rectangles, you can **{Exit Move}.**

You'll notice that this time we didn't bother to exercise you on the {Reverse} or the {Bring Others} options. That's because there's no change in how they behave here.

{Move to Level}

There are going to be different occasions when you'll want to line up several parts of your graphic directly to the right or left of each other. That's when you'd use this option, which is basically the same as the previous one, but rotated 90 degrees. Try this exercise, shown in Figure 10-8:

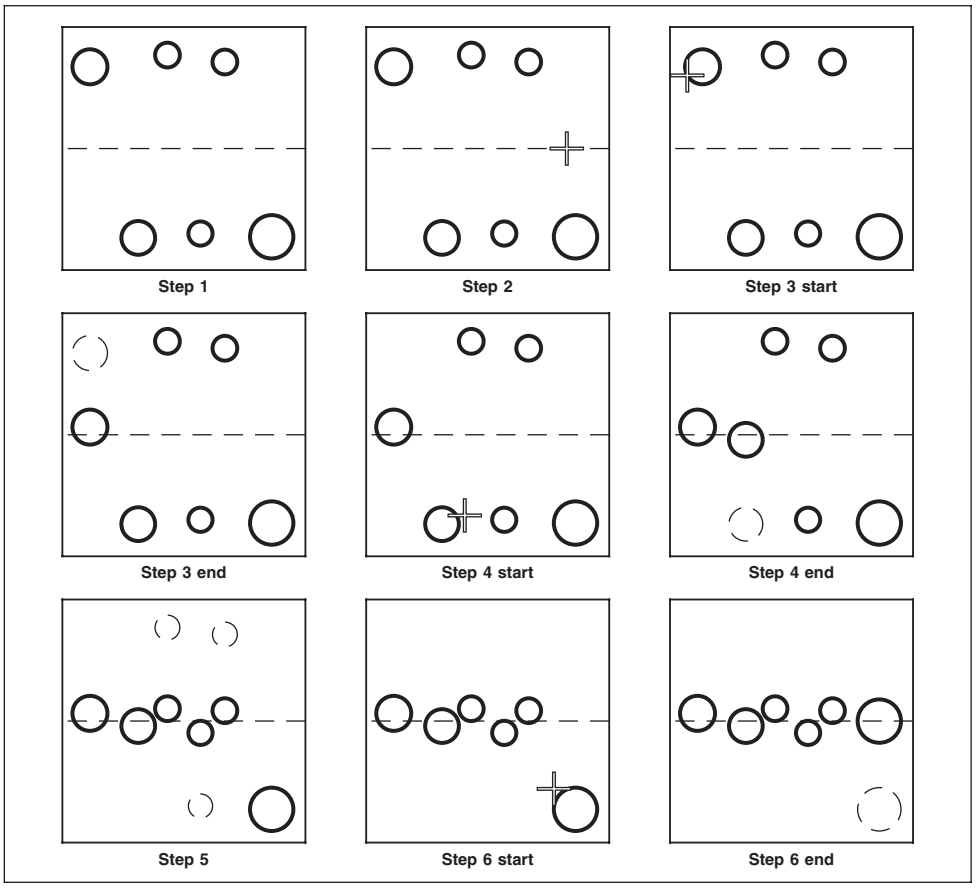


Figure 10-8: Using {Move to Level}

Prompts:

Pick level line, Pick item to move.

Step 1:

Use **[Arc]** to make a few circles across the top and bottom of the Window Area, leaving the middle clear. It would help if the right edge of each were to the left of the one next to it, as shown. **{Exit Arc Functions}.**

Step 2:

Choose **[Move], {Move to Level}**. You'll be immediately prompted to "pick level line", so pick a position anywhere near the vertical center of the Window Area. A dashed horizontal line will appear going through that spot. *This is a temporarily visible version of the imaginary horizontal line you were creating before with the {Move Y} option.*

Step 3:

The prompt you will now get is, "pick item to move". Starting with the far left circle, pick it somewhere, say the 8 o'clock location. The circle will immediately [Move] up or down, putting the 8 o'clock location precisely on the level line.

Step 4:

The "pick item to move" prompt will return, so pick the next circle somewhere, say on the 2 o'clock location. The circle will now slide up or down, lining up the location you picked with the level line.

Step 5:

Pick a couple more circles in the same way, and watch them go up or down to the level line.

Step 6:

If you want to try to center one of the circles onto the level line, wait until the "pick item to move" prompt returns. Then choose **{Cir Cen}** from the {Position Assistant}Functions. The prompt will change to "pick arc", so pick a location anywhere around the circle you want to {Level}. The circle will [Move] up or down until it is centered on the level line, and the "pick item to move" prompt will return.

Step 7:

When you're finished leveling all those circles, you can **{Exit Move}.**

The {Restore} or the {Bring Others} options will continue to work in the same old ways.

{Again}, {Reverse}, {Bring Others}

These suboptions are a little bit more complex than they might seem from the last exercise. When you move something, you can move it again, the same distance/direction by selecting {Again}. As many times as you choose {Again} the item will move. {Reverse} on the other hand, restores the item back one move. And will eventually restore it back to its original position, if you choose {Reverse} as many times as you moved it when using {Again}.

Try this one, shown in Figure 10-9:

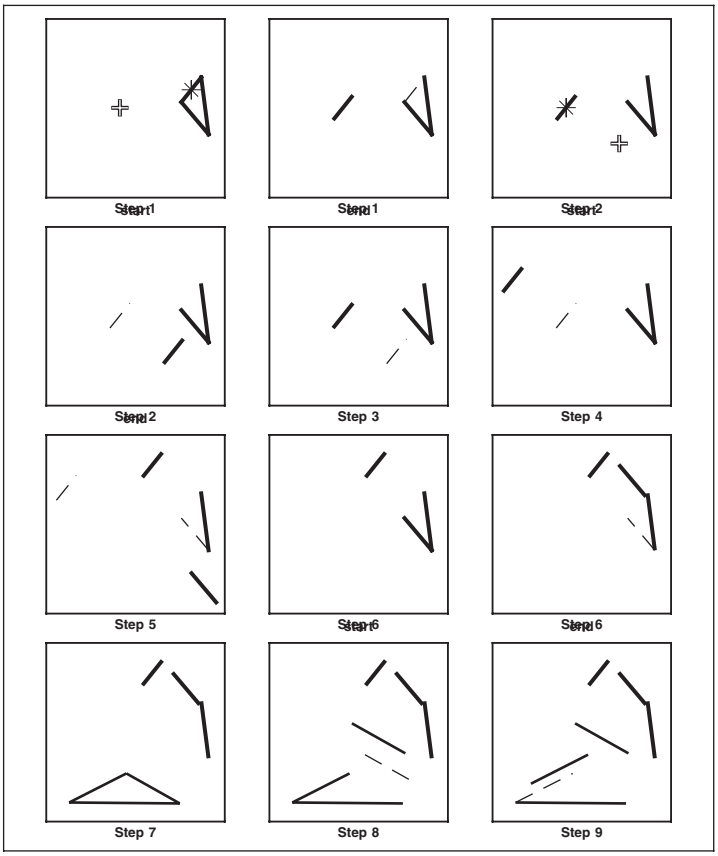


Figure 10-9: Using {Restore} and {Bring Others}

Step 1:

Make another triangle near the middle of the right side of the Window Area. **[Move], {Move to Anywhere}** again, and pick one of the sides of the triangle. Pick a new position about four inches left and one inch down. The side will [Move] to the new spot.

Step 2:

Immediately pick that same floating line as the item to [Move] and pick a second place to put it, say two inches down and three inches to the right - a different distance and direction from its last [Move]. Obviously, the line will [Move] again.

Step 3:

Choose **{Reverse}**. The line will go to its previous position, up and leftwards, but *not* to its earlier place in the triangle. That's because *{Reverse} only remembers one [Move] back.*

Step 4:

Use **{Reverse}** again. The line will jump up and leftwards again - the same (second) distance and direction.

Step 5:

Quit out of Restore Mode (and thus back into Move Anywhere Mode). [Move] that first line somewhere again. Then [Move] one of the other triangle sides.

Step 6:

Choose **{Reverse}** again. The second line will [Move] back. Use **{Reverse}** a third time, and that second line will [Move] yet again. But nothing will happen to the first line because, *{Reverse} only works if you change your mind immediately after moving the item you want to {Reverse}.* Any other action, including a [Move], involving a different item, changes the Restore Mode's memory of what you're likely to want reversed.

Step 7:

{Exit Move} and choose **[Line]** and make another triangle in a clear part of the Window Area.

Step 8:

Choose **[Move], {Move to Anywhere}** as before. [Move] the same side twice, as in Steps 1 and 2.

Step 9:

Choose **{Bring Others}** and pick one of the two remaining connected sides of the triangle. That side will [Move], but not to an attached position because it was moved twice.

The {Bring Others} suboption works by having the computer ask itself, "what was the relationship between this item I'm now supposed to {Bring}, and the item I moved last, *just before* I made that last [Move]?" When you did this in the previous exercise, the relationship between the first and second sides of the triangle was one particular distance and direction (the one that had them attached at one end). When you did it this time, a different direction and distance (one that had them separated) had been created by the previous [Move], and that *second* distance and direction combination was what got maintained by the {Bring Others} suboption.

The {Bring Others} suboption, like {Reverse}, only works one step back.

Try creating some other shapes and moving them around on screen with this {Move to Anywhere} option and its suboptions. You'll find that a circle or a rectangle will [Move] as a single unit. But a more complex shape (even a rectangle created out of separate lines), will [Move] one line or arc at a time. Experiment with these procedures until you're really comfortable with them.

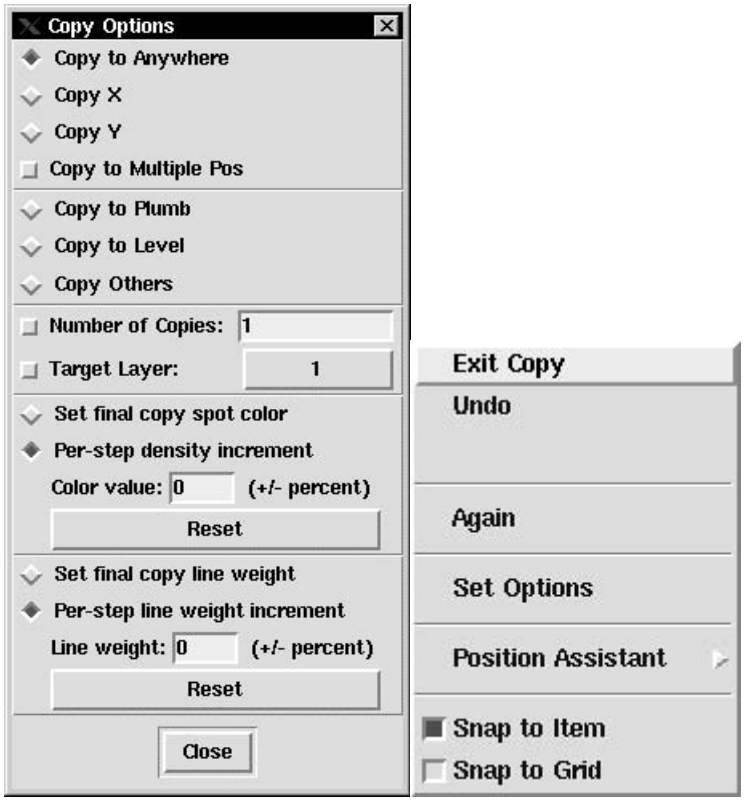
The [Copy] Tool

The major point of this option is to let you copy part of a repetitious illustration as many times as needed, in whatever positions they're needed in.

Choosing **[Copy]** will give you access to the Copy dialog. Using the options here you can copy any item to any position. Also, the dialog box can be left open while you are making your copy. The Undo, Copy Again, and Position options are found under the right mouse pop-up menu.

Misc. Notes

As with the [Move] options, it's not always necessary to use the cursor to pick new positions for items to be copied, leveled or plumbed to. You can type a number representing the distance you want to go to from the picked spot on the item involved, and press an [arrow] key. The item will be copied (or the plumb or level line will appear) that distance in that direction. You can also use the various Position Functions, especially {Hold Pos}, to get the same sort of precise effect.



{Copy to Anywhere}

This option on the Copy Menu lets you copy an item to anywhere you like. Try the exercises shown in Figure 10-10:

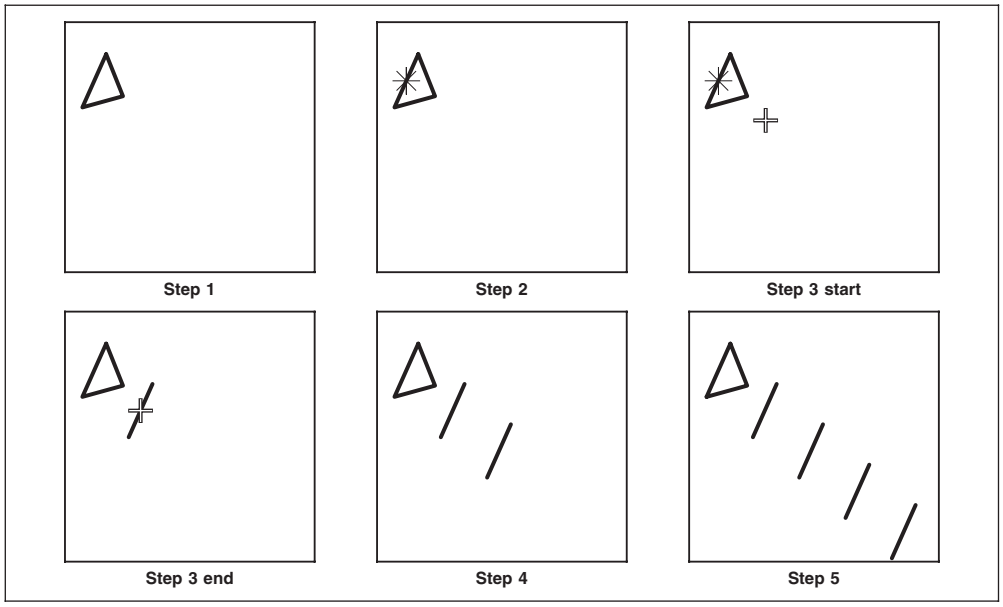


Figure 10-10: Using {Copy Anywhere} and {Again}

Prompts:

Pick item to copy, Pick new position - anywhere

Step 1:

Choose **[Line]** and make yourself a triangle near the left top of the Window Area. **{Exit Line Functions}.**

Step 2:

Choose **[Copy], {Copy to Anywhere}**, then at the "pick item to copy" prompt, pick a location near the middle of the left side of the triangle. Crosshairs will appear at that spot.

Step 3:

At the prompt, "pick new pos...", pick a position slightly to the right of the triangle, and visibly up or down a bit. Pick as usual, but instead of moving the puck away, hold it lightly in place. A duplicate of the left side of the triangle will appear at the new position. The location on the line where the crosshairs *were* will now be where the X-shaped cursor *is* on the new line, just as with the [Move] options.

Step 4:

Choose the **{Again}** suboption in the pop-up menu with the right mouse. A third duplicate of the line will appear, as far to the right of (and as far above or below) the second one as the second one was to the original. Note that distances and directions are being preserved here.

Step 5:

Repeat Step 4. A fourth duplicate will appear. You can keep making duplicates as long as you like. The "pick item to copy" prompt will return each time.

Step 6:

[Close] Copy.

Try creating some other shapes and copying them around on screen with this {Copy to Anywhere} option and its suboption. You'll find that a circle (or a rectangle created with the [Line], {Prorate Rules} option) will copy as a single unit. But a more complex shape will copy one line or arc at a time. Experiment with these procedures until you're sure you understand them.

{Copy X}

When you choose this option on the Copy Menu, you'll get familiar looking prompts. Just as with {Move X}, when you pick your new position, you're deciding on a new X coordinate while keeping the old Y coordinate. The result is that the item you picked copies directly sideways, to make the picked location on the item match the X-position directly above or below the new spot chosen. Try the exercises shown in Figure 10-11 to see what this looks like. Remember *X means sideways; Y means up-and-down.*

Step 1:

Use the **[Arc]** option to draw two circles, one in the top left and one in the bottom left of the Window Area. **{Exit Arc Functions}**

Step 2:

Choose **[Copy], {Copy X}**, and when prompted to "pick item to copy", pick the location on the top circle that corresponds to 10 o'clock. The crosshairs will appear there, defining imaginary horizontal and vertical lines.

Step 3:

When prompted to "pick new pos...", move the cursor over to the right and *below* the top circle's current bottom. Pick that X-position. This defines a new imaginary vertical line (X-coordinate).

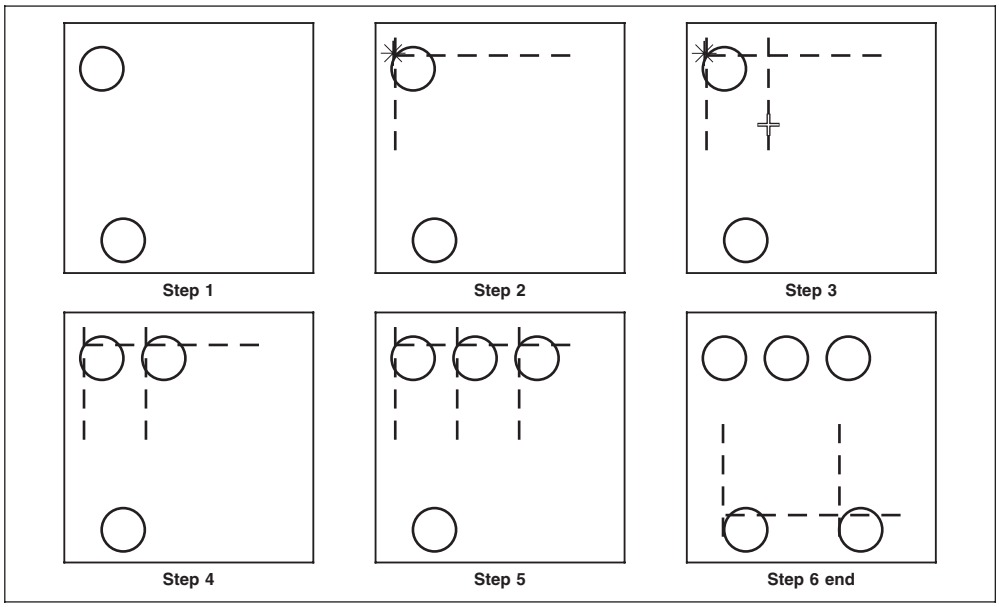


Figure 10-11: Using {Copy X Direction}

Step 4:

The circle will copy to the right, with the 10 o'clock location directly *above* the spot you chose. That 10 o'clock location will also be on the intersection of the old imaginary horizontal line and the new vertical one.

Step 5:

Choose **{Again}** from the right mouse pop-up menu. A third circle will appear directly to the right of the second one, at an equal distance. The "pick item to copy" prompt will reappear.

Step 6:

Repeat Steps 2 and 3 with the bottom circle; only pick a new X-position that's to the right and *above* the bottom circle's 10 o'clock location. The third circle will copy to the right, lining its 10 o'clock location directly *underneath* the picked new position.

Step 7:

[Close] Copy.

You can see that no matter how far your new spot is above or below the imaginary horizontal line running through the picked location on your original item, the equivalent location on the duplicate item will simply appear directly to the right or left, matching up with the imaginary vertical line going through the new position. It's also obvious that the {Again} option works exactly the same way it did with the {Copy to Anywhere} option.

{Copy Y}

This option is essentially the counterpart of the previous one. When you choose this option on the Copy Menu, you'll get familiar prompts. As with {Move Y}, when you pick your new position, you're deciding on a new Y coordinate while keeping the old X coordinate. The result is that the item you picked copies directly up or down, to make the picked location on the duplicate match the Y-position directly to the right or left of the new position chosen. Try the exercises shown in Figure 10-12 to see what this looks like.

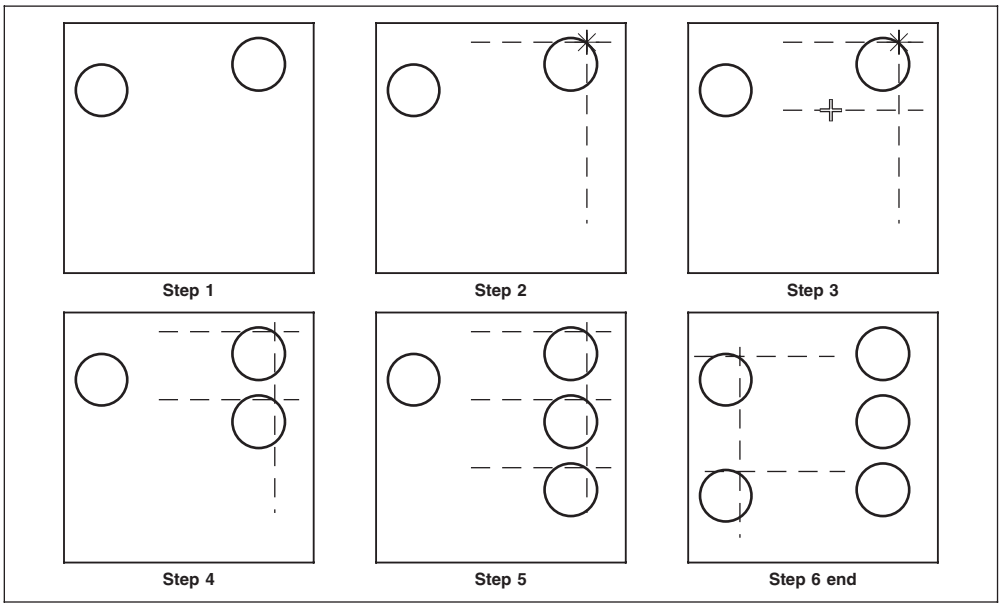


Figure 10-12: Using {Copy Y Direction}

Step 1:

Use the **[Arc]** option to draw two circles, one in the top left and one in the top right of the Window Area. **{Exit Arc Functions}.**

Step 2:

Choose **[Copy], {Copy Y}**, and when prompted to "pick item to copy Y", pick the location on the right circle that corresponds to 1 o'clock. The crosshairs will appear there. So you now have your imaginary horizontal and vertical lines again.

Step 3:

When prompted to "pick new pos...", move the cursor down and to the *left* of the right circle's left edge. Pick that Y-position. This gives you your new imaginary horizontal line (Y-coordinate).

Step 4:

The circle will copy downwards, with the 1 o'clock location on the duplicate directly to the *right* of the position you chose. That 1 o'clock location will also be on the intersection of the old imaginary vertical line and the new imaginary horizontal one.

Step 5:

Choose **{Again}**. A third circle will appear directly below the second one, at an equal distance. The "pick item to copy" prompt will come back.

Step 6:

Repeat Steps 2 and 3 with the top left circle; only pick a new Y-position that's down and to the *right* of that circle's 1 o'clock location. The top left circle will copy downwards, lining the duplicate's 1 o'clock location directly to the *left* of the picked new position.

Step 7:

[Close] Copy.

These now familiar exercises show that no matter how far your new position is to the right or left of the imaginary vertical line running through the picked location on an item being copied with this option, the corresponding location on the duplicate item will appear on the imaginary horizontal line going through the new spot. It becomes obvious that the {Again} option works exactly the same way it did before.

{Copy to Plumb}

There are going to be different occasions when you'll want to [Copy] parts of your graphic directly to the right or left of each other. That's when you'd use this option. Try this exercise, shown in Figure 10-13:

Prompts:

Pick plumb line, Pick item to plumb

Step 1:

Use **[Line], {Prorate Rules}** to make several rectangles down the right and left sides of the Window Area, leaving the middle clear. It would help if the top line of each were below the bottom line of the one above it, as shown. **{Exit Line Functions}.**

Step 2:

Choose **[Copy], {Copy to Plumb}**. You'll be immediately prompted to "Pick plumb line", so pick a spot anywhere near the horizontal center of the Window Area. A dashed vertical line will appear going through that spot. *This is a temporarily visible version of the imaginary vertical line you were creating before with the {Copy X} option.*

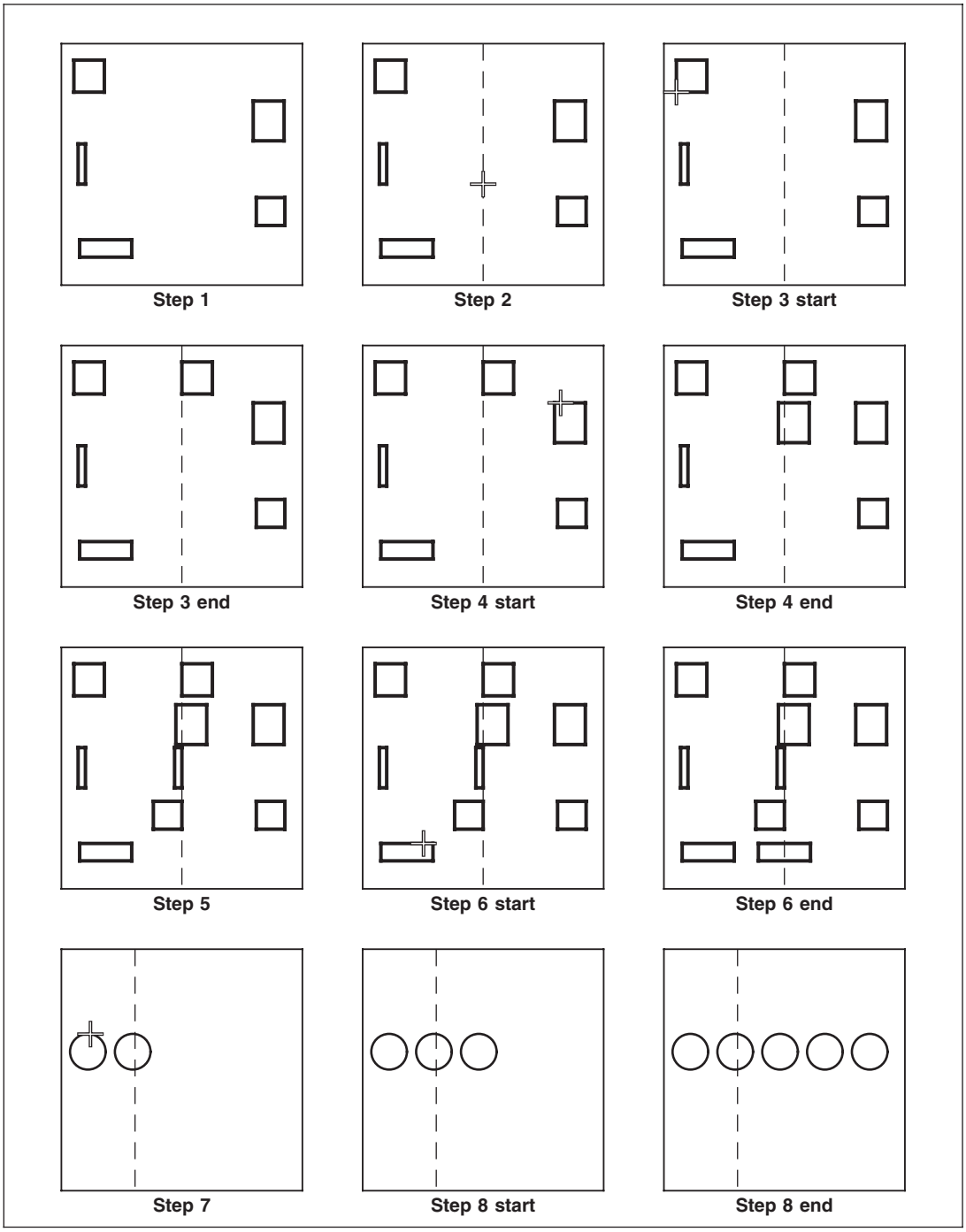


Figure 10-13: Using {Copy to Plumb}

Step 3:

The prompt you will now get is, "pick item to copy". Starting with the top rectangle, pick it somewhere, say the bottom left corner. The rectangle will immediately copy sideways, putting that corner (and thus the whole left side of the duplicate rectangle) precisely on the plumb line.

Step 4:

The "pick item to copy" prompt will return, so pick the next rectangle somewhere, say on its top line. That rectangle will now copy sideways, lining up the location you picked with the plumb line. Remember that if you get too close to the end of one of the rectangle's sides when you do your picking, MECCA 2000 is likely to assume that you really want the corner (the endpoint).

Step 5:

Pick several more rectangles in the same way, and watch them copy over to the plumb line.

Step 6:

If you want to try to center one of the duplicate rectangles onto the plumb line, wait until the "pick item to copy" prompt returns. Then use **{Mid Line}** in the Position Assistant Menu. The rectangle will copy sideways, with the duplicate centered on the plumb line.

Step 7:

[Close] Copy. Use **[Delete]** to get rid of all those rectangles. Then make one circle near the left edge, choose **[Copy], {Copy to Plumb}** again, and put the plumb line a short distance to the right of the circle. At the prompt, "pick item to copy", pick a location near the top of the circle. The circle's duplicate will show up on the plumb line.

Step 8:

Try the **{Again}** option in the pop-up menu and see how it works here. It will put another copy of your circle the same distance on the other side of the plumb line as your original circle is. Try it again, and it will keep going, putting more copies further away from the plumb line, always maintaining the distance on the direct horizontal.

Step 9:

When you're finished, you can **[Close] Copy.**

{Copy to Level}

There are going to be times when you will want to copy several parts of your graphic directly above or below each other. That's when this particular option comes in handy. To see how it works, do this exercise, shown in Figure 10-14:

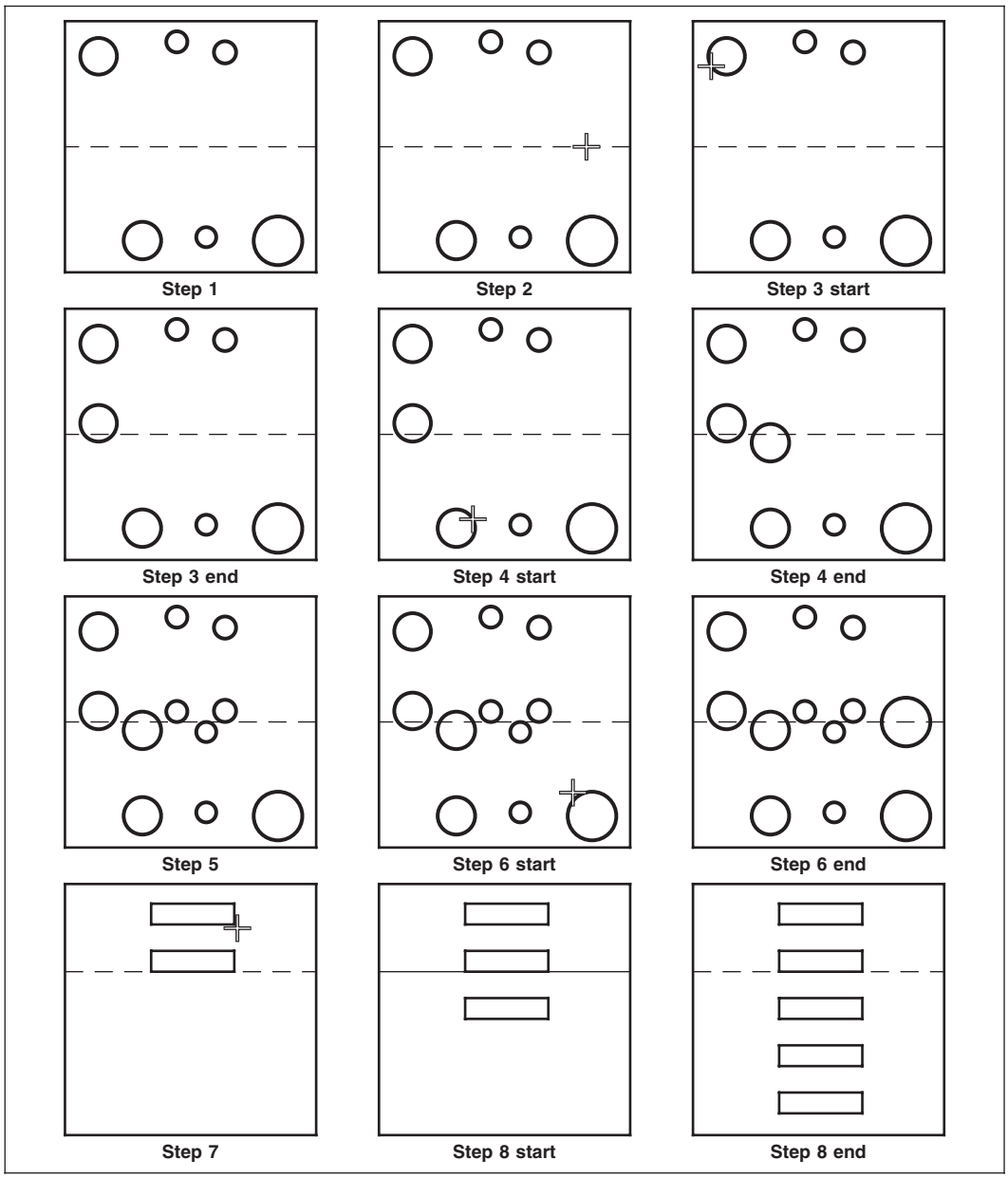


Figure 10-14: Using {Copy to Level}

Prompts:

pick level line, pick item to copy

Step 1:

Use **[Arc]** to make several circles across the top and bottom of the Window Area, leaving the middle clear. It would help if the right edge of each were to the left of the one next to it, as shown. **{Exit Arc Functions}.**

Step 2:

Choose **[Copy], {Copy to Level}**. You'll be immediately prompted to "pick level line", so pick a position anywhere near the vertical center of the Window Area. A dashed horizontal line will appear going through that spot. *This is a temporarily visible version of the imaginary horizontal line you were creating before with the {Copy Y} option.*

Step 3:

The prompt you will now get is, "pick item to copy". Starting with the far left circle, pick it somewhere, say the 8 o'clock location. The circle will immediately copy up or down, putting the duplicate circle's 8 o'clock location precisely on the level line.

Step 4:

The "pick item to copy" prompt will return, so pick the next circle somewhere, say on the 2 o'clock location. The circle will now copy upwards or downwards, lining up the duplicate's 2 o'clock location with the level line.

Step 5:

Pick several more circles in the same way, and watch the duplicates go upwards or downwards to the level line.

Step 6:

If you want to try to center one of the circles onto the level line, wait until the "pick item to copy" prompt returns. Then choose **{Cir Cen}** in the Position Assistant Functions. The circle will copy up or down, winding up centered on the level line, and the "pick item to copy" prompt will return.

Step 7:

[Close] Copy. Use **[Delete]** to get rid of all those circles. Then make one rectangle near the top edge, choose **[Copy], {Copy to Level}** again, and put the level line a short distance below the rectangle. At the prompt, "pick item to copy", pick a location near the bottom of the rectangle. Its duplicate will show up on the level line.

Step 8:

Try the **{Again}** option from the right mouse pop-up menu. It will put another copy of your rectangle the same distance on the other side of the level line as your

original rectangle is. Try it again and again, and it will keep going, putting more copies further away from the level line, always maintaining the distance on the direct vertical.

Step 9:

When you're finished, you can **[Close] Copy.**

{Again}

This option will put another copy of your item going the same distance and direction it was first originally copied. It is found in the right mouse pop-up menu.

{Copy Others}

This allows you to copy other items the same distance and direction in relationship to the last copy. It is useful when you forgot to group a piece of the copy. Just select {Copy Others} and "pick the item to copy".

{To Multiple Positions}

The copy {To Multiple Positions} allows you to select an item to copy, then pick each position on the drawing where you need a copy of that particular item. To execute the function select the {Do Copy Now} from the right mouse pop-up menu and a copy will be made to each position that was selected on the drawing. The multiple position option will only work in conjunction with {Copy to Anywhere}, {Copy X}, and {Copy Y}. It will not work with {Copy to Plumb} or {Copy to Level}.

{Number of Copies}

Click on {Number of Copies} and type in a number. Then make a copy. You will immediately have as many as you asked for. It will stay set until you quit out of copy or set it back to 1.

{Target Layer}

This option on the Copy Menu lets you select a layer for the new copy. After you set the layer, you would make your standard copy choices.

{Set Final Copy Spot Color}, {Set Per-Step Density Increment}

While using **Number of Copies,** you can start with one color and end with another color, two different ways. **{Set Final Copy Spot Color}** allows you to define the color of the last copy. It will change the copies in between by prorating the color values between the start color of the item you are copying and the end color you specify here. Just set the Color Value to be what you want the last color to be. **{Set Per-step Density Increment}** wants a percentage of color change for each copy made. For lighter use a negative number, darker a positive number. Once it gets to 100% or 0%, all copies afterwards will be that density.

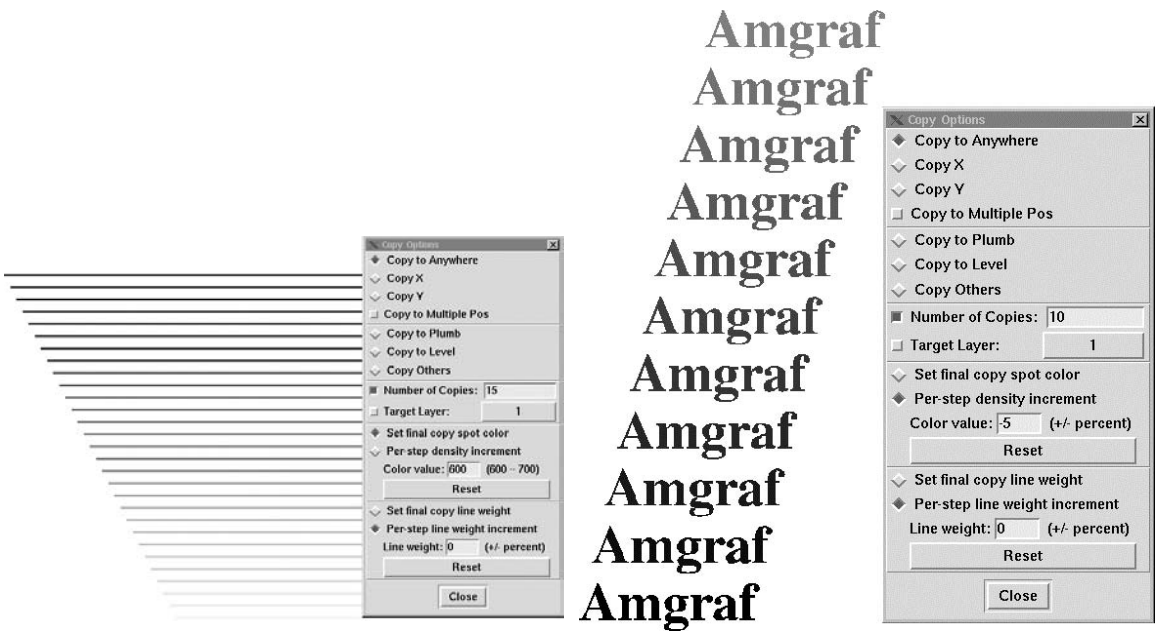


Figure 10-15: Using Number of Copies with {Set Final Copy Spot Color} and {Set Per-step Density Increment}

When using these options on a group of components, they should all be the same color. Change them to the same color if necessary, otherwise you will never know which color it chooses as the start color.

These option works with all component types except boxes.

{Set Final Copy Line Weight}, {Per-Step Line Weight Increment}

While using **Number of Copies,** you can start with one line weight and end with another line weight, two different ways. **{Set Final Copy Line Weight}** wants you to give it an ending target line weight. It will change the copies in between by prorating the line weight values between the starting line weight of the item you are copying and the ending line weight that you specified here. Just set the Line Weight Value to be what you want the last line to be. **{Per-Step Line Weight Increment}** will increase each line by the percentage amount entered. For example, to get a 10% increase you would enter 110 for the value. This will increase each copy 10% of the original line weight.

Note: Be sure to specify units of measure, to insure accurate line weights.

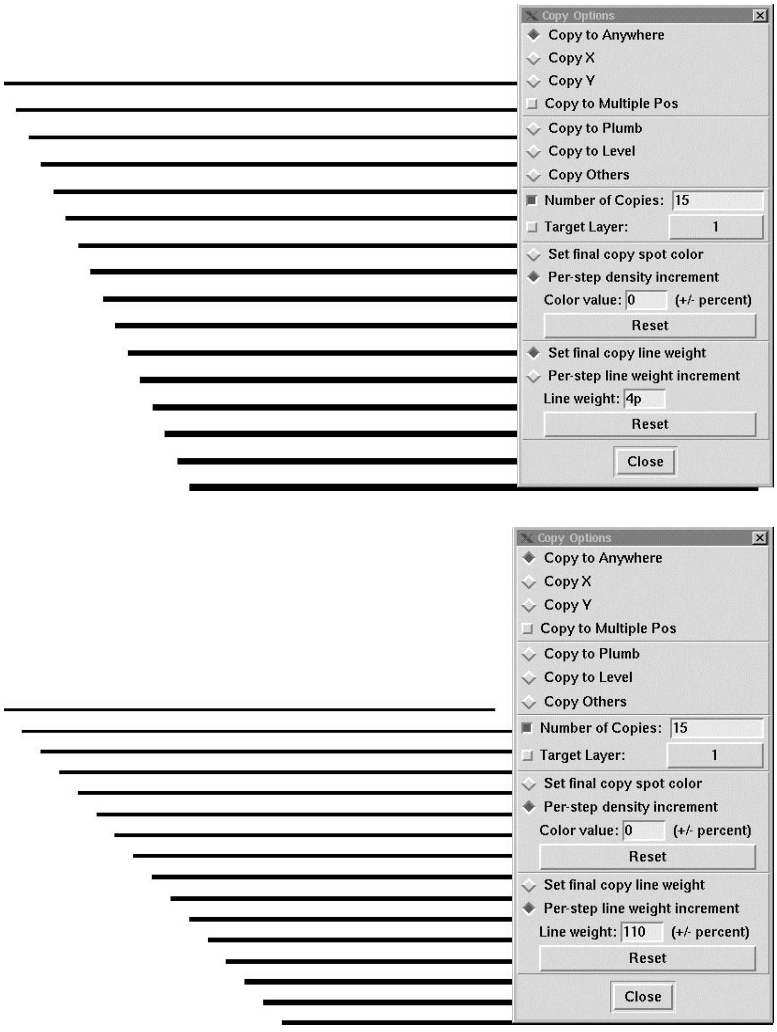


Figure 10-16: Using Number of Copies with {Set Final Copy Line Weight} and {Per-Step Line Weight Increment}

Transform Tools

The [Transform] options effect geometry that already exists. Each option is discussed in detail, with plenty of illustrations and exercises to help explain how the option works. It is advised to go through each exercise step-by-step to get the most out of [Transform].

{Rotate/Scale}

Here you can rotate or scale components. These items are together in the same menu because you can also rotate and scale at the same time. We have broken the exercises into rotating and then scaling to help you understand the menus better.

Suboptions:

Set Transform Center,
Set Parameters

Using Rotate

This option is used when you want to spin a graphic around the invisible center. The top, bottom and sides of the graphic will keep the same relations to each other, but they won't be aimed in the same directions that they originally were. {Rotate} is based on a 360-degree circle (as shown in our figure of the Rotation Circle) with 0 being at the right. There will always need to be *two pieces of information* before an item can be rotated: the *center* and the *angle.* To see exactly how it works, do the exercise of Rotating a Line.

The Rotation Circle

We'll be making references to the X and Y axis. The X axis runs horizontally across the screen from left to right. The Y axis runs vertically from the bottom of the screen to the top. See our figure of the rotation circle and axes. {Mirror} rotates items around the X and Y axis.

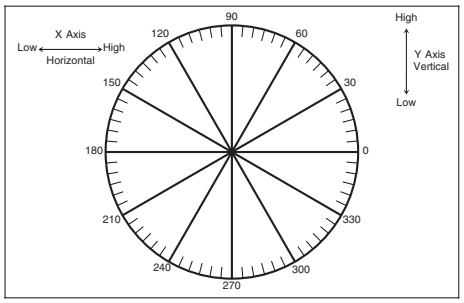


Figure 10-17: The Coordinate Planes and Rotation Circle

Rotate a Line

Step 1:

Start by making a simple vertical line (see Example), using **[Line], {Eight Directions}**, then **{Exit Line Functions}.**

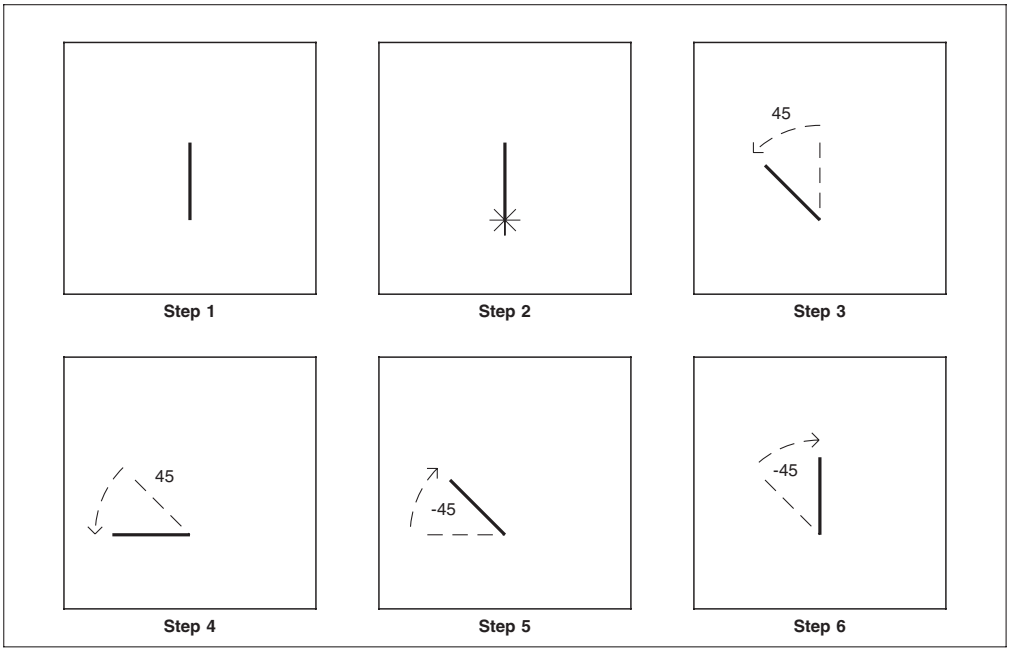


Figure 10-18: Simple use of Rotate

Step 2:

Choose **[Transform], {Rotate/Scale}.** There will always need to be *two pieces of information* before an item can be rotated: the *center* and the *angle.* Let's specify the center first, choose **{Set Transform Center}.** You will be prompted to "pick rotate/scale center position", **pick the bottom of the line.** Crosshairs will appear showing the Z axis (or pivot point). Now choose **{Set Parameters},** type **45** for the "Angle" value, then [Close].

Step 3:

Now the prompt urges you to "pick item to transform". **Pick the line anywhere** along its length. It will immediately slant to the left, as shown. This is a rotation of 45 degrees, in the standard *counterclockwise* direction. If you had typed in " -45" (minus 45), it would have resulted in a clockwise rotation instead.

Step 4:

The prompt once again says, "pick item to transform", so **pick the line again.** Once more it will slant to the left, this time winding up as a horizontal line, since 45 degrees plus 45 degrees equals 90. You didn't change your instructions as to the position of the center nor the number of degrees to rotate, so the program repeats the action. Every time you select the item, it will rotate again.

Step 5:

Choose **{Undo}** and the line will move 45 degrees back (clockwise). This is rotating the item in the opposite direction as was originally given. Choose **{Undo}** again and the line will return to its original position. If chosen again the line has now gone beyond the original position using the angle value given. You can backup as many times as you need.

{Set Transform Center} with {Rotate}

Your decision as to where exactly you put the center of the rotation can have a crucial effect on the results. The following exercise, shown in Figure 10-19, will demonstrate this:

Step 1:

Make several vertical lines in a row near the middle of the Window Area, as shown. Then **[Group], {All}, {Done Group}**.

Step 2:

Choose **[Transform], {Rotate/Scale}, {Set Transform Center}.** You'll be prompted to "pick rotate/scale center position", **pick the bottom of the rightmost line.** Crosshairs will appear defining the center point (or pivot point). Select **{Set Parameters}.** This will bring up a "dialog window", type **60** for the "Angle" value. Select [Close].

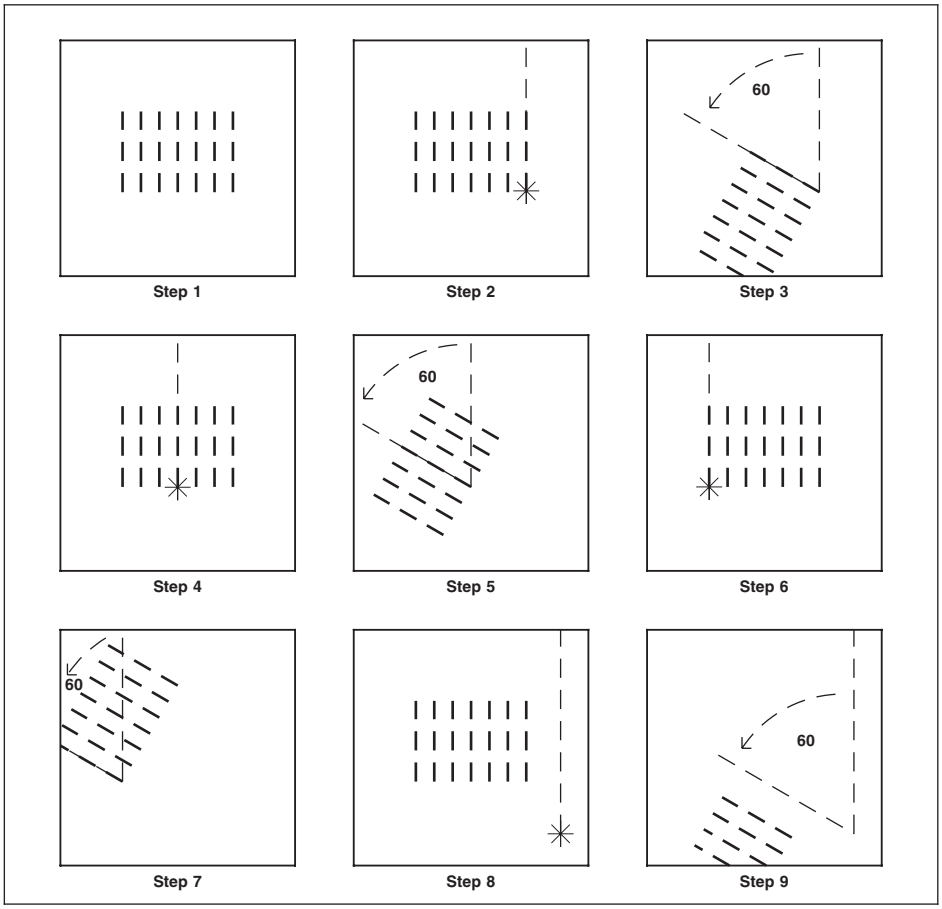


Figure 10-19: The Importance of {Specify Center} in {Rotate}

Step 3:

Now the prompt urges you to "pick item to transform". **Pick any line in the Group.** All of them will rotate to the left (in a counterclockwise direction), pivoting on the bottom of the *rightmost* line.

Step 4:

Choose **{Undo}** to undo the results. Choose **{Set Transform Center}**. You'll be prompted to, "pick center". Do so, this time **picking the bottom of the middle line.** Crosshairs will appear defining a new pivot point.

Step 5:

The "pick item to transform" prompt is back, so **pick any of the selected lines.** All of them will rotate 60 degrees to the left, pivoting on the bottom point of the *middle* line.

Step 6:

Choose **{Undo}** to undo the results (rotate the opposite direction). Choose **{Set Transform Center}**. At the "pick center" prompt, **pick the bottom of the leftmost line.** Crosshairs will appear defining another pivot point.

Step 7:

Once again, the "pick item to transform" prompt comes back. **Pick any of the selected lines,** and all of them will rotate 60 degrees to the left, this time pivoting on the bottom point of the *leftmost* line.

Step 8:

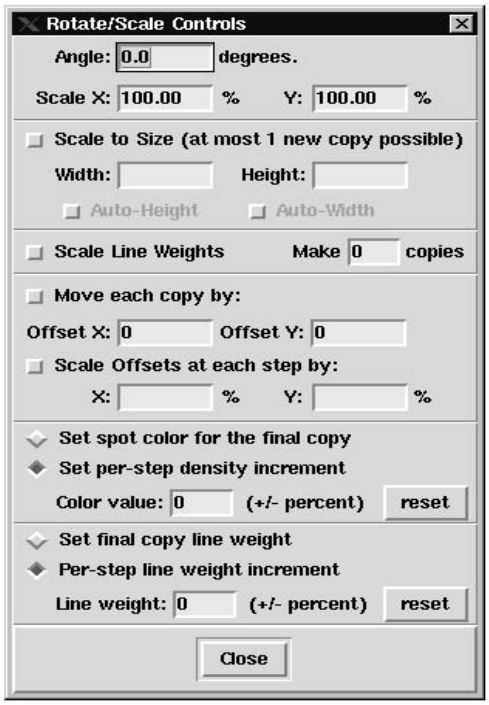
Choose **{Undo}, {Set Transform Center}**. Here we want to **pick a spot down in the lower right corner** of the Window Area, **not touching** any of the lines at all. The same old crosshairs will show up.

Step 9:

At the "pick item to transform" prompt, **pick the Group as before.** This time the whole Group will rotate around and half off of the screen! Why? Because, just as before, they were rotating around the chosen "center point", with each item maintaining the same relationship to each other and the same distance from the center as it had before the rotation.

{Set Parameters}

This option is where you set the controlling factors for your scale size or rotation angle. Also whether or not you need to make copies while rotating or scaling.



Measuring Direction Before Rotating

You may have a situation where you need to know the angle of an existing line so that you can rotate a piece of text in the same angle. Use the {Measure} tool. Let's do the exercise in Figure 10-20.

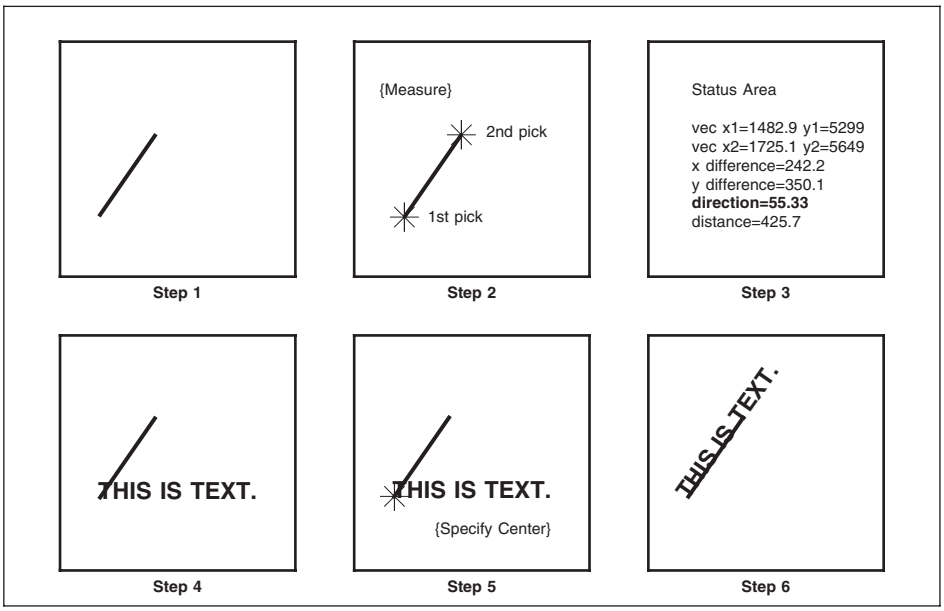


Figure 10-20: Measuring the Direction Before Rotating

Step 1:

Use **{Line} {All Directions}** to draw a line that is angled. At this point we do not know the angle.

Step 2:

Choose **{Measure}.** At the prompt "Pick measure point 1", **select the line starting point.** For the prompt "Pick measure point 2" **select the line ending point.**

Step 3:

In the Status Area (top bar) you will see *direction*=. This "direction" is the angle in which the line is drawn. **Write down the direction** before quitting out of measure. In the example the direction was 55.33.

Step 4:

Let's try this with text. **{Quit}** out of Line. Go into **{Text} tool, {Input Text}.** At the prompt "pick a position", **select the starting point of your line.** Type in: **THIS IS TEXT,** and click **[Okay].** The text is now composed on the screen and ready to rotate.

Step 5:

Choose **[Transform]** and then **{Rotate/Scale}.** You'll be prompted to "pick center", so use the mouse to **pick the bottom left of the text.** Crosshairs will appear defining the pivot point. The Rotate/Scale Dialog will appear. Set the Angle to **your direction and [Close].** Our example was 55.33.

Step 6:

Now the prompt urges you to "pick item to transform". **Pick the piece of text.** It will rotate to the left ending up on the angled line.

Step 7:

Let's clear our screen. **{Delete}** your line and text. {Yes}.

Using the Scale Features

The scale options are the ones, which let you change the size of your graphics completely or in the X and Y coordinate planes. In other words, you can make things bigger or smaller. Scale, like rotate, must have *two pieces of information* before it can act: the *center* and the *scaling factor.*

Suboptions:

Set Transform Center,
Set Parameters

An Exercise in Scaling

Step 1:

Since we are going to be scaling, first **draw a square** in your window to represent our drawing area. This way if you need to [Win-Fit] it will fit around the outside border. Then **draw a rectangle** to scale. See Figure 10-21.

[Transform], {Rotate/Scale}, {Set Transform Center}. You'll see a prompt saying, "pick rotate/scale center position". To find the center of a rectangle use **{Mid point}** in the {Position Assistant} menu. **Pick two opposite corners.** Crosshairs will appear showing the center of the rectangle. The scaling will be centered around this point.

Step 2:

Choose **{Set Parameters}**. For our example, let's ask for half of what we have. So type **50** in the boxes provided for the "Scale X/Y" values, then [Close]. Now the prompt will want you to "pick item to transform". **Pick the rectangle anywhere,** and it will immediately be half of what it originally was, shrinking in all directions into the center point.

So that we can go on to step 3, select **{Undo}** to get the rectangle back to its original size

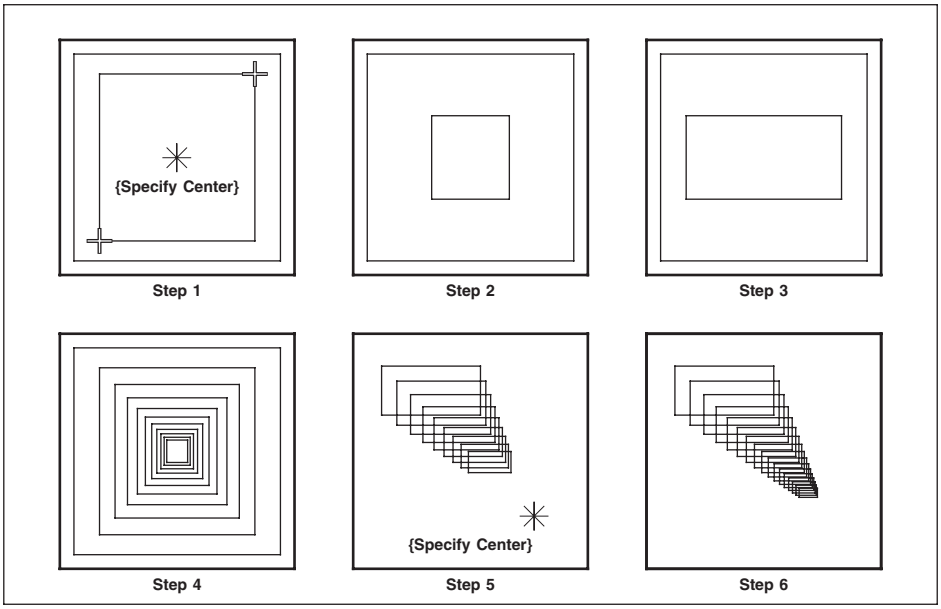


Figure 10-21: Using X / Y Scaling Feature

Step 3:

You can also scale by the X or the Y only. Let's scale the Y only. Type **50** in the box provided for the "Y" value, then [Close]. At the "pick item to transform" prompt, **pick the rectangle anywhere.** It will suddenly get shorter, though it will stay just as fat as it was. What you've done is to shrink it by half in depth only. Because of the center point being in the middle of the rectangle, it has shrunk from both the top and bottom, and leaving the rectangle positioned in the same spot.

Choose **{Undo}** to put it back the way it was originally.

Step 4:

Here we are going to discuss scaling with copies. Type **90** for both the "X" and "Y" values. The "pick item to transform" prompt keeps displaying. Before picking the rectangle, type **1** for "Make Number of Copies" then [Close]. This will leave the original, but scale a copy. Now **pick item to scale,** which is our rectangle. It has put a scaled rectangle inside of our original. It will always scale towards your specified center.

Now type **8** for the number of copies, [Close]. Now **pick the inside rectangle.** We have just made eight copies, with each one 10% smaller.

Step 5:

[Project], {New Graphic}, {Yes} to start with a fresh screen. **Draw a rectangle** in the upper left hand corner of the window.

We are going to scale with copies but put the center in a different spot. **[Transform], {Rotate/Scale}, {Set Transform Center}**. You'll see a prompt saying, "pick center". **Pick in the lower right hand region of the window.** Crosshairs will appear showing the new center point. Any scaling will be towards that point.

Again type **90** for the "X" and "Y" scaling values. Type **8** for the number of copies, then [Close]. Now **pick item to scale,** which is our rectangle. See how it is copying and scaling towards our center point.

Step 6:

Pick the last (smallest) rectangle and it will make 8 more copies. Again, towards the center point we selected.

{Scale Line Weights}

While scaling if you want the line weights to scale also, toggle {Scale Line Weights} on. It will scale the weight of all vectors, splines, arc/circles, the percentage being scaled.

Using {Make Copies} with {Rotate}

This suboption allows you to rotate and copy the image at the same time. You can create pretty drawings, but be aware that you are copying data and that the drawing size is growing. Also, you can create something extremely large and not know it until you output and segmenting has created many pages. Always measure and check page size afterwards. Let's do the exercise shown in Figure 10-22.

Step 1:

(a) Draw a **{Line}, {Eight Directions} pick your start** and type in: **.5i [Up-Arrow] [Enter].** This will draw a line that is 1/2" long. Now **{Exit}** out of line.

(b) Choose **[Transform], {Rotate/Scale}**. At the "pick center position" prompt, **select the bottom of the line.**

Step 2:

The Rotate/Scale dialog will appear. {Set Rotation Angle} to be **10 [Tab].** When you're prompted to "pick item to transform", **pick the line anywhere.** It will rotate 10 degrees counterclockwise, which you expected. **{Undo}** and let's start again.

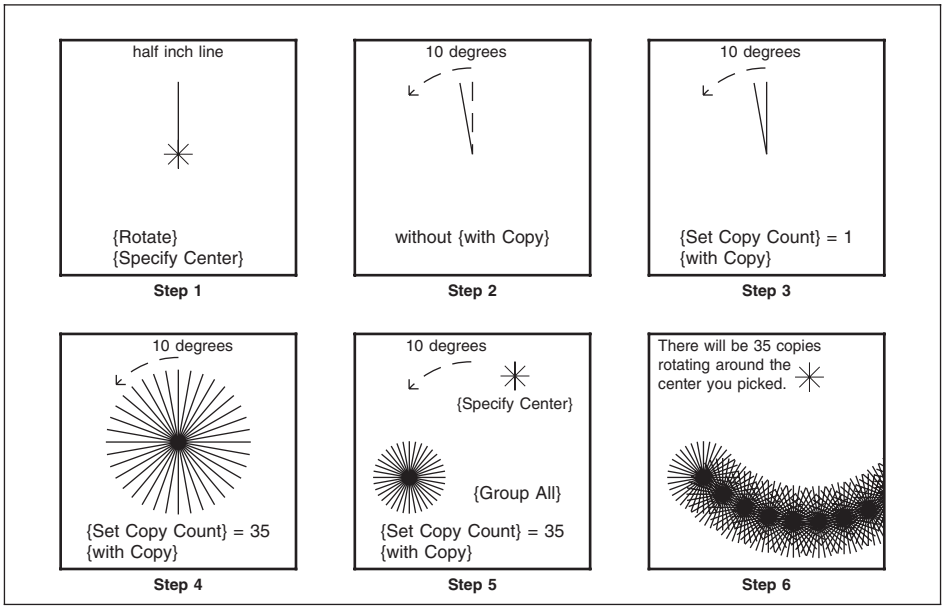


Figure 10-22: Using {Make Copies} with {Rotate}

Step 3:

Enter **1** for **{Make Copies}.** The "pick item to transform" prompt is still there. **Pick the line** and a copy of it will {Rotate} 10 degrees counterclockwise. Also note that you can {Undo} a copy.

Step 4:

Enter **35** for **{Make Copies}.** Now, **pick the line anywhere.** We now have a pretty design. (For your information, a circle is 360 degrees. Our angle of copy was set to 10 degrees. Since we already have one line drawn, we only need 35 more to complete the circle.)

Step 5:

{Group} and **{Select All}, {Done Group}.** This will allow us to copy the whole design. Also, we want to change our center to make a wreath effect. **Click the right mouse button and {Set Transform Center}** select a spot approximately two or three inches **away from the design.** You will notice that all this time the "pick item to transform" prompt is still there. **Pick the design anywhere.** You will see 35 copies being placed around the center you picked. The new design naturally is a larger file, and according to where you placed your center, is controlling the circumference of the wreath.

Creating Complex Design Patterns

Unique fine-line borders can be quickly created by drawing an easy design and applying a Rotation Angle and X-Offset. Once the border is created it can be copied, scaled, mirrored, and masked. The following custom borders demonstrate how easy it is to get unique looks.

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.

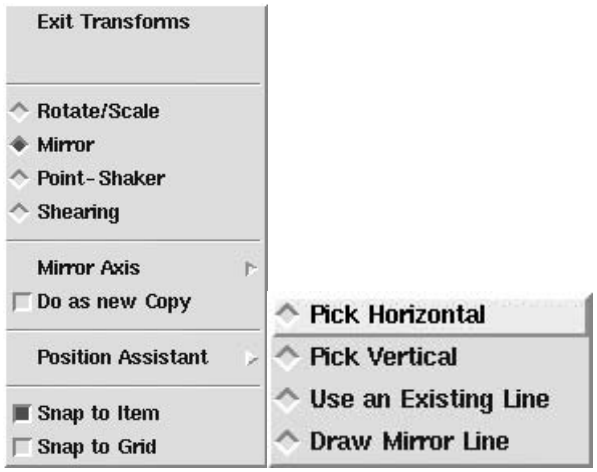
Almost any shape that can be created on MECCA 2000 can quickly become a complex design pattern. Items such as curves, ovals, circles, spiral shapes and even straight lines can create some of the most unique designs. By simply adjusting the amount of rotation and offset spacing, a single shape can create many varying and interesting results. For more information see ***Volume 1, Chapter 8: Security Document Composition.***

{Mirror}

With this option you can flip a graphic from right to left, or top to bottom, or along any drawn angled line you like. The result is a mirror image; the right and left sides of the graphic will be switched. Please note that text cannot be mirrored. An exercise follows.

Prompts:

Pick Hor/Ver Mirror Axis, Pick Mirror Line, Pick Item to Mirror,



Step 1:

Draw something similar to our drawing see Figure 10-23. Be sure there are differences that can be seen when mirroring, definite right and left sides, as well as a definite up and down to it. Choose **[Group], {All}**, and wait for all the lines in your graphic to turn white.

If your graphic fills up the Window Area, choose **[Zoom], [1/2x],** and **[Zoom]** again, placing it in the upper left corner of the dynamic zoom square. Get your window to look similar to our sample in Step 1.

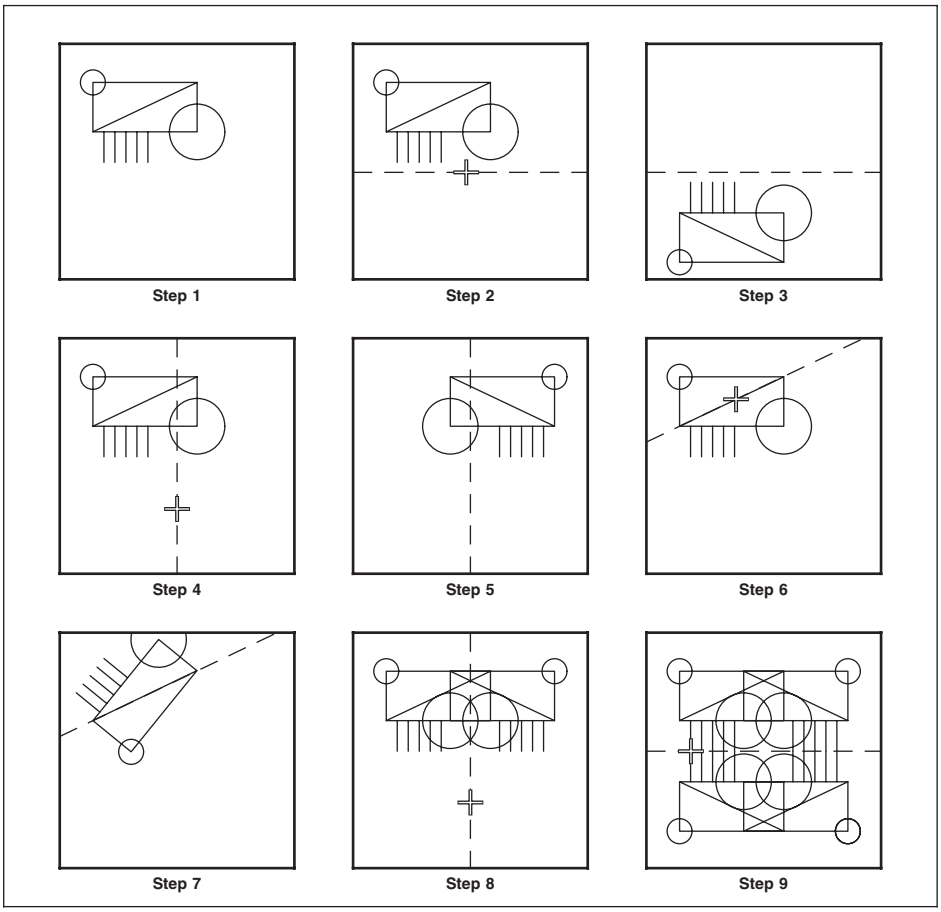


Figure 10-23: Using {Mirror}

Step 2:

Choose **[Transform], {Mirror}**. The prompt, "choose option" will appear. Choose **{Mirror Axis}, {Pick Horizontal},** and you'll get a new prompt, "pick position". **Pick a spot** in the Window Area that's **slightly below your graphic.** A horizontal dashed line will appear going through that spot.

Step 3:

The prompt will change to "pick item to mirror". **Pick your graphic anywhere,** and it will suddenly vanish from its current position and appear on the other side of the mirror axis, upside down. **{Undo}** and the graphic will be restored to its original position. Or, if you just pick the graphic again, it will to flip-flop across the horizontal axis every time it is picked.

Step 4:

Choose **{Mirror Axis}, {Pick Vertical}**, and you'll get a new prompt, "pick position". Pick a spot in the Window Area that's more to the right of your graphic. A vertical dashed line will appear going through that spot.

Step 5:

The prompt will go back to "pick item to mirror". **Pick your graphic** anywhere, and it will suddenly flip from its current position right side up but with the right and left sides reversed.

The "pick item to mirror" prompt is still there, so **pick the graphic again.** It will go back to the way it was.

Step 6:

Choose **{Mirror Axis}, {Use an Existing Line}**, and you'll get a new prompt, "pick line". For this option, you must pick a line, so **pick a line** anywhere in your graphic (we chose the diagonal line running through our rectangle, for maximum dramatic effect). You will see the dashed mirror axis line as before, but running in the same direction as the line you chose.

Step 7:

The prompt will go back to "pick item to mirror". **Pick the graphic,** and it will flip along the axis chosen.

{Undo} to put the drawing in its original position, so that we can continue.

Step 8:

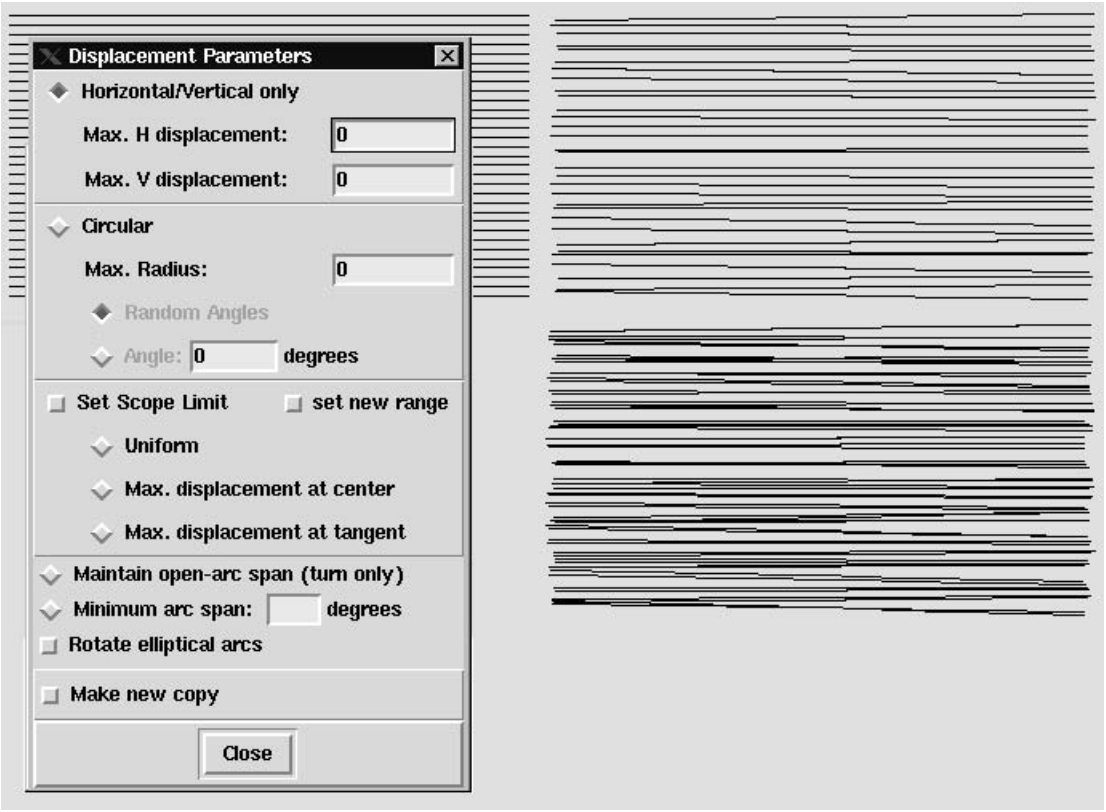
Select **{Do as a New Copy}** and you will see it toggle on. Now, select a new vertical axis **{Pick Vertical},** and **pick a spot more to the right of the drawing.** When you **select your graphic** a copy of the graphic will mirror. With the copy itself still Grouped and the rest ungrouped.

Step 9:

[Group] {All} {Done Group} and you will see everything turn white. Now, select a new horizontal axis **{Pick Horizontal},** and **pick the very bottom of the drawing.** You will see a dashed horizontal axis appear. When you **select your graphic** a copy of the graphic will mirror.

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.

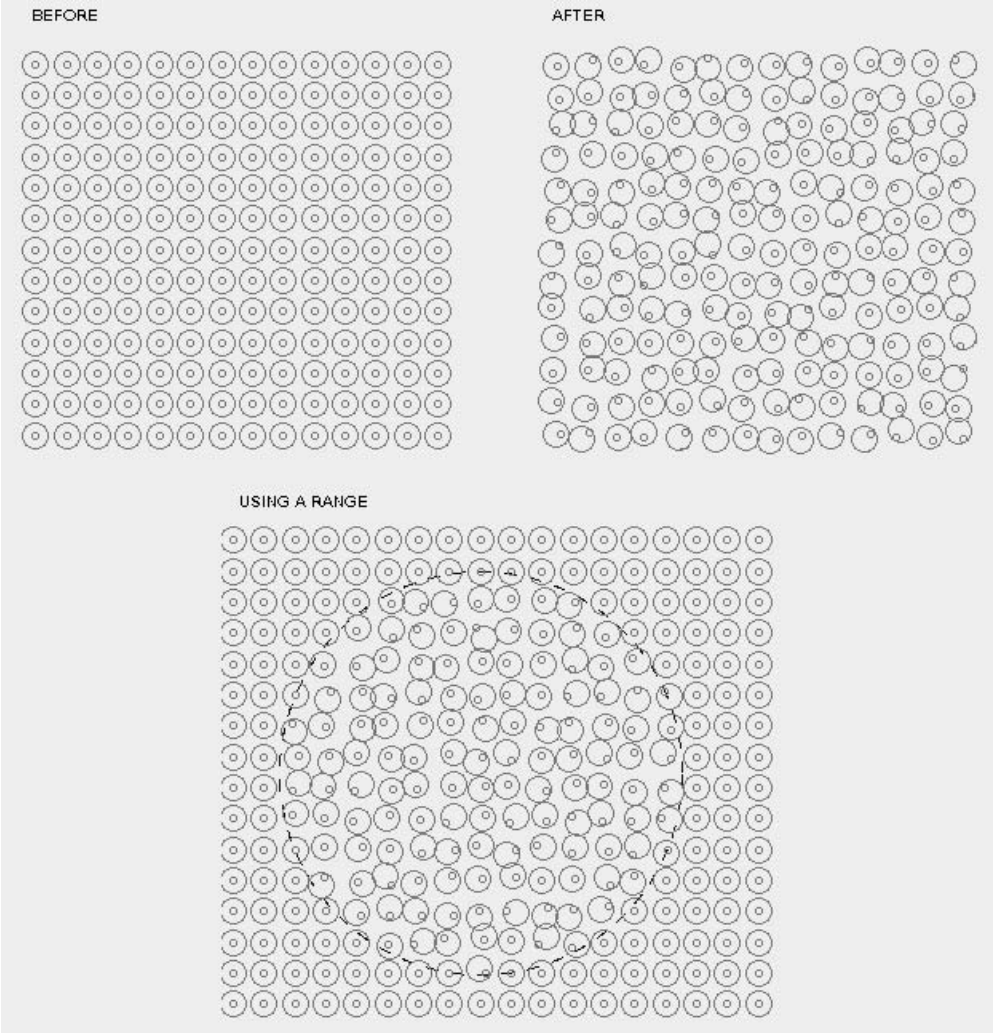


With this option, you can create very unique backgrounds, which can be masked and placed inside of your form or check. Just input the maximum amount for displacement and the program will randomly move the endpoints (but not exceed) your amount.

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 is 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.

{Shearing}

The purpose of the Shearing function is to graphically distort geometry for logo and label design. Once geometry has been distorted, it can then be shaded using the [Area] tools.

There are two ways to do distortions (mathematically known as *shearing,)* which we call "Pulling" and "Bending". Pulling applies distortion to either the top or bottom, while bending applies same direction distortion to both top and bottom. Distortion can also be applied vertically or horizontally.

For horizontal distortion, the pulling and bending affect the left and/or right sides of the geometry. See various examples of pulling and bending of the geometry of words AMGRAF, INC.

Getting Started

To get started using this function, create some geometry. You may wish to experiment with your name, so key in some text and convert it to outlines. The only rules to remember are that the geometry is limited to vectors, splines, arcs, and circles.

> **Note: Do not try to distort shaded areas, actual typefaces, rasters, or boxes.**

Group select the geometry you wish to distort, then make a copy of it. Keep a non-distorted copy around because once distorted, there is no way to go back to the original geometry. Now pick **[Transforms], {Shearing}, {Pull Vertical}.** As shown in this example, your geometry will be displayed with Bezier splines on the top and bottom. The control points for the splines are shown as little stars. The {Move a Point} function will be highlighted on your menu. **Pick one of the control points** on the top Bezier spline and **move it up.** You will see the spline change into a curve. **Pick to stop the modification,** then pick the menu function **{Done Pulling}.** Your object will immediately be distorted.

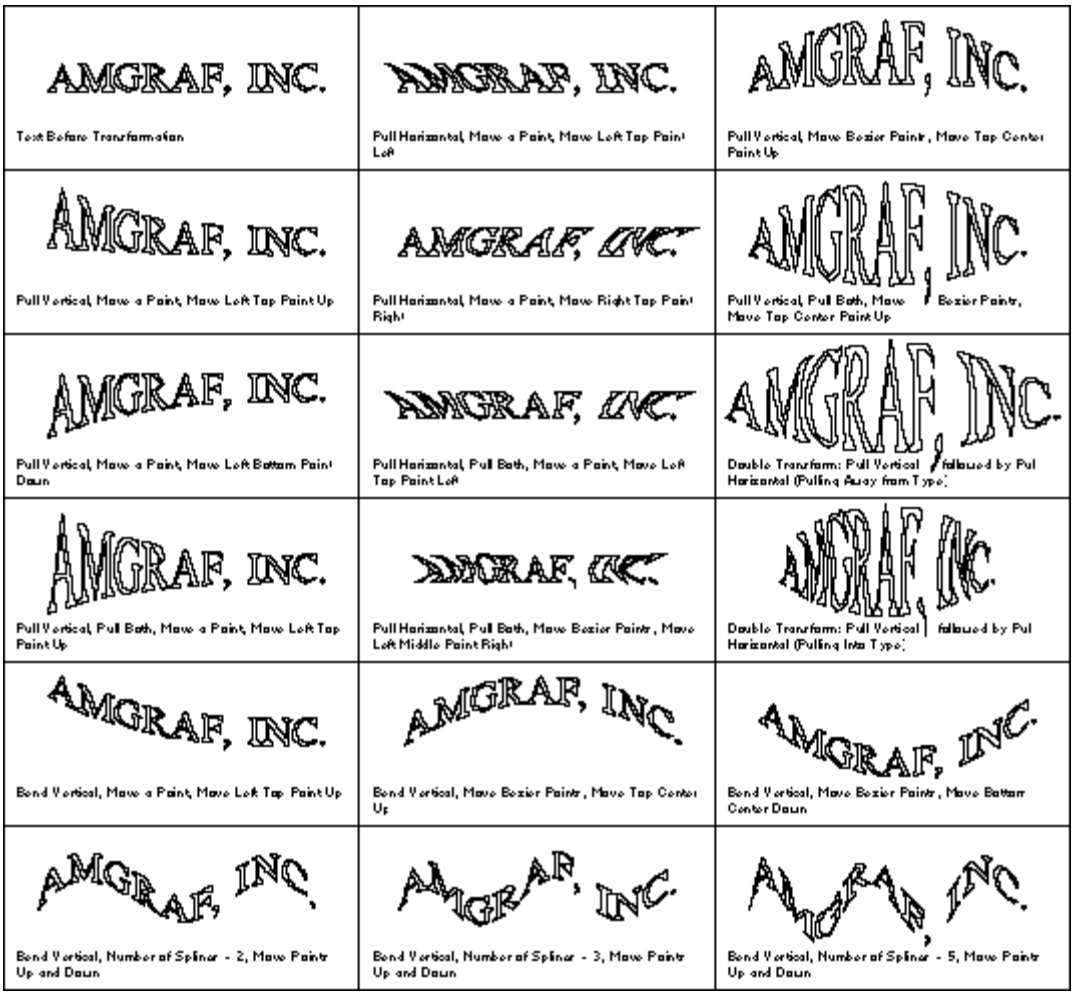
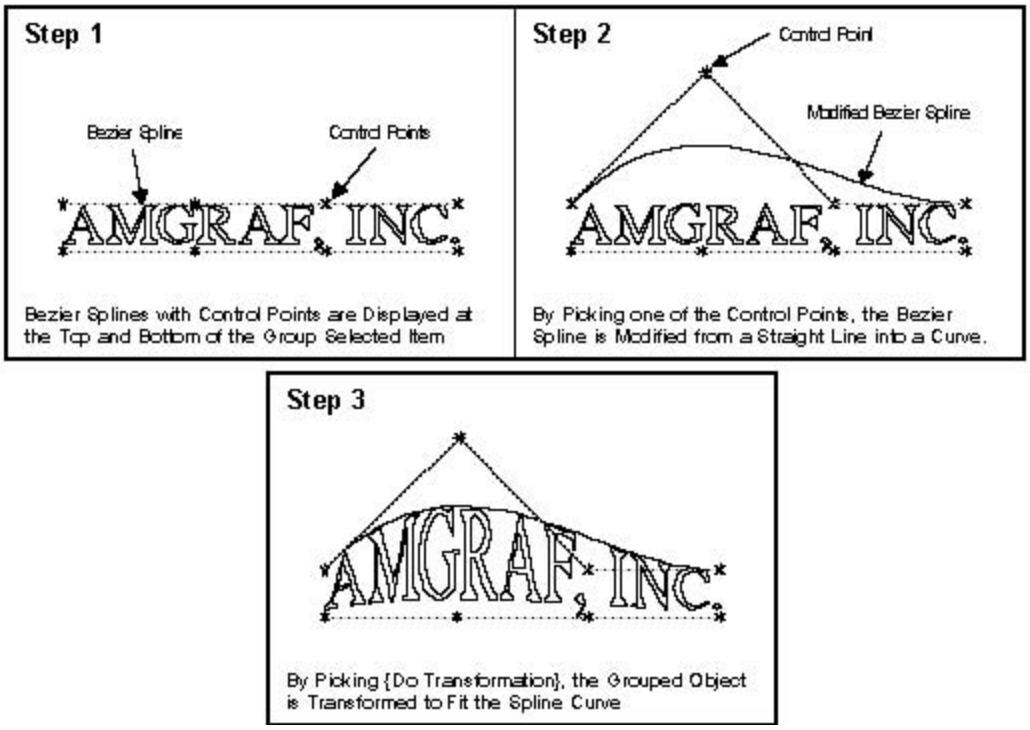


Figure 10-24: Examples of Shearing, Pulling and Bending

Using additional copies of your original, try some of the other functions to get results like those in this example. When you are satisfied with the results of the transformation, use the {Area Functions} described earlier to fill the geometry with shading.

Referring to this example, Step 2, you can move any or all of the control points as many times as desired to create a modified spline. You can increase the number of control points by picking {Set Number of Splines}, and setting the number to 2, 3, 4, or 5. Each new spline will add 3 additional control points.



Note: Do not to pull the top spline down below the bottom spline, and vice versa.

Menu Items

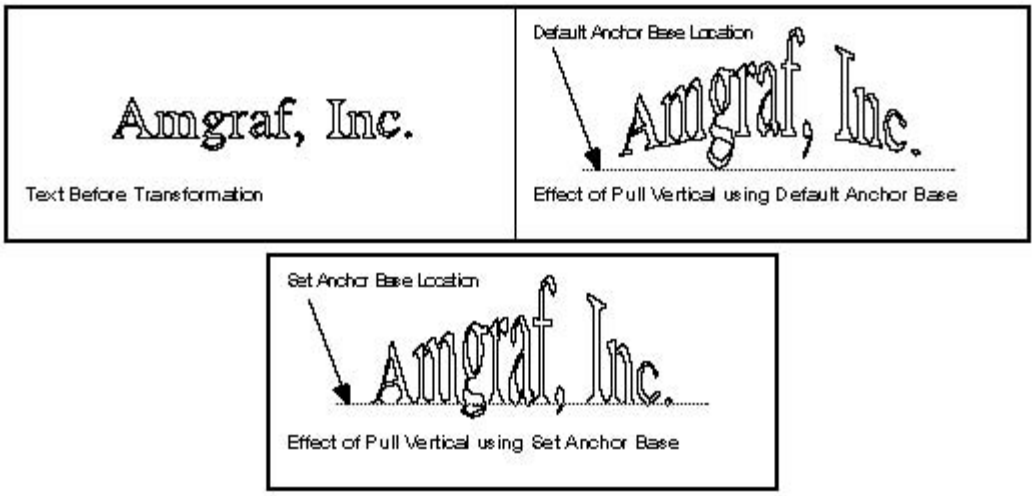
The following is a description of each of the menu functions:

{Reset Envelope} restores the Bezier splines to their unmodified state.

{Set Spline Segments} changes the number of control points. The default is one spline with 4 control points. Do not exceed 5 for your number of splines.

{Pull Both} causes the control point movement to be mirrored to the other spline, for symmetrical results.

{Set Anchor} allows you to restrict the distortion effect to only geometry above a baseline position. By default, the anchor base is placed at the very bottom of the geometry. This can be a problem, especially for typeface outlines with decenders. Use this function to reset the anchor base to match the visual baseline of the type. See this example for the way this works.



{Clear Anchor} resets the anchor point back to the bottom of the geometry.

{Move a Point} is used to move a single control point up and down.

{Move a Joint} is used to move a segment simultaneously. You will need more than 1 segment for this option.

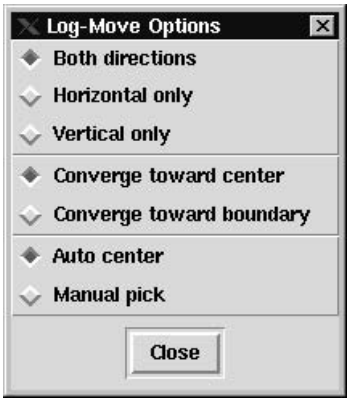
{Turn around a Joint} rotates two points around a common joint interactively. You will need more than 1 segment for this option. Straighten will undo this option.

{Done} executes the transformation of the geometry according the current modification state of the Bezier splines.

{Eight Direction Mode} restricts your cursor movement to up, down, left, and right.

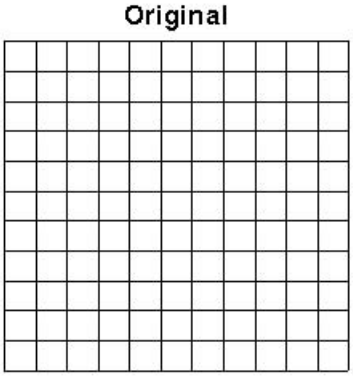
Using {Logarithmic Move}

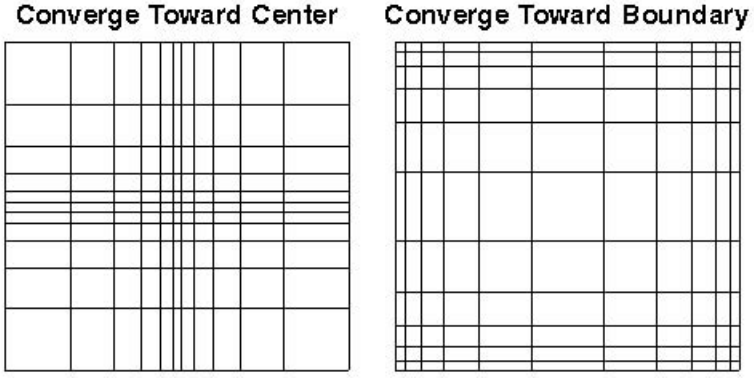
[Transforms] {Logarithmic Move} allows you to modify vectors and splines in such a way to create original background images. The vectors and splines of a group move in a logarithmic pattern towards the center (or manual pick) or away from the center, towards the edge of the group.



Example

In the following example we used prorated rules to quickly create a group of lines. They have been displaced using Logarithmic Move towards the center, and then towards the boundary, to give you a visual of how the logarithmic move behaves. As you can see, the lines on the right appear to have more space taken out as they move to the center. The effect is reversed when moving towards the boundary. The lines get closer as they travel towards the edge destination. With this option, you can create very unique backgrounds which can be masked and placed inside of your form or check.





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Chapter 11: The Assistant Tools

The three Assistant Tools [Group], [Measure], and [Query]. [Group] allows you to combine individual items together temporarily. [Measure] allows you to measure the distance between two points. [Query] will bring up an attributes dialog with that item's current attributes. You do have an opportunity at that time to change any attribute shown.

The [Delete] tool is also a very necessary item.

[Group]

There will be many occasions when you will want to [Move], [Copy], [Delete] or otherwise affect several items at once. Choosing **[Group]** gives you the ability to select multiple items to be members of a single [Group]. Anything you then do to *one* of those items will be automatically done to *all* of them.

When you are practicing and just want to get rid of all components, you can use group to **Clear the Window.** But, this is one of MECCA 2000's most powerful tools, and therefore needs to be used carefully.

Default:

Intersect Mode

Prompts:

Pick 1st corner for Group
Pick 2nd corner for Group
Pick Items

Only one Group exists at a time, and *items stay "Grouped" until you {Ungroup} them.* So if you are going to need more than one Group to accomplish your task, you need to {Ungroup} the members of your first Group before "Grouping" those of the second Group. Then you'll have to {Ungroup} those members before "Grouping" the ones for the third Group, etc. If you don't carefully {Ungroup} unwanted items from your current working Group, you'll wind up affecting parts of your graphic from earlier steps. The results can be

quite messy, so get in the habit of always doing an {Ungroup All} after finishing each Group operation, whether single- or multiple-step. This is especially important if it's going to be several minutes before you get around to creating another Group.

Distances and directional relationships are maintained during the [Group] process. Figure 11-1 shows this example.

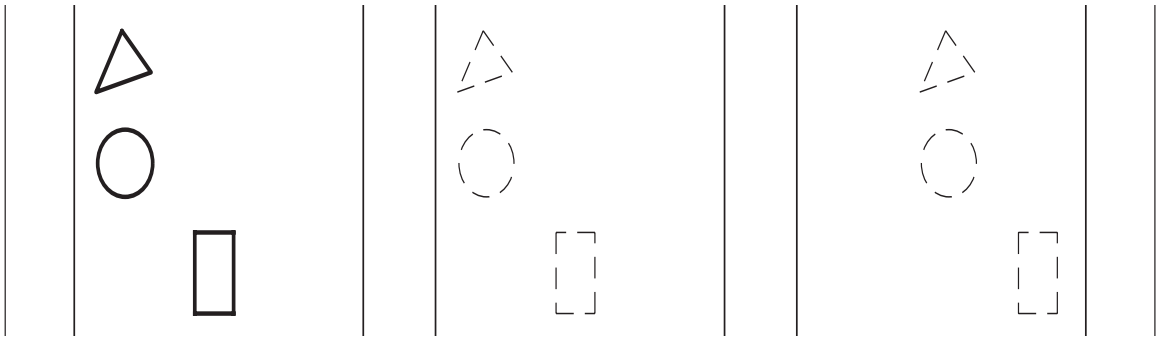


Figure 11-1: How {Group} Maintains Distance & Direction Relationships

Items that have been grouped will appear in white on your screen. (We're going to use *dashed lines* to represent the items that have been grouped. Items that have not been grouped yet, or which have been ungrouped, will be in normal solid lines.)

{All}

With this option you can make every single item in your graphic, *whether visible in the Window Area or not,* part of one Group. This can be incredibly powerful, both for mass reproduction of small graphics, and for quick erasure of the total graphic. Try this exercise, shown in Figure 11-2:

Step 1:

Use your regular drawing methods to make a graphic, simple or complex, in the upper left corner of the Window Area.

Step 2:

Choose **[Group], {All}**. Every line in the Window Area will turn white, indicating that the entire graphic has been selected as a Group.

Step 3:

Choose **[Copy], {Copy X}**. Pick your graphic on its left side, then pick a spot a little bit to the right of the graphic's current position. A duplicate of your graphic will appear there, in white light (indicating that *it* is now the Group).

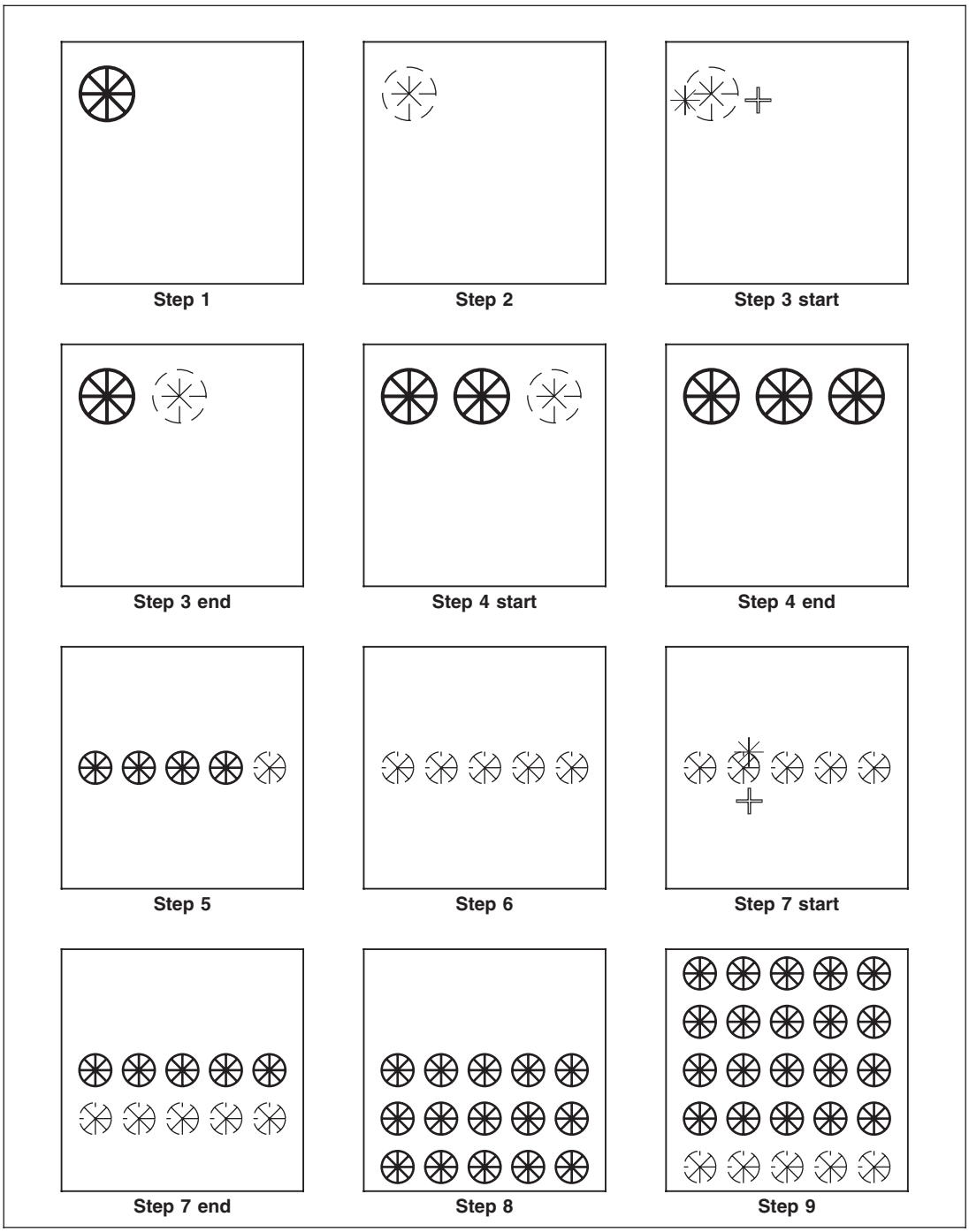


Figure 11-2: Using {Group All} with {Copy} Options

Step 4:

Use the **{Again}** option repeatedly, to make several duplicates across the screen. Keep going two or three times after the white version of your graphic disappears off screen.

Step 5:

Do a **[Win-Fit],** to make those extra duplicates reappear on screen. The last one will be white, and all of them will seem somewhat smaller (they haven't actually changed size as far as the printed versions would be concerned). The row will go across the middle of the Window Area. **{Exit Copy}** out of Copy Mode.

Step 6:

Choose **[Group], {All}** again. This time, your entire row of duplicates will turn white. **Select {Done Group}.**

Step 7:

Choose **[Copy], {Copy Y}**. Pick the top of any of the duplicates, then pick a spot below them. An entire new row of duplicates, all in white light, will appear below the first row.

Step 8:

Use **{Again}** several times. Keep going a few times after the white row vanishes off the bottom of the screen. **{Exit Copy}.**

Step 9:

Do another **[Win-Fit],** to make the last rows reappear. At this point you'll have most of the Window Area full of duplicates of your original graphic.

Clearing the Window

By the way, here's a quick way to erase the Window Area: Quit whatever you're doing and choose **[Group], {All}, {Done Group}** (to get out of Group Mode), **[Delete]**, and pick one of the items in the Group. The entire Window will empty immediately. You also have {Start New Graphic} under [Project]. This procedure will be known as "Clearing the Window". Figure 11-3 shows this, using the example from the last exercise.

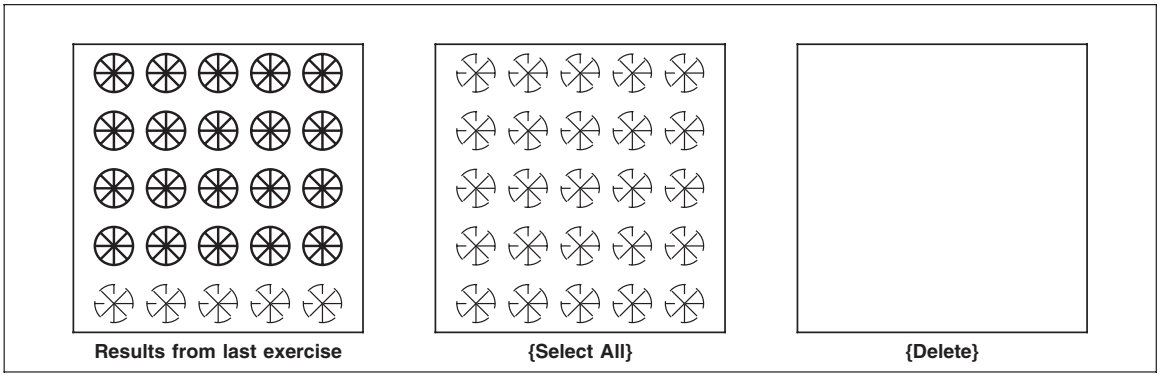


Figure 11-3: Clearing the Window

{Pick}

This option on the Group Menu lets you pick one item (line, rectangle or arc/circle) at a time and add it into your current Group. To see how it works, do this exercise, shown in Figure 11-4:

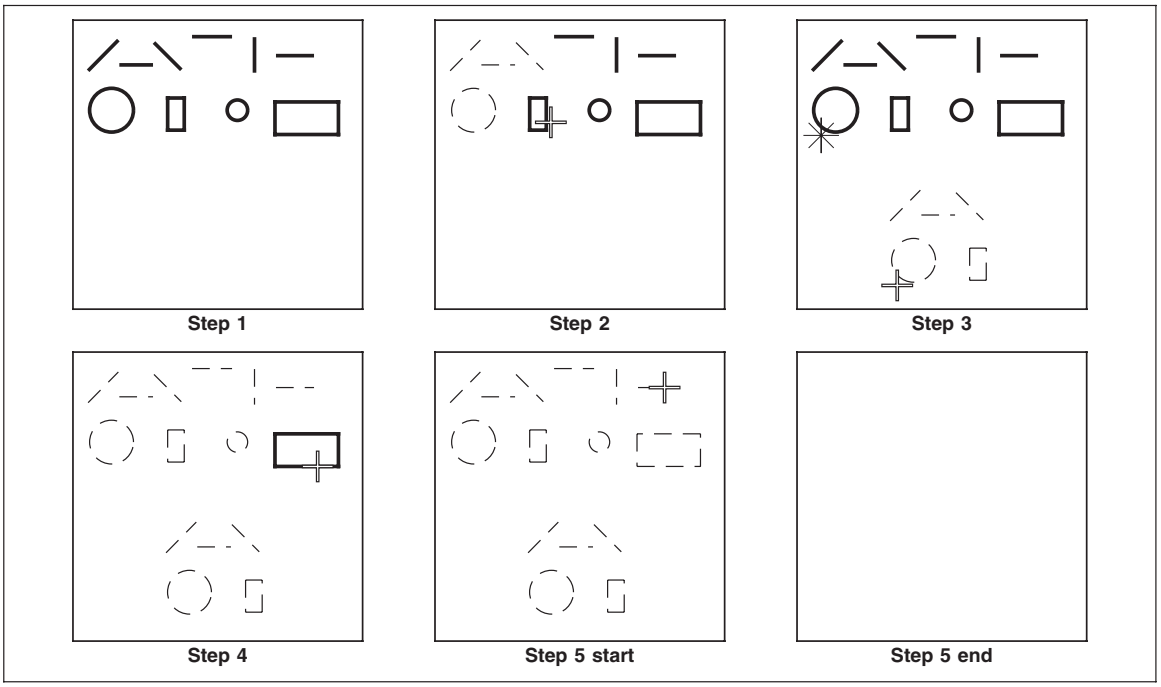


Figure 11-4: Using {Pick}

Step 1:

Use the regular [Line] and/or [Arc] options to make several items on screen.

Step 2:

Choose **[Group], {Pick}**, and use the cursor to pick several of the items. Each time you pick one, the "pick item to group" prompt will return, and you'll see the item turn white on screen (dashed in our illustrations), indicating that it's been grouped as a member of your current Group.

Step 3:

Do a **[Copy], {Copy to Anywhere}** to a clear part of the Window Area and notice which items appear there. The duplicates are in white light, indicating that *they* are now the Group. **{Exit Copy}.**

Step 4:

Choose **[Group], {Pick}** again, and pick the rest of the items on screen to [Group] them. **{Done Group},** out of Pick mode.

Step 5:

Choose **[Delete]**. Pick one item with the cursor to clear the Window Area.

{Intersect}

Since this is the default mode for [Group], you don't actually have to choose {Intersect} in order to use it. To see how it works, do this exercise, shown in Figure 11-5:

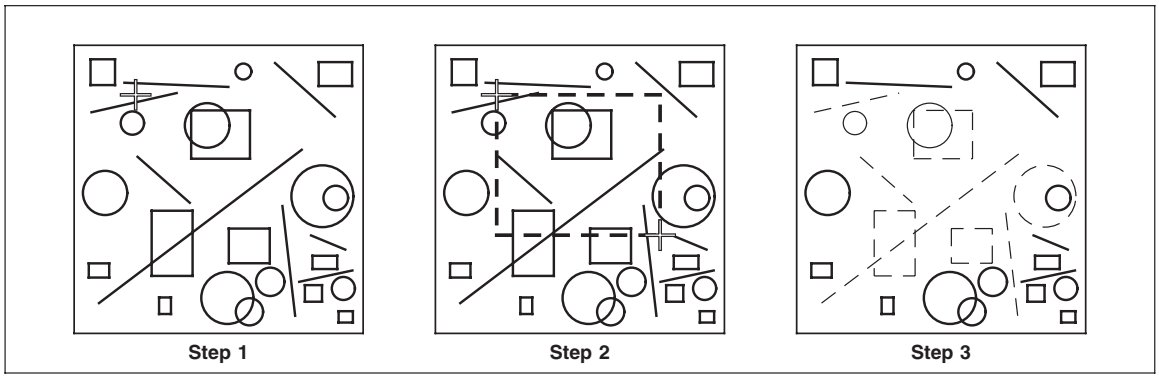


Figure 11-5: Using {Intersect}

Step 1:

Use the regular [Line] and [Arc] options to make enough items to fill the screen.

Step 2:

Choose **[Group], {Intersect}**. The prompt "pick 1st corner for Group" will show up. Put your cursor in the middle of the items you just drew, and pick a spot. As you move the cursor away, a box will stretch and move with the cursor.

Step 3:

The prompt now reads, "pick 2nd corner for Group", so do so, as soon as the grouping box is enclosing a few different items. As you pick the box will vanish, and every single item that was inside the grouping box or which was even touching one of the sides, will be grouped.

Step 4:

Choose **{Ungroup All}**

{Inside}

This option appears very similar to the last one. The difference, however, is very important. To make it clear, do this exercise, shown in Figure 11-6:

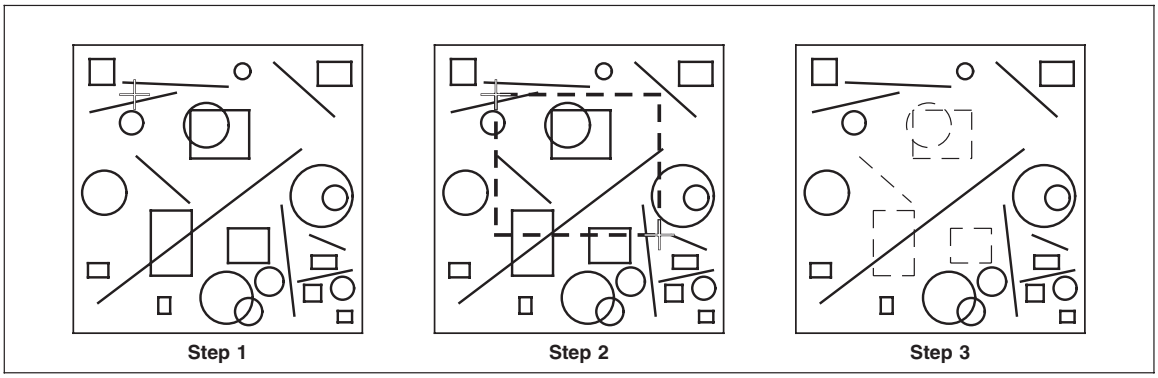


Figure 11-6: Using {Inside}

Step 1:

Keeping the results of the last exercise, choose **[Group], {Inside}**. The same prompt of "Pick 1st corner for Group" will appear, so pick a spot as close as possible to the one you picked first in the last exercise.

Step 2:

As the "Pick 2nd corner for Group" prompt appears, move the cursor, and thus the grouping box, away from your first corner. Move the box around until it matches the one you made last time.

Step 3:

Pick the second corner and watch the items inside the grouping box turn white, even as the box vanishes. Notice the difference from the previous exercise: none of the items that were even one bit outside of the box were grouped, *except for some of the rectangles.* If you had any rectangles with entire *sides* inside the grouping box, those rectangles will have been grouped along with the other items.

Why? Because rectangles are an example of "combined" graphics, in this case ones that are created automatically rather than drawing individual lines. You can think of a combined graphic as being a permanent "micro-group", so that anything you do to one part of it gets done to the rest, just as we said happens with Groups created with the [Group] options. So if you manage to enclose one entire side (one complete "item" - i.e. a line - within the combined graphic) of a rectangle within your grouping box, the entire rectangle will be affected.

{Ungroup All}

Not surprisingly, this function, which you've already used a few times, is the opposite of {All}. Figure 11-7 shows this very simple exercise:

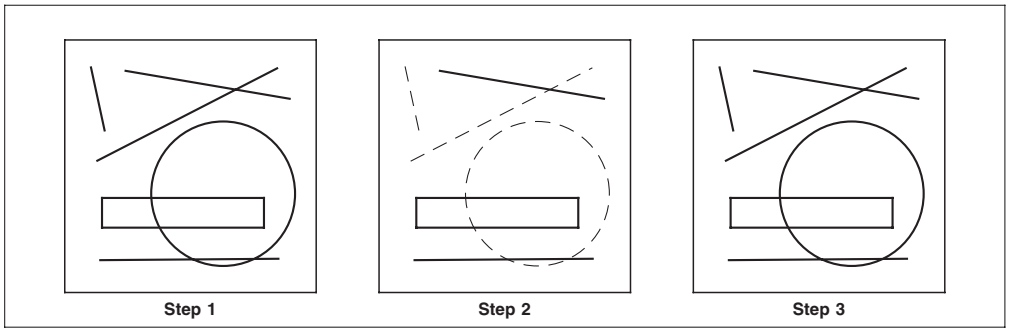


Figure 11-7: Using {Ungroup All}

Step 1:
Clear the window, then draw several items.

Step 2:
Use **[Group], {Intersect}** to turn some of those items into the members of one Group.

Step 3:
Choose **{Ungroup All}**. Every item on the screen will go back to its original color, having been ungrouped.

{Ungroup Pick}

This option is the exact opposite of {Pick}. Logically enough, it's used to subtract items from the current Group. This exercise, shown in Figure 11-8, will make it easy:

Step 1:
Clear the window, then draw a few simple items.

Step 2:
Use **[Group], {All}** to turn all those items into the members of one Group.

Step 3:

Choose **{Ungroup Pick}**. The prompt, "pick item to ungroup" will nudge you, so use the cursor to pick an item. It will go back to its original color, indicating that it is no longer a member of the Group.

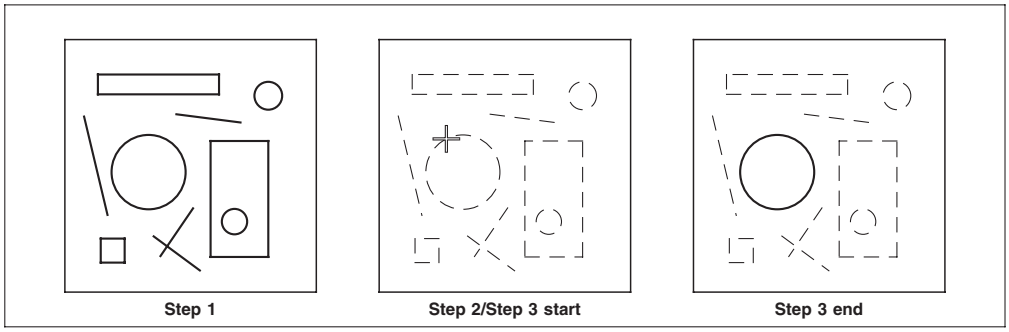


Figure 11-8: Using {Ungroup Pick}

{Ungroup Intersect}

This option is the opposite of {Intersect}. It too involves the use of a grouping box (or in this case an "ungrouping box"), and its prompts are familiar. This exercise, shown in Figure 11-9, will show how easy it is to use:

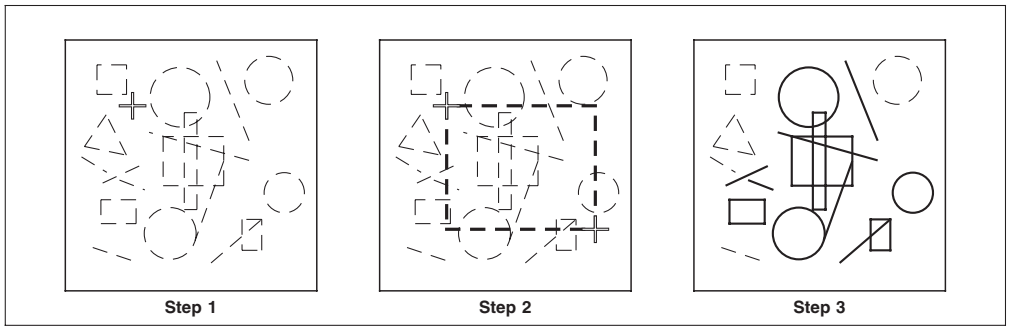


Figure 11-9: Using {Ungroup Intersect}

Step 1:

Clear the window, then draw a lot of simple items. Use **[Group], {All}** to turn all those items into the members of one Group.

Step 2:

Choose **{Ungroup Intersect}**. The prompt, "pick 1st corner for Ungroup" will appear, so use the cursor to pick a spot in the middle of the items.

Step 3:

At the prompt, "pick 2nd corner for {Ungroup}", move the cursor away until it has defined a box that encloses some items and intersects others. Pick the second corner, the box will vanish, and all the items inside or intersecting it will go back to their original colors, indicating that they are no longer members of the Group.

Step 4:

Do a **{All}** but *don't* clear the Window.

{Ungroup Inside}

And last but not least, this option is the opposite of {Inside}. It works exactly the same way, creating an ungrouping box. This exercise (Figure 11-10) will demonstrate:

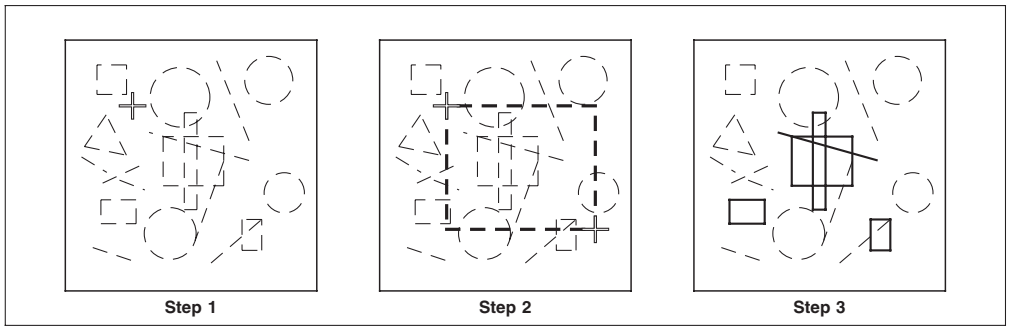


Figure 11-10: Using {Ungroup Inside}

Step 1:

Keeping the results of the last exercise, choose **[Group], {Ungroup Inside}**. The same prompt of "pick 1st corner for Ungroup" will appear, so pick a spot away from the currently grouped items.

Step 2:

As the "pick 2nd corner for Ungroup" prompt appears, move the cursor, and thus the ungrouping box, away from your first corner. Move the box around until it encloses several items and intersects a few others.

Step 3:

Pick the second corner and watch the items inside the ungrouping box turn colored, even as the box vanishes. Notice that none of the items that were even one bit outside of the box were ungrouped, again except for any rectangles having entire sides inside the ungrouping box.

{Invert Selection}

This is a toggle, which switches the group to the items, which are not grouped.

[Delete] with [Group]

Here's another simple exercise, this time on Deleting Groups that you've Selected (see Figure 11-11).

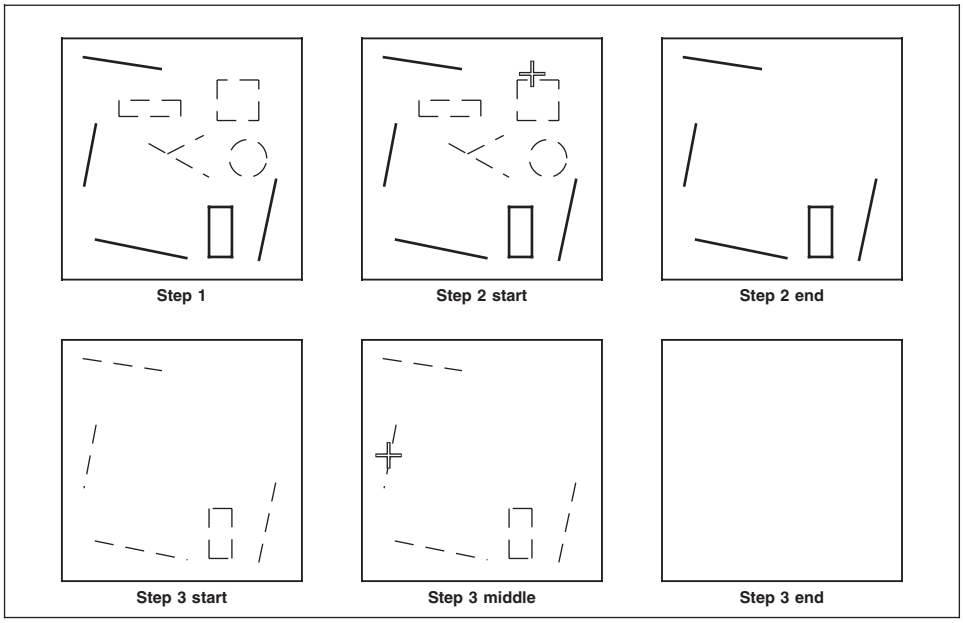


Figure 11-11: Deleting Group Items

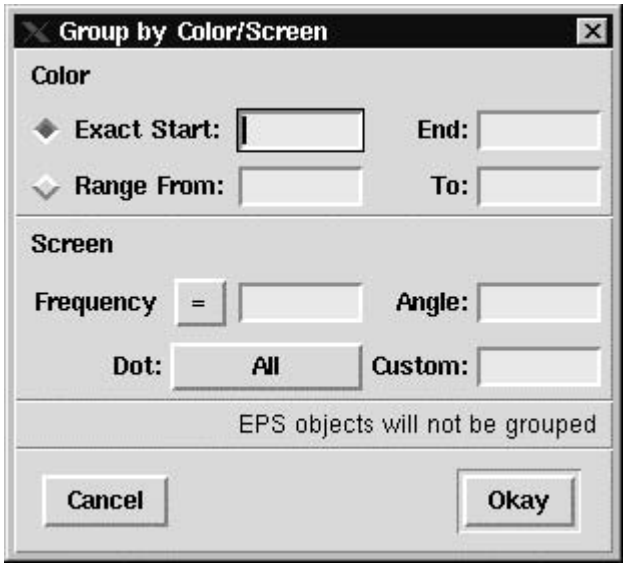
Step 1:
Keeping the results from the last exercise, use **[Group], {Inside}** (or {Pick} or {Intersect}, if you prefer), and Select several of the items as members of a Group.

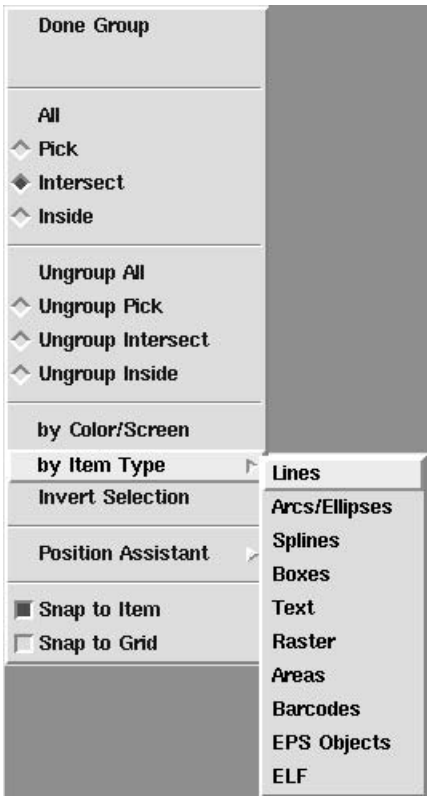
Step 2:
Select {Done Group}. Choose **[Delete]**. At the prompt, "pick item to delete", pick any of the members of the Group. All of them will vanish.

Step 3:
Clear the Window, either by picking the rest of the items one at a time, or else by using the method: [Group], {All}, {Done Group}, [Delete], and picking one item on screen. Then **{Exit Delete}.**

Group by Color Screen and Group by Item Type

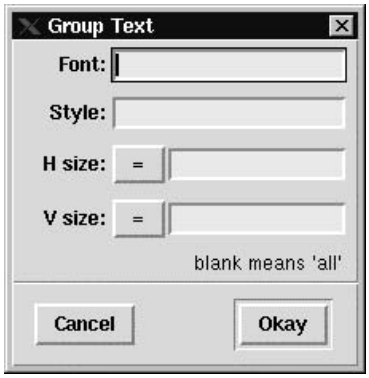
The following options allow you to group by component attributes or component types. When you select the {'by Color/Screen} option the following dialog will appear allowing you to input a specific value or range.





Grouping by component type is extremely handy when you want to change the attributes of a certain component type. You can still use either intersect or inside, but it will limit the type of components the group is looking for within the boundary.

When grouping only text items, there is also the ability to limit the selection to a certain font or point size. Just enter in the font and/or style and it will group all components matching those attributes.



[Measure]

The [Measure] option allows you to find the X and Y distances between two points and is displayed at the top of your screen using the [Units of Measure] indicated by the "red" icon at the right of the window.

First select the **[Measure]** option. Here you will be prompted to "Pick where to measure from", so select your first measure point. Now you will be prompted to "Pick where to measure to". Once the second measure point is selected your coordinates will display at the top of your screen, showing your "angle", "distance", "distance in the X direction", and "distance in the Y direction".

This comes to be very helpful when the angle of a line vector needs to be determined. Also you are given the distance directly between the two select points. Now at this point you can either pick another element to measure or you can **[Cancel]** and return to your current function menu and option in use.

NOTE: If you are currently working inside another function such as [Line] and choose [Measure] your coordinates are displayed shifted to the left of the "x" and "y" position indicators.

[Query]

The [Query] option allows you to query or ask information about an item on the screen. After selecting the option, you will receive a "dialog window" similar to one of the {Change Attributes} dialog windows. With [Query] you can simply just look at the attributes or you can make changes to them at this time.

By picking different elements you will be given various types of information. For example, by selecting a line vector you will be told its line weight, line style, line shade, layer and angle.

When using [Query] on a text string paragraph you find out its main attributes: font, style, horizontal size, vertical size and composition mode. Whether kerning is on or off, the X and Y coordinates, leading and the layer and angle it is set to. It will show the main information concerning the paragraph.

A raster will always [Query] as a *Raster Image.* This means it is rows and columns of pixels. The dialog box will tell you its original scan resolution and the effective resolution. This effective resolution is how many pixels are considered one inch. It can be

different from the original scan resolution if the image has been scaled. When in the [Query] dialog, if you make any changes to the size or resolution, and okay those changes, you will be changing the raster. To see the effects of size and resolution, click onto the [Re-calc] button and you will see the new pixel info in the dialog box.

Graduating a Mono (Black-and-White) Raster

Raster images which are just “black-and-white” can have a directional graduation applied. To graduate such an image, use the [Query] tool. Only when you [Query] the raster component will you have available the Color Start and Color End attributes.

Graduating a raster will output 8- or 12-bit PS gray values for each ``black pixel" in the image, depending on the RIP PostScript level. When outputting to a color printer or color EPS file, then each pixel becomes 32- or 48-bit. Be aware the time it takes to generate the PS file will be considerably longer and the resulting PS file will be much larger.

The Query dialog will report a rough estimate about the image PS size since the files created during printing will be large. Graduating rasters will not increase the drawing file; only the printer file size is dramatically increased.

The [Delete] Tool

MECCA 2000 has a [Delete] option for the same reason that pencils have erasers. Sometimes you'll accidentally put an item into your graphic that you don't really want. Other times you may temporarily need some "construction lines" to help you layout your picture, but not want them around later.

With the [Delete] option, you can get rid of individual items or entire groups of them. But once they're gone, they're gone - unless you instantly use {Restore} to bring them back.

Try this simple exercise, shown in Figure 11-12:

Step 1:

Using the usual methods, draw several items on screen.

Step 2:

Choose **[Delete]**, the prompt "pick item to delete" will come up in the Prompt Area. So use the cursor to pick an item you'd like to get rid of. It will instantly vanish and the "pick item to delete" prompt will return. Once and item has been deleted you will now have an option to {Restore}.

Step 3:

Don't clear the Window this time, but just **{Exit Delete}** and go on to the next exercise.

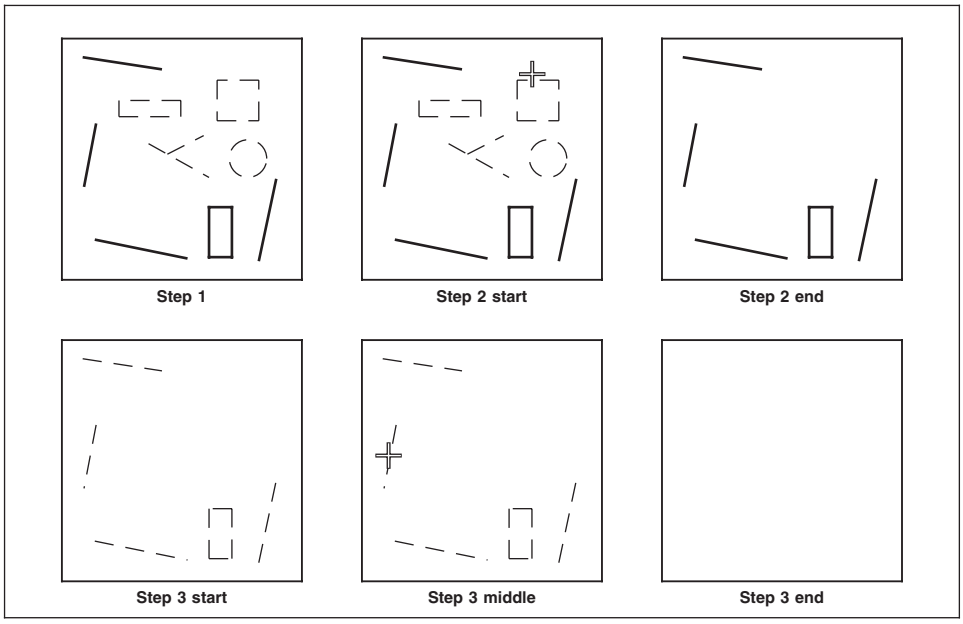


Figure 11-12: Deleting Picked Items

{Restore}

But what if you change your mind? The {Restore} option can help, but you have to be quick about it. This exercise, shown in Figure 11-13, will show why:

Step 1:

Make four rectangles, one in each corner of the Window Area.

Step 2:

Choose **[Delete]** and pick the rectangle in the upper right corner. Naturally, it will vanish. The "pick item to delete" prompt will come back.

Step 3:

Choose **{Restore}**. The rectangle will return! And so will the "pick item to delete" prompt.

Step 4:

Pick the upper left rectangle next, and watch it go away.

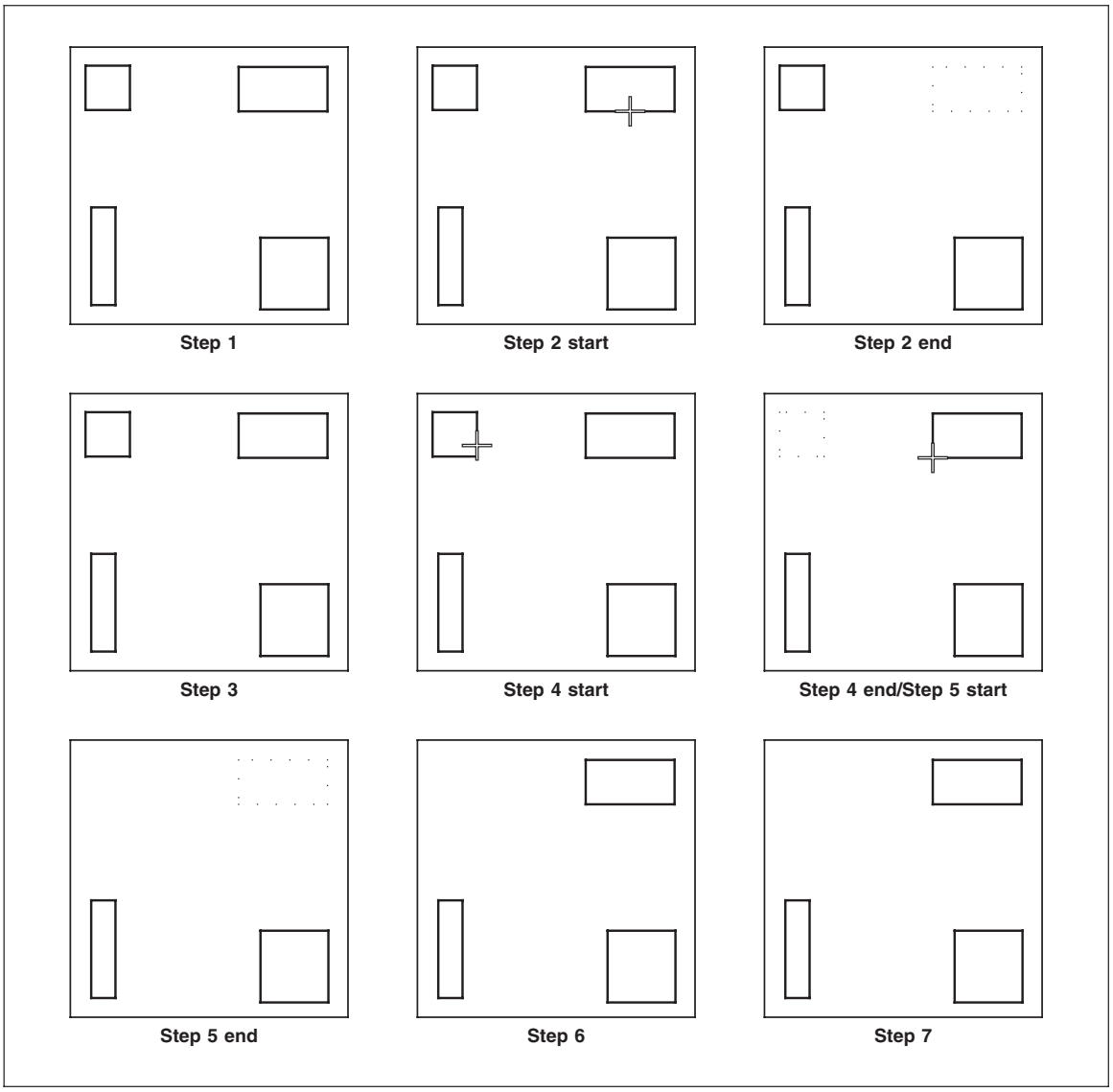


Figure 11-13: Using {Restore}

Step 5:

Pick the upper right one again, and it will vanish.

Step 6:

Choose **{Restore}**. The upper right rectangle will pop back.

Step 7:

Choose **{Restore}** again. Nothing will happen!

Step 8:

{Exit Delete} and clear the Window.

So what does this last exercise show about the {Restore} option? Two things: (1) *{Restore} only works on the very last item Deleted,* and (2) *If you leave Delete Mode for any reason, {Restore} won't remember what the last item was.*

So you may want to get into the habit of always doing a [Win-fit], *before* every critical deletion (or at least before you leave Delete Mode), in order to give yourself a chance to {Restore} anything you erased unintentionally. This is especially important whenever you've been deleting selected Groups and/or working inside a [Zoom] window. In either situation, you may not have been paying attention to accidentally Grouped items or they may not have been visible at the time.

{Cancel}

The {Cancel} option allows the user to back out of any function menu in use. The {Cancel} option can also be used to abort a function after it is selected.

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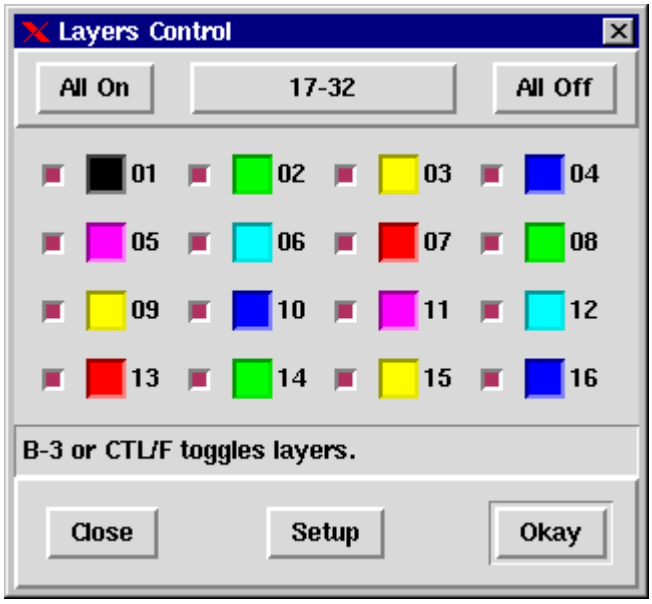
Chapter 12: The [Layer] Tool

A nice feature of MECCA 2000 is that it supports the layering of data. You have the ability to place text and graphics on one of thirty-two separate layers. This allows you to either display or hide particular layers on the screen as well as during output. With this ability, you can separate artwork that is to be printed in colors at the time of creation. Then output both a combined drawing for proofing and separate color layers by specifying what layers get printed at one time through the [Parts] option.

Defaults:

All 32 Layers Turned On



This [Layer] option turns the display on or off and controls the color in which a layer will display for the Window's Spot Color mode.

To set an item's layer attribute, use the {Set Attributes}, *Layer* option that is found in another location. The default is layer 1, but you can also change an item's existing layer through the {Change Attributes} menu. *Layer* option.

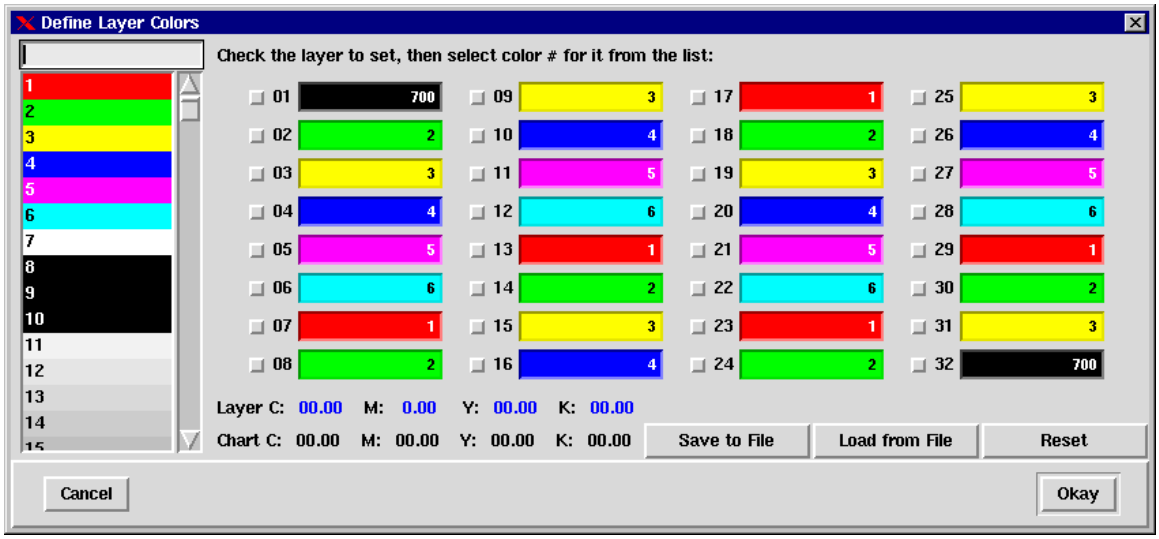
To turn layers on or off use this option, select **[Layer].** Here you will be given a listing of layers 1 thru 16 to choose from. Select the **[Next 16]** option to show a submenu of layers 16 thru 32. To toggle a layer on or off, select the small button next to the color of that layer. After changing the active layers, use the **[Okay]** option to return to your current menu. Now your screen will clear, displaying only the current layers that are shown as "on" in the "layer" menu.

A shortcut: To invert (or toggle) the entire selection, press Button-3 on the mouse while the cursor is anywhere within the dialog.

Defining Layer Colors

To set the color of a layer, select [Setup]. This will open up a new menu displaying all 32 layers, a Color Number Chart, and the CMYK percentages.

Pick your layer by clicking on the small button. Once you have made a selection the Color Number Chart will become active. Scroll through the chart and click the color number you want. You will notice that after you make your selection the layer color will change to represent the color number you chose. Be sure to [Okay] to accept your changes.

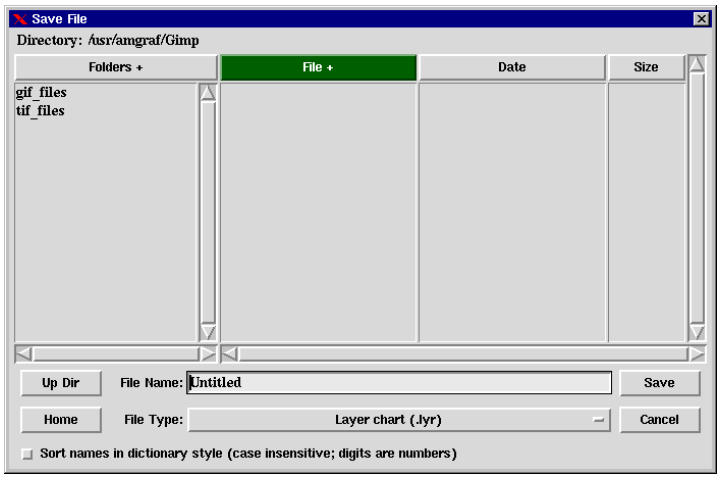


While in the Layer Setup dialog, right-button (button 3) click over a color chip, will trigger a search in current FCP chart the closest color (to that layer's CMYK values); the color found will then be high-lighted in the color list on the left hand side, and its CMYK values will be shown on the bottom. The "closest match" is defined as the smallest "color difference".

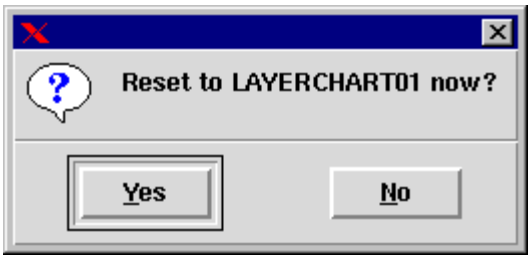
[Save to File], [Load from File], and [Reset]

[Save to File] writes the active layer table of the current 32 layer colors to a file with the extension of ".lyr".

[Load from File] reads in an existing .lyr file to setup each layer's color.



[Reset] reloads *layer_color01* default file reading its CMYK values.



The LYR files referenced in the first two options are in an ASCII format with the extension of ".lyr". Each line holds a Layer Number followed by the FCP number assignment.

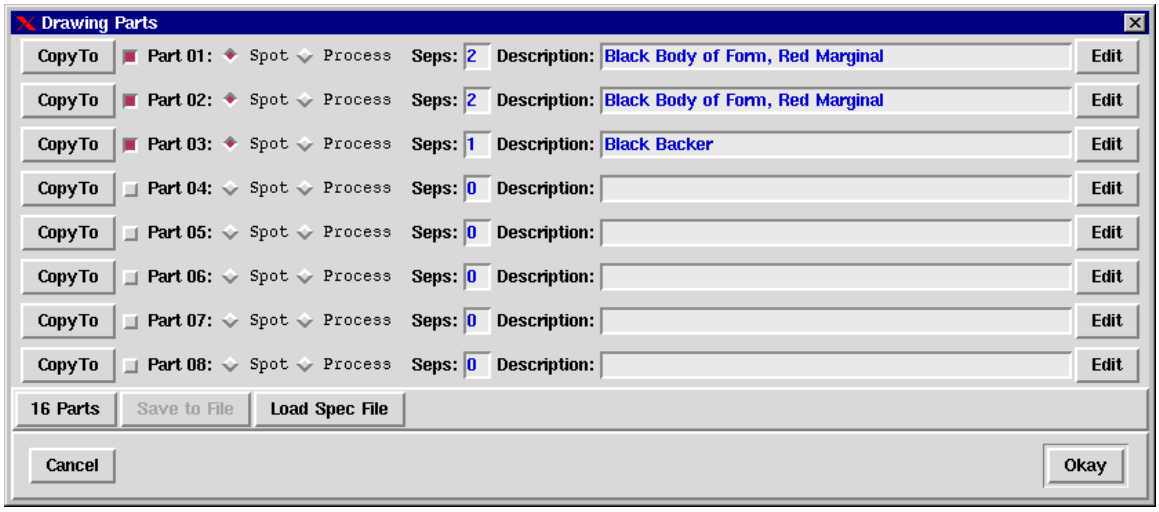
```
xLYR
01 700
02 185
03 289
etc...
```

Note: The Active Layer Table holds the FCP number assigned to a layer and retrieves its CYMK values from the /color/fcp01 table (or the default table specified). [Load from File] only sees layer number and its FCP color number. Any additional CMYK info is ignored. After [Load from File] changes some layers, user can still [Cancel] to not effect any change.

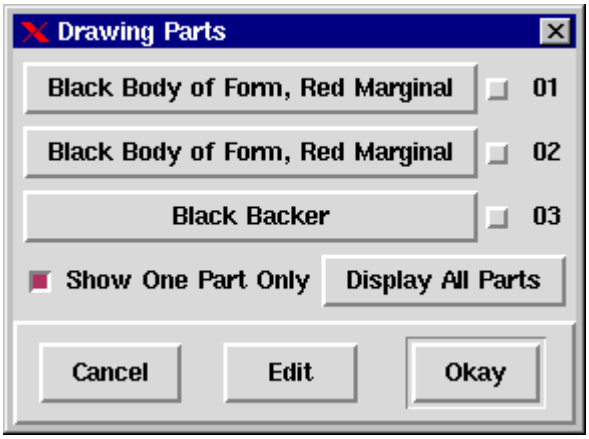
On the other hand, [Reset] cannot be canceled. MECCA 2000 will ask user to confirm reset action, upon Yes, the setup dialog closes automatically and the layer table resets to startup state.

Chapter 13: The [Parts] Tool

The [Parts] tool is where you setup your Output Specification for the job. As soon as you click the [Parts] button a "dialog window" for *Drawing Parts* will appear. In this window you will need to specify whether you are doing *Spot* or *Process* color output. You will also need to determine how many *Parts (Sheets)* and *Separations (Ink Colors)* will be needed. Once you have entered all appropriate information, click [Edit] to define the separations for each individual Part.



These part specifications will eventually affect the display and printing of the job. After parts have been designated with layers used, then the Parts tool can be used to display each part individually.



Just check which part to display. If you need to make changes to the specifications, click the [Edit] button.

Spot Color Specifications

In order to make use of Spot Color Specifications you must first understand the printing process. The presses need to have individual plates for each color of ink for each part of a form, as well as, separate plates for any back printing.

Each plate generally contains the image of the form that is to be printed, as well as, plate marks and registration marks. These items will normally be dictated by the print shop.

The first step to making use of Spot Color Specifications begins before the first component is drawn. Following is a good example of what information can be deduced by a quick evaluation of the form.

The form we will be working on for this exercise would be evaluated like this one:

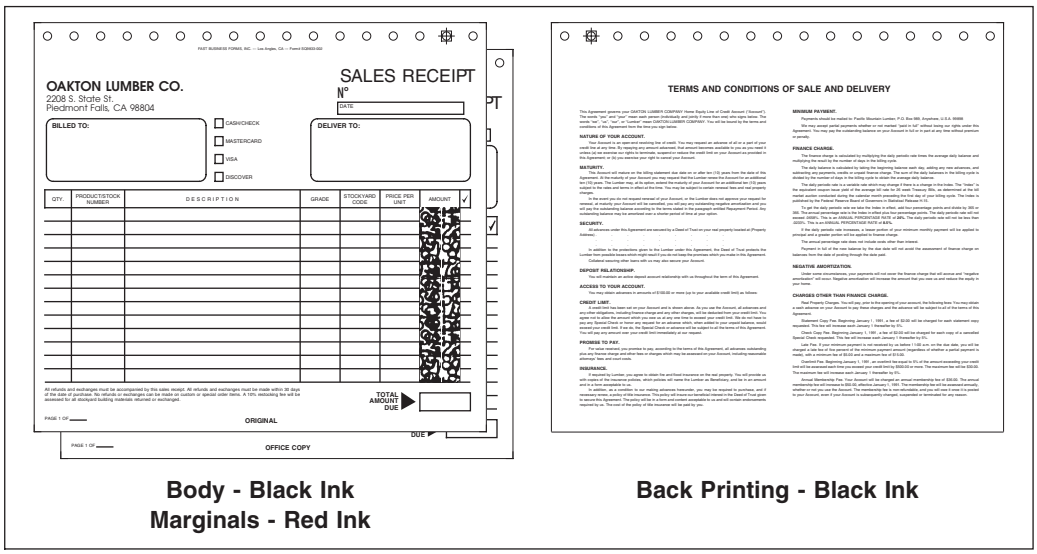


Figure 13-1: Multiple Part Form with a Backer

- Registration Marks on the top-right for Front Printing
- Registration Marks on the top-left for Back Printing
- Body of form is static on Parts 1 and 2
- Body of form prints in black ink
- Marginal words print differently on Parts 1 and 2
- Marginal words print in red ink
- Backer prints in black ink

With these points in mind, we need to formulate a plan before composing to insure the plates can be output to meet the needs of the press. A form similar to Figure 13-2 is very useful to plan the job before composition. We know in order for the job to be printed we need 4 plates. We will compose making use of the 16 different layers so the layers can be output according to the job requirements.

Description	Plate Number	Color	Layers Needed
Part 1 and 2	1	Black	10,15,16
Marginals Part 1	2	Red	1,15,16
Marginals Part 2	3	Red	2,15,16
Backer	4	Black	5,14,16

Figure 13-2: Plan the Job Before Composition

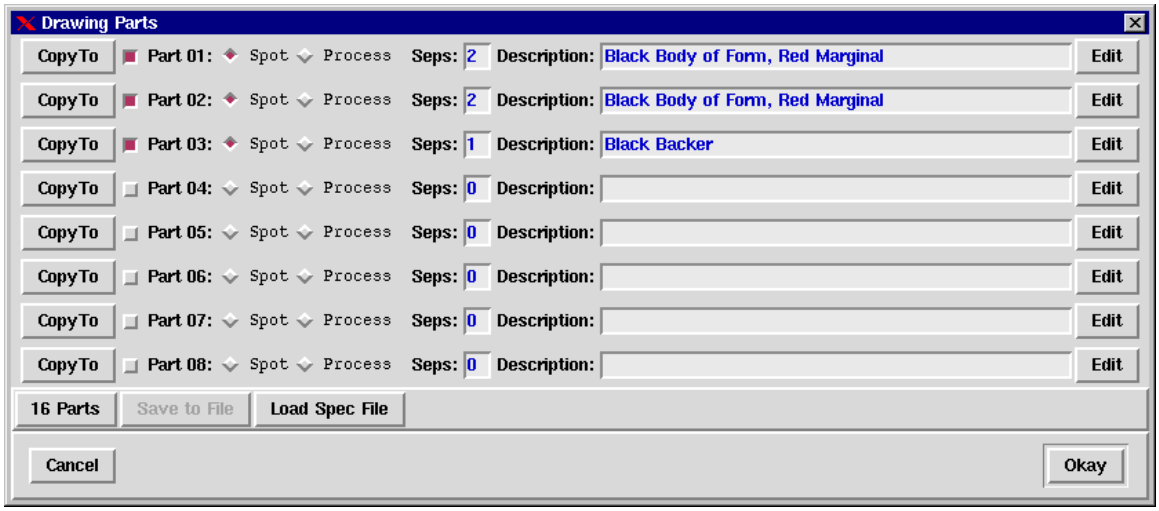
Use of Layers in Job

```
Plate Marks                              Layer 16
Registration Mark for Front Printing     Layer 15
Registration Mark for Back Printing      Layer 14
Body of Form Common to Part 1 and 2      Layer 10
Marginal for Part 1                      Layer 1
Marginal for Part 2                      Layer 2
Back Printing Text                       Layer 5
```

Defining the Specifications

We will use Parts specifications to define what layers are needed for each plate.

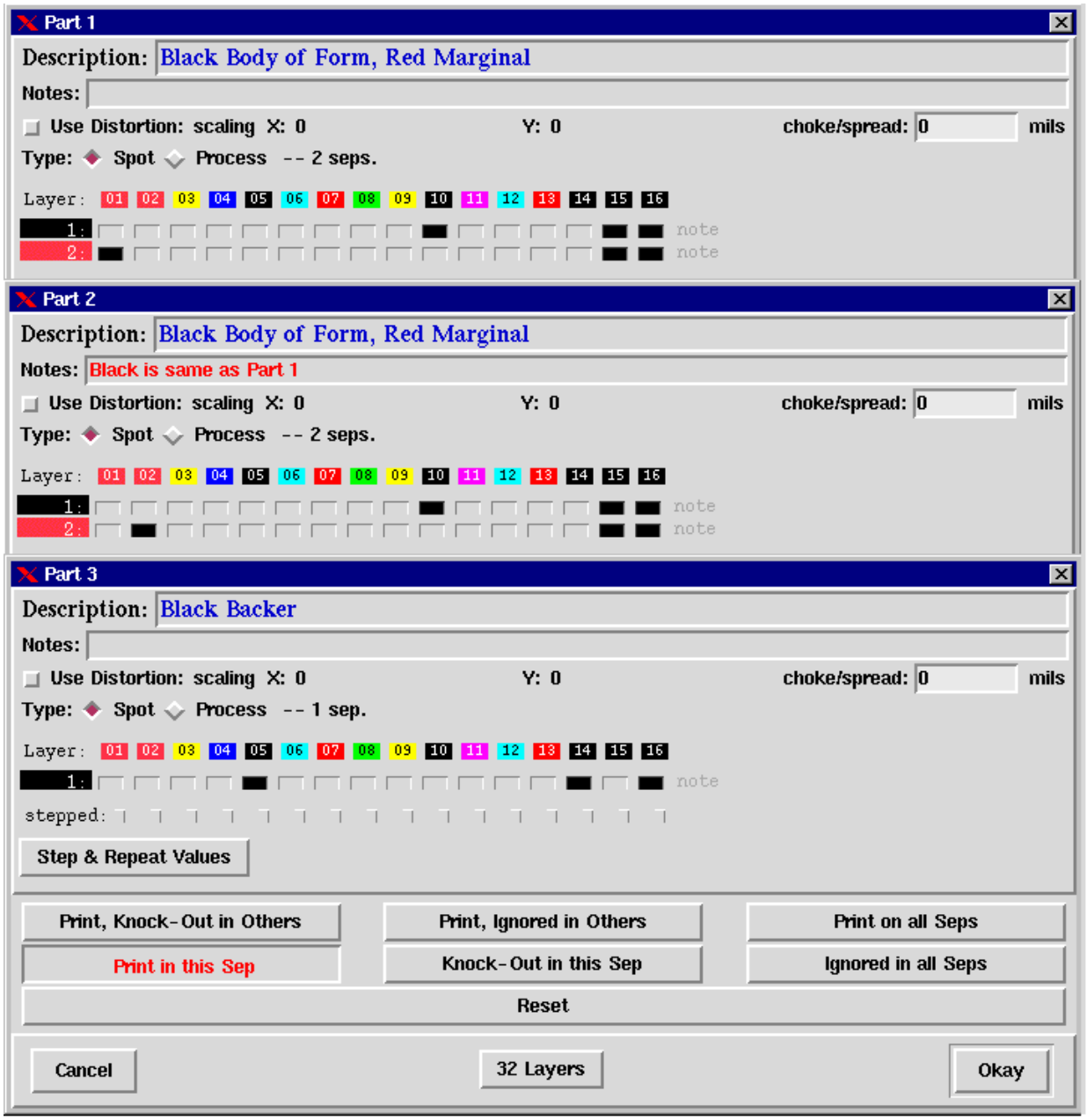
Select **[Parts].** This will take you to the "dialog window" for defining each part/sheet needed. This is the point that you control the arrangement of "Parts" for a multiple part job. With this menu, you can define up to 16 parts, each with the ability to handle 9 separate films.



Check a Part for each sheet, **select Spot,** and **input how many** Separations (Ink Colors) needed for that sheet. Adding an English Description of each separation helps later in identifying why each separation is needed. Then **[Edit]** each part needed.

Note: There are a maximum of 9 separations per part definition. It is not necessary to use all 9 separations. The number in this field tells the system how many separations are needed within this definition. If the Separation is set to 3 it will give you 3 seps in the next dialog: Sep 1, Sep 2, and Sep 3. Our example is asking for 1 and 2 seps.

Editing the Part



The color separations are controlled by this dialog. It is here that you indicate which layers are needed for each separation by using the "Print in this Sep" button and clicking on the appropriate layer checkbox.

The **Description** will show on the Print menu for each part. The **Notes** will not. The Distortion and Choke/Spread are explained later in this chapter.

Using the Part Dialogs:

Sep 1 through 9 Layers: There can be a maximum of nine separations per part. The 16 (or 32) fields to the left represent the layer (or layers) that will be output for that separation. If the checkbox for the layer is displayed in black, this indicates the components on that layer will print during output. If the checkbox is displayed in white, it will cause a knock-out in that separation. If the checkbox is left blank, the components on that layer will not print. It is necessary to use buttons for these functions. They are described below.

Mostly, you will be using **[Print in this Sep]** to turn layers on. It is the default.

[Print, Knockout in Others] This will make the layer you have chosen print while automatically knocking out the layer in all of the other separations.

[Print, Ignored in Others] This will make the layer you have chosen print, and turn off that layer in all other separations. If you have picked the wrong separation for a layer to print, use this option. It will remove it from the wrong separation as you pick the correct separation.

[Print on all Seps] Print positive this layer on all separations, regardless. (This is layer 16 in our file. See how it is repeated on all separations.)

[Positive in this Sep] This allows you to manually select a layer to print positive and it will not automatically reverse or ignore or effect how the other separations are setup. (This is how we turned on our layers one at a time.)

[Knock-Out in this Sep] This allows you manually to select a layer to be knocked out and it will not effect how the other separations are setup.

[Ignored in all Seps] This causes a layer to be ignored in all nine separations. It is completely ignored and will not print on any separation.

[Reset] This will clear all layer assignments so that you can start again.

[32 Layers] Default is to show only 16 layer checkboxes. If you need to assign printing specifications to layers above 16, select this button.

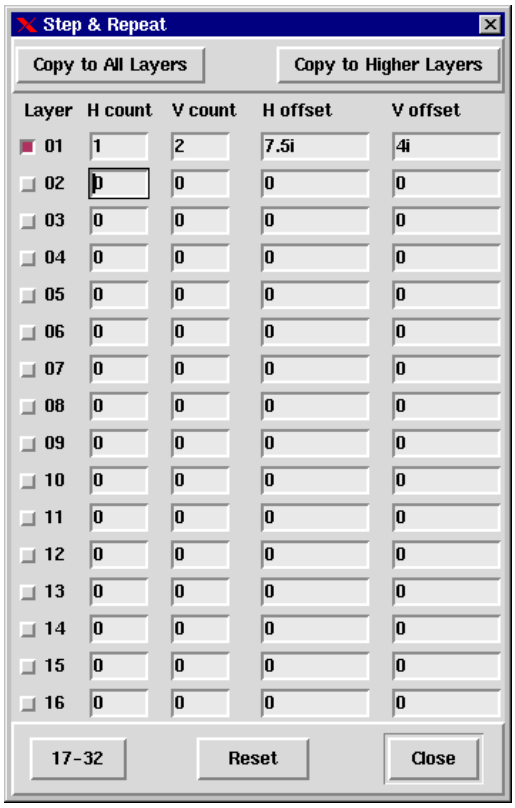
[Cancel] will quit you out of the part description menu without saving your changes.

[Okay] will save the part description with your layer selections.

Once defined you can use the **[Copy To]** button to copy an existing Part specification to another part. Define the first part, then select [Copy To] and the new part it should be copied into.

Also the entire Parts Specification can be saved into a ".spec" file to be used with other drawings by selecting **[Save Spec File].** You can also load in an existing ".spec" file with the **[Load Spec File]** option.

Step-and-Repeat Values



Stepping 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 image 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. The instructions on the stepping are controlled in the dialog for stepping.

Layers toggle on the layer to step

The *H Count* is how many across horizontally. Always have at least 1.

The *V Count* is how many up or down vertically. A positive number steps up, a negative number steps down. Always have at least 1.

H Offset is the physical dimension the image should be copied horizontally, while **V Offset** is the dimension to copy vertically.

Note: Never input 0 for H/V Count (the file will not print).

Step-and-Repeat Exercise for Labels – 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 - we have used Layers 11 through 15 when creating those.

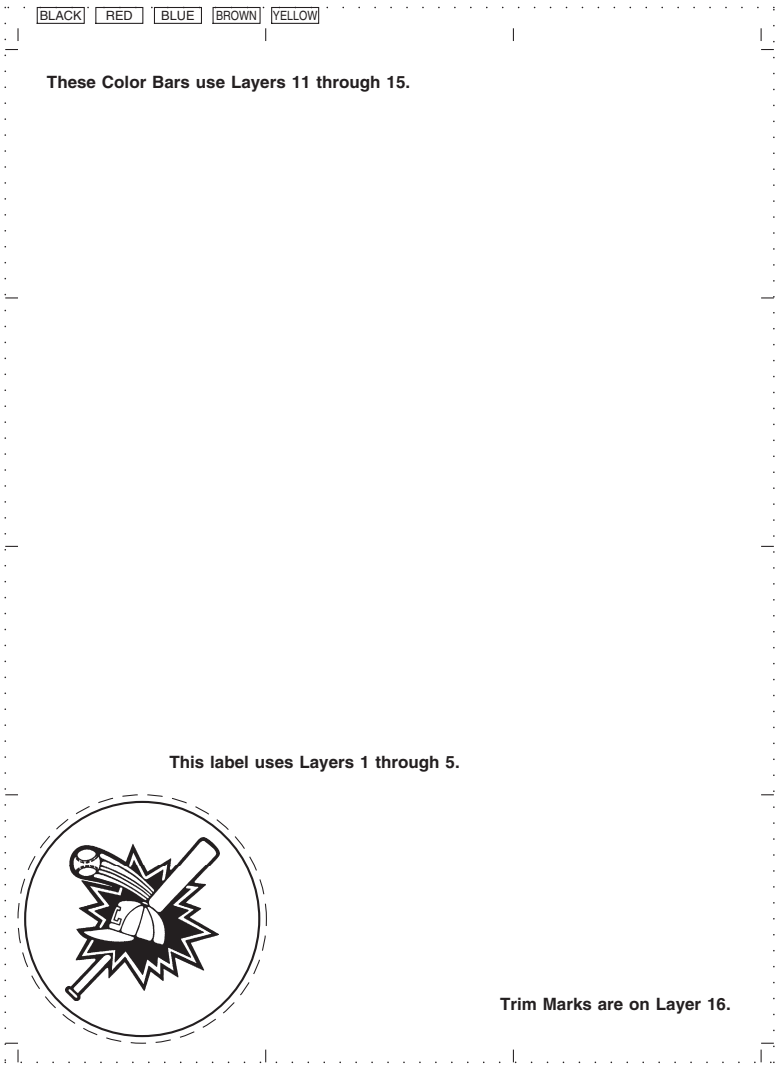
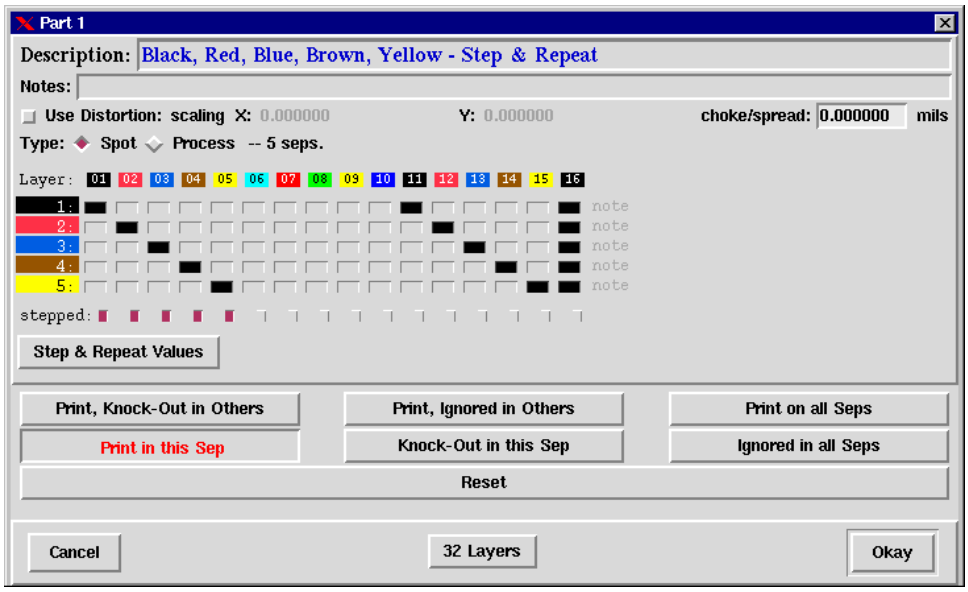


Figure 13-6: The Completed Label with Plate Marks

You can now save the label drawing; it is ready to output using the Part Specifications.

Setting up the Part Specifications

Looking at the definition of the *Part Specifications* you can see that each separation is calling up a different layer. Layers 11 through 15 are for the "Color Bars" needed at the top of our plate, with Layer 16 being the Trim marks.

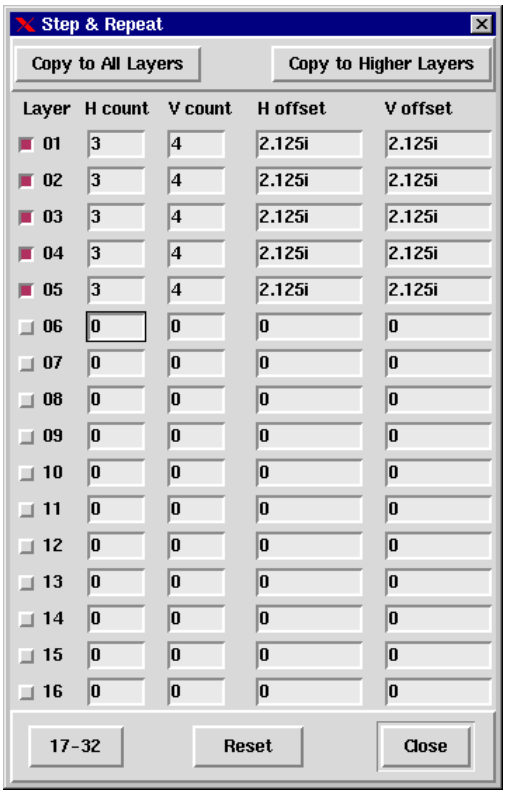


Step and Repeat Values are saying to step only Layers 1 through 5. These are the ones we used for the label.

The *H Count/V Count* shows that we want 3 across and 4 up.

H Offset/V Offset is the physical dimension of the label, including bleed. Stepping a label that is 2 1/8" in diameter.

Note: Never input 0 for H/V Count (the file will not print).



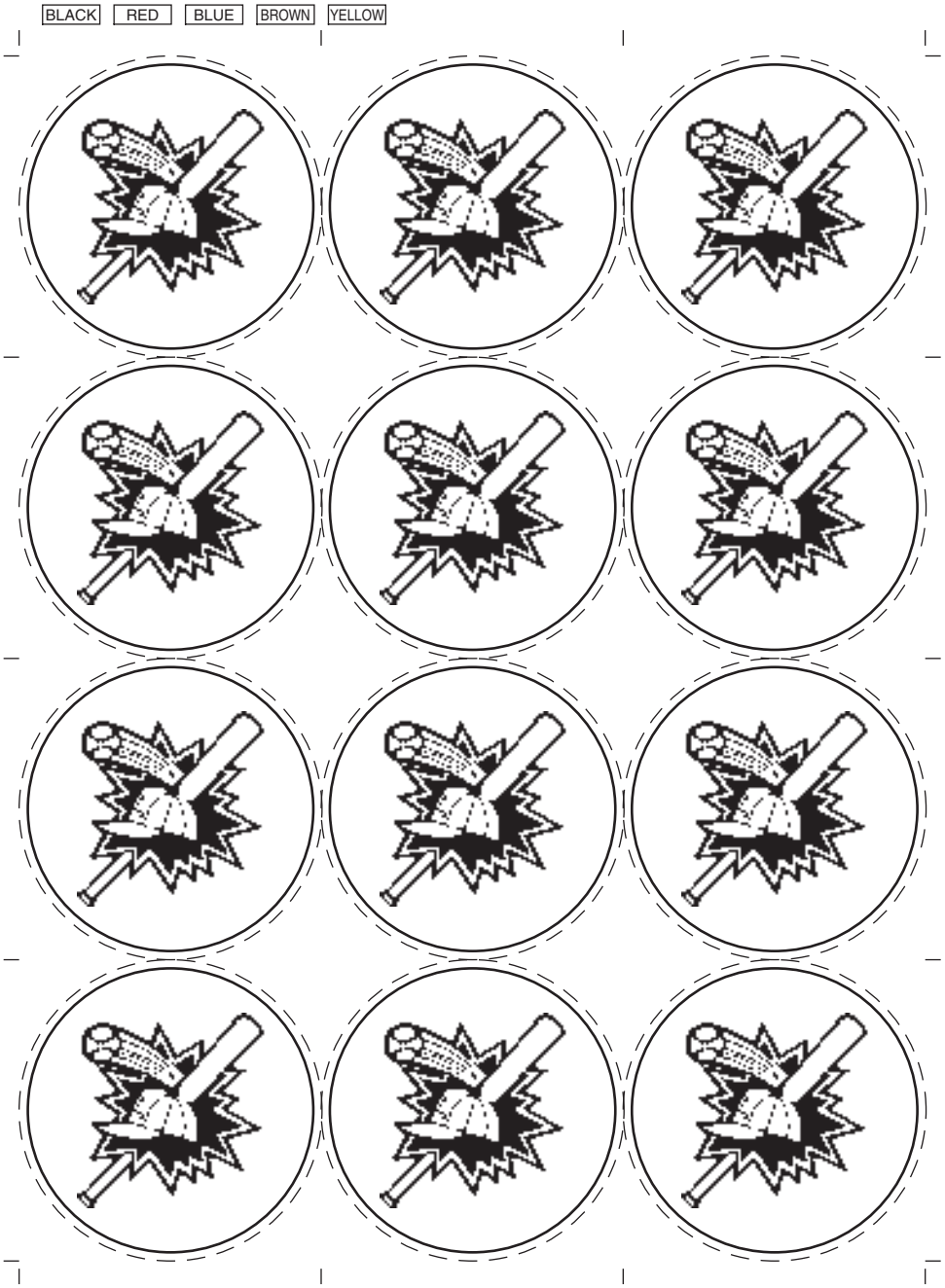


Figure 13-7: The Finished Product

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 miss-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 knock-out is smaller than the item that created the knock-out. A spread is when the hole created by the knock-out is true to size, but the object that sits in the hole is larger. See Figure 13-3, for a visual example.

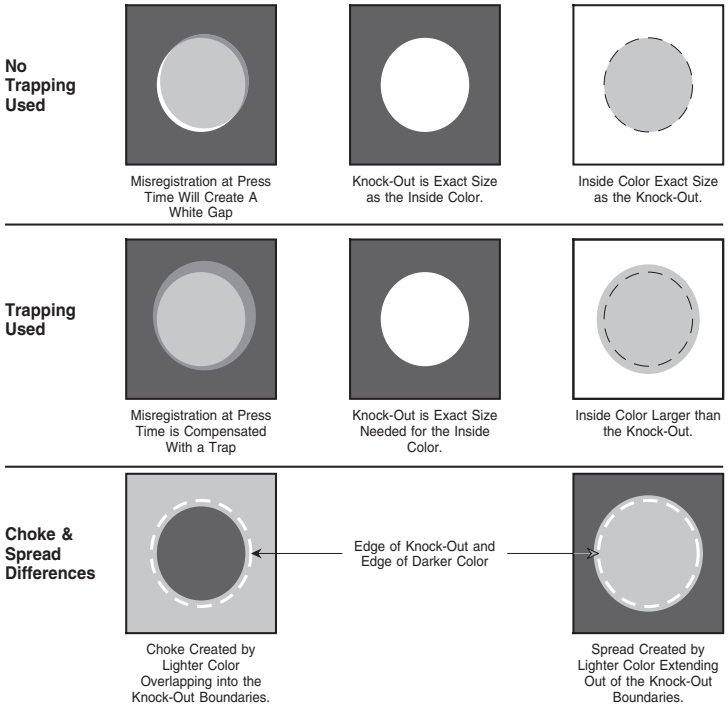


Figure 13-3: The Purpose of Choke & Spread is to Ease Press Registration

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 five 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. Part Specification - Automatic Choke & Spread for Text 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 job?
2. How does the contacting color effect each other? Do they over-print, knock-out 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.

By using the choke/spread value in the parts specifications during output you can create most knockouts needed automatically. There are times though that the automatic knock-outs and trapping from the part spec 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 part spec 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 determine how to setup the trap. It helps you to 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 assign Ink Darkness values if you wish to have automatic chokes and spreads. The parts specification program has to know the relative Ink Darkness to know whether to choke or spread the layer. It is necessary to setup the Seps within each part accordingly. Always have Sep 1 be the lightest, with ascending Seps going darker.

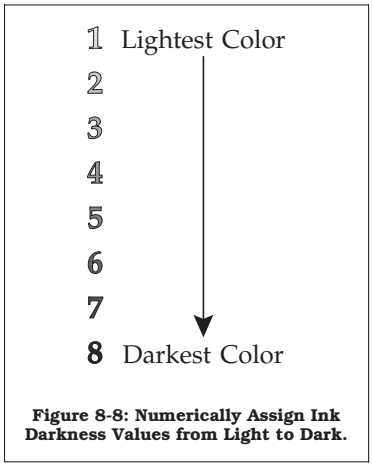


Figure 13-4: Numerically Assign Ink Darkness Values from Light to Dark

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 Sep 1, red is Sep 2, and black is Sep 3. If we later added a fourth color, such as yellow, we would need to rearrange the Seps: yellow 1, blue 2, red 3, and black 4.

When using the parts specification, Sep 1 must be setup for the lightest color with all other Seps in sequential ascending order. If two colors are approximately the same ink darkness, don't fret; go ahead and assign them sequentially, 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 knock-out 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 knock-out and the other layer will be the manual trap that over-prints.

For automatic choking through parts specifications, it is required that the layer colors of your drawing also be setup from light to dark in the same exact sequence as that of Seps.

When to Use Choke/Spread in the Parts Specifications

In the parts spec, 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 knock-out 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 13-5.

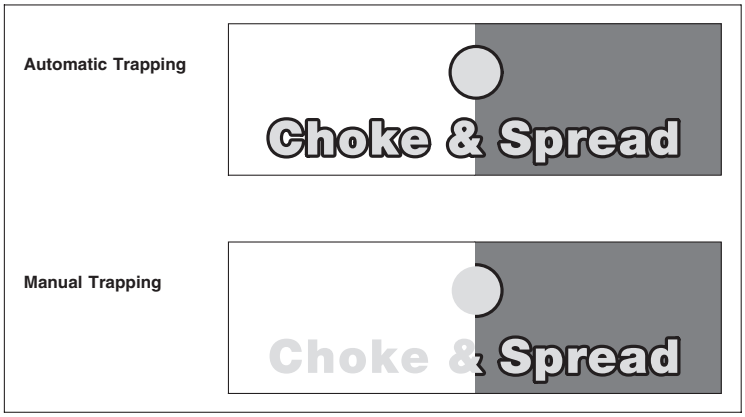


Figure 13-5: Spread Effects Entire Component

Component Limitations

When using Parts 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 parts that use automatic knock-outs 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 the part specification automatic choke/spread value can be applied.

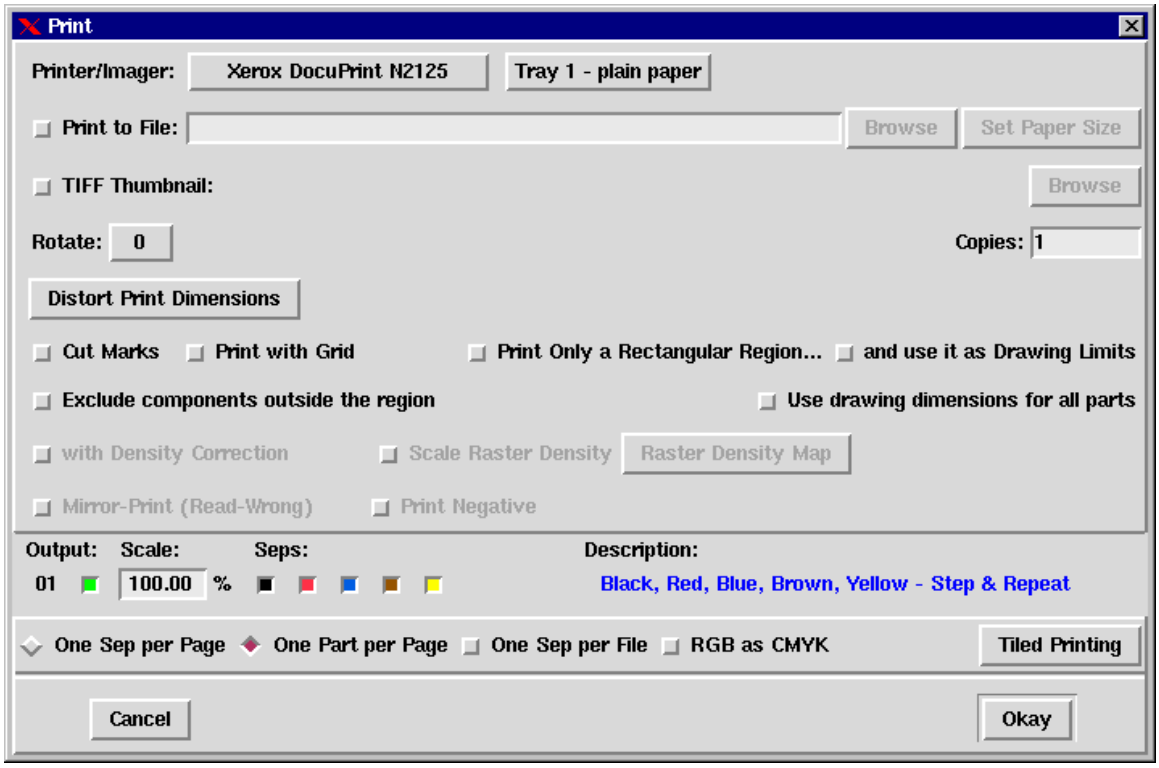
This does not mean that you can't use the part specification for knockouts when all components knockout. It would still be a benefit to knockout through the part specification while using a manual outline as the trap.

How Parts Effects Printing

We have explained the task of creating and editing output specifications, but how do we output once we have the specifications defined? It is relatively simple. Go to [Project] and select **{Print}.**

With MECCA 2000, all 32 layers print regardless of layers visually displaying. Parts specifications COMPLETELY CONTROL what layers are recognized for printing.

Once you select {Print} a "dialog window" will appear. At the bottom of this window are the output controls for separations and composites. This is a reflection of the [Parts], specification file you defined.



The numbers to the left represent the *Part*. Default is to have all Parts print. You can toggle off any part or separations not needed.

If you have multiple parts with multiple separations you can select them individually without having to print them all.

There is also two printing choices: Separations "One Sep per Page" or to print a Composite by selecting "One Part per Page".

After you made your choices select [Okay] to start printing.

Software Control Files for Spot Color

Gray Color Table Format

The format is easily understandable. It is */color/fcp01.gray* and is illustrated below:

```
xFCP
x        1         2         3         4         5         6
x2345678901234567890123456789012345678901234567890123456789
PMS #   CYAN  MAGENTA YELLOW  BLACK   ANGLES
x-------------------------------------------------------------
7       0     0       0        0      -1.0    -1.0    -1.0    45.0
600     0     0       0        0      -1.0    -1.0    -1.0    45.0
601     0     0       0        1      -1.0    -1.0    -1.0    45.0
602     0     0       0        2      -1.0    -1.0    -1.0    45.0
603     0     0       0        3      -1.0    -1.0    -1.0    45.0
604     0     0       0        4      -1.0    -1.0    -1.0    45.0
605     0     0       0        5      -1.0    -1.0    -1.0    45.0
606     0     0       0        6      -1.0    -1.0    -1.0    45.0
607     0     0       0        7      -1.0    -1.0    -1.0    45.0
608     0     0       0        8      -1.0    -1.0    -1.0    45.0
609     0     0       0        9      -1.0    -1.0    -1.0    45.0
610     0     0       0       10      -1.0    -1.0    -1.0    45.0
```

The first column designates the "color number" used when setting or changing FCP attributes. The 3-digit decimal numbers range from 600 to 700.

> **IMPORTANT:** Color number zero (0) is always 100% black. This is our default color number.

Dot Angles

The significance of a dot angle value is meaningful only if needed changed by a particular print shop operation. Ordinarily, illustrators or operators should not be concerned. If a change needs to be made, you may edit the file */color/fcpangle.gray.* This file gives Black the angle of 45 degrees.

Layer Color Tables

The MECCA's software for spot color output relies on a layer color table to display color.

The variable *LAYERCHART* defines the reference to a layer color table file named */color/layer_color01.* The layer color table file controls the display of the color.

When MECCA is started the layer_color01 table is loaded, and those colors defined in the table */color/layer_color01* are displayed.

The supplied layer color table file, */color/layer_color01,* contains CMYK color definitions to create the display. You may edit this file, or create your own file of a different name, by using a text editor.

Color Table Format

The format is easily understandable. Look up */color/layer_color01* (do this by typing at the $-prompt: *more /color/layer_color01 [Enter]).* The file is illustrated below:

```
xLYR        1         2         3         4         5         6
x2345678901234567890123456789012345678901234567890123456789012345678901234567890
LAYER#  PMS #   CYAN      MAGENTA   YELLOW    BLACK     COMMENT
x-------------------------------------------------------------
1       166     0         80        100       0
2       700     0         0         0         100
3       320     100       0         30        0
4       700     0         0         0         100
5       700     0         0         0         100
6       232     0         100       0         0
7       102     0         0         70        0
8       266     100       80        0         0
9       280     100       60        0         20
10      300     100       40        0         0
11      307     100       10        0         0
12      116     0         20        100       0
13      151     0         70        100       0
14      375     50        0         100       0
15      403     40        30        50        30
16      563     50        0         30        10
```

It is important to note that there are seven fields in every line of this file. These are defined as follows:

1. The first column designates the "layer number".

2. The second column designates the PMS number assigned. If the next four fields are present, they will be used. If not, it will look at the file (/color/fcp01), for the CMYK percentages.

3. The third column represents the Cyan value. This is a number between 1 and 100, that is the percentage of cyan for a 100% black component on that layer. The fourth column is the Magenta percentage and the fifth column is the Yellow percentage, with the sixth column being the Black percentage of that color. The seventh column is an optional comment stating the color name.

To create a color, you enter the percentage of the respective primary color as it comprises the color defined by that color number. For example, if you have a color that has 10% Cyan, 10% Magenta, 50% Yellow, and no Black. You normally reference that color as the number 11 and it will always be placed on layer 2. The line that starts with 011 should look like the following:

```
LAYER#   PMS #    CYAN    MAGENTA    YELLOW    BLACK    COMMENT

 2       011      10      10         50        0
```

You may optionally append a short comment on each line at the end stating a color name or what that color is.

Now, anything placed on layer 2 will be displayed as a color 11. You will not ask for color 11, but will ask for percentages of black. A 50-percent screen would be 650, but would display as a 50-percent screen of color 11, only because it is on layer 2.

The color monitor display has been modified to show on the screen the colors that will be produced by the various layers. The layer color descriptions are stored with a drawing.

Process Color Specification Files

In order to make use of the Part Specifications for Process Color you must first understand the printing process. The presses need to have individual plates for each color of ink for each part of a form, as well as, separate plates for any back printing.

What is Process Color

Process colors are built up by printing each of the four printer's inks; Cyan, Magenta, Yellow and Black, not quite on top of each other, but so close that it takes a magnifying glass to distinguish one color from the other. The combined effect produces the rainbow of colors seen in today's books, magazines, and other printed products. The creation of artwork for these multi-color images has always been difficult using conventional manual stripping techniques. Many factors must be taken into consideration. Amgraf's Full Color Process (FCP) software that is incorporated with the MECCA 2000, gives you the ability to easily produce automatically separated Cyan, Magenta, Yellow and Black layers and manage these four registered screens necessary for process color printing.

Let's discuss the following basic controls before we go any further:

Color Attributes

Color attributes can be assigned to any text or graphic element. This includes typefaces, body copy, rule lines, curves, arcs, circles, rectangles, and any filled area.

By mixing percentages of the four primary colors, thousands of colors are printed. They create four individual screens for the printing process. There is a standard set of colors coordinated by Pantone Incorporated. This standard, known as the Pantone Matching System (PMS) TM, identifies each color with a corresponding number value. The number assigned then identifies the percentage of each of the four colors necessary to produce the final color.

Color tables in the FCP software allow the user to identify the color wanted according to industry standard identification numbers, or assign specific percentage values for the Cyan, Magenta, Yellow and Black components of each process color. In FCP artwork the percentage assigned to the color defines the size of dot used to create the final color screen. For example, final colors with a large percent of Yellow and a smaller percent of Magenta will contain larger dots on the Yellow layer and smaller dots on the Magenta layer.

The number 185 in the color table produces bright Red because it has been assigned to output 81-percent on the Magenta and 72-percent Yellow. Number 354 produces a Kelly Green by outputting 59-percent Cyan and 81-percent Yellow, ignoring the Magenta and

Black. We will discuss maintenance and modification of the color tables later. Let's go on to screen lineage.

Screen Lineage

The number of dots in a row is referred to as the lineage (also known in the industry as screen frequency, gauge, or ruling). The screen lineage value controls the number of dots to be used in a linear inch. The higher the lineage the smaller the space will be between the dots in a row. If the lineage is set too high for the output device to properly handle, the color separations will be too dark. It is recommended that the lineage for final color output on a 300dpi printer be set to 60 color dots per inch and for a 1270dpi printer set at 133. Screen Lineage (depending on the output device) can be specified within a range of 40 to 300 lines per inch.

Dot Angle

To complicate things even further, these dots of color on the four individual layers do not lay directly on top of each other. Rather, they are coordinated at an angle relatively close together so as not to block each other out, but to lie next to each other.

The dot angle assigned to each color separation defines the direction that a row of dots will travel when producing that screen. Improperly angled dot color causes moire patterns that interfere with the appearance of the final color. The screen angles are determined by an algorithm. Angles may be edited for individual color correction.

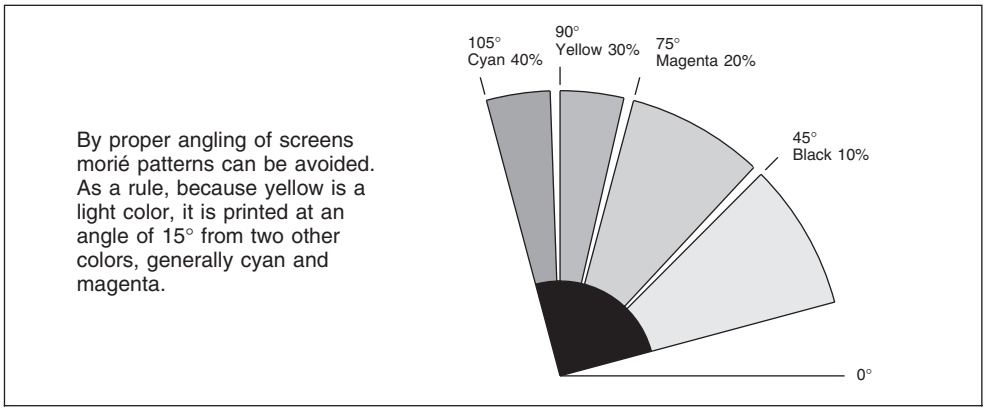


Figure 13-8: Process Color Screen Angles with Different Percentages

Designing with Process Color

In designing with process color, the CMYK process separations are created automatically by the *Full Color Process Software* through Parts. Graphic and text elements in a drawing or form are assigned color FCP numbers ranging from 1 to 9000. Also the gray FCP numbers from 600 to 700 are still valid, and you can define your own FCP numbers by editing the system's color tables. (FCP color number 8 is a special number designed for registration marks, which causes them to be output on all separations.)

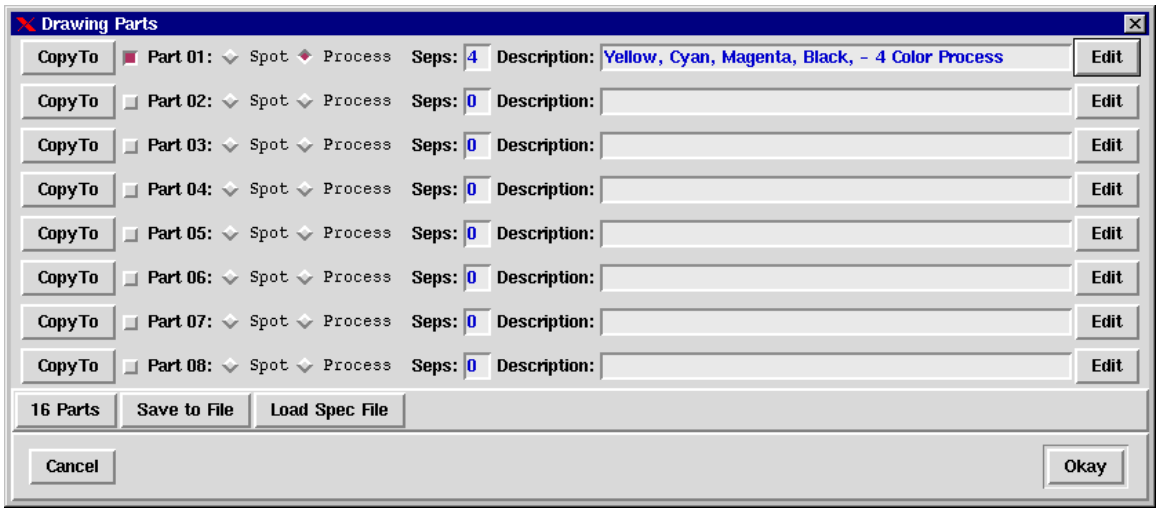
The colors corresponding to these FCP numbers are displayed on the MECCA color display by toggling Window's Process Color display.

After specifying Parts to be Process color, when the drawing is output, artwork is automatically separated into CMYK process overlays so that when printed on a four-color printing press the colors will mix perfectly to produce the requested FCP color.

Defining Process Color Specifications

After the job is composed with components assigned FCP Color attributes, on appropriate layers, go to the Parts button. In order to get the 4 CMYK plates (negatives), we will use Parts to define what layers are needed for each plate.

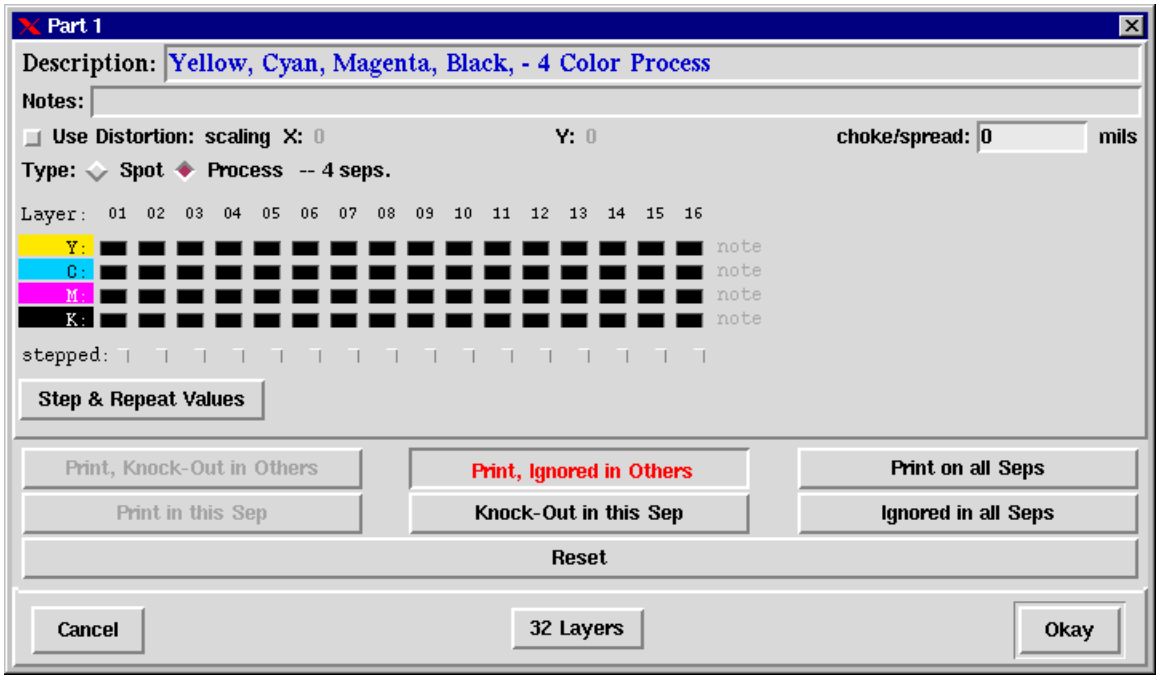
Selecting **[Parts] [Edit]** will take you to the "dialog window" for defining each part/sheet needed. This is the point that you control the arrangement of "Parts" for a multiple part job. With this menu, you can define up to 16 parts, each with the ability to handle 4 CMYK films.



Check a Part for each sheet and **select Process.** By default this gives you 4 Separations (Ink Colors). Adding an English Description also helps to later identify the Part. Then **[Edit]** each part needed.

Note: There are a maximum of 4 separations per part definition. It is not necessary to use all 4 separations. The number in the field tells the system how many separations are needed within this definition. If the Separation is set to 3 it will give you Yellow, Cyan, and Magenta, with no Black. Normally, for Process Color you would always ask for all four ink colors and check off the colors not wanted during the printing stage, instead of trying to turn off a separation here. The Separations are always in the order of Yellow, Cyan, Magenta, and Black.

Editing the Part



The color separations are controlled by this dialog. It is here that you indicate which layers are needed for each separation. With Process color files, you normally print all layers on all 4 films. So that is our default as shown above.

Using the Part Dialogs:

Sep C, M, Y, K Layers: There are four color separations per "part". The thirty-two fields to the left of the comment area represent the layer (or layers) that will be output for that separation. If the layer number for the field is displayed in black, this indicates the components on that layer will print during output. If the number is displayed in white, it will cause a knock-out in the separation. If the field is blank, the components on that layer will not print. In order to set the layer to print, knock-out or not print, it is necessary to use buttons below. The usage of each button is described below.

Normally, you will not be making any changes here, since the default works for most instances. But if you do need to turn off a layer, or knockout in a color, you will need to use the buttons available.

[Print, Knockout in Others] This will make the layer you have chosen print while automatically knocking out the layer in all of the other separations.

[Print, Ignored in Others] This will make the layer you have chosen print, and turn off that layer in all other separations. If you have picked the wrong separation for a layer to print, use this option. It will remove it from the wrong separation as you pick the correct separation.

[Print on all Seps] Print positive this layer on all separations, regardless. (This is layer 16 in our file. See how it is repeated on all separations.)

[Knock-Out in this Sep] This allows you manually to select a layer to be knocked out and it will not effect how the other separations are setup.

[Ignored in all Seps] This causes a layer to be ignored in all four separations. It is completely ignored and will not print on any separation.

[Reset] This will clear all layer assignments so that you can start again.

[32 Layers] Default is to show only 16 layer checkboxes. If you need to assign printing specifications to layers above 16, select this button.

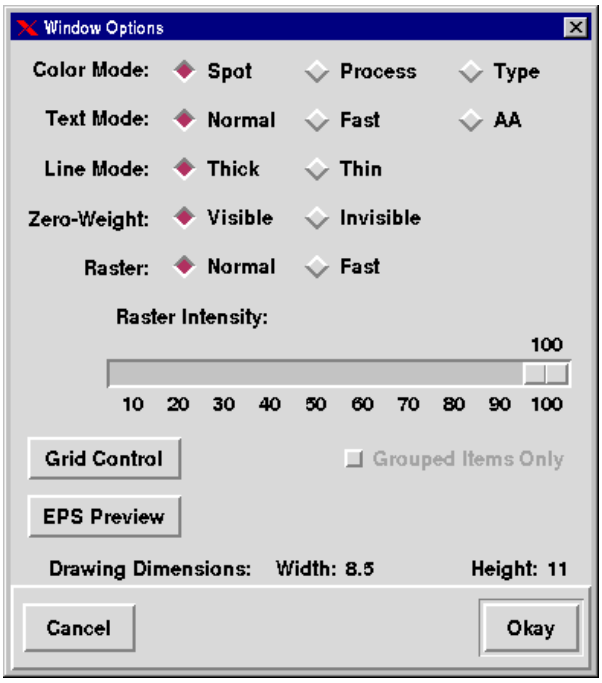
[Cancel] will quit you out of the part description menu without saving your changes.

[Okay] will save the part description with your layer selections.

Once defined you can use the **[Copy To]** button to copy an existing Part specification to another part. Define the first part, then select [Copy To] and the new part it should be copied into. Also the entire Parts Specification can be saved into a ".spec" file to be used with other drawings by selecting **[Save Spec File].** You can load in an existing ".spec" file with the **[Load Spec File]** option.

Chapter 14: The [Window] Tools

Under the [Window] option is a menu that affects how various items are displayed on screen. These however do not affect output, only the image displayed on the screen.



Color Mode

Spot Color: is the default *Color Mode* for MECCA2000. This option found under [Window] uses color to represent layer output, for final print color. For example everything on layer one will display as red, layer two as blue, etc. This allows the operator to see all layers on, and distinguish between them for proofing. The FCP Software allows for a layer color chart, which can be customized to represent the final print colors. See *Defining Layer Colors* for more information.

Process Color: Here the graphic is represented by the true color of the PMS color chart. Black text will show as black, red text as red, white as white, etc. To see an example go to **[Line], {Set Attributes}**, and for *Color* type in a number other than from the 600-700 range, [Okay]. Now draw a line. It will display in the color of the PMS number you chose. Go to [Window] and toggle your *Color Mode* from "Process" to "Spot" to see the difference.

Type Color: display is used to represent line weights and typestyles in color on a black background. This display has the advantage of giving the operator a quick proof of the graphic by color representations.

Text Display

There are three ways of displaying text *Normal, Fast,* and *Anti-Aliased.* The default display is *Normal.* This is an actual raster display of readable type on your screen. If your type size is small it may display in the "Fast" mode and you would have to [Zoom] on it for it to be readable. Another option for very small text is the "Anti-Aliased" mode. This will render small text with a cleaner and sharper display but takes longer to render.

Fast text displays each line of text as a bracketed line, with the brackets being the actual height and length. This mode displays faster than *Normal* text.

Line Mode

The normal *Line Mode* for MECCA2000 is to display the to show its actual thickness for positioning or proofing of a graphic. The *Thick* line mode will cause any line over 5 pixels wide to display in an accurate representation on the screen. (**Note:** A pixel is one colored dot on the graphics screen). When using *Thick* you may have to use the **[Zoom]** option to make your line display wider than 5 pixels. The *Line Mode* option toggles the display from thin to thick lines and vice versa.

Zero-Weight

When drawing a form you may have construction lines set to a "0" line weight. These items will not print but show on the window display. These lines may sometimes get in the way when it comes to determining exactly what is going to print. The *Zero-Weight* option allows you to hide these items.

Raster Mode

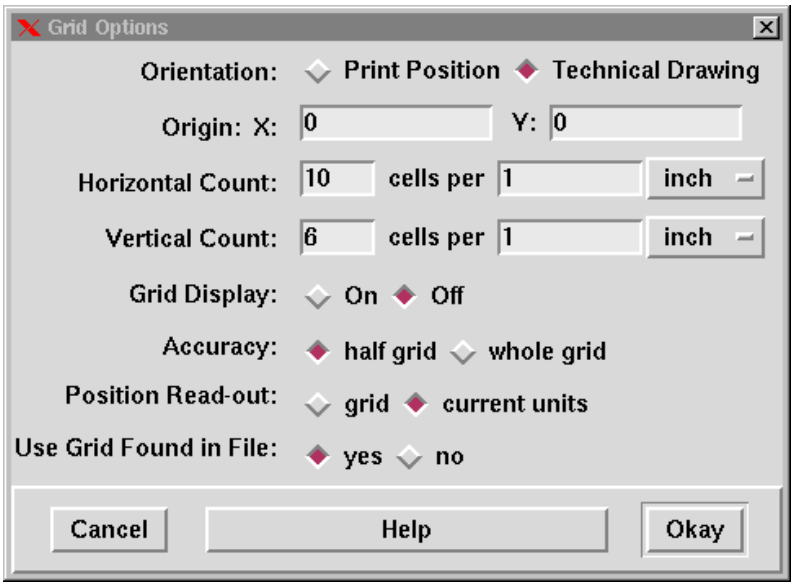
Raster is dealt as, bit mapped graphics, in the MECCA2000 system. That means that each point must be separately addressed when drawing an image. In *Normal* Raster Mode, the drawing is displayed in its true form. MECCA 2000 offers a *Fast* display mode, which substitutes a solid rectangle, the size of the image. This image shows the actual position of the image, and draws very quickly.

Intensity

Occasionally the raster image cannot be seen in front of a screen because of the conflict of pixel colors. Changing the raster intensity adds a little white to the raster display, which will allow the raster to be seen.

Grid Control

The [Grid Control] will be displayed according to your menu selections. It will display both the major and minor divisions. The grid will also be saved with your drawing so if needed it can be printed later.



Orientation You can choose from *Print Position* or *Technical Drawing*. Depending on which "Orientation" you select controls the **Position Read-Out** selection.

Print Position is based off of your upper left corner of your template or page size. If you choose this selection then you must enter in a "Y" value for the *Origin*, this is usually the total depth of your drawing. Also with this option the **Position Read-Out** will display the choices of "C/L" (columns and lines) and "Current Units

Technical Drawing is based off of the lower left corner of your template or page size. With this option the **Position Read-Out** gives you the choices of *Grid* or *Current Units*.

Origin: the default of the grid origin is X=0 Y=0. You can move the origin (or starting position) of the grid to match an existing piece of artwork with this option. Most generally the only time you need to enter any values for the origin is when you select *Print Position* and then you must enter the "Y" value of the origin.

Horizontal Count, Vertical Count: These Options under grid allows you to set the x and y coordinates for grid snapping. At start-up MECCA defaults to a one-inch square grid. However this is user definable to whatever vertical and horizontal spacing you desire. One use of this would be for forms. When creating a form for a typewriter or computer printer, you can set the X and Y values to relate to the spacing of the lines and characters. This creates a pre-spaced form that will fill in correctly.

NOTE: When setting *Horizontal* and *Vertical* increments, the units of measure must be set the same.

Grid Display has a toggle between viewing the grid and hiding the grid. While hidden, the grid settings remain the same as were previously set or to that of the default.

Accuracy controls how the **Snap** will work. If you select *Whole* it will only snap to your defined *Horizontal* and *Vertical* grid settings. If you select *Half* it will allow you to snap in-between these settings. For example, if your Horizontal= 1/10 and your Vertical = 1/6, with *Half* selected you will be able to pick grid points of 1/20 and 1/12.

Position Read-Out: This option selects whether the current cursor location is reported in *grid units*, or in your *Units of Measure* units. If you selected *Print Position* as the grid orientation, you also have the option of displaying your location by *C/L* (columns and lines).

Use Grid Found in File: You have the option when loading in a drawing with a grid already defined whether to use that grid or define a new one.

Grouped Items Only

When toggling on the [Grouped Items Only] option, the display will only show items that have been grouped. They will display in their original colors instead of white and the only options available are Measure and Query. Toggling off this option will display the group as white and take you back to normal operations.

EPS Preview

When combining an 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.

Viewing Options

There are several different ways to deal with the viewed image in the display area on the monitor. They are {Win-Fit}, {Win-Cen}, {2x}, {1/2x}, {Zoom}, and {Back}. These options are available at all times.

{Win-Fit} This option, gives you a complete view of your image regardless of size. It will put all elements of the graphic into the "window" area of the monitor. Your graphic size is not affected; you are only viewing your drawing.

{Win-Cen} This option will allow you to use your cursor to select any part of the screen or drawing and make it become the center of the screen viewing area. You can also use the arrow keys. Select {Win-Cen} then use one of the four arrow keys to pan around the drawing. Pressing [Enter] will take you out of {Win-Cen}.

{2X}, {1/2X} These functions all work in a like manner to each other. The image perspective is changed in viewpoint by the X factor of the option selected. The image will appear to get bigger or smaller. The actual size is not affected, only your viewpoint. For example if you selected the **{2X}** option your screen would clear and redraw two times larger than it previously was before, but still output at its original size.

{Zoom} option allows you to take a close look at a small area of the screen and view it from a closer perspective.

To use {Zoom}, first select it from the menu. A prompt will ask you to "Pick Zoom Corner 1" of a rectangle defining the image you desire to look at. After selecting the first point, a box will appear. Move the cursor and the box will expand or contract. When the box encloses the desired area, "Pick Zoom Corner 2". The screen will redraw, and fill the "window" with the area you have selected, giving you a closer view.

When selecting this option the size of your drawing is not effected, only your viewpoint of your drawing.

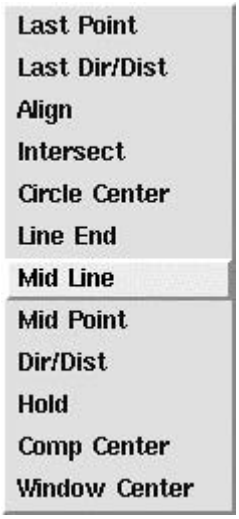
Prompts:

Pick Zoom Corner 1, Pick Zoom Corner 2

{Back} This is a toggle between your previous window and any of your other window viewing options.

Chapter 15: The Position Assistant Options

The purpose of the position options are to allow the user to easily define a specific position of the graphics cursor. The system allows the use of these options in all of the primary graphic functions.



{Last Point}

The {Last Point} option when selected supplies the point which was last defined by the cursor. This is useful especially in combination with the {Hold} feature.

{Dir/Dist}

Using the {Dir/Dist} option allows you to locate a position point by going a certain direction and distance from a known origin point. {Dir/Dist} can be used with many of the systems primary functions such as [Move, [Copy], [Line], {Hold} etc.

Defaults:
0 Degrees

Prompts:
Enter Direction, Enter Distance

Step 1:
Draw a rectangle on the screen.

Step 2:
Using the **[Copy]** function for the example go into its menu, and select **{Copy to Anywhere}.**

Step 3:
The prompt will say "Pick Item to Copy", select the upper left-hand corner of the rectangle you have just drawn. You will see the cursor appear at the point selected.

Step 4:
Now select the **{Dir/Dist}** option from the position function menu.

Step 5:

Now the prompt says "Enter Direction". We want to copy our rectangle at 45 degrees with a 50-point space between them. So here you would key in at the keyboard **45** and press the **[Enter]** key.

Step 6:

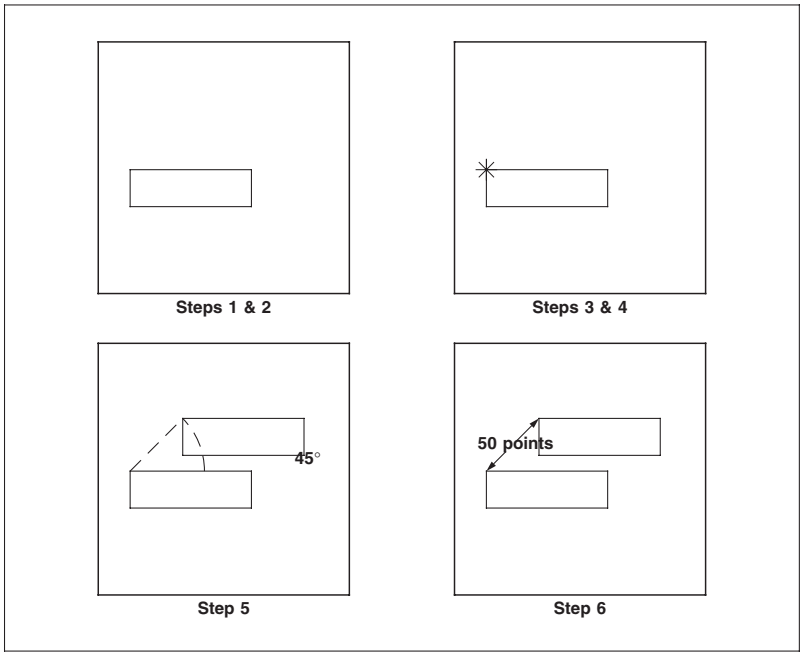
Now you will be prompted to "Enter Distance". Since we want 50-points between the old rectangle and the new one you would key in **500,** (if system is currently using decipoints) and press the **[Enter]** key.

Step 7:

You will now notice that you have two identical rectangles. If you measure the distance between the old rectangle's point selected in Step 3 and the same point on the new one. You will see that the direction is 45 degrees and that the distance between them is 50-points.

{Last Dir/Dist}

This option retains the last set of coordinates used for {Dir/Dist}.

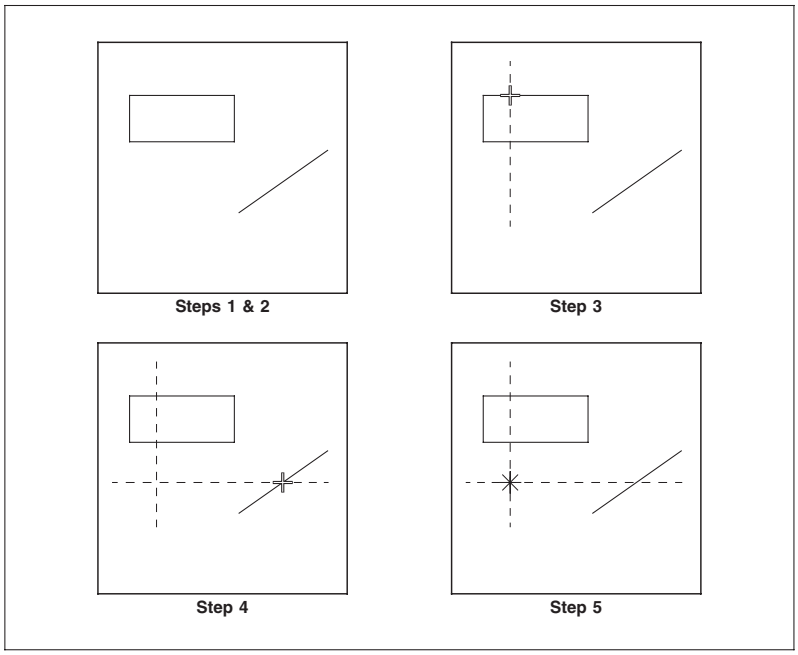


Using the {Dir/Dist} Function

{Align}

The {Align} feature is a simple but powerful option that allows the X and Y values of a point to be specified separately. It is as if you drew a vertical construction line through the first point selected, and a horizontal construction line through the second point, and then took the intersection of the horizontal and vertical construction lines as the final point. Once again this option can be used along with the {Hold} option.

Prompts:
Pick Align X Position, Pick Align Y Position



Using the {Align} Function

Step 1:
First draw a line and a rectangle anywhere on the screen. Go into the main function desired (i.e. [Line], [Text], [Arc], etc.).

Step 2:
Select from the {Position Assistant} functions menu **{Align}.**

Step 3:
Make your first select point, which is your X value, on one of the rectangles horizontal sides. This point will lie on a vertical plane with your final position.

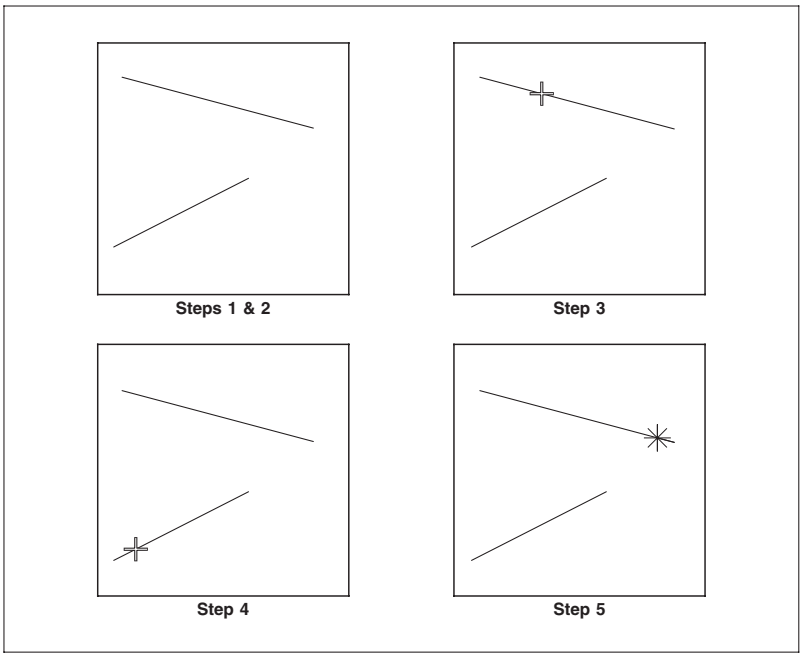
Step 4:
Now select your Y value some place on the line created. The final position of the cursor will lie on a horizontal plane with the point just selected.

Step 5:
Your final {Align} position should now be selected. You can now proceed with the main function you are presently working with.

{Intersect}

Using {Intersect} establishes a point at the Intersection of lines and/or circles and arcs. Lines are considered to be extended to infinity in each direction, and arcs are considered to be complete circles. If more than one Intersection is possible, such as when a line passes through a circle, the Intersection closest to the point picked in Step 3 will be used. This option can also be used along with the {Hold} feature.

Prompts:
Pick Intersect Item 1, Pick Intersect Item 2



Using the {Intersect} Function

Step 1:
Create two non-parallel lines, not necessarily touching.

Step 2:
Go to the menu and select **{Intersect}.**

Step 3:
First select one of the two lines with the crosshairs.

Step 4:
Select the other line as in Step 3.

Step 5:
Now your final position should appear at the point where the two lines cross each other. Remember that MECCA 2000 recognizes lines to extend in each direction to infinity. Therefore two non-parallel lines will eventually Intersect each other at one point.

{Circle Center}

The {Circle Center} defines the point that lies at the center of an existing circle or arc. Remember that the system recognizes an arc to be a complete circle. The {Hold} option can be used along with the {Circle Center} option.

Prompts:
Pick Arc/Circle for center

Step 1:
Select from the menu area **{Circle Center}.**

Step 2:
Select a single point which lies on the perimeter of a circle or arc. The cursor will appear in the exact center of the desired circle or arc.

{Line End}

The {Line End} feature allows you to snap to a components exact endpoint. It will go to the end closest to your pick position. This function works for all components except a full circle.

Prompts:
Pick line for Line End

Step 1:
First draw a line and 3-point arc anywhere on the screen.

Step 2:
Select [Move]. At the "Pick item to move" prompt select **{Line End}** from the {Position Assistant} menu. It will prompt you to "Pick line for Line End", now

pick on your line. You'll notice that the position marker moved to the end that it determined closest to your pick.

Step 3:

Now at the "Pick new position" prompt, again select **{Line End}** from the {Position Assistant} menu. This time at the "Pick line for Line End" prompt, pick your 3-point arc. You will notice that the end of the line you picked to move has moved to the end of the 3-point arc you chose as its new position.

{Mid Line}

The {Mid Line} feature allows the user to define the exact center point of a line.

Prompts:

Pick Line

Step 1:

Select the **{Mid Line}** option from the position assistant menu.

Step 2:

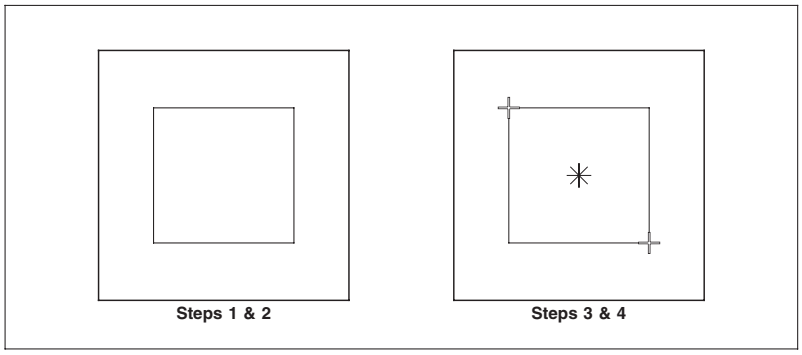
Pick the line whose midline is desired. The cursor will appear at the exact midpoint of the line.

{Midpoint}

When using the {Midpoint} option, you are referenced a point midway between any two points selected. Once again the {Hold} feature can be used along with the {Midpoint} option.

Prompts:

Pick Midpoint item 1, Pick Midpoint item 2



Using the {Midpoint} Function

Step 1:
Create on your screen a rectangle.

Step 2:
Select from the position functions **{Midpoint}.**

Step 3:
To find the midpoint of the rectangle, first pick the upper left-hand corner.

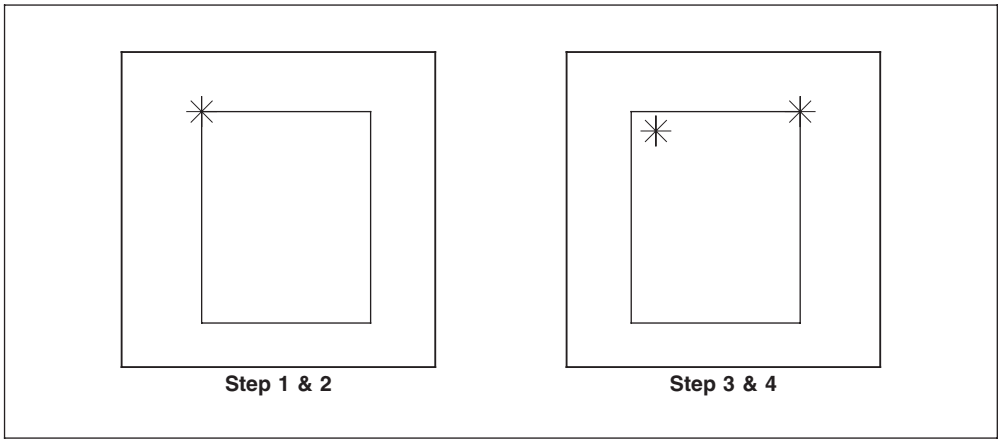
Step 4:
Then select the lower right-hand corner of the rectangle. You now have the exact center point of the rectangle selected as your current cursor position.

{Hold Pos}

The {Hold} function allows the user to pick an item at any point and key in a relative distance to move the cursor position from the point selected. A good example of using {Hold} would be to start with a standard 8 1/2" by 11" page size, and create a horizontal rule that is 24 points down and 16 points from both the left and right edges of the page.

Step 1:
Create your 8 1/2" by 11" page (614.6 points by 795.3 points), then go to the line function and set your attributes. Then select the **{Hold}** option.

Step 2:
Now that you are in {Hold}, pick the upper left hand corner of your page. Once you have selected the corner you will notice your cursor appear on the screen.



Step 3:
At the keyboard type in **240** (if in decipoints) and press the **down arrow key.** Here your cursor should move down from its previous point. Now key in **160** and

press the **right arrow key,** again your cursor should move. Now that your cursor is positioned correctly press the **[Enter]** key to accept its new position.

Step 4:

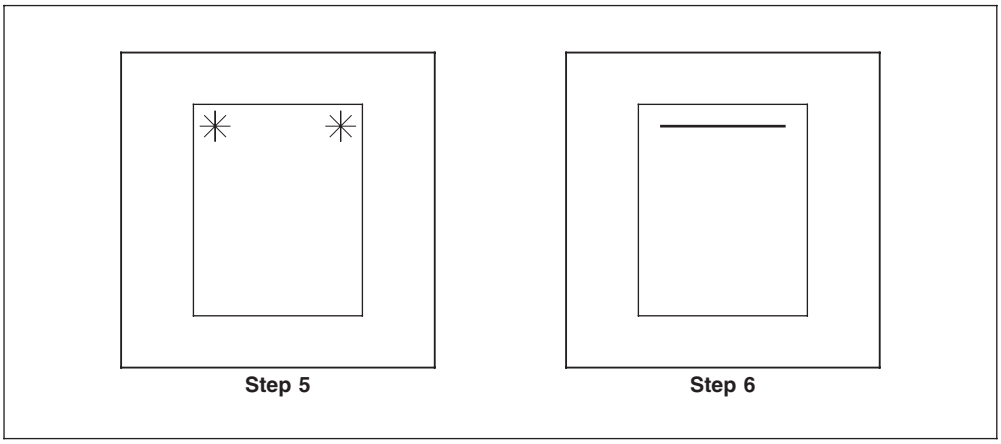
You now have your first {Hold} position accepted. Select the **{Hold}** option once again. Now select the upper right hand corner of the page. You will see a second cursor appear at this select point.

Step 5:

At the keyboard using decipoints, key in **240** and press the **down arrow key.** Then type in **160** and press the **left arrow key.** Your cursor should now be in its correct position, but if for some reason your cursor position is not correct, you can still key in another distance and press an arrow key. *Your cursor position in not accepted until the* **[Enter]** *key is pressed.*

Step 6:

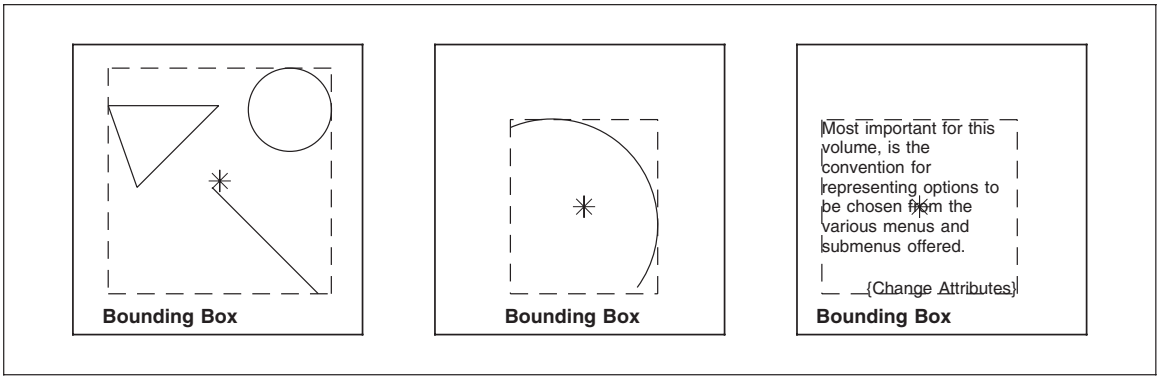
Once your second cursor is positioned and you have pressed the **[Enter]** key, you will see a line appear with its endpoints at the two accepted cursor positions. If you **[Measure]** the line you will find that it is 24-points down from the top and 16 points from the left and right edge of the page.



Using the {Hold Pos} Function

{Comp Center}

The Component Center option will allow you to find the center of the bounding box of a picked item or an entire group. This will simplify the need to find the exact center of a rectangle or box. You can also [Group] multiple items and the {Comp Cen} will find the center of the group bounding box. The {Comp Cen} will make positioning items easier with less menu picks.



Using the {Comp Cen} Function on Grouped Items

{Window Center}

The Window Center option will allow you to find the center of the Window Area.

Snap to: {Item} and/or {Grid}

The **{Snap to}, {Grid}** option forces the system to allow only the grid points to be picked as select points. When you select a point, it will "snap to" the nearest grid point automatically. **{Item}** returns the system to normal, snapping not to grid points but to drawn components. You can have both {Grid} and {Item} turned on, which will adjust to pick grid points first, then see if any components are able to be picked.

Default:

Item

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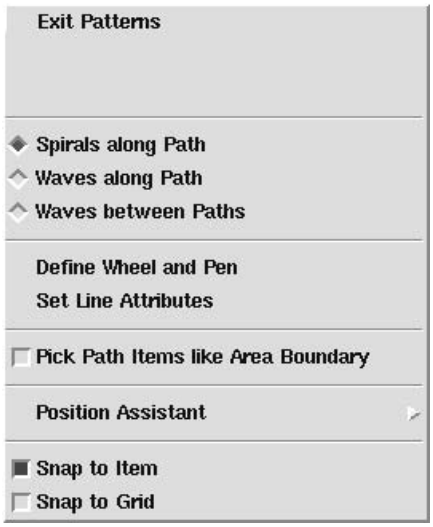
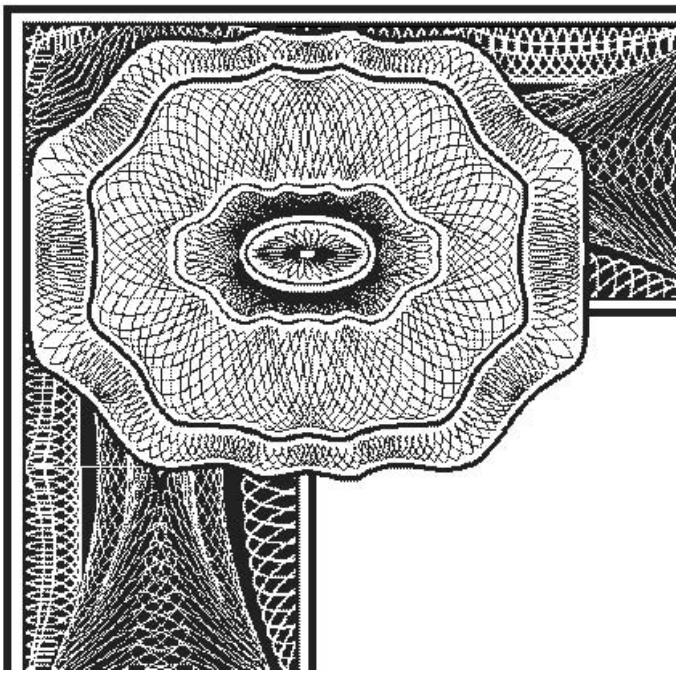
Chapter 16: The [Patterns] Tool

The purpose of the [Patterns] tool is to allow the user to easily create unique custom backgrounds, borders, and ornaments.



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.



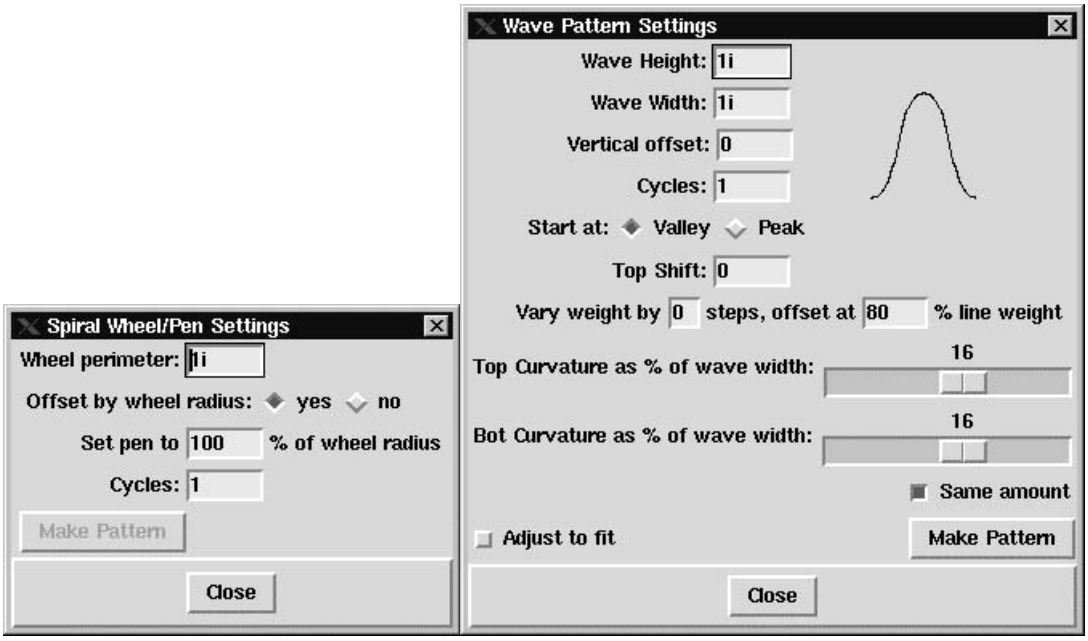
Features such as wave height, wave width, cycle count and boundary offset are just a few of the controls available. Additionally, other options allow the appearance of the wave shape, spiral perimeter, and pen position to be adjusted if needed. In addition, the

geometry that generates the pattern can never be replicated, even by the same designer using the same MECCA 2000 system.

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.

Spiral and Wave Pattern Dialogs



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.

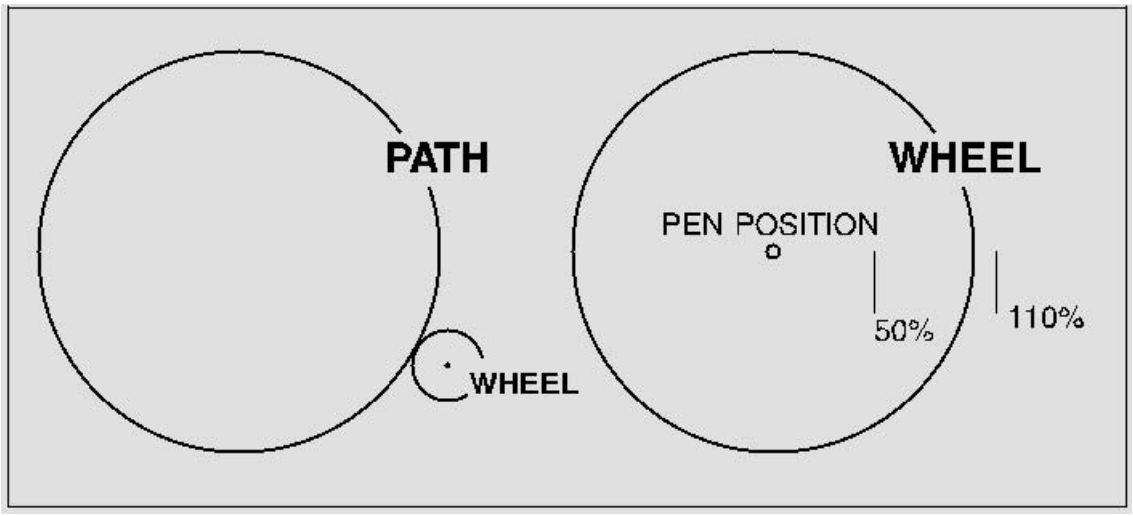
The design being placed along the path is controlled by four attributes: wheel parameter and offset, pen percentage, and number of cycles. These designs are vector chains.

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

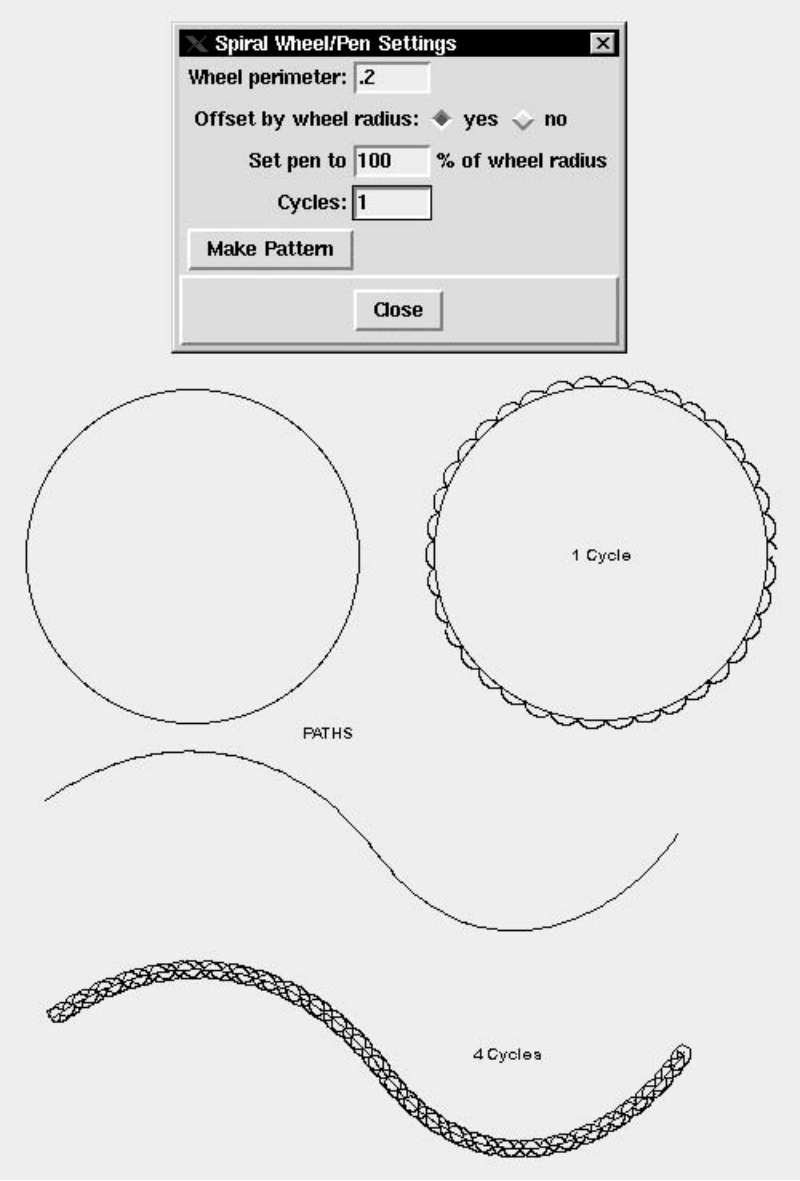
Wheel Perimeter: The wheel travels around the path. If the path is not closed, such as our spline example, it will travel along the top side and then the bottom side to complete the path. This will control the size of the wheel as it rolls around the path.

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.

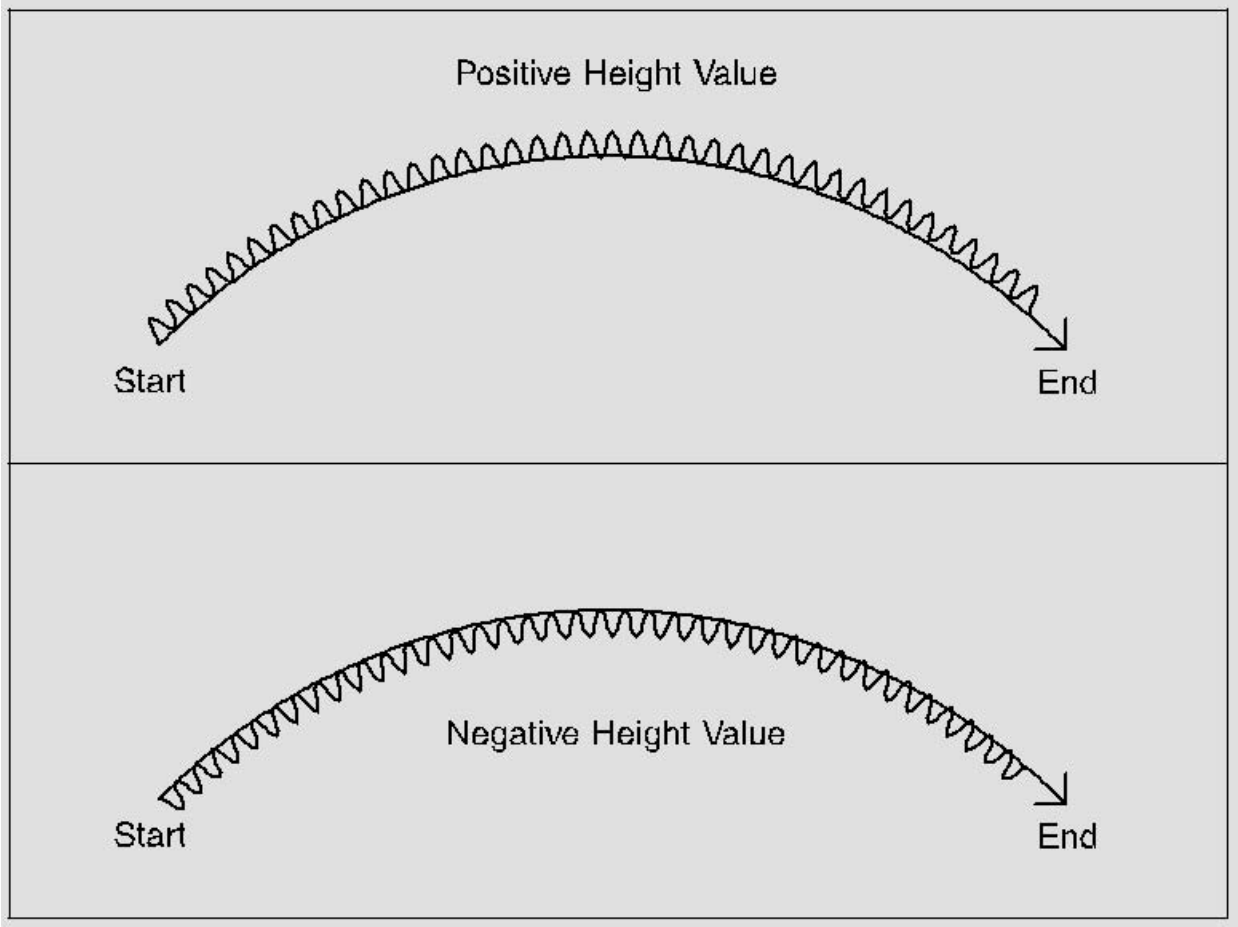
If the path is made up of multiple splines, then select "Pick Path Items Like Area Boundary" before picking. This will allow you to pick around the entire boundary, then select {Done}.

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.

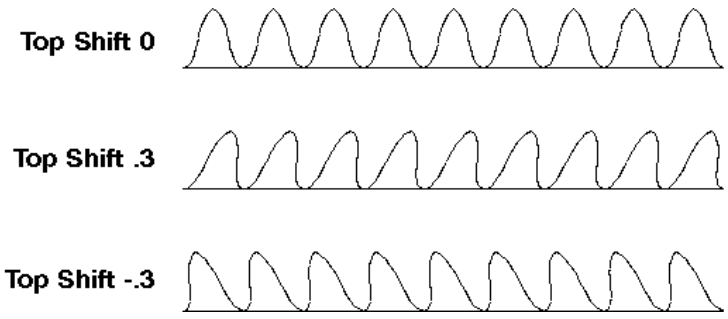


Vertical Offset: This causes the pattern to offset itself from the path.

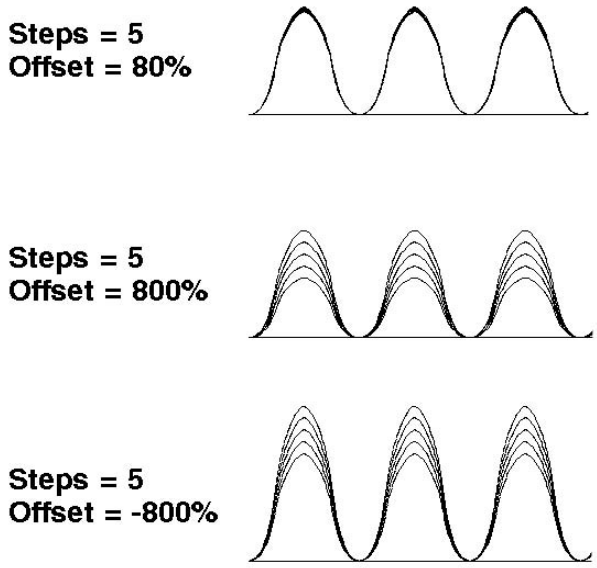
Cycles: This is how many times you want the pattern to travel around the path.

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.

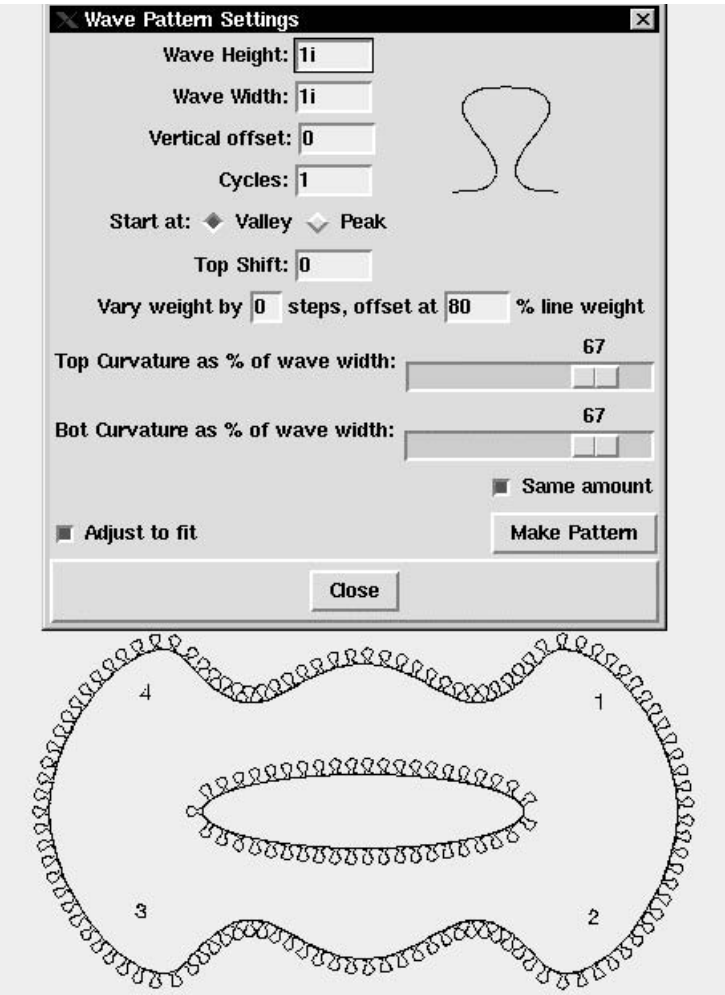


Vary Weight: This option allows you to vary the weight of the line making the pattern. It is repeating the line a number of times (steps) and offsetting that line a percentage of the line weight. A positive value will offset the copy below the original line. A negative value will offset the copy above 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.

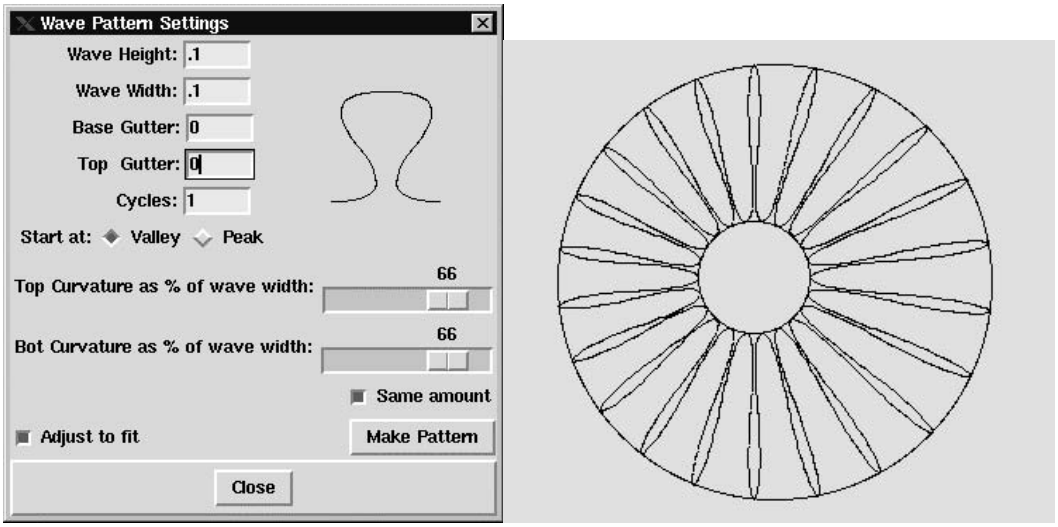
Base and Top Gutter: This lets you apply a gutter to keep the pattern away from the path if needed.

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}.

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