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## 2.0 Future Mat Designer Software

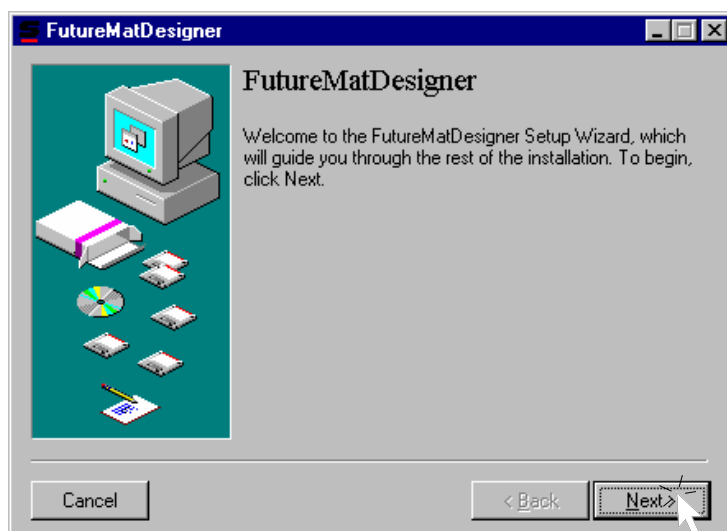
### Introduction

The Future Mat Designer Software must be installed on any personal computer that will be operating your Future mat cutting machine. The instructions in this section will cover installation, setup, and basic mat design features of the program.

### 2.1 Software Installation

Prior to installation of the Future Mat Designer software, please verify that your PC has the necessary hardware resources to adequately operate the program. The Minimum System Requirements are:

- Windows 95/98, Me, 2000, NT, or XP
  - Pentium III, 266Mhz CPU, or higher
  - 64 Mb RAM (128+Mb recommended)
  - 20 Mb of available hard disc space
  - CD-ROM drive
1. To install the program, first confirm that all Windows programs are closed. Insert the Future Mat Designer software CD-ROM into the CD drive. If the software installation does not begin automatically, proceed to step 2. Otherwise, proceed to step 4.
  2. Right-click the Start button, then left click “Explore” to open Windows Explorer. Click on the CD drive (usually the “D” or “E” drive), in the left column of the Explorer screen to view the contents of the CD-ROM.
  3. On the right side of the screen, double-click on the “Setup” file. The screen below will open:



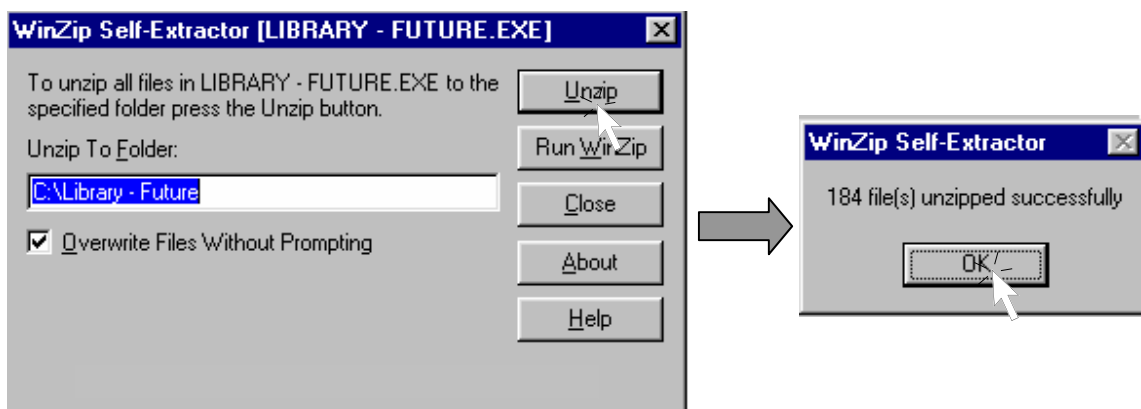
- Click "Next" to begin installation of the program. Follow all the screen prompts to perform the normal Setup install. When complete, the screen below will be shown.



Click "Finish" to complete the installation. A new Future Mat Designer icon should now be on the Desktop.

*Note: Do not open the Mat Designer program until the serial cable connection from the computer to the MatPro CMC machine has been made.*

- To install the "Shapes and Corner Library" to your computer, again view the contents of the Mat Designer CD-ROM from Windows Explorer (see Step 2 above). Double-click on the file "Library – Future.exe" to begin installation. The window below will appear:



Click the "Unzip" button to extract the files to your hard drive. When the files have been fully unzipped, click "OK" on the small window shown, and on "Close" in the WinZip Window. The Future Mat Designer software installation is now complete.

## 2.1.1 Installing English Translation Files

To facilitate the ease of using the Future Mat Designer software, you may install the supplemental English translation files from either a 3.5" floppy or CD-ROM. Close the Future Mat Designer program before starting the procedure.

1. Insert the appropriate disc into the computer disc drive.
2. From Windows Explorer, click on the corresponding disc drive in the left column of the screen. The contents of the disc will appear in the right column.

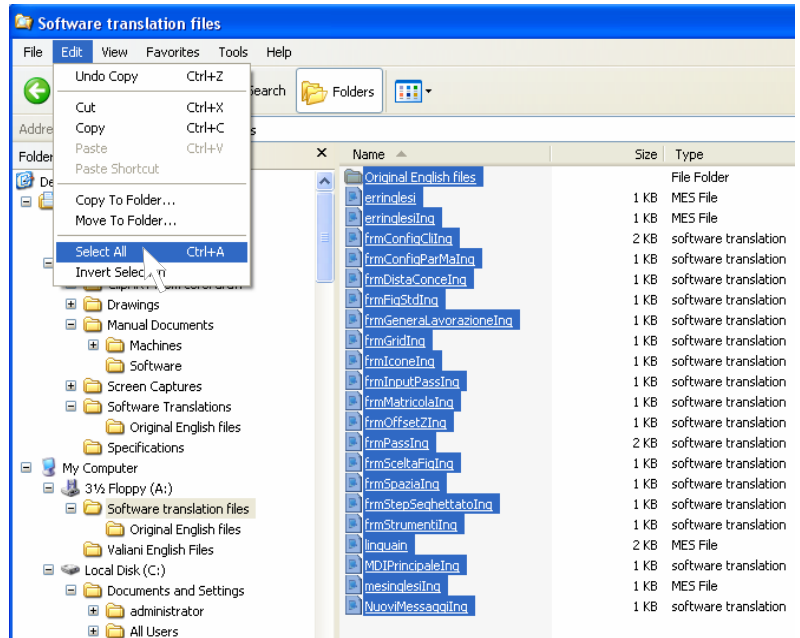


Figure 2.1

3. Click "Edit," "Select All" from the Menu Bar. All of the translation files should be highlighted in blue on the right side of the screen (Figure 2.1).

4. Click "Edit," "Copy" from the Menu Bar to copy these files to the Clipboard (Figure 2.2).

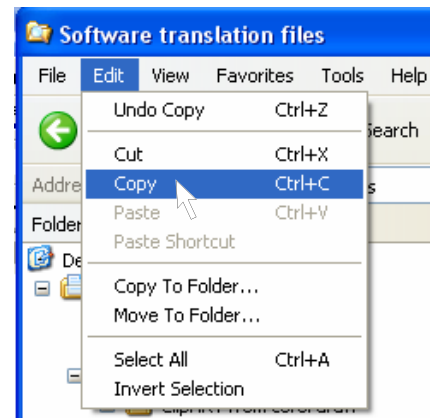


Figure 2.2

5. On the left side of the screen, scroll down (or up) to the "Program Files" directory on the hard drive (C:). Click the + button next to Program Files to expand the contents of the directory.

- Click on the Future Mat Designer program directory to highlight it, displayed under the Program Files directory (Figure 2.3).

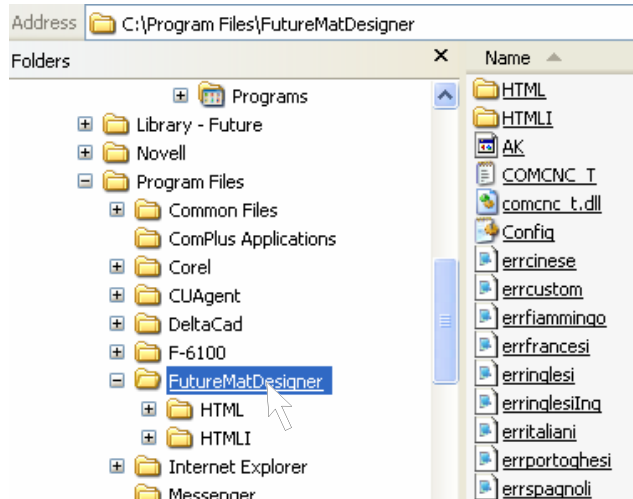


Figure 2.3

- Click “Edit,” “Paste” on the Menu Bar (Figure 2.4). This will paste the new English files over the existing ones. You will see the prompt: “This folder already contains a file named...” Click the “Yes to All” button to overwrite all of the translation files at once (Figure 2.5).

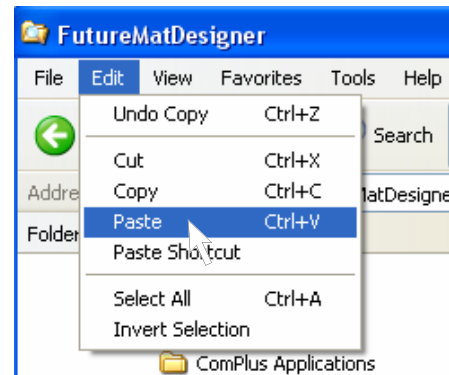


Figure 2.4

- Open the “Future Mat Designer” program and confirm the English screen changes. (Hint: the “Working” menu will have changed to “Cutting”).

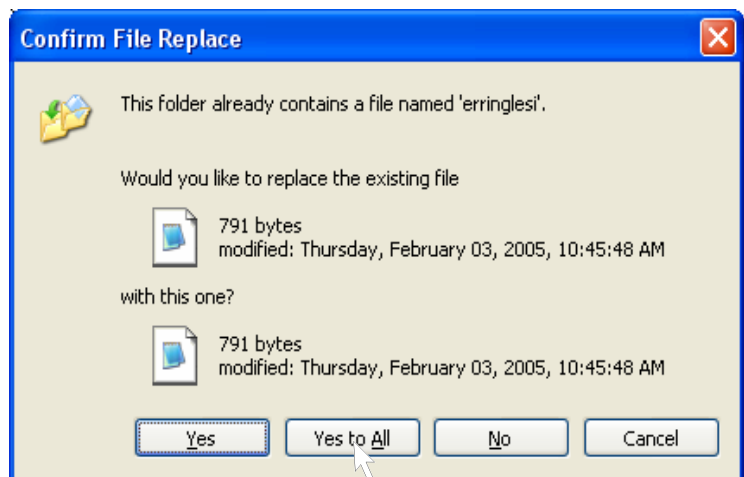


Figure 2.5

## 2.2 Getting Started - Opening the Program

To open the Future Mat Designer program, click the Desktop icon, or open from the Start>Programs menu. The initial screen will appear as in Figure 2.6.

To begin a new mat design, click the “New Mat” button in the upper left of the screen. The initial design screen will open, as shown in Figure 2.7.

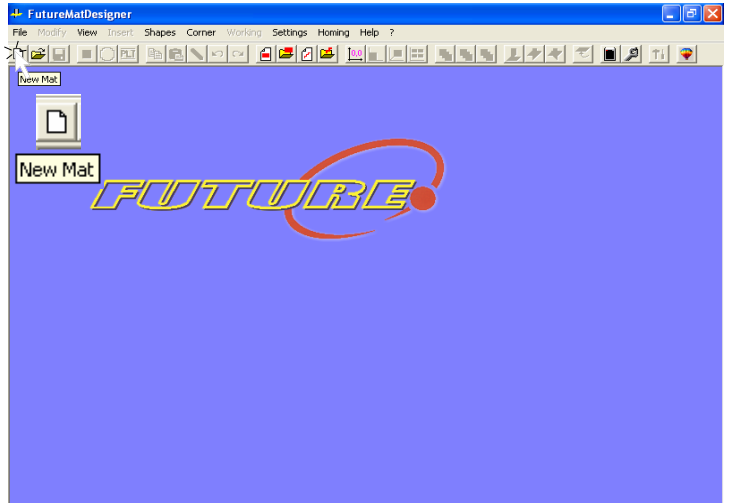


Figure 2.6



### Screen Layout and Tools

Designing a mat can be accomplished by a number of different methods, from a simple rectangular, single-layer mat, to a multiple-opening, multiple layer mat with V-grooves and imported “clipart” CorelDraw (PLT) files.

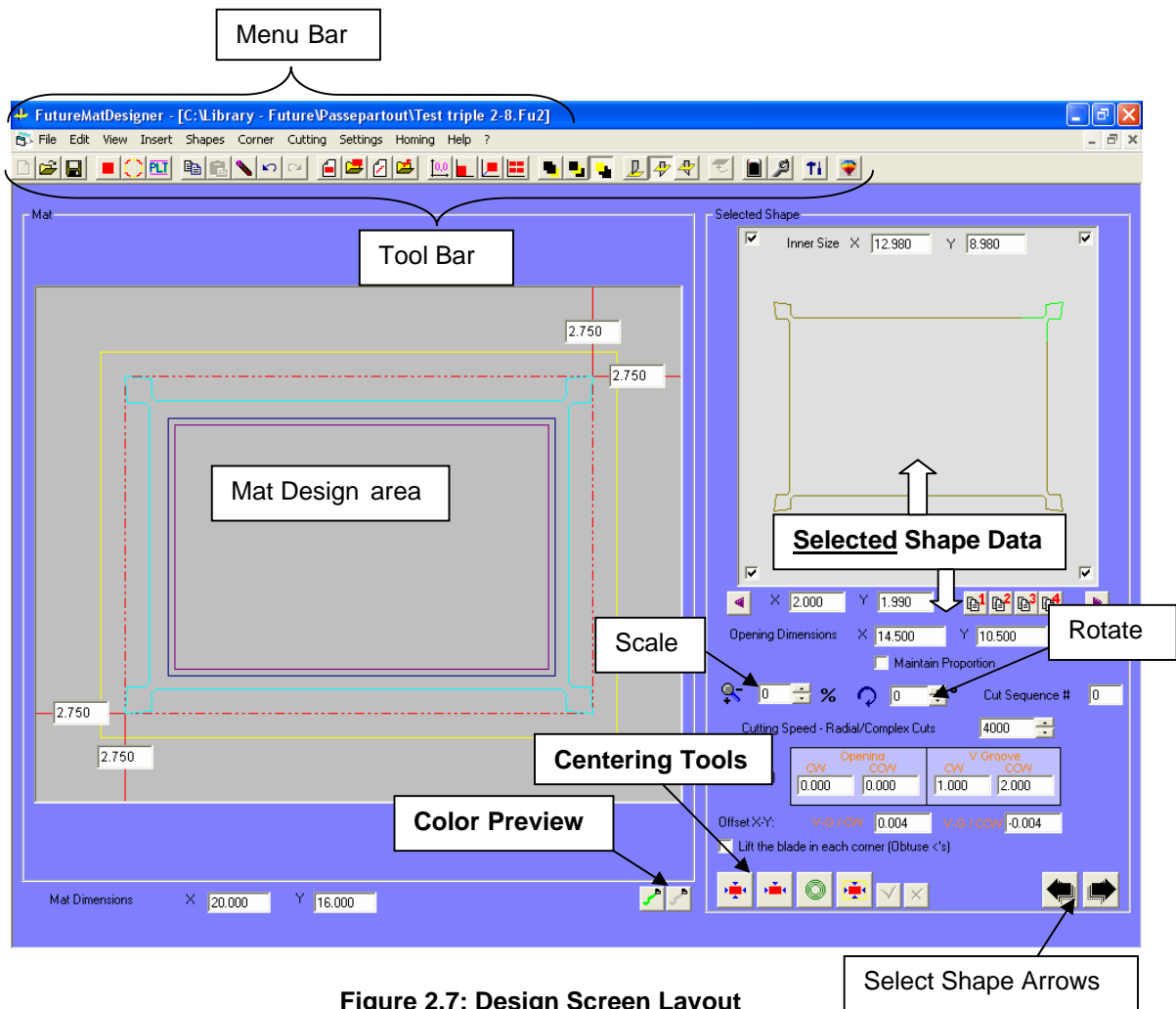


Figure 2.7: Design Screen Layout

## 2.3 Menu Options and Toolbar

Design tools may be accessed from the **Toolbar**, or from drop-down options on the **Menu Bar** (Figure 2.7). A brief description of the Menu options and corresponding Toolbar buttons (if available) follows below. Keyboard shortcut commands are shown in parentheses when available.

### 2.3.1 Menu Bar

#### File Menu



**New Mat (F1):** Begins a new mat design when the program is initially opened.



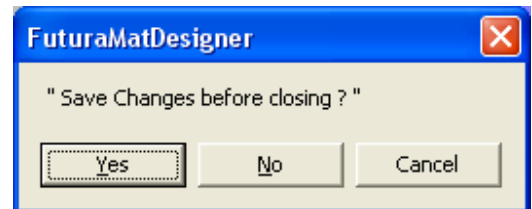
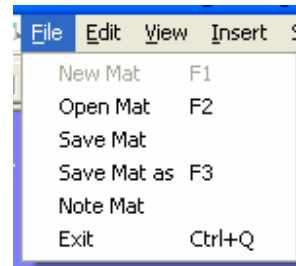
**Open Mat (F2):** Opens a previously saved mat design file.



**Save Mat / Save Mat as (F3):** Saves the current mat design. If you have not already named the design with a file name, it will function like the “File - Save Mat As” command. If a file has been previously saved, changes will be saved and the file overwritten.

**Note Mat:** Opens a notation box at the top of the mat design screen. Allows the user to save reminders or any pertinent information about a particular mat. The mat must be saved in order for the “note” to be saved as well.

**Exit (Ctrl+Q):** Exit or close the Future Mat Designer program. You will be prompted to save any open files prior to closing.



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#### Edit Menu

As with many Windows programs, you may Copy and Paste selected elements of the design. You may also Delete, or erase, any selected shape or design element from the mat layout by clicking the Delete tool.



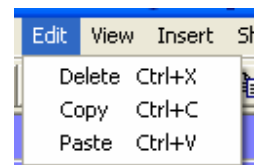
**Copy (Ctrl+C):** Copies any selected element to the Clipboard, or temporary computer memory.



**Paste (Ctrl+V):** Retrieves any copied item from the Clipboard and “pastes” it into the mat design. This toolbar button is not active unless there is an item currently copied to the Clipboard.



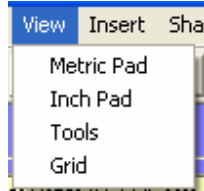
**Delete (Ctrl+X):** Deletes or erases an object from the design. *Note:* The Delete command will NOT “Cut” the selected element from the design and place it onto the Clipboard.



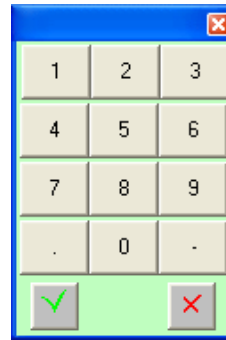
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## View Menu



**Metric Pad:** Displays a Metric keypad that may be clicked with the mouse to enter numerical values as an alternative to using the keyboard.



## Metric Keypad

**Inch Pad:** Displays a fractional inch keypad to permit entry of fractions by clicking with the mouse. Fractions are shown in 1/16" increments.



## Inch Keypad



**Tools:** Opens the Tools Box, which displays the various alignment and positioning tools used primarily for multiple opening mat designs. More than one opening must be selected in order for most of the tools to become active (see section 2.5, *Tools Box*, for a detailed explanation of each alignment tool).



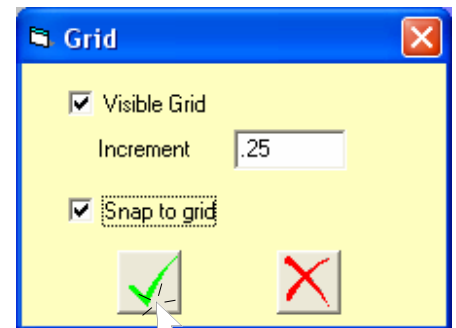
## Tools Box

**Grid:** Opens the Grid control window.

- ✓ **Visible Grid:** When checked on, displays the grid on the design screen area, in the increment size selected.

**Increment:** The size of each grid square.

- ✓ **Snap to grid:** When checked on, aligns selected shapes with the nearest grid line when moving with the mouse.



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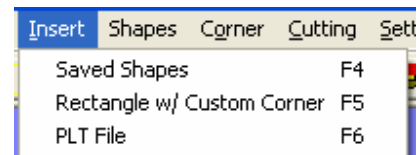
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## Insert Menu



**Insert Saved Shape (F4):** This tool opens the saved Shapes menu, shown on next page (Figure 2.8).

Double-clicking the desired shape icon will insert it into the mat design screen. You may predetermine the shape's opening size by entering the border dimensions in the lower left "Set Borders" box. If these are left blank, the shape will simply open at its previously saved default dimensions (see section 2.9, *Creating New Shapes*).



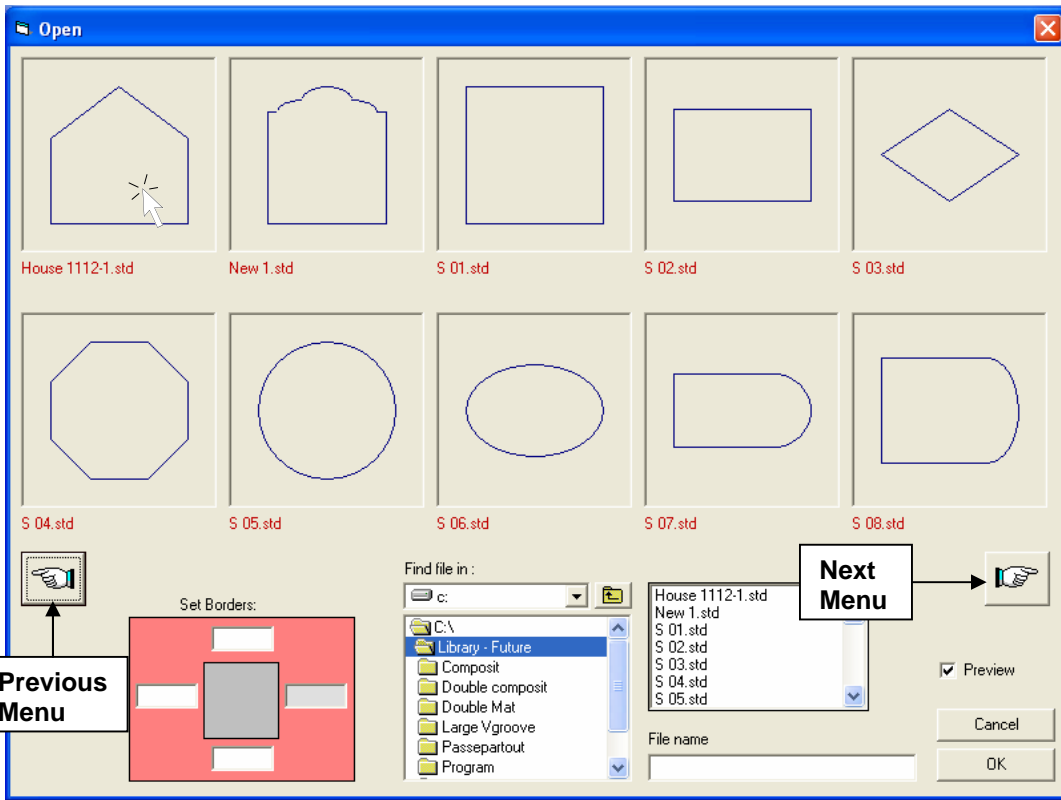


Figure 2.8



**Insert Rectangle with Custom Corner (F5):**

Opens the menu of saved custom corner designs. Double-clicking a custom corner icon will place it on your mat. You may also pre-size the custom corner opening by entering Border dimensions in the lower left of the Open menu (Figure 2.9), as with the Shapes menu.

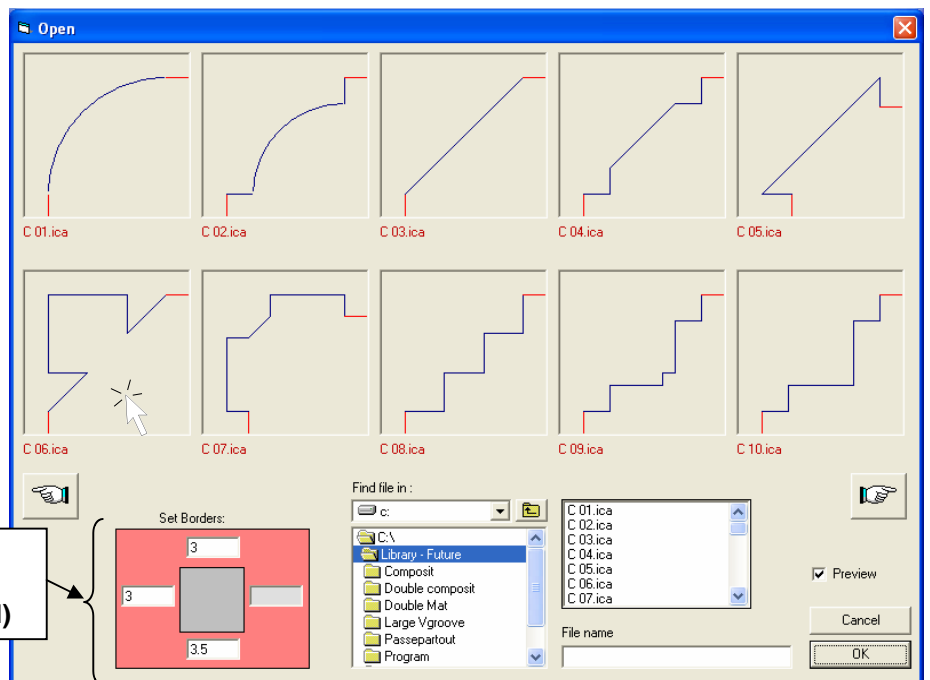


Figure 2.9

You may create and save your own Custom corner designs with the “New Corner” tool. (See section 2.10, *Creating New Corners.*)



### Insert PLT File (F6):

Opens the menu to import a saved CorelDraw (.PLT) file.

**Note:** You must open the appropriate directory to access and preview these files.

**A sample of pre-drawn .PLT files is saved in the C:\Library-Future\Shapes figure.PLT directory, as shown in Figure 2.10.**

You may create your own unique designs with CorelDraw (must be purchased separately), and save them as templates to this menu.

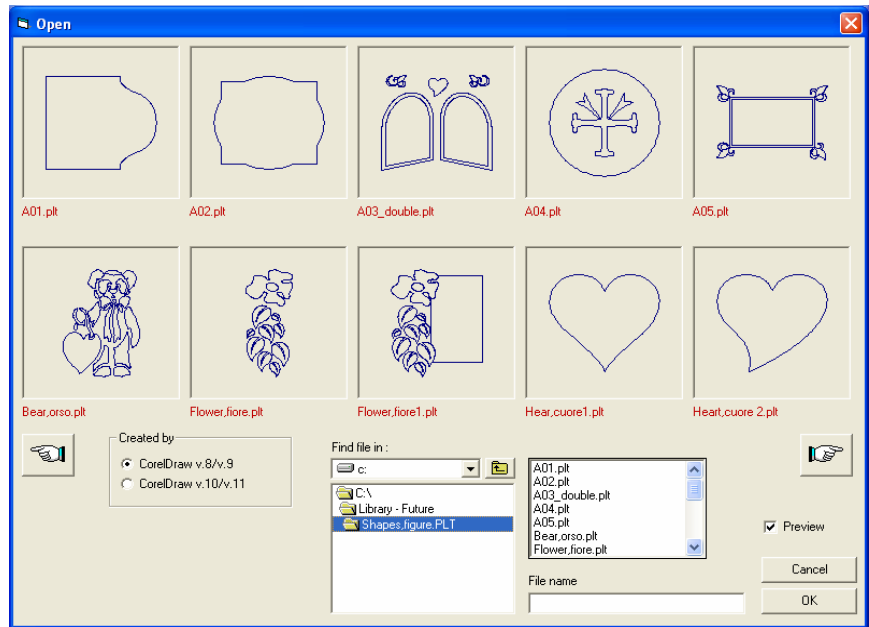


Figure 2.10

### Shapes Menu



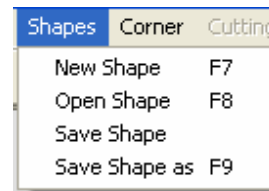
**New Shape (F7):** Opens the New Shape creation screen (see section 2.9, *Creating Your Own Shapes*).



**Open Shape (F8):** Opens the saved “Shapes” menu screen. When a saved “Shapes” icon is double-clicked in the menu, it will open in the Shape creation screen, where it can be modified and/or saved as a new shape template.

**Save Shape:** Saves the new or modified shape, overwriting the current file. Active only in the Shape creation screen.

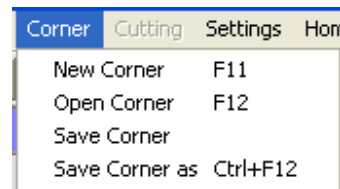
**Save Shape as (F9):** Saves the new or modified shape in the Shape creation screen, allowing the user to give it a new File name.



### Corner Menu



**New Corner (F11):** Opens the New Corner creation screen (see section 2.10, *Creating New Corners*).



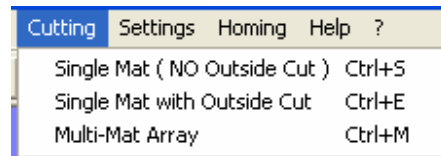


**Open Corner (F12):** Opens the saved Custom Corners menu. When a previously saved custom corner icon is selected, it will open in the Corners creation screen, where it can be modified and saved as a new custom corner.

**Save Corner:** Saves the new or modified corner design in the Corner creation screen; will overwrite an existing File name.

**Save Corner As (Ctrl+F12):** Saves the new or modified corner design in the Corner creation screen, allowing the user to give it a new File name.

## Cutting Menu



Single Mat (NO Outside Cut) (Ctrl+S):

**Clicking this command will execute a mat *opening* cut only. No outer mat sizing will be performed. You must verify that the sheet of mat you have placed on the machine is of adequate size to properly cut the mat design created on the screen, and that it is oriented as drawn, i.e. vertically or horizontally.**



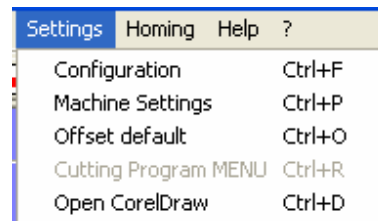
Single Mat with Outside Cut (Ctrl+E): **This tool executes a mat opening and subsequent sizing cut. Make sure that the matboard used is large enough to accommodate the mat opening and additional waste produced along the left and bottom clamped edges.**



Multi-Mat Array (Ctrl+M): **This command will initiate the option to cut multiple copies of a given design on one sheet of board. The “Insert Multi-Mat Array Parameters” screen will open, prompting you to input the necessary dimensions and parameters.**

See section 2.11, *Operation – Cutting Mats*, for more detailed information on cutting commands and options.

## Settings Menu



**Accesses the various machine settings and cut calibrations (see section 2.6, *Settings*, for a detailed description of each Settings tab and screen).**

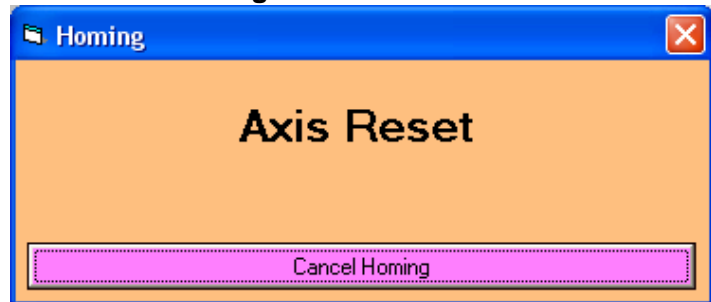


## Homing



The Homing command returns the cutting head and gantry to the origin point (0,0) of the cutting board prior to cutting a mat. This homing operation must be performed each time the machine is used for the first time in a cutting session, and will be done automatically if you forget to do so. It is also recommended that you perform a Homing command after cutting a large multiple opening or complex mat, in order to minimize minor dimensional cutting errors.

The window at right will pop up when the Homing button is clicked. Click the “Cancel Homing” button to stop the Homing movement.



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## Help Menu

A comprehensive online help manual (HTML format) is available. Click on the pertinent underlined chapter to review in the Help Contents screen (Figure 2.11).

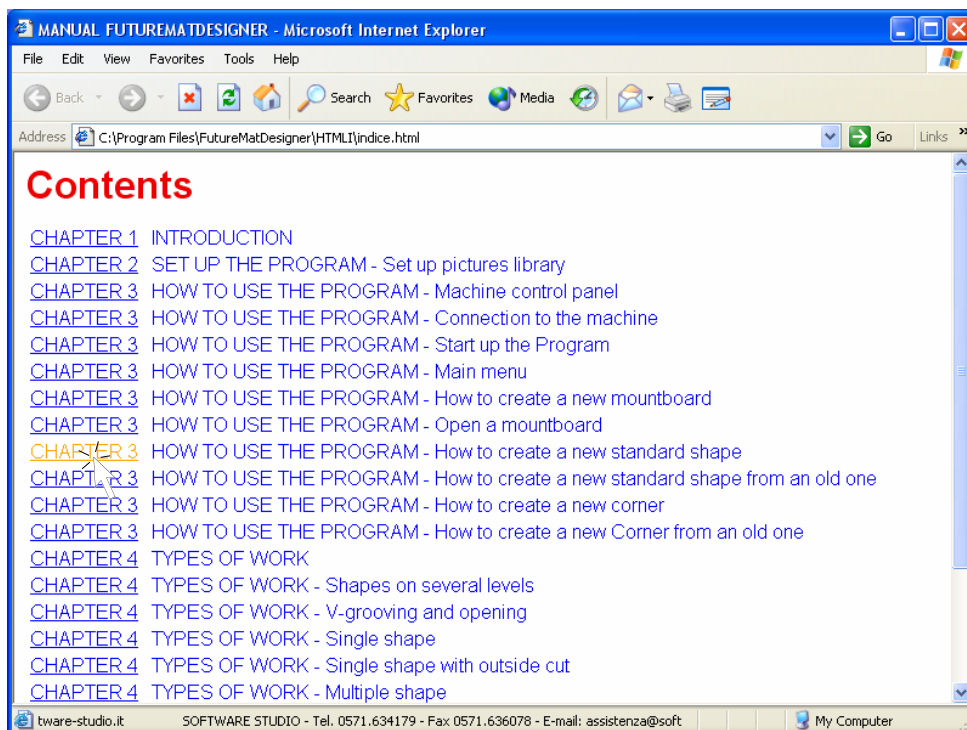


Figure 2.11

?: Software “About” Menu

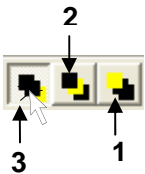
Click the question mark “?” button to view the version number of Future Mat Designer software loaded on your computer. This information may be required if you are reporting any software problems to Fletcher Technical Services.



Figure 2.12

### 2.3.2 Toolbar Buttons

The Tools explained below are those not already covered through Options on the Menu Bar.

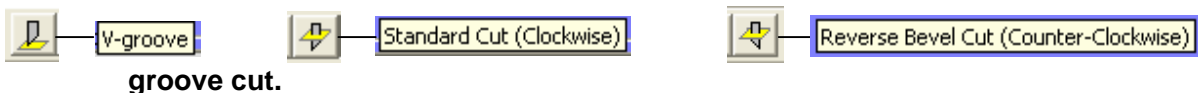


Mat Level/Layer: Click one of these three buttons to place a selected mat opening or element on the desired mat layer of your design. Mat levels are numbered from bottom (Level 3) to top (Level 1).



Undo and Redo: These commands permit the user to “Undo” or “Redo” the previous five (5) operations done in the program.

Cut Type / Direction: Select one of these 3 buttons for a given mat opening or layer to designate a V-groove, Standard, or Reverse-bevel cut. *Note:* The blade depth must be reduced on the cutting head dial prior to executing a V-





**Cut Face Down:** Select this option if you want to cut the mat from the back, or “face” down. You may want to cut a mat face down to prevent possible pressure marks on a delicate-surfaced mat type (such as suede, embossed, etc.) that can be produced by the cutting head roller. Also, for optimum alignment with the mat opening(s), choose this cut option only on mat designs that do not contain V-groove cuts (see section 2.11, *Cutting*).



**Change Offset Default:** Opens the “Offset Table Z” settings window. You may correct for errors in the start/stop cut on various cut types; Face up or Face down, and shapes with or without corners (see section 2.6, *Settings, Offset Defaults*, for more detailed information on Offsets).



**Open Configuration:** Opens the Configuration screen, where the user can set the software Language, mat preview colors, PC port connections, and several other parameters (see section 2.6, *Settings*, for more information on Configuration options).



**Tools:** Opens the Tools box, which displays the various alignment and positioning tools used for multi-opening mat designs. More than one opening must be selected in order for the tools to become active (see section 2.5, *Tools Box*, for a detailed explanation of each alignment tool).

Tools Box

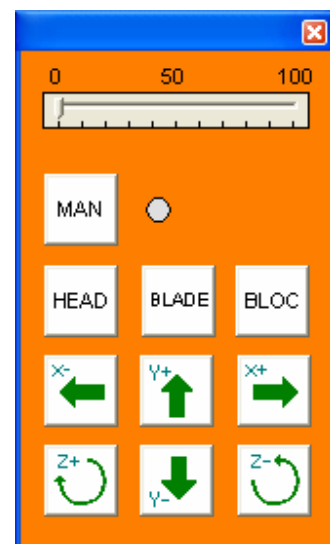


**Open CorelDraw:** Opens the CorelDraw program on your computer. The correct path to the program location must be set in Settings>Configuration>PLT (tab)>Path CorelDraw. The correct Corel version number must also be selected; i.e. Version 8/9 or 10/11 (see section 2.6, *Settings*, for more detailed information).



**Manual Control Panel:** This toolbar button opens the on-screen Control Panel. Each of the machine’s motors and pneumatic controls may be operated individually from this panel. This may be done for trouble-shooting purposes, or simply for aid in setting the blade depth for a particular mat thickness or type (see section 2.12, *Manual Control*, for more detailed information).

Control Panel



## 2.4 Screen Tools and Options

Several additional tools are also available on the right side of the screen for modifying elements of the mat design. These options are described here in more detail, from top to bottom, in three sub-sections.

### 2.4.1 Selected Shapes and Corners Screen Data

The upper right side of the screen area (Figure 2.13) displays information for the selected shape or “Corner” design. The user may control various dimensions and parameters as follows:

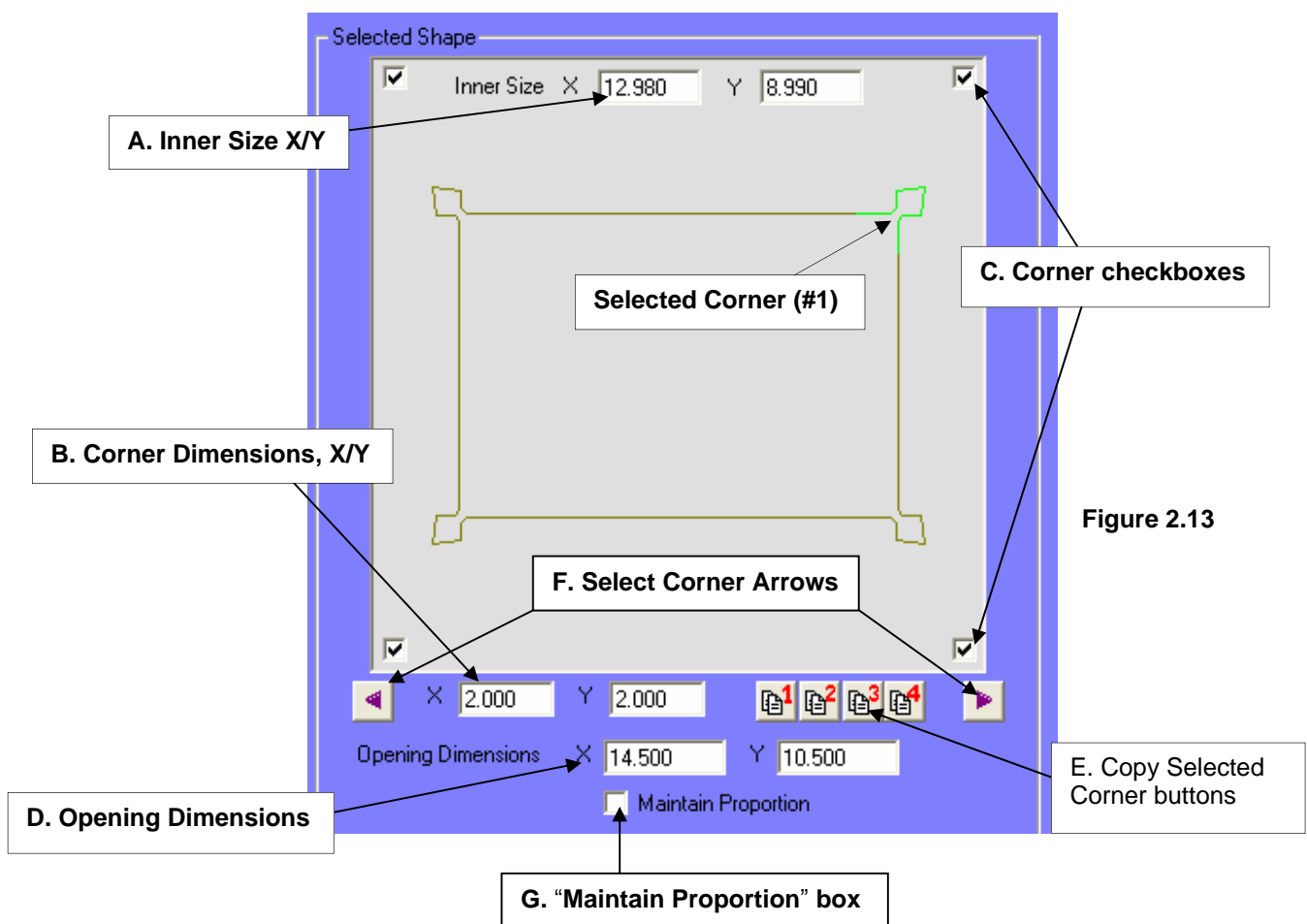
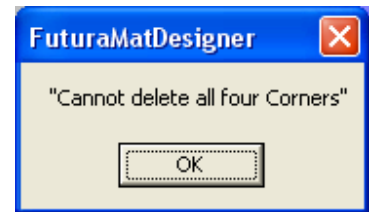


Figure 2.13

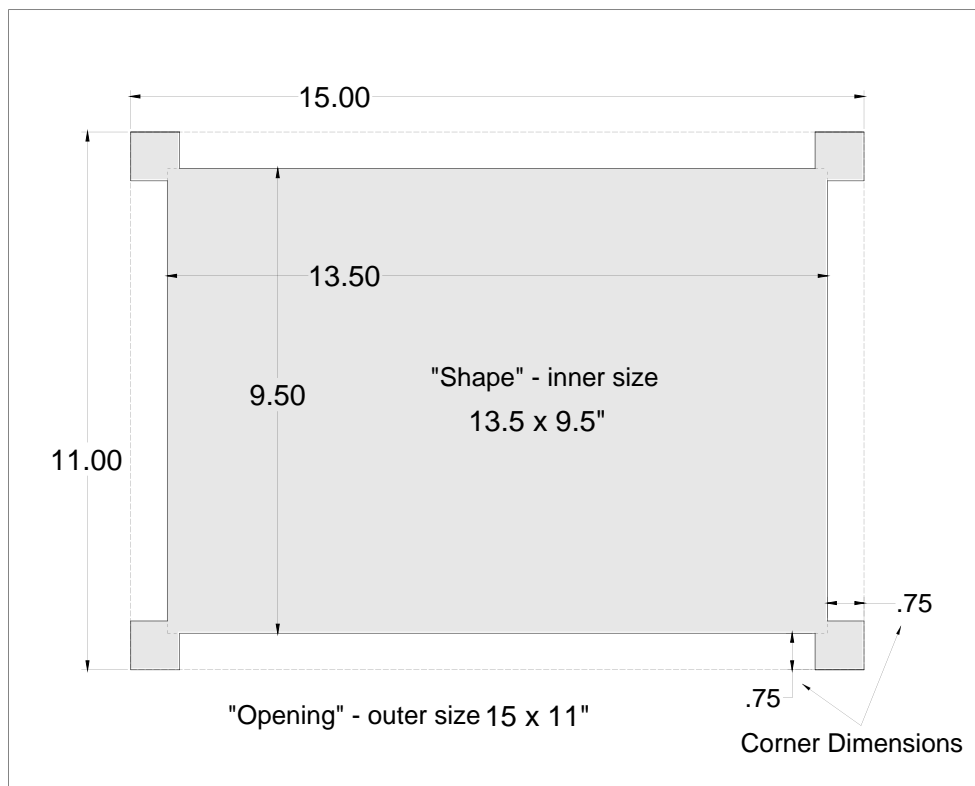
A. Inner Size X/Y: Dimensions of the *innermost*, or rectangular portion of the “Corner” opening area (see Figure 2.14, next page).

B. Corner Dimensions, X and Y: **Permits independent control over the width and height of the Corner detail dimensions. Each corner may have different dimensions, if desired.**

C. Corner checkboxes: **Turns the designated Corner detail on or off for each of the four (4) corners. Unchecked corners revert to normal 90° corners. At least one corner checkbox must remain on when using a Corner-type design.**



D. Opening Dimensions: **The width (X) and height (Y) dimensions of the *outermost* portion of the selected mat Shape/Corner opening. These dimensions may be larger than the inner "Shape" dimensions when certain Corner designs are used (See Figure 2.14).**



**Figure 2.14, Inner vs. Opening Dimensions**

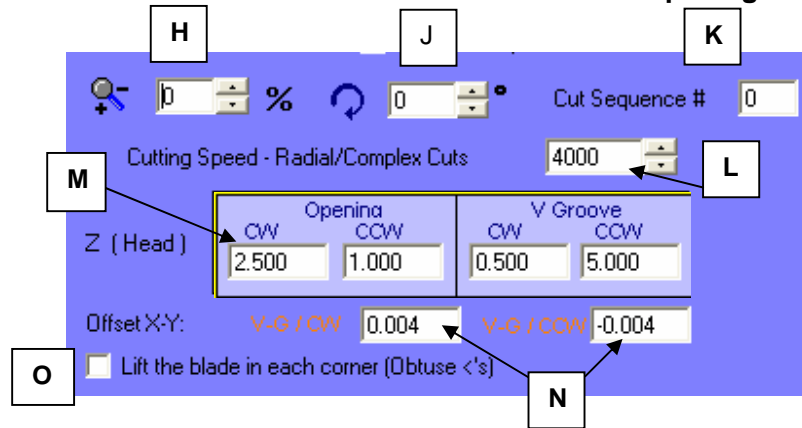
E. "Copy from" corner number buttons, 1-4: **Click any or all of the four corner numbers to copy the corner detail data from the selected corner. Corners are numbered clockwise with corner #1 being the top-right corner.**

F. Select Corner Arrows: **Click to move the selection highlight to another corner. The selected corner shows in bright green.**

G. Click on the “Maintain Proportion” box to change *either* X or Y dimension and automatically change the other dimension to maintain the same mat opening

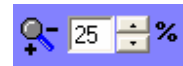
## 2.4.2 Modifying Tools

Figure 2.13:  
Screen Tools  
and Options

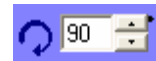


aspect ratio.

H. Scale/Zoom +/-: Increases or decreases the size of the selected shape by the designated percentage. Negative scale factors decrease the shape dimensions. The up/down arrows may also be clicked to change the scale factor by 1% increments.



J. Rotate: Rotates the selected shape by a given number of degrees. Positive (+) rotation values rotate *clockwise*, negative (-) values rotate *counterclockwise*. Clicking the up/down arrows will rotate the shape in one-degree increments.



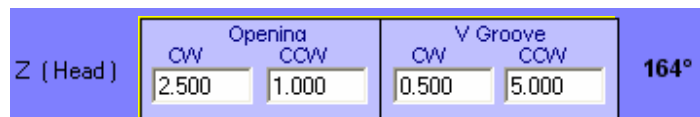
K. Cut Sequence: Designates the order in which the mat openings will be cut. Allows control over which openings are cut first, second, and so on in a multiple-opening or complex mat design. Click on a shape to select it, then enter the sequence number you want it to cut in.



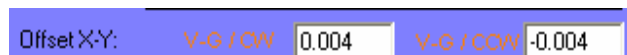
L. Cutting Speed – Radial/Complex Cuts: Designates a slower cutting speed for radial (curved) cut shapes. Prevents possible damage to the mat board and/or blade (see section 2.6, *Settings, Configuration, “Cutting”* for details).



M. Z (Head) Offsets: Corrects for blade insertion/retraction marks and “hooks” for various shapes. Settings are pre-calibrated for a range of size and aspect ratios, but may be changed by the user as necessary. Settings shown here are for an oval shape (see section 2.6, *Settings, “Offset Default”*).



N. Offset X-Y: Defines V-groove width by changing the opening size of either the clockwise (CW) or counterclockwise (CCW) direction opening cuts. Making the clockwise value larger and/or the counterclockwise value smaller will make the V-groove wider, and vice-versa.



O. Lift the Blade in each corner (Obtuse <'s): **When cutting shapes with large obtuse (>90°), angles between cut lines, the machine will *by default* leave the blade plunged into the mat in order to avoid visible overcuts. The resulting corner will be “smoothed” out. If the user prefers to have the blade retract at each cut intersection, this box must be checked on.**

Lift the blade in each corner (Obtuse <'s)

### 2.4.3 Centering Tools



**Center All Four Sides:** Centers the selected shape or element precisely within the mat area.



**Center Shape on Top and Sides:** Centers the selected shape or element to create equal borders on the top, right and left sides of the mat. Will result in either a bottom or top “weighted” mat unless the aspect ratio of both the mat and the shape are exactly equivalent.



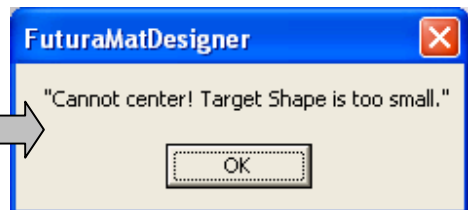
**Create Concentric Shape:** Creates a shape a designated distance around or within a selected shape, depending whether the Exposure value is positive or negative (see section 2.7, *Basic Mat Design*, “Adding Mat Layers”).



**Center in Shape:** Centers the selected shape within a designated shape. To execute this command:

1. Select the shape you wish to center.
2. Click the “Center In Shape” tool.
3. Click the “Target” shape you wish to center within.
4. Click the OK (check) button to confirm.

**Note:** The selected shape must be smaller in size than the shape it is commanded to fit within. This error message will appear if you attempt to center a shape inside of a smaller target shape:



**OK or Confirm:** Confirms the design command.



**Cancel:** Cancels the current design tool command.

**Selection Arrows:** Click either of these arrow buttons to scroll through the openings and/or mat levels in your design. (Selected elements are shown in light blue.) The selection sequence will



follow the order the openings were created in, forward and back. Use the arrows to select a shape that may be difficult to click on with the mouse due to its close proximity to another opening or mat layer.



## 2.5 Tools Box

The Tools in this box are generally used for alignment of more than one mat shape or opening (see section 2.8, *Multiple Opening Designs* for examples of how to use some of the aligning tools).



**Align to Left Border:** Aligns the left side of all selected openings with the opening closest to the left edge of the mat.



**Align to Top Border:** Aligns the top side of all selected openings with the opening closest to the top edge of the mat.



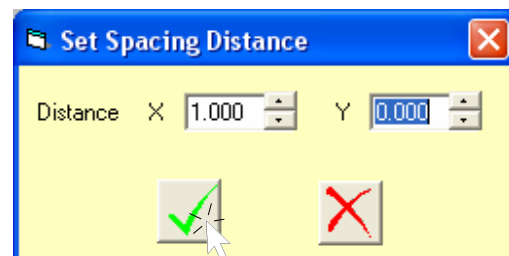
**Align to Right Border:** Aligns the right side of all selected openings with the opening closest to the right edge of the mat.



**Align to Bottom Border:** Aligns the bottom side of all selected openings with the opening closest to the bottom edge of the mat.



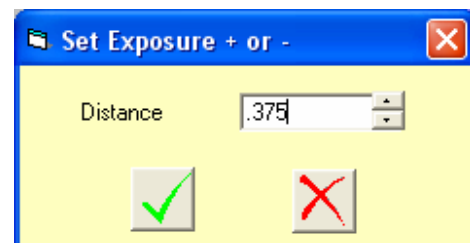
**Set Distance between Selected Shapes:** Designates the X and/or Y distance between selected shapes. Enter the desired spacing distance in the dialog box shown, and click the “Confirm” check button or press the enter key to execute.



**Note:** The opening closest to the left (X spacing) or bottom (Y spacing) edges of the mat is automatically the fixed, or “reference” opening. This opening remains fixed, and all other openings will be spaced relative to it.



**Modify Distance between Concentric Shapes:** Opens the “Set Exposure” box to permit changing of the relative distance between concentric shapes. The innermost shape is always the reference, or fixed opening, and the outer opening will grow or shrink as designated.



**Note:** This tool is active only when two (2) concentric shapes are selected together.



**Recalculate DATA Cut Face Up/Down:** When a shape's Face Up or Face Down designation has been changed, click this tool in order to recalculate the Z Offsets for the selected shape according to the Offset Z chart (see section 2.6, *Settings*, "Offset Default"). This tool is functional only when a single shape/opening is selected.

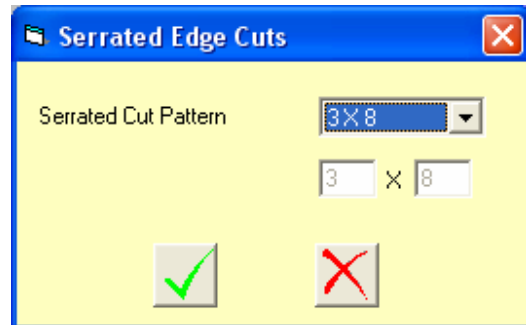


**Serrated Edge Cuts:** Opens the "Serrated Edge Cuts" entry box. Select from one of the drop-down options to vary the random "zig-zag" effect in the mat. Experiment with various ratios to view the differences in the wave-type cuts. A user setting is also available.

**Restrictions on Serrated Edge Tool:**

Functional only with:

- *Single* selected shapes
- Square or rectangle shapes
- Shapes that have not been rotated from the initial 0° position. Serrated edge openings may be rotated afterwards.



**Center on the Mat Board:** Centers a *selected group* of shapes/openings within the overall mat area.



**Center on Y-axis:** Centers a *horizontal* group of selected openings along the vertical, or Y-axis centerline of the mat. Automatically creates equal side borders and spacing between the openings. This tool does not function with selected concentric shapes.



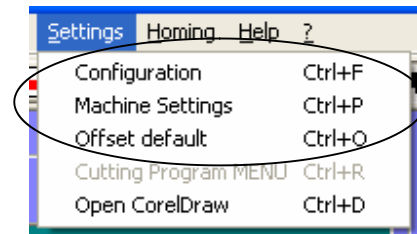
**Center on X-axis:** Centers a *vertical* group of selected openings along the horizontal, or X-axis centerline of the mat. Automatically creates equal top and bottom borders and spacing between the openings. This tool does not function with selected concentric shapes.



**Blank button:** No function at the time of this writing - reserved for future use.

## 2.6 Settings

The Settings menu consists of five different categories, three of which are covered in this section:



1. **Configuration** (Ctrl+F): The various settings for how you will be designing mats and using your machine.
2. **Machine Settings** (Ctrl+P): These settings are specific to your particular machine model, i.e. Future Lite or Future Plus. A password is required in order to alter most of these settings.
3. **Offset Default** (Ctrl+O): Corrects various cut issues, i.e. “hooked” cuts and oval cuts.

Please consult an authorized technician prior to changing **any** of the Settings described in this section. A more detailed description of the Settings menu follows.



## 2.6.1 Configuration

The Configuration options are organized into 6 tabs, as shown (Figure 2.16).

**International Tab: Select the Language and unit of measurement that you will be using the program in. “English” and “Inch” options will be selected for most North American users (Figure 2.16).**

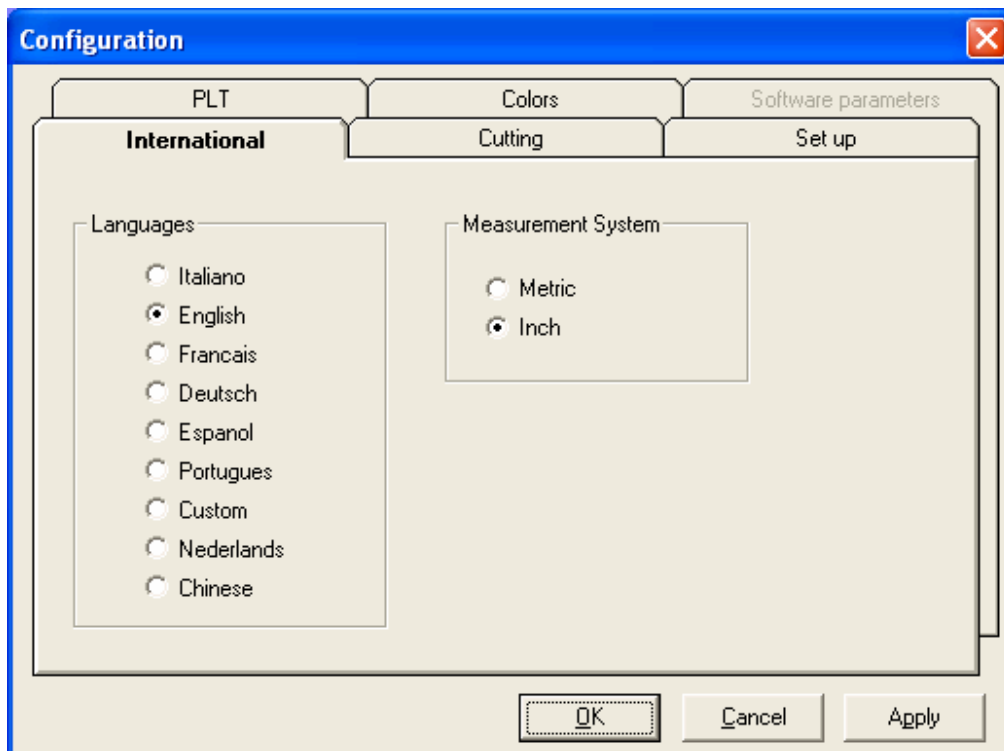


Figure 2.16

## Cutting Tab:

(Figure 2.17)

- **Default size of a New Mat:** The default mat size when beginning a new mat design.
- **Default Mat Thickness:** Set at 0.047” for a standard 4-ply mat.
- **Cutting Speed – Straight Lines:** Speed is shown in mm/minute. Default settings should be correct for most cut and mat types.
- **Cutting Speed – Radial/Complex Cuts:** Speed should generally be slower than straight-line speed.
- **Cutting Speed – Non-Orthogonal Lines:** This setting is for any straight line cut which is not exactly horizontal or vertical. Should generally be slower than the “Straight Lines” cutting speed setting.
- **Offset X-Y V-Groove Send/Return:** These values determine the V-groove width.
- **Z-axis Correction:** Corrects for any rotational error (“hooks,” etc.) in the blade/cutting head.

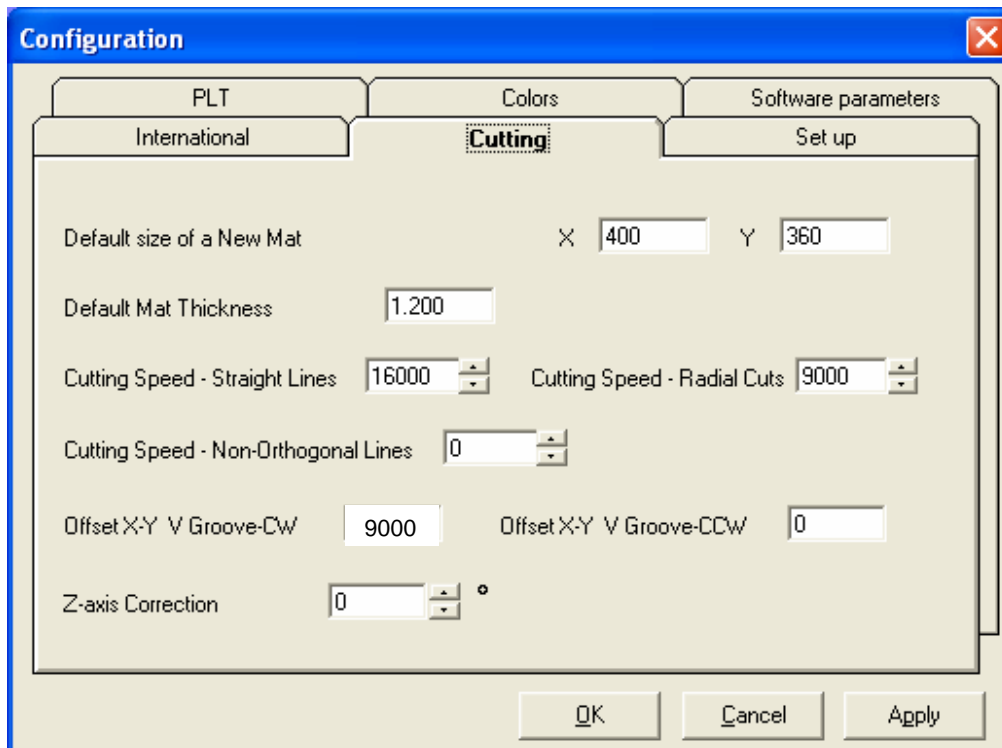


Figure 2.17

Set up Tab  
(Figure 2.18)

**Communication Parameters:**

- **Serial port:** Select the appropriate port setting for the computer that is connected to the machine.
- **Serial Parameters:** Corresponding port settings for the PC serial connection.

**Save Cut Type - Yes/No:**

**Path: Default Path for opening and saving designs.** Select the default drive/directory that you plan to save the majority of your mat designs in. This is also the default directory accessed for opening saved files.

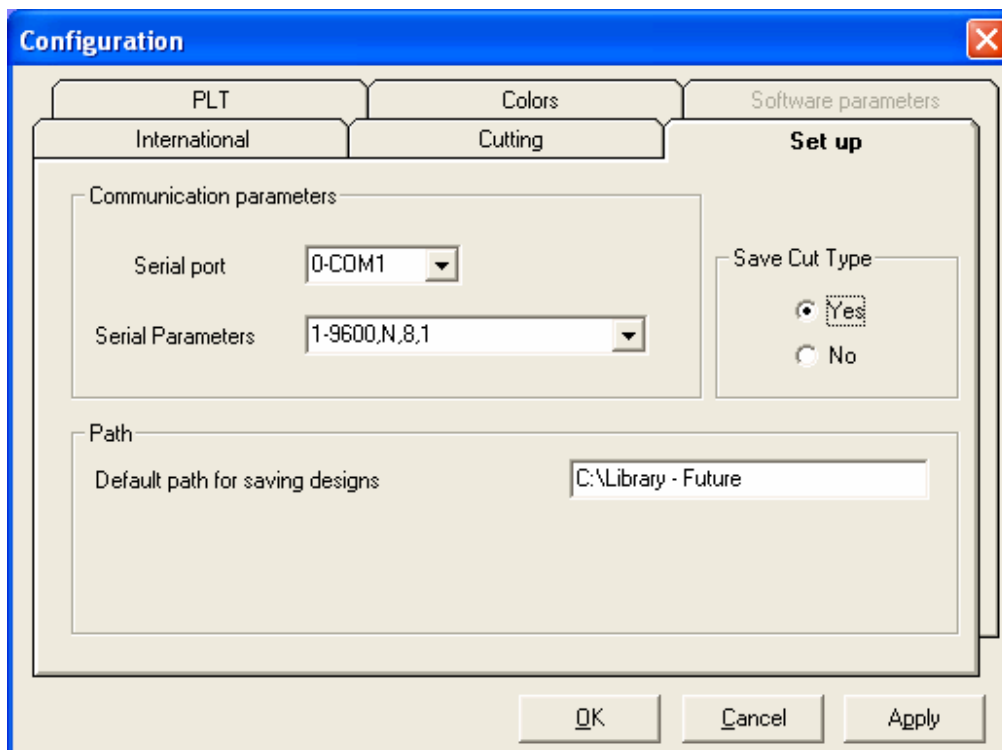
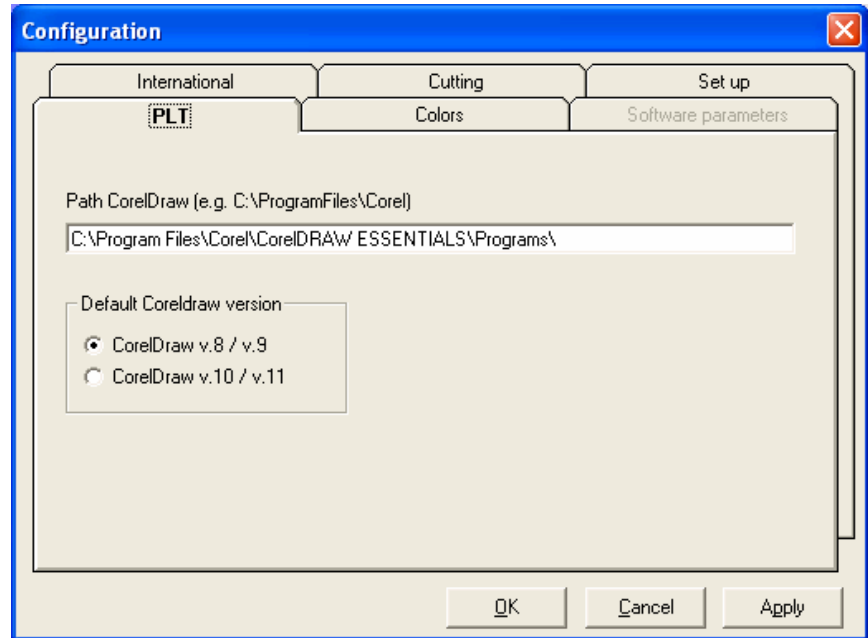


Figure 2.18

**PLT Tab  
(Figure 2.19)**

**Path CorelDraw:**  
Designates the location of the CorelDraw program on your computer. This path must be correct in order for CorelDraw to launch from the toolbar button.

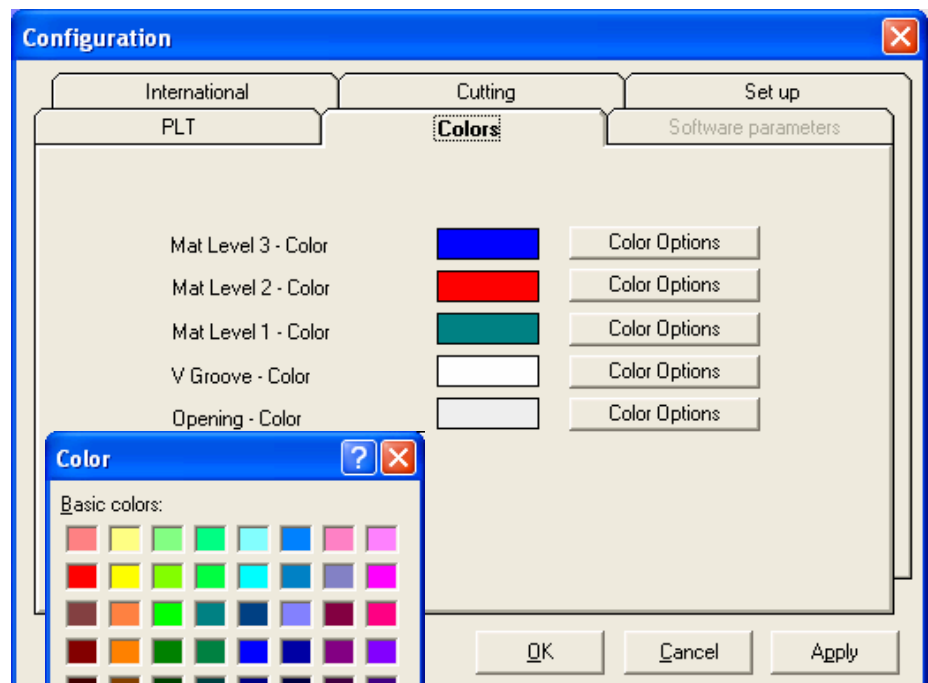
**Default CorelDraw version:** Select the appropriate version that you have loaded on your computer, version 8/9 or 10/11.



**Figure 2.19**

**Colors Tab  
(Figure 2.20)**

**Select colors according to preference, or to aid in previewing each layer of a particular mat design. Select colors from the palette for each Mat Level or cut type (see Color Preview On/Off buttons).**



**Figure 2.20**

## 2.6.2 Machine Settings

The **Machine Settings** are specific to a particular CMC model and serial number. **All machine settings are password-protected; obtain the necessary password from Fletcher-Terry Technical Services.**

**Machine Settings** are organized into 5 separate “Tabs”:

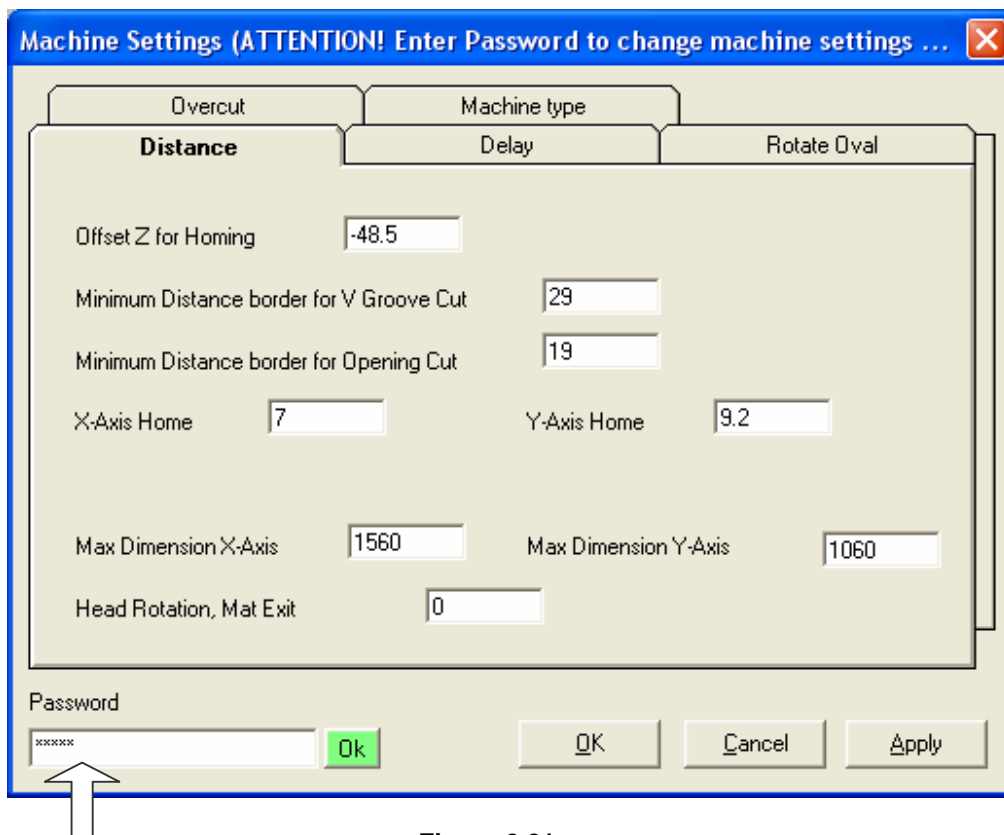


Figure 2.21

Enter Password Here

“Distance” Tab (all values shown in mm above, Figure 2.21)

- **Offset “Z” for Homing:** Sets the correct cutting head rotational “0” point, in degrees.
- **Minimum Distance border for V-Groove Cut:** This distance must allow for the cutting head and blade to clear the mat clamps when cutting both sides of V-grooves. Also applies to counterclockwise cuts.
- **Minimum Distance border for Opening Cut:** Minimum distance required for cutting a standard opening (Clockwise Cut only).
- **X and Y Axis Home:** Sets the correct horizontal and vertical distances in order to produce correct border dimensions.
- **Maximum Dimension X- and Y-axis:** Represents the largest mat board size dimensions for a given machine type, shown in mm; width (X-axis) and height (Y-axis).
- **Head Rotation, Mat Exit:** Corrects rotational blade position as the blade retracts from the mat.

“Delay” Tab  
(Figure 2.22)

These settings designate the time (in seconds) for the cutting head and blade motion at different points of the cut cycle. Do **not** attempt to change these settings without guidance from Fletcher Technical Services.

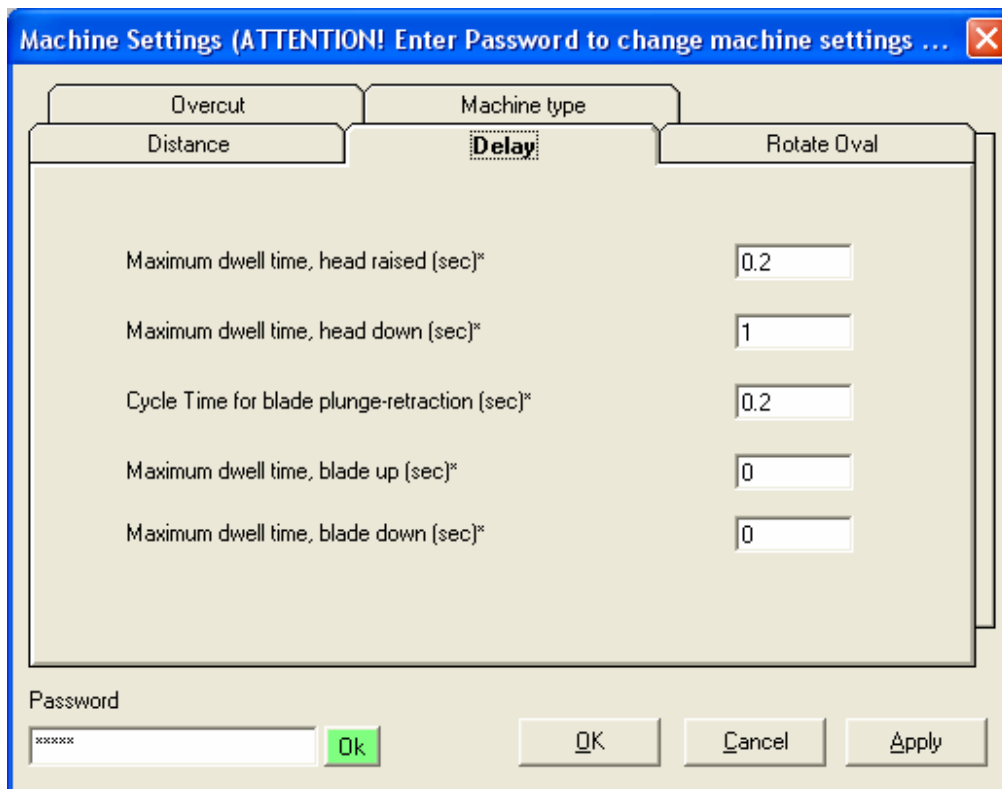


Figure 2.22

“Rotate Oval” Tab  
(Figure 2.23)

Corrects for the apparent “tilting” of various size/aspect ratio ovals. **Increasing** the number **raises** the right side of the oval, and vice-versa. Rotate Oval setting values are in degrees.

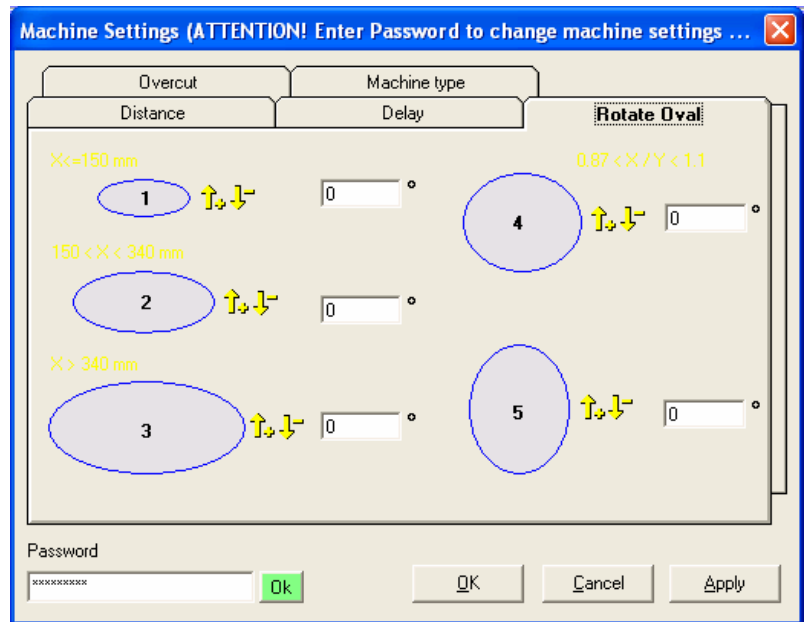


Figure 2.23

“Machine Type” Tab  
(Figure 2.24)

**Future Model:** This setting must be set prior to operating the machine for the first time. Select both the Future machine model and Cutting head type from the respective drop-down options.

**Note:** The program will shut down automatically when the Future model is changed.

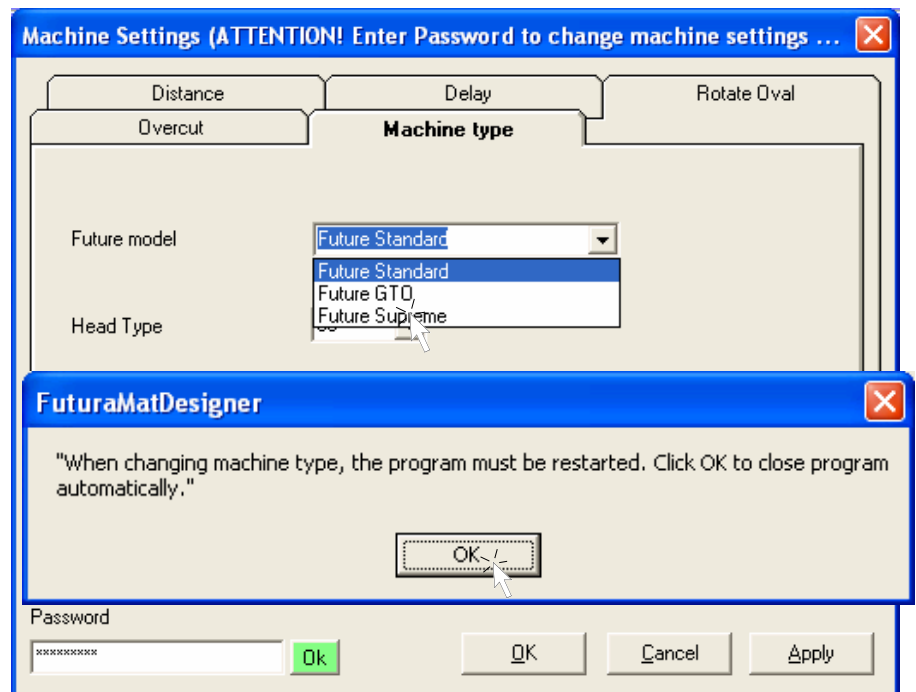
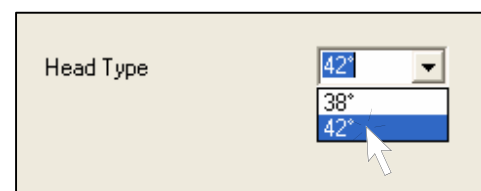


Figure 2.24

**Head Type:** Refers to the bevel-angle of the blade, either 38° or 42° (from vertical). This setting must be correctly selected **prior to** making any changes in the Overcut tab or other cut settings.



## “Overcut” Tab

This tab consists of four values pertaining to the degree of overcuts produced for a given mat thickness (Figure 2.25). Be sure that the Head bevel angle type is correctly selected in Machine Settings before proceeding here. Change these settings with direction from Fletcher Technical Services only.

**Minimum height for activating overcut correction (mm):**

**Variable for anticipated stop in overcut correction:**

**Variable for mat board thickness compensation:**

- **Cut from the Front:**
- **Cut Face-Down:**

The image shows a software dialog box titled "Machine Settings (ATTENTION! Enter Password to change machine settings ...)". The dialog has several tabs: "Distance", "Delay", "Rotate Oval", and "Overcut". The "Overcut" tab is currently selected. Inside this tab, there are two columns of settings, one for a 38° head bevel angle and one for a 42° head bevel angle. The settings include numerical input fields for "Minimum height for activating overcut correction (mm)", "Variable for anticipated stop in overcut correction", and "Variable for mat board thickness compensation". The 38° column has values of 1.25, 6.5, and 4.5. The 42° column has values of 0, 0, and 0. Below these are two checkboxes: "- Cut from the Front" and "- Cut Face-Down". At the bottom of the dialog, there is a "Password" field with a masked input (\*\*\*\*\*), and buttons for "Ok", "OK", "Cancel", and "Apply".

Setting	38°	42°
Minimum height for activating overcut correction (mm)	1.25	0
Variable for anticipated stop in overcut correction	6.5	0
Variable for mat board thickness compensation	4.5	0
- Cut from the Front	<input type="checkbox"/>	<input type="checkbox"/>
- Cut Face-Down	<input type="checkbox"/>	<input type="checkbox"/>

Figure 2.25

### 2.6.3 Offset Default

The Offset Default settings are used to correct various cut issues related to the rotational angle of the blade as it enters the mat. Offset Defaults are organized into two primary tabs, DATA – Cut Face UP and DATA – Cut Face DOWN, and 3 secondary tabs, Design WITH Corner, Design WITHOUT Corner, and an Examples tab (Figure 2.26).

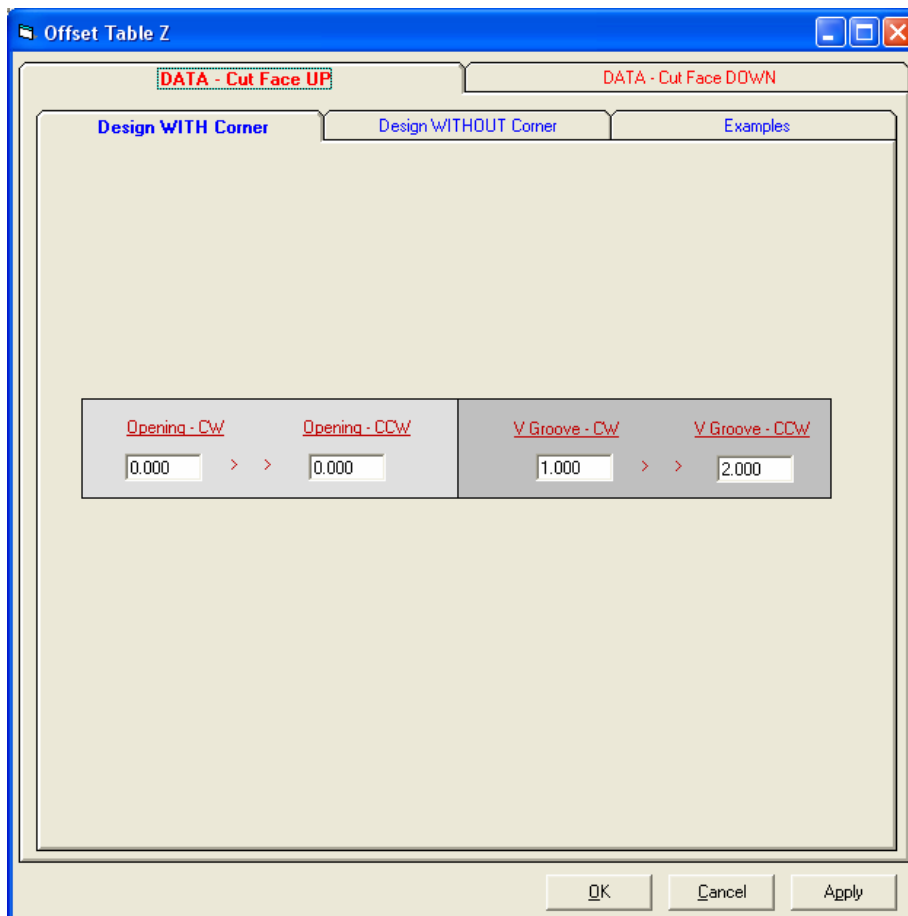


Figure 2.26

**Cut Face UP:** This is the standard default mat orientation for the Future machine. Select this primary tab for any cut problems as described below.

**Design WITH Corners:** This tab allows blade angle corrections (“hooks,” etc.) for standard clockwise (CW) and reverse-bevel (CCW) cuts, as well as V-groove cuts which consist of both a clockwise and counterclockwise cut. Designs with Corners consist of any shape where the blade plunges and retracts completely at an intersection point, i.e. rectangle, hexagon, etc. Default settings for these cuts are generally quite accurate and should not be changed without consulting Fletcher Technical Services (see the *Examples* tab, Figure 2.28, for graphical samples of cut issues and Offset corrections).

**Design WITHOUT Corners:** Designs without Corners are essentially circles or ellipses (ovals) that do not have a discrete intersection point for the blade to plunge or retract. The Offset Table (Figure 2.27), displays the default settings for a range of circular/oval shapes. The angles for any size or aspect ratio circle/oval are displayed to the right of the “Z (Head)” inputs on the main design screen.

Connecting Corner	Opening - CW	Opening - CCW	V Groove - CW	V Groove - CCW
... - 135°	> 0.000	> 0.000	> 0.000	> 0.000
136-137°	> 0.000	> 0.000	> 0.000	> 0.000
138-139°	> 0.000	> 0.000	> 0.000	> 0.000
140-141°	> 0.000	> 0.000	> 0.000	> 0.000
142-143°	> 0.000	> 0.000	> 0.000	> 0.000
144-145°	> 0.000	> 0.000	> 0.000	> 0.000
146-147°	> 0.000	> 0.000	> 0.000	> 0.000
148-149°	> 0.000	> 0.000	> 0.000	> 0.000
150-151°	> 2.500	> 1.000	> 1.500	> 6.000
152-153°	> 2.500	> 1.000	> 1.500	> 6.000
154-155°	> 2.500	> 1.000	> 1.500	> 6.000
156-157°	> 2.500	> 1.000	> 1.500	> 6.000
158-159°	> 2.500	> 1.000	> 1.500	> 6.000
160-161°	> 2.000	> 1.000	> 1.000	> 5.000
162-163°	> 1.000	> 1.000	> 1.000	> 1.000
164-165°	> 2.500	> 1.000	> 0.500	> 5.000
166-167°	> 1.000	> 1.000	> 1.000	> 1.000
168-169°	> 0.500	> 0.500	> 0.500	> 0.500
170-171°	> 1.000	> 1.000	> 1.000	> 1.000
172-173°	> 4.500	> 1.000	> 2.000	> 2.000
174-175°	> 2.000	> 2.000	> 2.000	> 2.000
176-177°	> 1.000	> 1.000	> 1.000	> 1.000
178-.... °	> 2.000	> 0.500	> 0.500	> 0.500

Z (Head)	Opening		V Groove		164°
	CW	CCW	CW	CCW	
	2.500	1.000	0.500	5.000	

**Figure 2.27: Offset Default values for a 164° oval (4.5 x 7”) – correspond to Z (Head) values on screen.**

If there is a noticeable start/stop mark in the bevel for a circle or oval cut, first determine from the Examples tab (Figure 2.28) which type of mark it is (+ or -). Increase or decrease the correct direction Offset number slightly and make a test cut. Continue the process until the start/stop blade mark has been minimized to an acceptable level. **Note:** The sample drawings shown in the Examples tab are exaggerated for clarity.

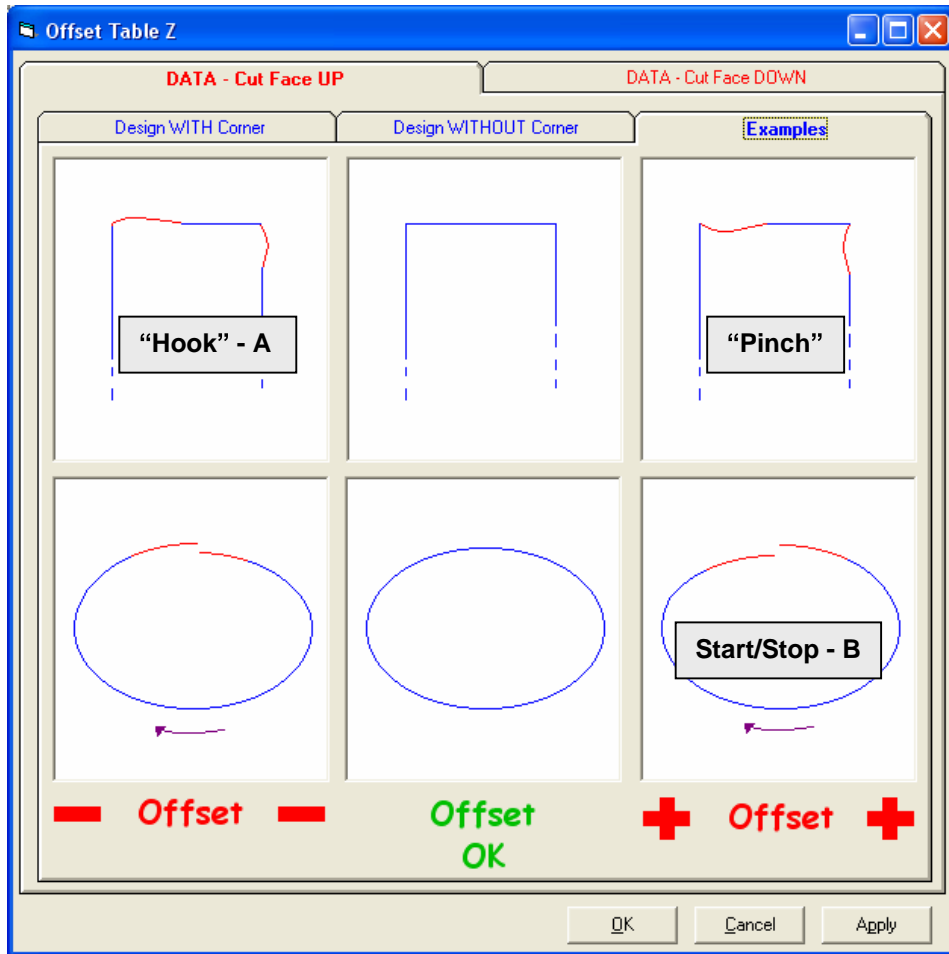


Figure 2.28: "Hook" and Oval Start/Stop Mark Samples and Corrections

**Sample Corrections:**

- A. A rectangle cut from the front shows a "hook," similar to the drawing in "A" above. Reduce the Opening – CW Offset value in .5 or 1 degree increments until the hook is eliminated.
- B. A "Face UP" oval cut shows a noticeable start/stop mark, as in "B" above. Increase the Opening – CW Offset for the corresponding oval size type (i.e. 164°), until the mark has been reduced to an acceptable level.

**Cut Face Down:** Offset Corrections for Face Down cut issues are similar, but reversed from the “Cut Face Up” orientation. Note that the + and – Hook and Start/Stop mark correction examples are on opposite sides of the screen. Always confirm that you are viewing the correct cut orientation screen before altering any Z Offset values (Figure 2.29).

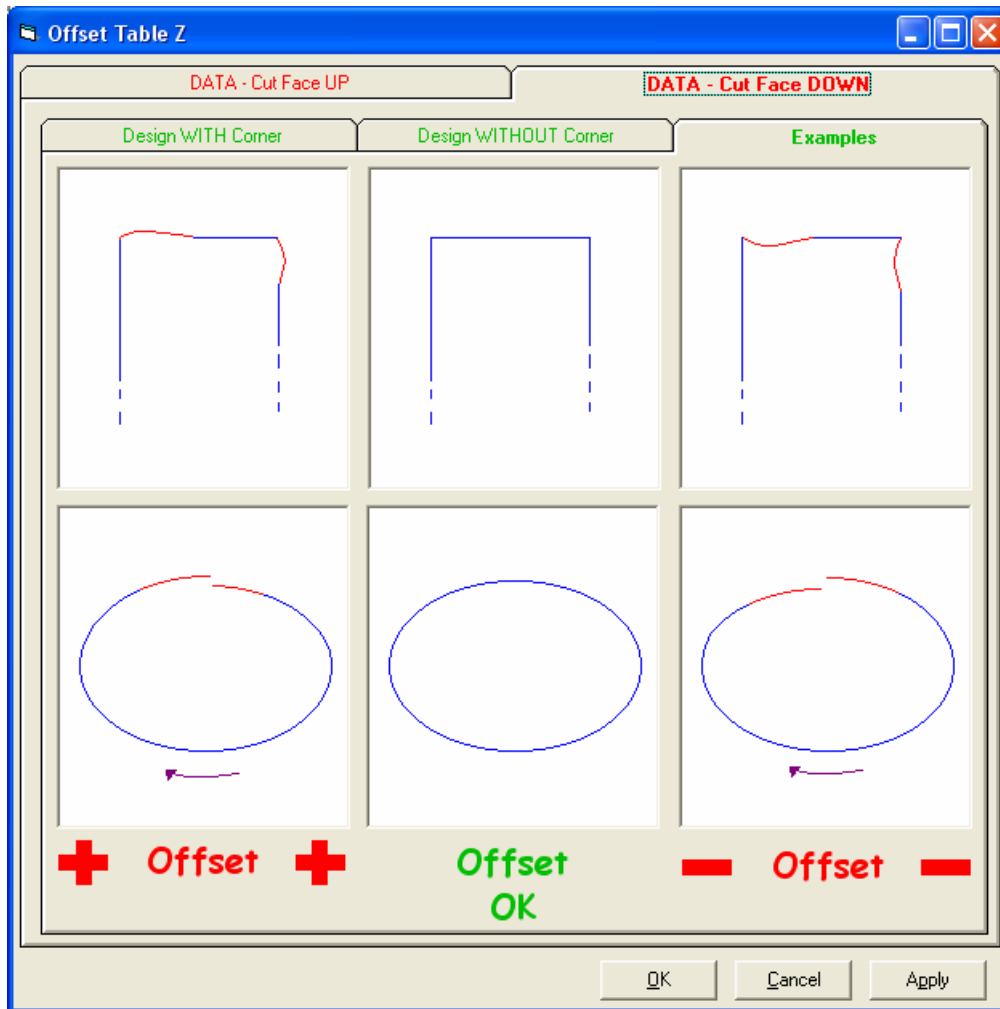
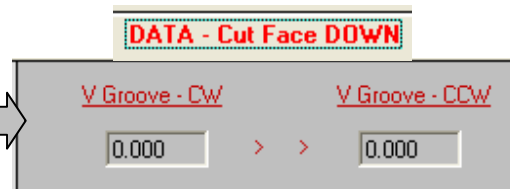


Figure 2.29: “Hook” and Oval Start/Stop Mark Samples and Corrections; Cut Face Down.

**Note:** V-groove Offset corrections are not applicable to the “Cut Face Down” orientation. The V-Groove values are grayed out in the Design with Corners tab.



## 2.7 Basic Mat Design

### Rectangle Mat Opening

To begin, click the “New Mat” button on the toolbar (Figure 2.30).



Enter the outer mat dimensions on the lower-left part of the screen. (The default mat size here is 20” wide x 16” high; you may change this in Settings, Configuration, Cutting, “Default size of a New Mat”.) We will use a standard 20” x 16” mat for this example.

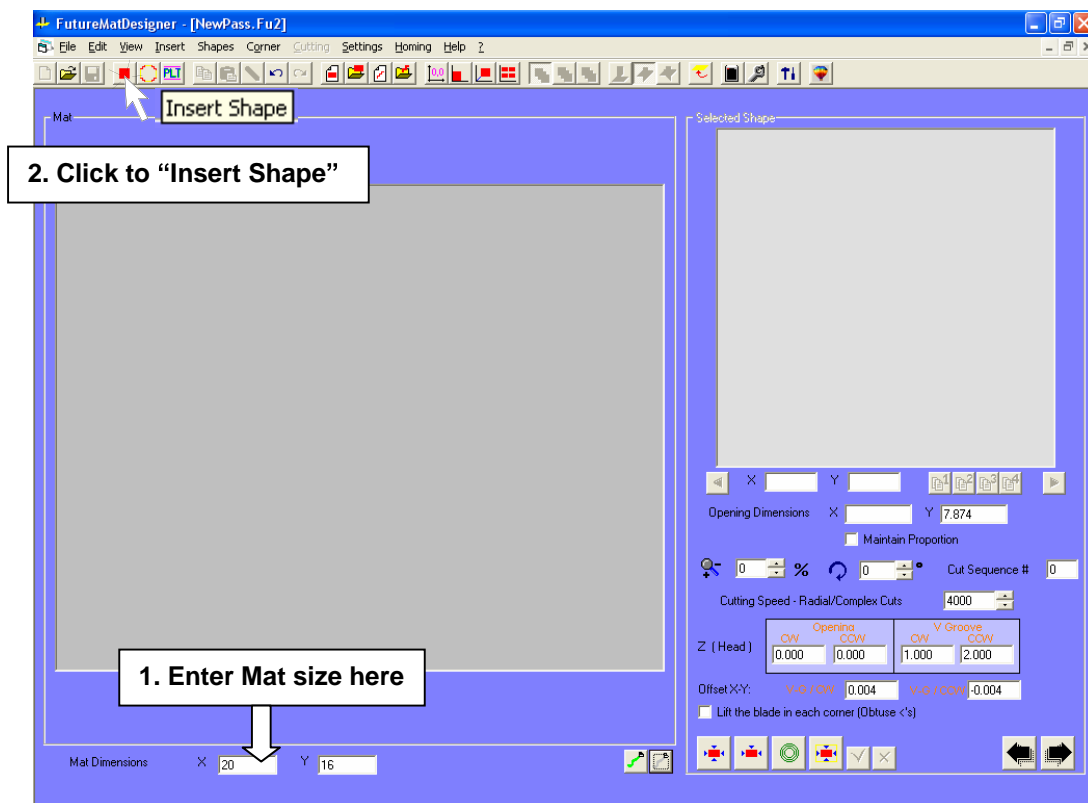


Figure 2.30

Next, click the “Insert Shape” button to select a shape template from the menu of saved shapes. In this example, select a basic rectangle shape by double-clicking its icon from the Open menu.

Note: If you know the Border dimensions/opening size of your mat, you may enter them in the lower-left portion of the Open menu. Both left and right side Borders must be the same when entering them here (see “Set Borders,” Figure 2.31, next page).

You may also choose to simply leave the Borders blank, since you can designate the mat shape size and/or location in the design screen later.

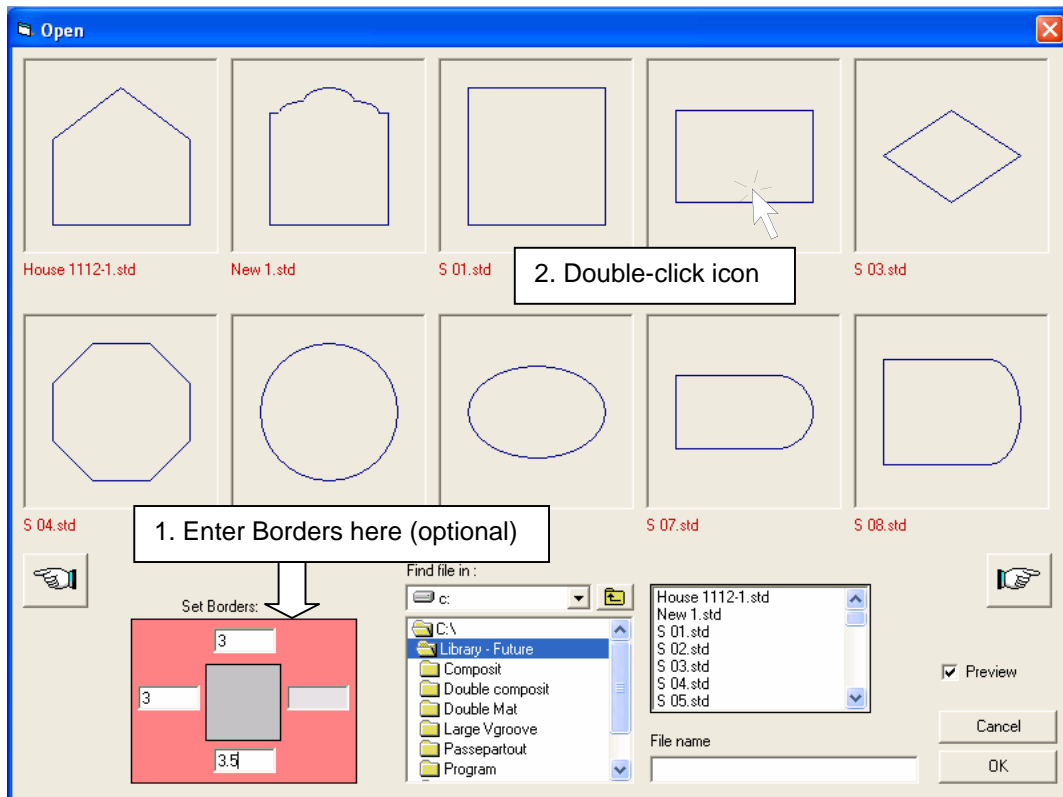


Figure 2.31

The selected Shape will then appear in the mat design screen. If borders were entered in the Open menu, the shape opening will be sized according to the existing mat size dimensions, and centered on the mat. If Borders were *not* designated, you may type in the opening size in the “Shape Dimensions” entry boxes (Figure 2.32). For this example, enter a width (X) dimension of 13.75”, and a height (Y) dimension of 9.5”.

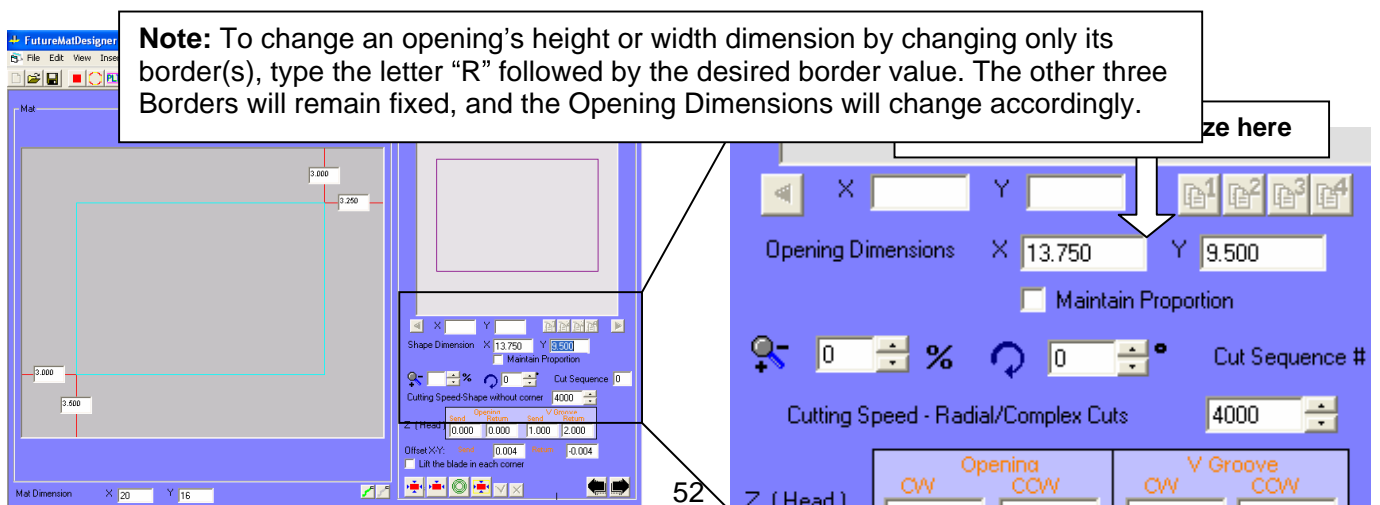


Figure 2.32



To re-center the Shape within the mat area, click the “Center all 4 Sides” button. The shape will move to the center of the mat, leaving Top and Bottom borders of 3.25” and Left and Right borders of 3.125” (Figure 2.33).

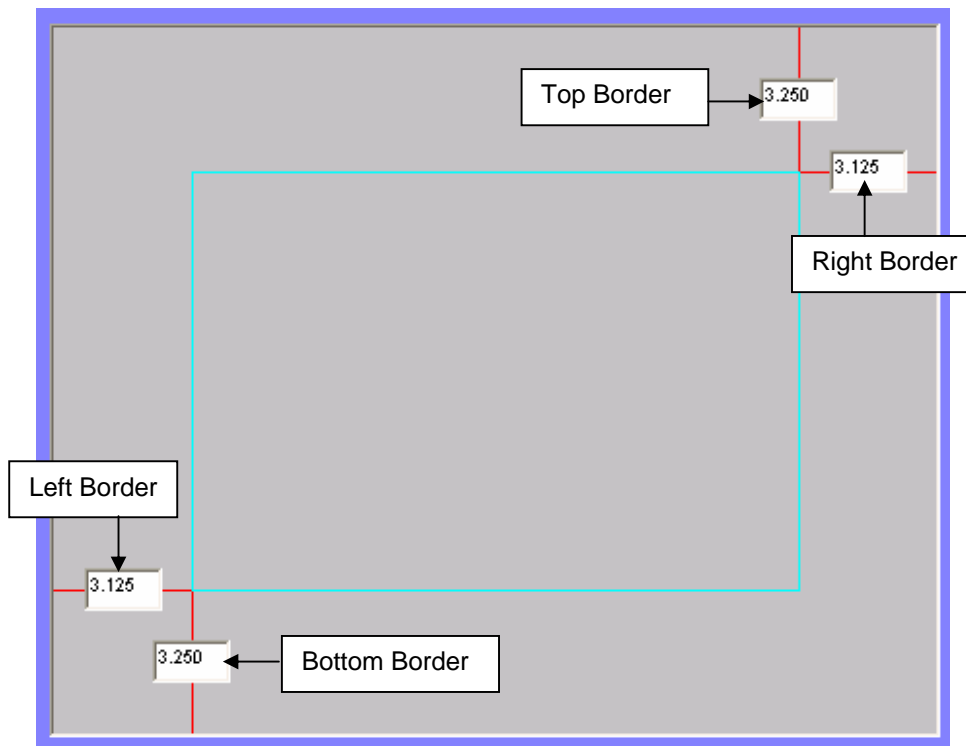


Figure 2.33

To “Bottom-weight” the opening within the mat, leaving equal borders on the top and both sides (if mathematically possible), click the “Center Top and Sides” button. The mat borders should now be 3.125” on Top and Sides, and 3.375” Bottom.

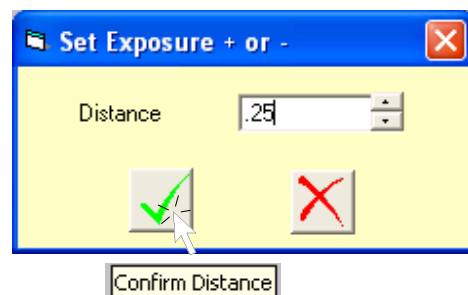


### Adding Mat Layers

To add another layer to the existing design, click the “Create Concentric Shape” button. A pop up window will appear, “Set Exposure + or -”. Enter a value of .25” to create a top mat outside of the existing shape with a 1/4” exposure, or “reveal.”

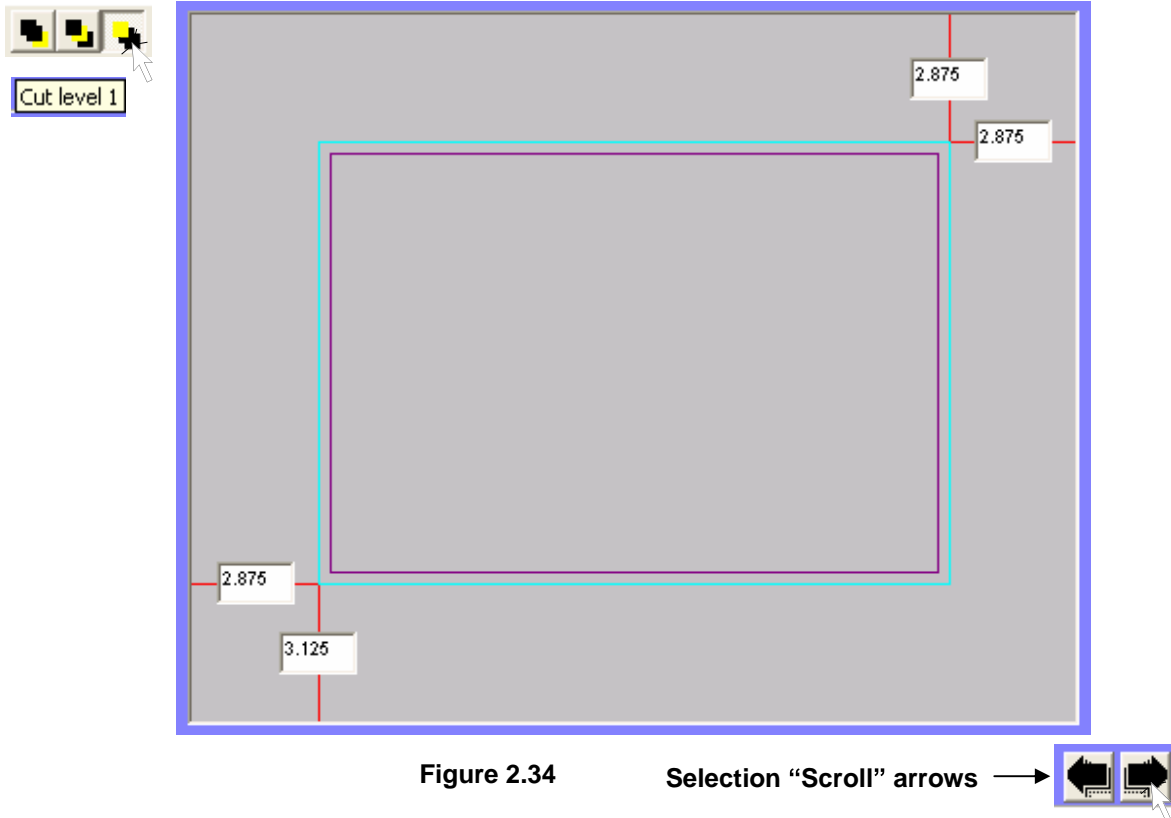


Click the “Confirm Distance” button or press the Enter key to confirm, or click the “X” button to Cancel the command.



**Note:** To create a new concentric shape *inside of*, or *smaller than* the selected shape, enter a negative (-) value in the Set Exposure window.

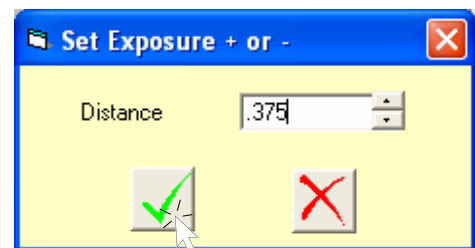
Now that the new “top” mat layer has been added, you will need to designate the mat as such. To do so, click the “Cut level 1” button to place the new layer as the “Top,” or outermost mat in the design (Figure 2.34).



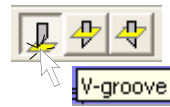
**Note:** The selected shape or opening in a mat design is always shown in light blue. To select a different layer or shape within a design, you may either click on it with the mouse, or click the arrow buttons in the lower-right area of the screen to scroll through the openings in the order they were created.

### Adding a V-Groove

To add a V-groove to the top mat in this example, simply click the “Create Concentric Shape” button again. (Make sure that Cut level 1, or the top mat layer is selected beforehand.) Type in an Exposure value to designate the distance from the top mat cut to the V-groove, .375 (3/8”) in this example.



To designate the new shape as a V-groove cut, click the “V-groove” button on the toolbar.



### Previewing the Mat Layers

To visually confirm that each shape and layer is on the desired mat level, click the Color Preview On button at the bottom of the design screen. Each element of the design will then display in the designated color. In this example, the V-groove cut shows in white, top mat (or level 1) in green, bottom mat (or level 2) in red, and the opening “hole” in light gray (Figure 2.35).

Colors may be designated according to preference in Settings, Configuration, Colors. Simply click the “Color options” button for the corresponding layer you wish to change, and select a color from the palette.

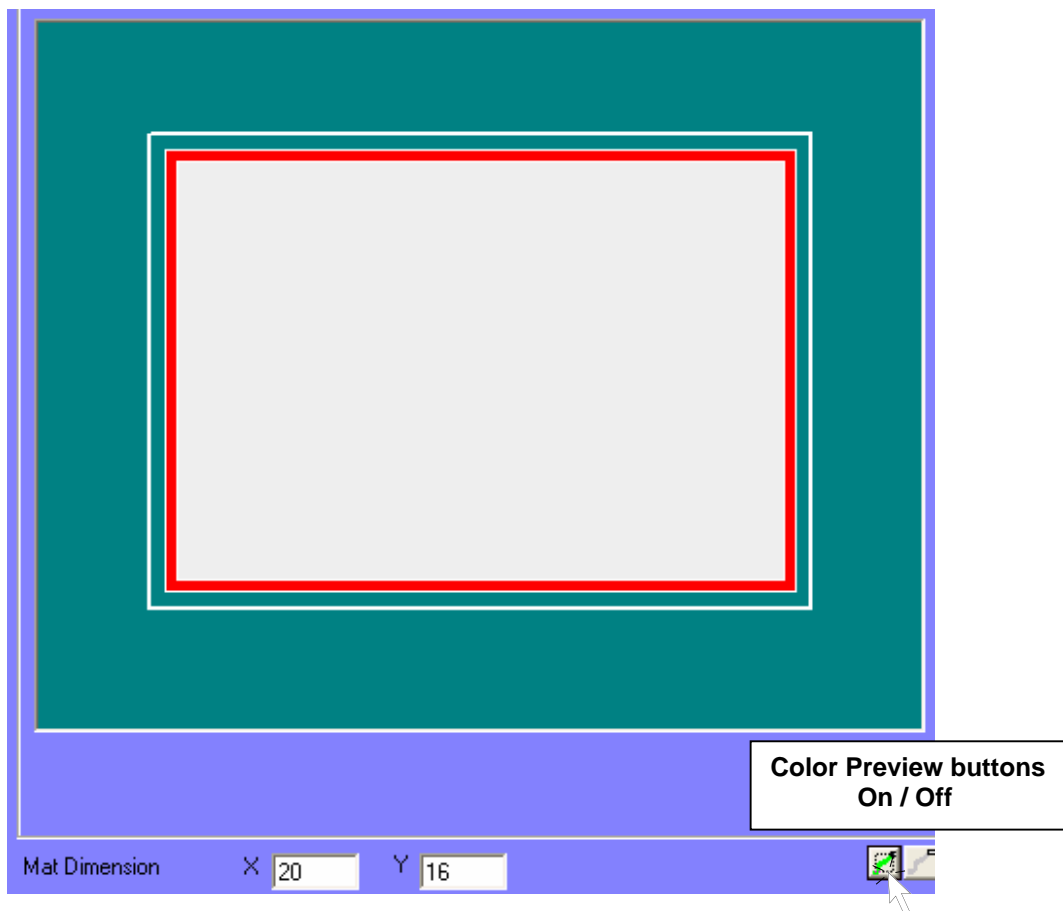


Figure 2.35

## 2.8 Multiple Opening Designs

The design possibilities for a multi-shape/opening design in the Future Mat Designer software are virtually limitless. This example will cover some of the basic design options and techniques available to you, and briefly cover the multi-shape alignment Toolbox.

The diagram below (Figure 2.36) shows a typical multiple opening layout. It consists of a 20"x16" mat with eight photo openings (3.25"x4.75") and one oblong title (8"x1") opening. All pertinent borders and other dimensions are shown as well.

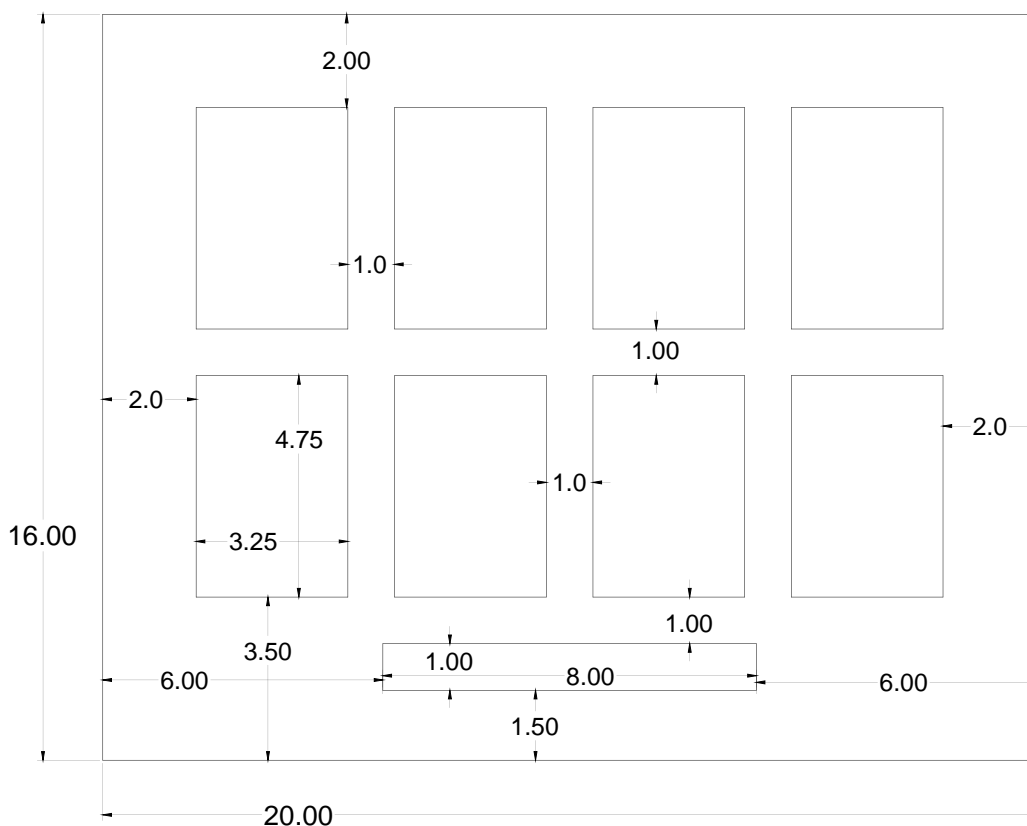


Figure 2.36

Enter a mat size of 20" wide by 16" height in the bottom-left portion of the screen. Click the New Mat button on the toolbar (or File, New Mat). Click on the Insert Shape button and select a basic rectangle from the Open menu of saved Shapes by double-clicking its icon.

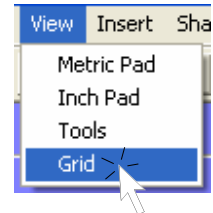
In the selected shape data entry boxes, type in the dimensions of the new shape (rectangle), for this example, X - 3.25" width, Y - 4.75" height.

You may place the mat shape within the mat area in a number of different ways. One of the simplest is by clicking and dragging with the mouse. To click and drag the first opening, *right-click* the opening and drag it around the mat. As you move it, the dimensions to each mat edge are displayed in the four Borders boxes. You

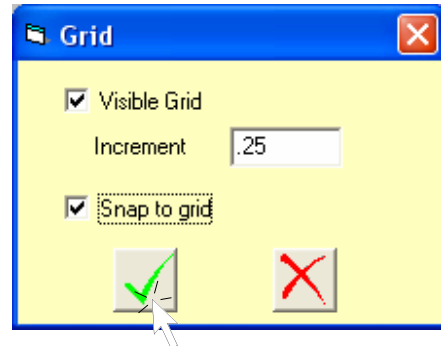
will likely find that it is quite difficult to place the opening precisely where you want it using this method alone.

**Note:** The reason for a *right-click* and drag instead of left-click is to avoid the possibility of inadvertently moving an opening when you merely intend to select it with a left-click.

To make it easier to place openings with precision on the mat, click View, “Grid” from the Menu Bar.



Check the “Visible Grid” and “Snap to Grid” boxes to activate the Grid feature, and enter .25 as the grid Increment for this example. Click the OK check button to confirm.



Try again to right-click and drag the mat shape around on the mat. You’ll now notice that the mat Borders numbers change only in steps, or increments, of .25” (1/4”), making placement quicker and more precise.

**Tip:** If you find that the grid is visually distracting, you may disable the “Visible Grid” checkbox and still retain the *Snap to Grid* function.

Place the opening in the position shown here, 2” from the left edge, and 3.5” from the bottom (Figure 2.37).

You may also place individual mat shapes in a desired location by simply typing the appropriate border dimensions in the border boxes.

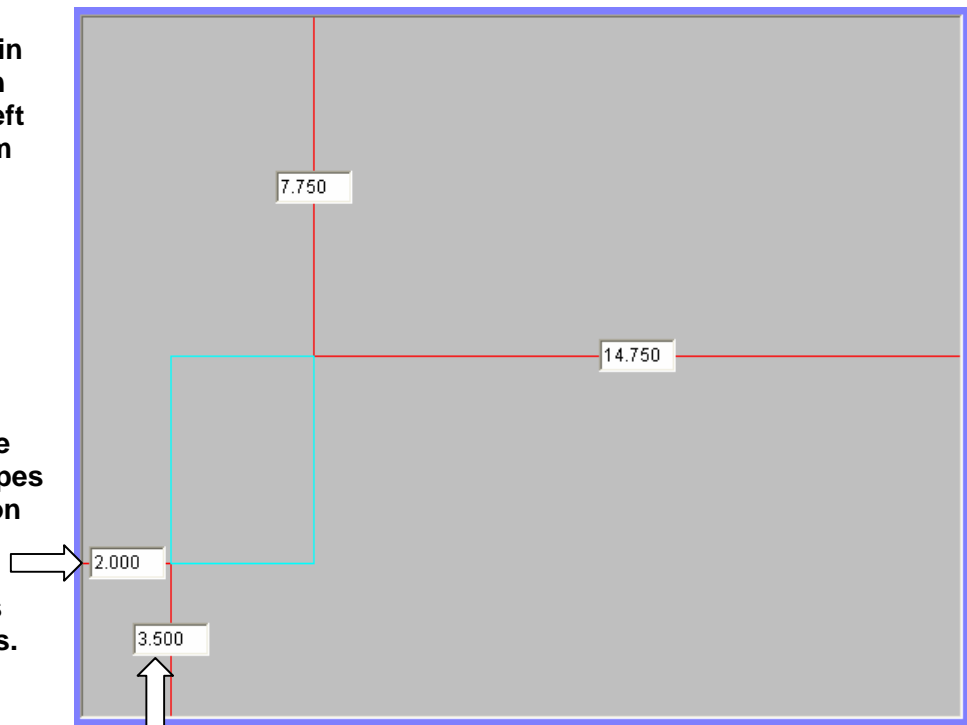


Figure 2.37

### 2.8.1 Copy and Paste



To create additional openings of the same size, click the Copy button on the toolbar (or CTRL+C). This will copy the selected mat shape to the *Clipboard*, or temporary memory of the computer. Then click the Paste button on the toolbar (or CTRL+V) to place a copy of the original opening in the center of the mat area.



Drag (remember to right-click!) the new opening next to the original opening. Don't worry about exact placement at this time. Repeat the Paste command two more times to create the first row of four openings.

### 2.8.2 Aligning a Row of Openings

You may place each of the openings in the first row either with the mouse, or by typing in the appropriate borders for each opening individually. In many cases however, it will be easier to align and set the spacing between openings using the Alignment Tools.

Begin by selecting the first row of openings by clicking and dragging a

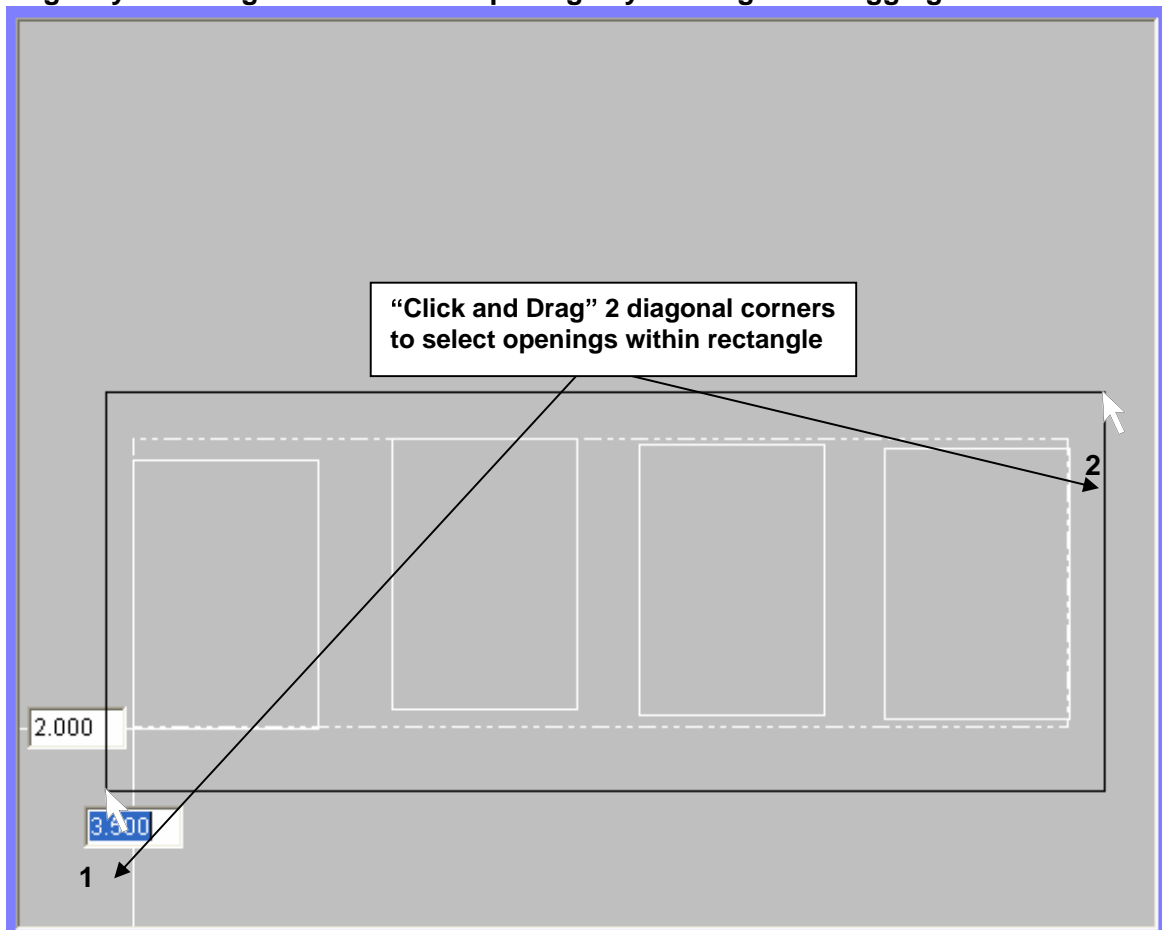


Figure 2.38



Click the “Tools” button from the toolbar (or View, *Tools* from the Menu Bar), to open the alignment toolbox. Click the “Set Distance between Selected Shapes” tool.

The “Set Spacing Distance” box will open. Enter an X distance of 1”, and a Y distance of 0. Press the Enter key or click the check button to confirm.

The four openings will then be spaced evenly, with a 1 inch space between them horizontally (X). The vertical location (Y) of the openings will not change (Figure 2.39).

**Note:** The opening closest to the left and/or bottom edges of the mat is the “reference” opening. It will remain in a fixed position and all other openings will move relative to this opening.

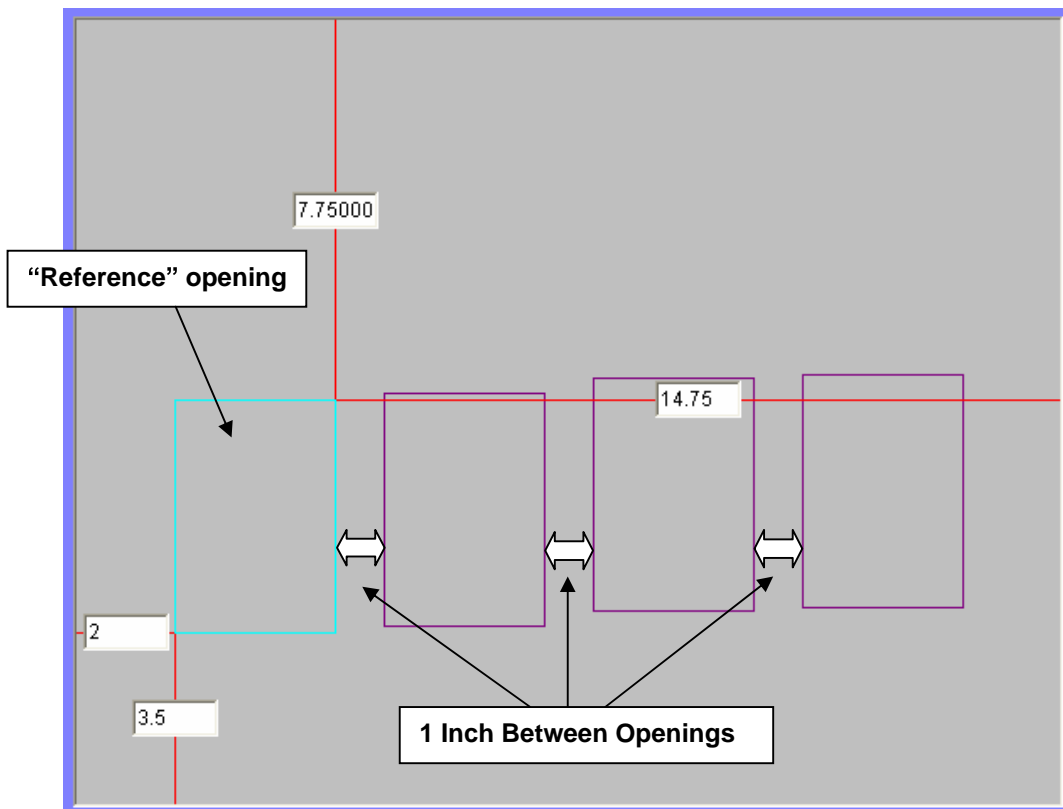
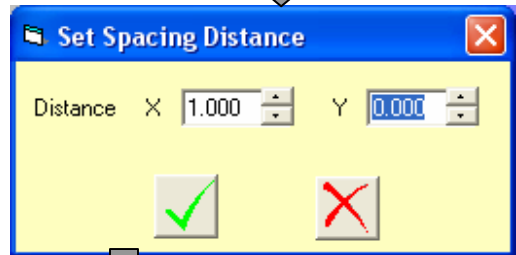
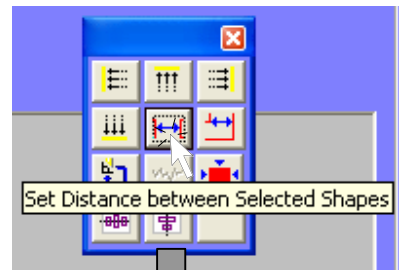


Figure 2.39

### 2.8.3 Aligning Openings on a Common Dimension

Now that the first row of openings has been spaced *horizontally* as desired, it is necessary to align them *vertically* along a common border dimension. You may choose to simply enter the desired bottom border for each opening (3.5"), or you can align them as a group.

Select all four of the openings as a group again. Click the "Align to Bottom Border" tool from the toolbox.

The first row of openings will now be aligned with each other along a common vertical dimension, in this example a border of 3.5" from the bottom edge of the mat (Figure 2.40).

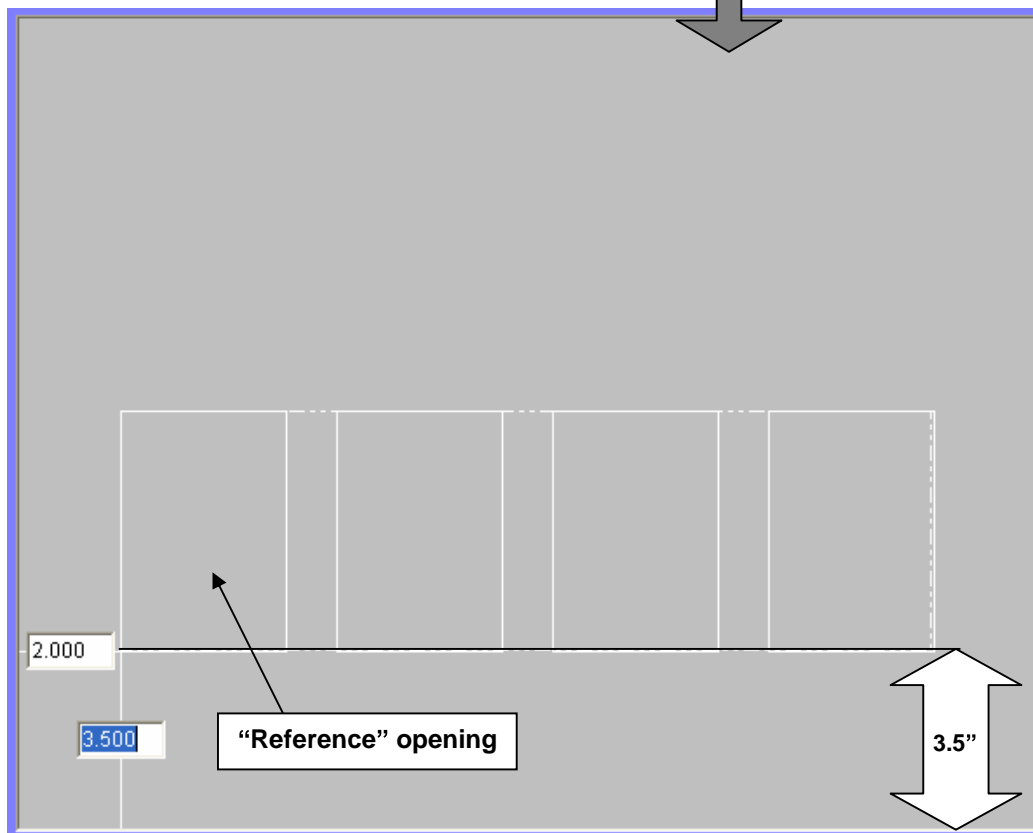


Figure 2.40

**Note:** When using the "Align to Border" tool functions, the opening that is *closest to the designated border* becomes the "reference" opening. Make sure that none of the openings is closer to the bottom border than the one at lower-left before executing the Alignment command.

## 2.8.4 Copying More than One Opening

Now that the first row of openings have been aligned and positioned, you may choose to copy them as a *group* in order to save time. Select the four openings as a group once again. Click the Copy button on the toolbar (or Ctrl+C). Click Paste (or Ctrl+V), and a new row of identically sized and spaced openings will appear in the center of the mat. (Figure 2.41).

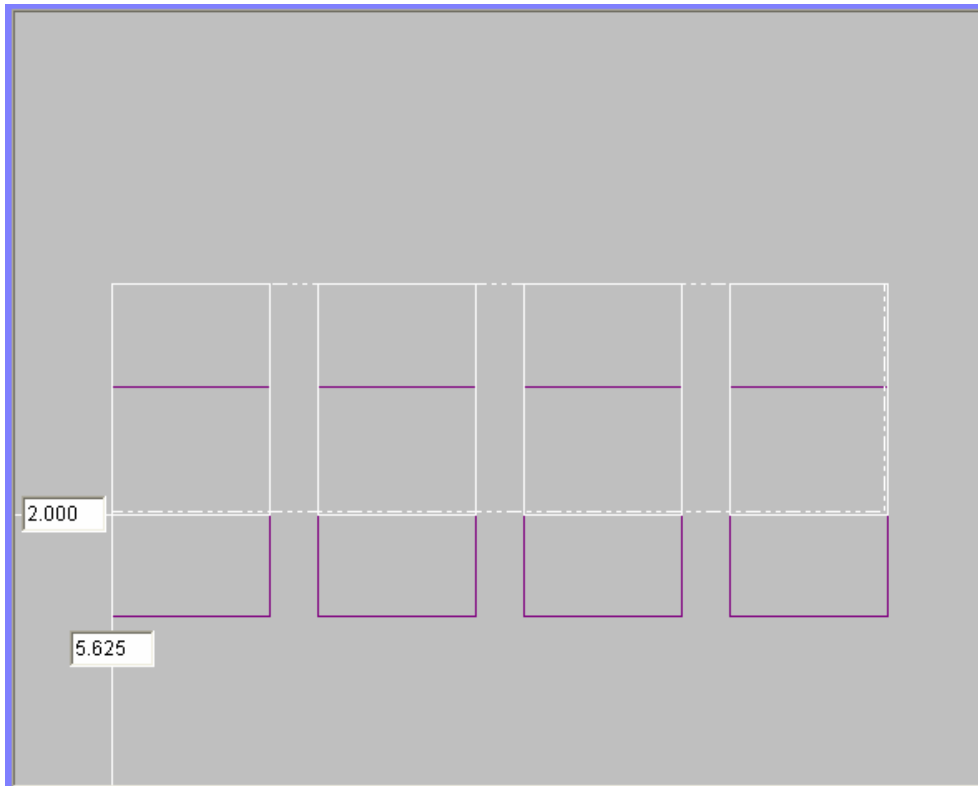
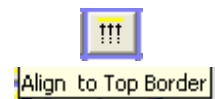


Figure 2.41

To align these four new openings with the correct top border, you may –

- Enter a bottom border dimension for all four selected openings, if known (9.25” for this example), or:
- Select each opening individually and enter a 2” top border, or:
- Select *one* of the openings, and enter a 2” top border. Then select all four of the new openings again (Figure 2.42, next page), and click the “Align to Top Border” tool.



**Note:** When selecting multiple openings, only those openings that are *entirely* enclosed within the rectangular selection frame will be selected.

**Tip:** For an *alternate* method of selecting more than one shape/opening, click an opening, then hold down the Shift key as you click additional openings to add them to the selected group.

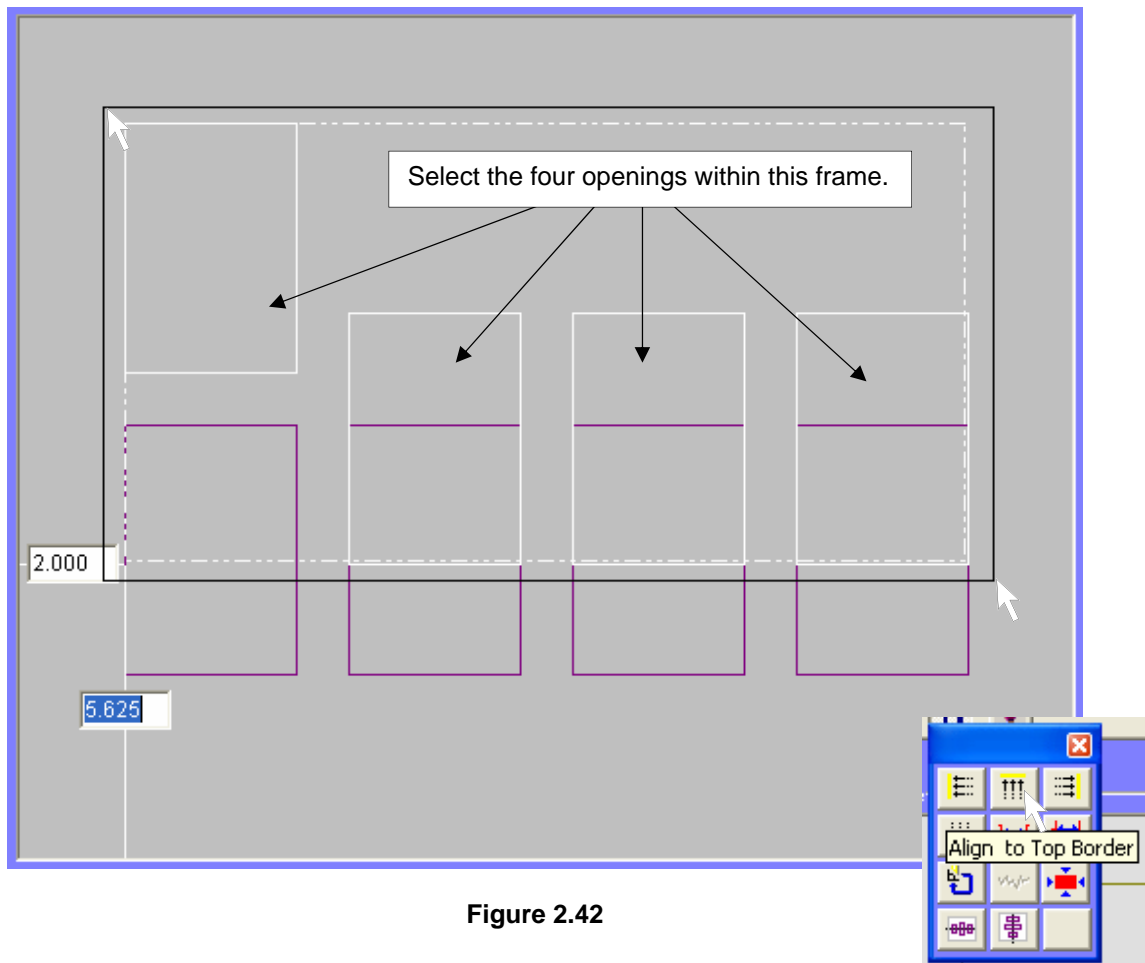


Figure 2.42

To add the last “title” opening to the design, click the “Insert Shape” tool, and select a rectangle shape from the menu. Enter an opening size of 8” (X) by 1” (Y) (Figure 2.43).

Enter a left border of 6” and a bottom border of 1.5” to place the title opening in its final location (see diagram, Figure 2.36).

All nine mat openings should now be in the correct location for cutting.

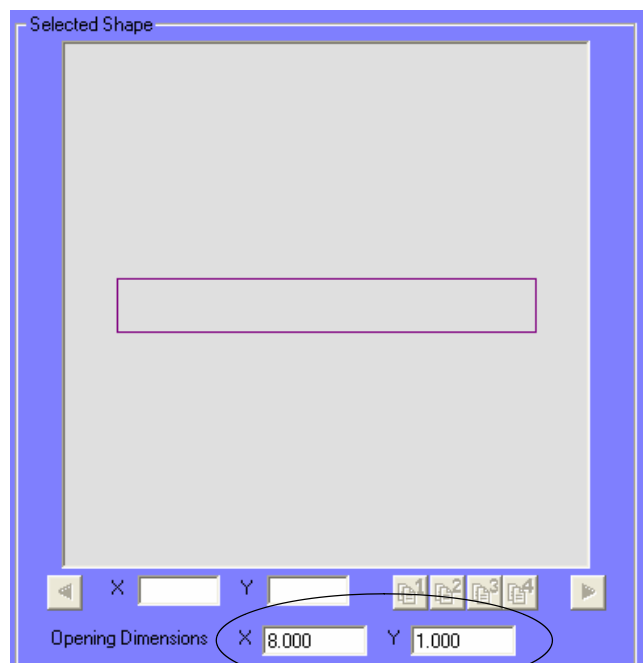


Figure 2.43

## 2.8.5 Cut Sequence


Cut Sequence

You may choose to designate the cut sequence in which the openings will be cut. Select each opening in turn and type the desired number for its cut order in the “Cut Sequence” box at the right of the screen.

## 2.8.6 Add a V-Groove

You may add a V-groove around each opening (Concentric Shape tool) or, as in this example, a single V-groove which will bisect the title opening vertically. We would like the V-groove to be  $\frac{5}{8}$ ” from the openings on the top and sides of the mat (or  $1\frac{3}{8}$ ” from the edges), and passing through the vertical center of the title opening (2” from bottom edge).

Click the *Insert Shape* tool to view the “Open” menu screen.

 Insert Shape

The V-groove will be placed 1.375” from the top and side borders, and 2” from the bottom border. Enter those borders in the lower left portion of the Open menu, then double-click the rectangle shape to insert it into the design (Figure 2.44).

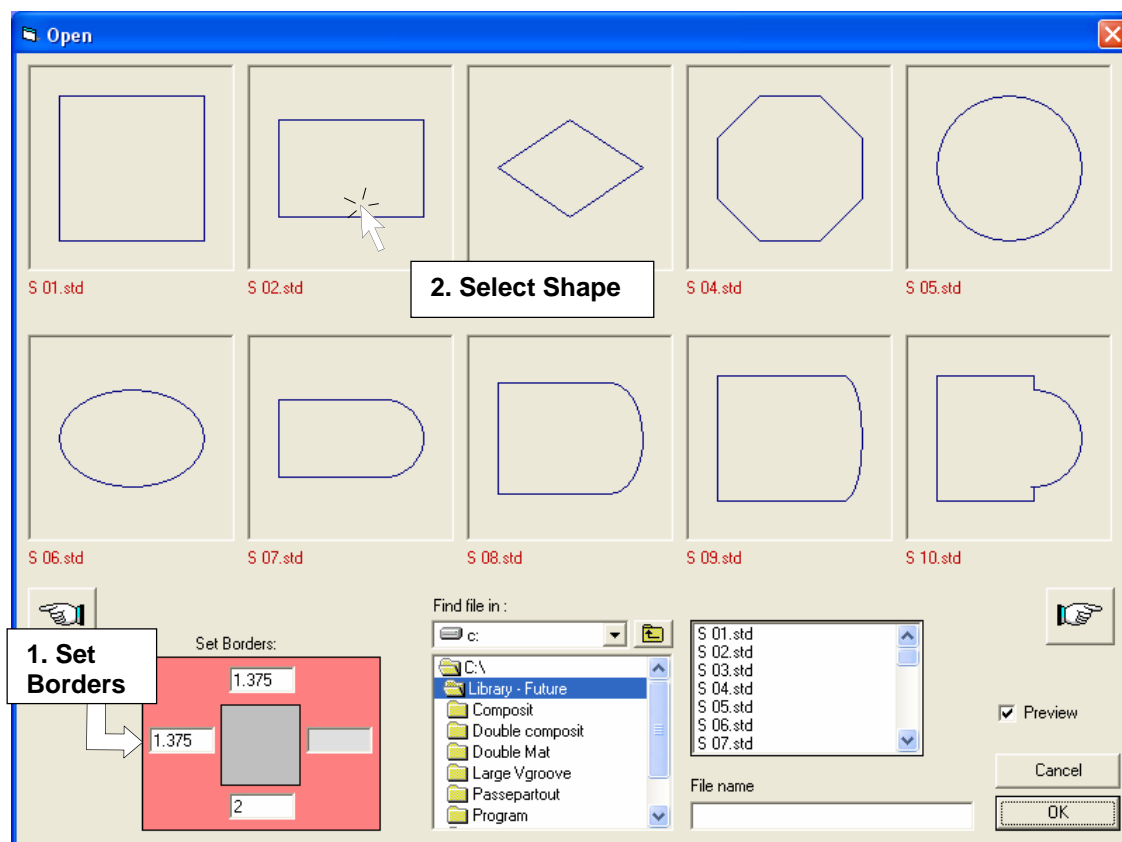


Figure 2.44

The new rectangle will then be placed on the mat with the desired border dimensions. Click the “V-groove” toolbar button to designate this rectangle as a V-groove cut.

**Tip:** V-grooves should be cut *before* mat openings whenever possible, especially when the V-groove will be passing through a “void” area in the mat such as a title opening.



### 2.8.7 Mat Preview

You may preview the mat layers/colors before cutting by clicking the Preview On button at the bottom of the design screen.

The multiple opening design you have created should appear similar to Figure 2.45 below.

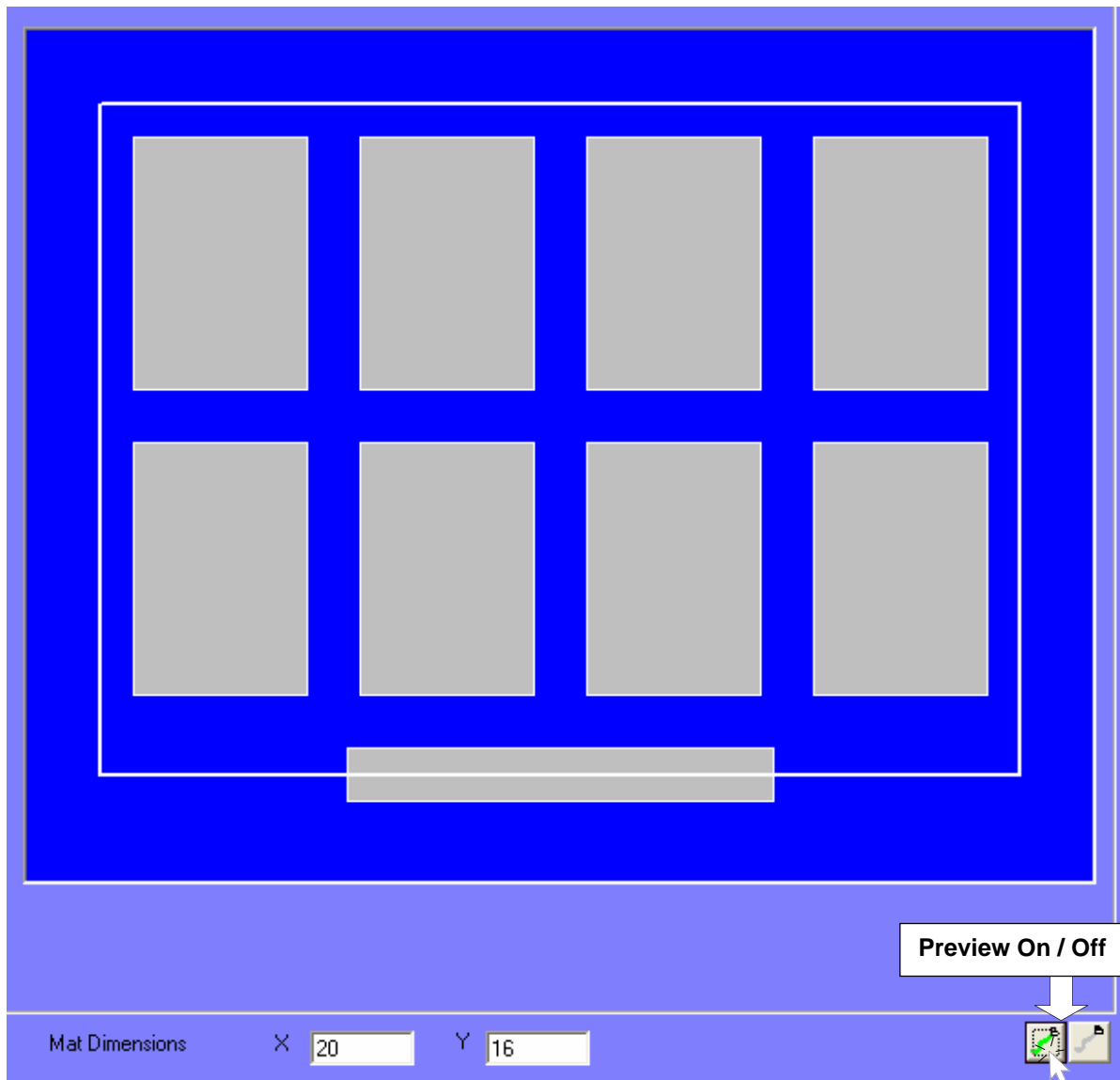


Figure 2.45

## 2.9 Creating New Shapes

The Future Mat Designer Software gives you the ability to create your own custom-designed shapes, which can then be saved as fully scalable templates. You may also open any saved Shape template at a later time, modify it, and re-save it as a new Shape.

The New Shape and New Corner design screens share many of the same tools and capabilities. We will cover the New Shape screen first.

### Screen Layout



To open the New Shape creation screen, click the “New Shape” tool on the toolbar, or Shapes, New Shape (F7) from the menu. The blank New Shape screen appears (Figure 1).

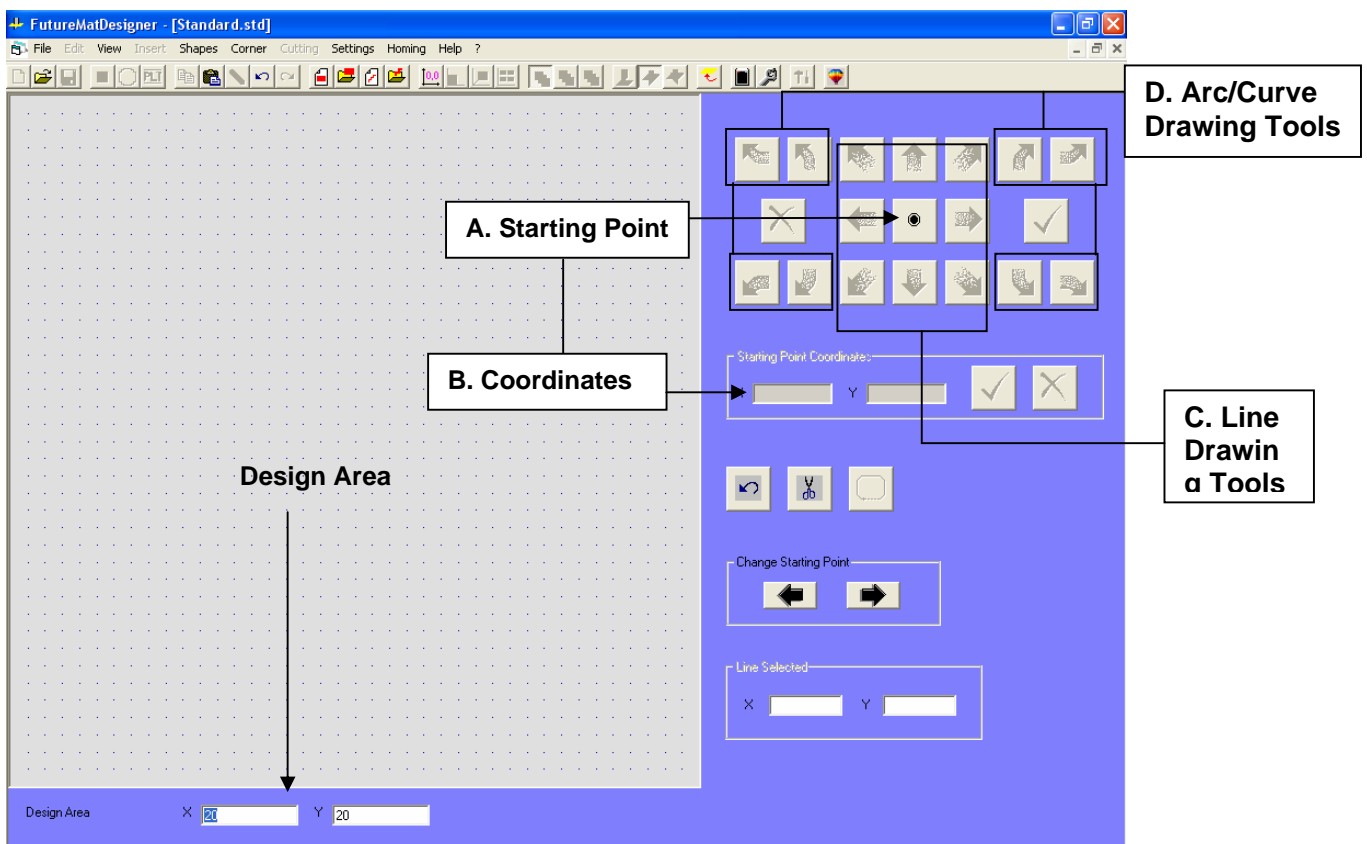


Figure 2.46

Before starting a New Shape, enter an appropriately sized Drawing Area at the lower-left of the screen. The default design area size is 20”x 20”, but you may make it larger or smaller based on the dimensions of the shape/opening you will be creating. The aspect ratio of the design area will always remain square, i.e.: 20 x 20, 30 x 30, etc.

**Note:** The Design area is shown with a default grid of .5” increments. You may use this as a visual aid when drawing, although there is no “Snap to Grid” feature option.

To begin any new shape drawing, you must first designate a Starting Point (A). You may set the starting point either by clicking arbitrarily with the mouse, or more precisely by entering X,Y coordinates in the Starting Point Coordinates boxes (B).

**Note: The Starting Point in the drawing will also function as the starting cut point on the Future machine. You may select an alternate Starting point after the drawing is complete by clicking the "Change**

After you have designated the Starting point coordinates, you will begin drawing the shape itself with the Line or Arc tool buttons.

Drawing of any new shape is done by selecting a sequence of connected lines (C), and/or arcs (D), and entering the desired dimensions for each. You will generally know in advance most or all of the dimensions required in order to complete a new shape drawing.

There are 8 Line and 8 Arc drawing tools available; all are directional in nature. With a bit of practice, you will find them to be quite easy and intuitive to use (Figure 2.47).

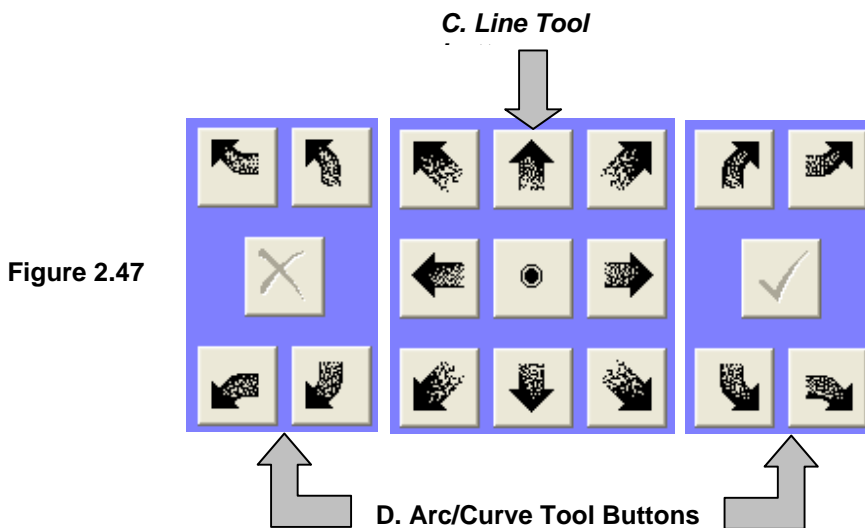


Figure 2.47



## Sample New Shape Drawing

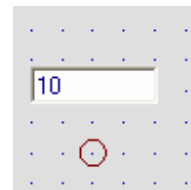
For this example, we'll enter a starting point of 3,3 and press Enter or click the OK /Confirm check button. The Starting Point (3,3) will appear as a small circle in the lower left portion of the Design area.



The sample Shape design will be an arch-dome mat, with an oval (elliptical) shaped top. It consists of five (5) line segments and two (2) elliptical arcs. The necessary dimensions for each drawing element are shown in Figure 3.

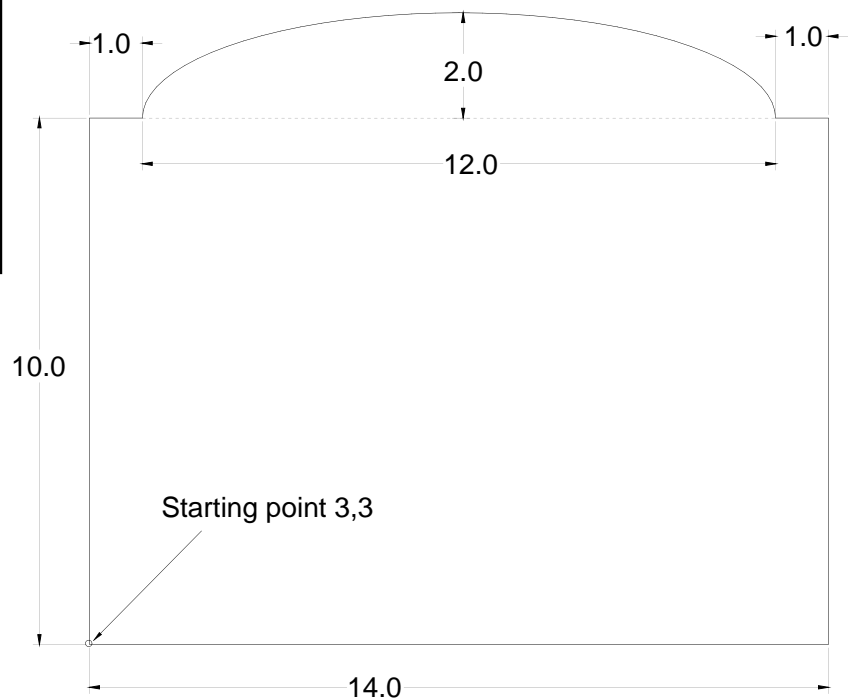


1. Begin by clicking the Up arrow line button. A dimension entry box will appear just above the Starting point, so that you may designate the length of the line. Enter a line length of 10", and press the enter key or click the green OK/Confirm button. A 10" vertical line will be drawn in the Design area.



**Note: You may draw any New Shape or Corner in either a clockwise or counter-clockwise direction. This is strictly arbitrary, and will not affect the cut direction. For this example, the drawing**

**Figure 2.48 :  
New Shape  
Dimensions**



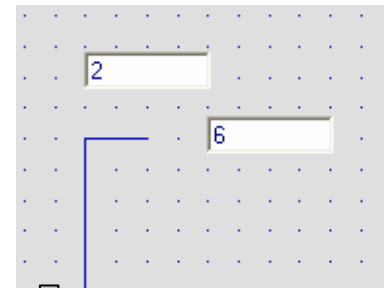
2. Proceed next to the 1-inch "shoulder" line that begins at the top point of the 10" vertical line. Click the right direction arrow button, and enter a length of 1-inch.



Click the Up – Right Arc button to draw one half of the “dome” portion of the shape. Two dimension entry boxes will appear – one for the horizontal and one for vertical arc size. Enter a horizontal distance of 6” (1/2 of the overall oval width of 12”) and a vertical distance of 2” (see Steps 3a & 3b).

3. Draw the second half of the elliptical arc-dome by clicking the

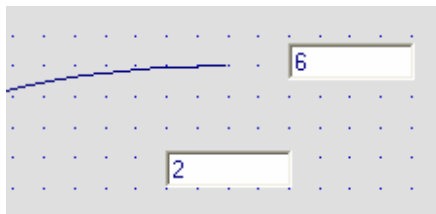
**Note: Each Arc drawing command consists of 90° of a circle or ellipse (oval). Equal horizontal and vertical arc dimensions will result in a circular arc; unequal dimensions result in an elliptical arc.**



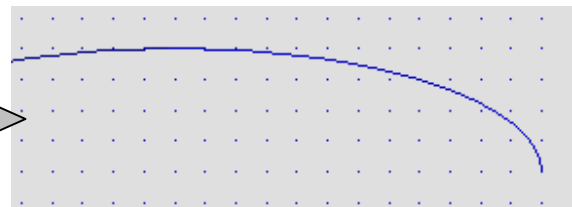
Step 3a: 1<sup>st</sup> Arc dimensions



Right – Down Arc button. Enter the same dimensions as the first arc: 6” horizontal and 2” vertical. These dimensions should appear by default, since they are the last values entered (Steps 4a & 4b).



Step 4a – 2<sup>nd</sup> Arc dimensions



Step 4b – 2<sup>nd</sup> Arc completed

Figure 3b: 1<sup>st</sup> Arc complete



4. Continue by drawing the “shoulder” line segment at the right side of the arc. Click the Right line button again, and enter the same 1” length.



5. Click the Down arrow button, and enter a vertical line dimension of 10”, as on the left side of the shape.

6. To complete the outline of the new shape, you may either:



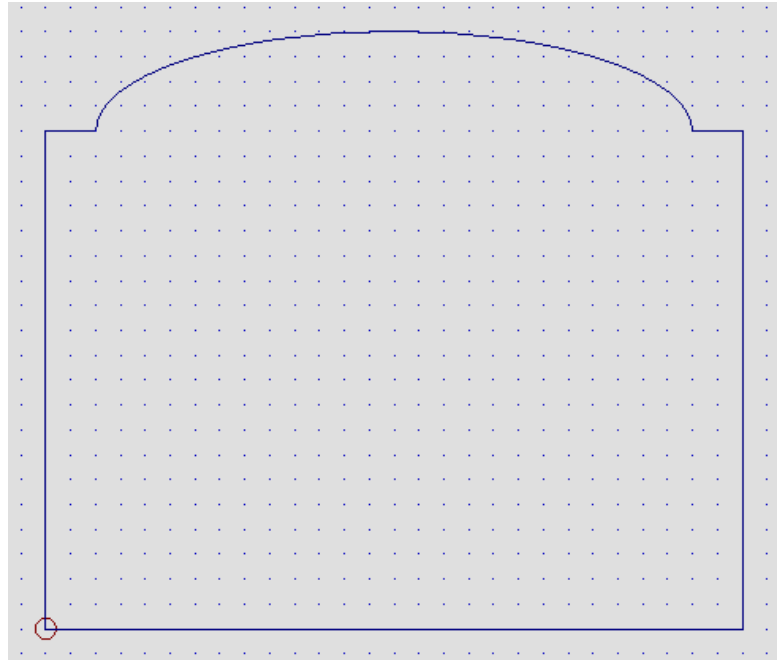
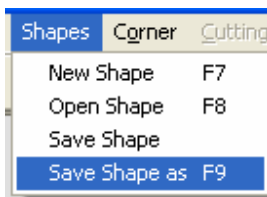
A. Click the Left arrow button, and enter a line length of 14”, **or:**



B. Click the “Close Shape” toolbar button, which automatically joins the last endpoint drawn with the Starting Point.

Your first New Shape is now complete!

To save the shape for cutting or future use, click Shapes, Save Shape as from the menu bar. The default save directory will normally be Future – Library folder. Name the new shape “arch test-1”.



## Inserting a Saved Shape

To open or “Insert” a saved shape for cutting, simply click the “Insert Shape” tool or menu option. Select the shape from the Open menu (Figure 4), by double-clicking it. Keep in mind that the shape will open with the *exact* dimensions you created it with. If you begin with a larger or smaller mat size and enter Border Dimensions in the Open menu, the Shape will be scaled accordingly.

Once the saved Shape (or Corner) has been opened in the standard design screen, it can be modified as with any other template. You may add layers, cut it as an opening or a V-groove, or Rotate or Scale it as desired.

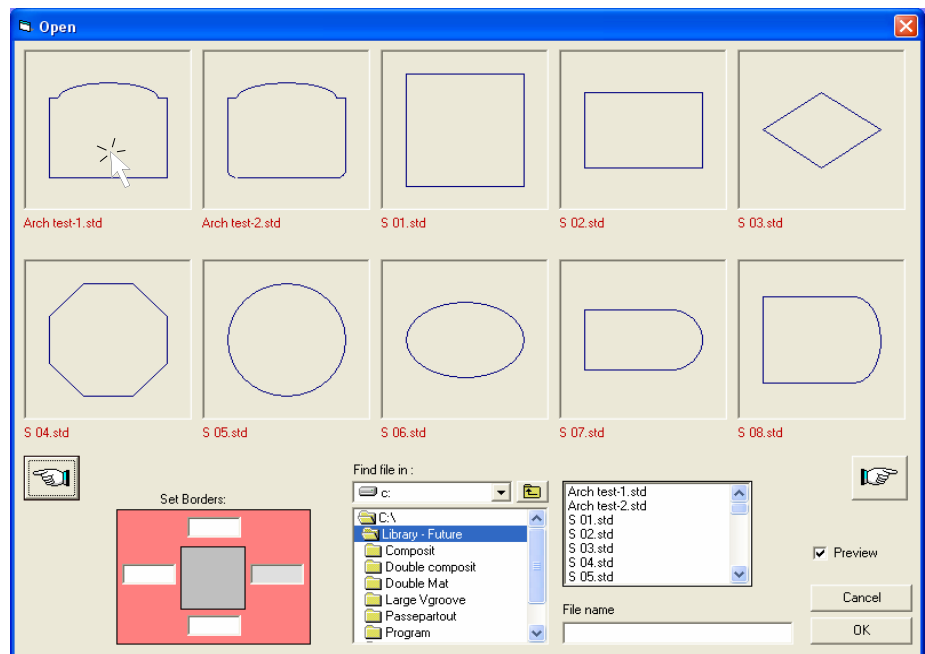


Figure 2.49

## 2.10 Creating a New Corner Design



You may create a New Corner design template in much the same manner as creating a New Shape. Click the “New Corner” toolbar button or menu option to open the New Corner design screen (Figure 2.50).

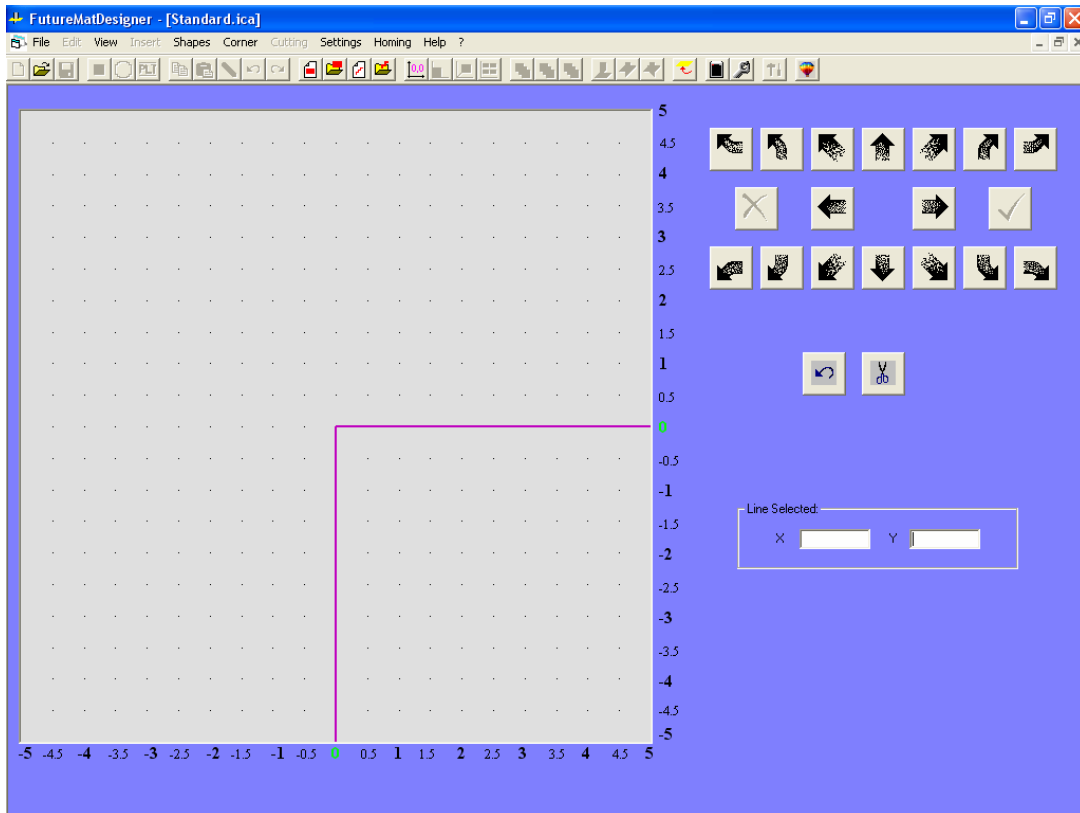
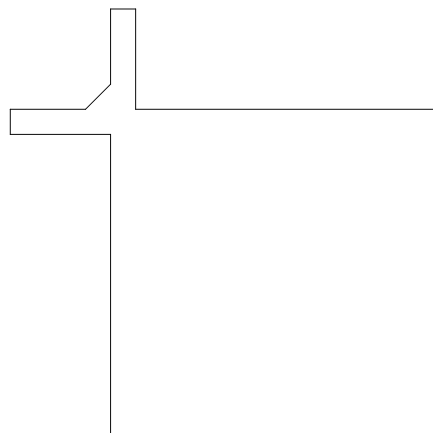


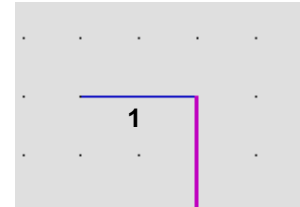
Figure 2.50

The arrow Line and Arc drawing buttons functions are the same as the New Shape tools, although there is no “Starting Point” command. The Starting point of the drawing (0,0) is simply the intersection point of the two corner lines drawn on the beginning New Corner screen.

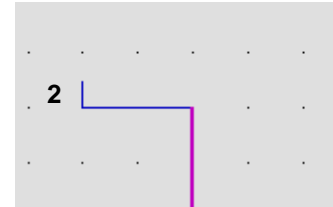
The diagram at right shows the design we will attempt for this tutorial example. It consists entirely of lines (7), and will be drawn in a clockwise direction.



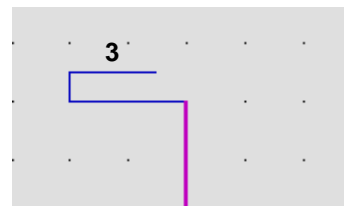
1. Click the Left line arrow, and enter a length of 1" for the first line.



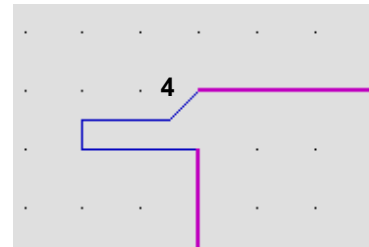
2. Click the Up line arrow; enter a length of .25".



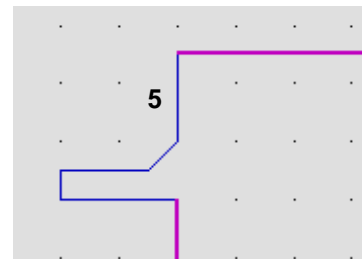
3. Click the Right line arrow; enter a length of .75".



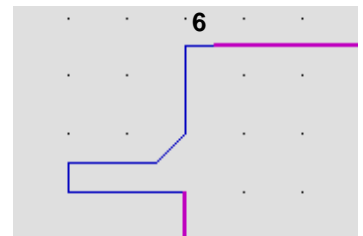
4. Click the Up – Right arrow; enter .25" for both X and Y dimensions. Don't be concerned by the completed look of the corner at this point; this is normal.



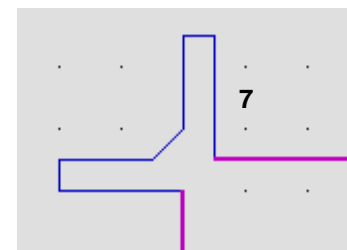
5. Click the Up arrow; enter a length of .75".



6. Click the Right arrow; enter a length of .25".



7. Click the Down arrow; enter a length of 1". This completes the New Corner design sequence!



## Saving the New Corner

Save the New Corner design by clicking the Corner, “Save Corner As” menu option. Save the design as “Teepee 1” in the C:\Library - Future directory (Figure 2.51).

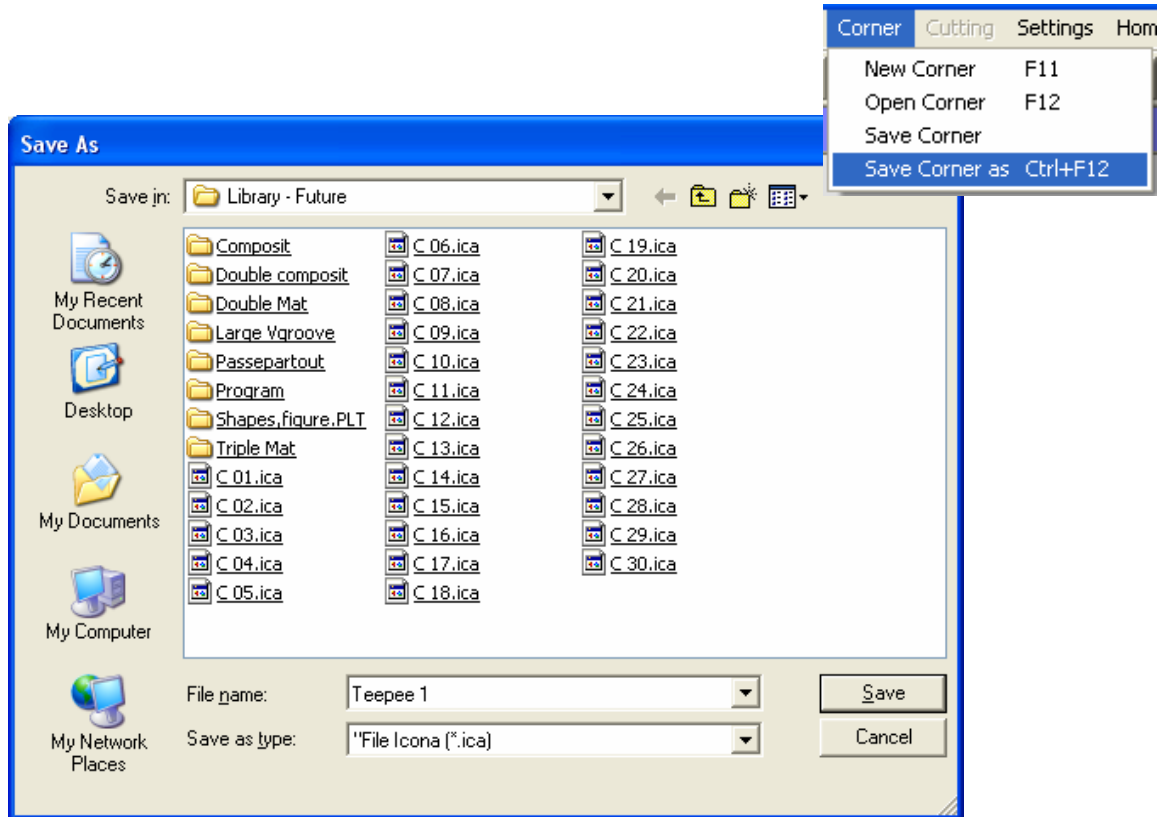


Figure 2.51

### 2.10.1 Modifying a Corner Template



From the standard or New Corner design screen, click the “Open Corner” toolbar button. Scroll to the last Corner menu and select the “Teepee 1” template by double-clicking it. We now want to make a few changes to the design so that it looks like Figure B below.

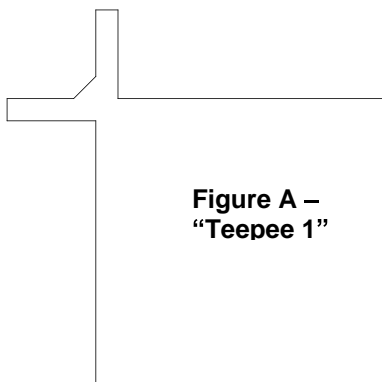


Figure A –  
“Teepee 1”

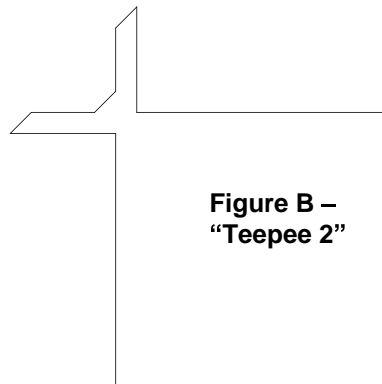
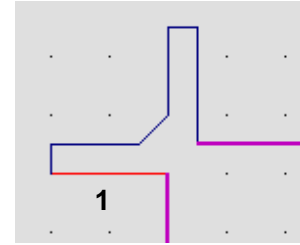
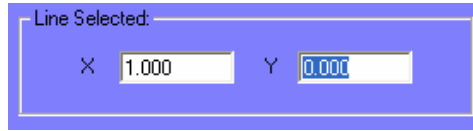
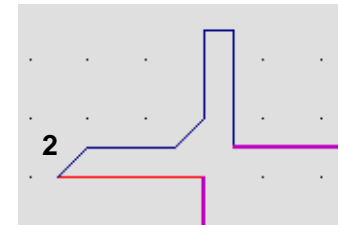


Figure B –  
“Teepee 2”

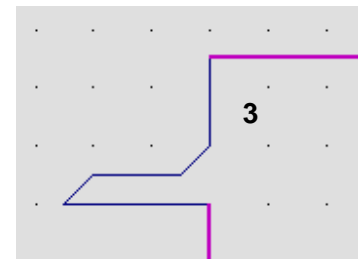
1. Click on the first line drawn when the New Corner was created (1"-Left) to select it. It will be highlighted in red, and the "Line Selected" boxes will display X = 1" and Y = 0".



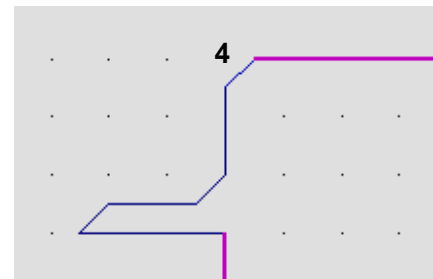
2. Change the X dimension from 1" inch to 1.25"; leave the Y dimension at 0. The Corner will change to appear like this:



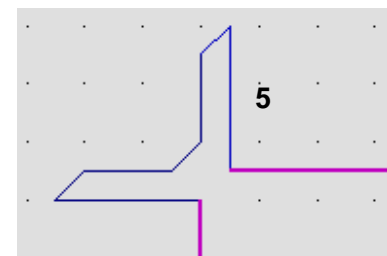
3. Click the *Cancel Last Line* button **twice** to delete the final two lines drawn when the corner was created. The corner will look like this now:



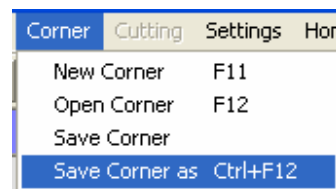
4. Click the Up – Right line arrow button, and enter both X and Y dimensions of .25". The drawing should now look like this:



5. Click the Down arrow, and enter a length of 1.25" to complete the redrawn Corner.





Save the Modified corner as "Teepee 2", and you now have two new Corner templates to choose from!




## 2.11 Operation - Cutting Mats

When the desired mat design has been completed, you may select from one of the three mat cutting options (Toolbar or Menu options for each):

 **Single Mat (NO Outside Cut)** 1. **Single Mat (NO Outside Cut):** Cuts all mat openings, layers, and V-grooves of a design. The mat must be sized prior to cutting, with a minimum border of .75" for mat openings and 1.125" for V-grooves or reverse bevels. If either border is less than these dimensions, one of the other two Cut options must be used.

 **Single w/ Outside Cut** 2. **Single with Outside Cut:** Cuts all mat openings, layers, and V-grooves of a design, followed by the outer mat dimensions. One mat at a time is cut, and approximately 1 1/8" (27mm) of mat waste is left at the left and bottom edges. For example: to cut an 8" x 10" mat, the mat blank must be at least 9 1/8" x 11 1/8" prior to cutting.

 **Multi-Mat Array** 3. **Multi-Mat Array:** Cuts multiple copies of the mat design to fill the available sheet of board entered. The mats will be laid out on the sheet of matboard in order to obtain the greatest number of mats with the least amount of waste (Optimization). Each V-groove and opening on a given layer will be cut, followed by the outside/sizing cut for each mat.

The on-screen prompts and inputs for each Cut Type are described in more detail below.

 **Cut Option 1: Single Mat – NO Outside Cut** (normal cut procedure)

### Mat Thickness

With each of the Cut Type options, an Input Mat Thickness window will open (Figure 2.52). You may use the default setting, or enter a mat thickness for any mat layer which is different from the default value, usually ~0.047" for a standard 4-ply mat. This will allow the program to prompt you to adjust the blade depth dial correctly for the appropriate mat layer during cutting, and will automatically compensate for changes in overcuts and mat opening size that may occur with a thicker or thinner matboard.

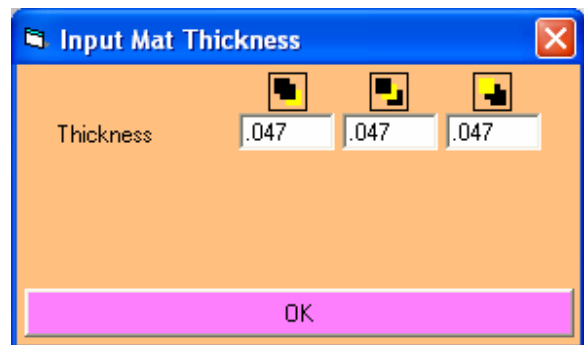



Figure 2.52

 **Homing**

If you are cutting for the first time in a session, the machine will not cut until a Homing sequence has been performed. Click OK when this message box appears to move the cutting head to the X, Y, and Z-axis "0", or "Home" position.



## Cut Commands

After the Homing movement has been completed, you will have to reselect the Cut Type option. The Cut Commands screen will then open (Figure 2.53).

This screen consists of the commands and options below.

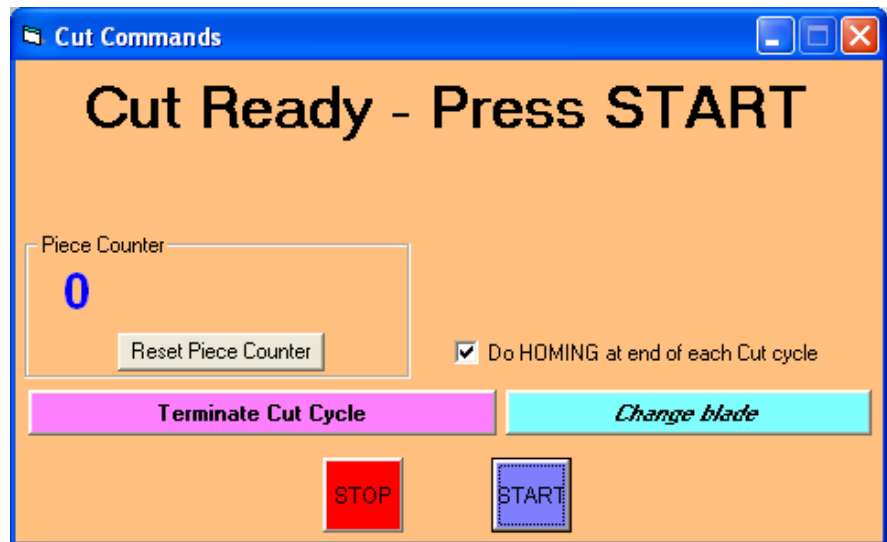


Figure 2.53

**Reset Piece Counter:** Click this button to reset the Piece Counter to 0. The program will keep a count of the quantity of *complete* mats that have been cut, regardless of the Cut Type option selected.

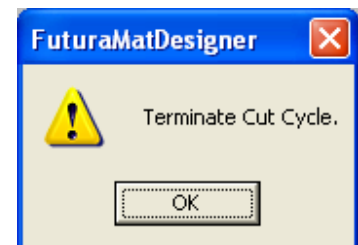
**Do HOMING at end of each Cut cycle:** Checking this box “on” will make the machine automatically perform a homing sequence after each Cut cycle. A Cut cycle consists of any complete mat design: 1, 2, or 3 mat levels and any V-grooves as well. You may elect to leave the box checked off in order to speed up the cutting of large production runs, although re-homing should be performed periodically to maintain optimum cut accuracy.

**Change Blade:** Rotates the cutting head and blade to allow easier access for blade replacement (see section 1.3, *Blade Replacement* procedure).

**Start:** Initiates the Cut cycle sequence. Mats will be cut from the top mat (Mat 1), to the bottom (Mat 3). V-grooves will cut *before* the mat opening(s) for each corresponding layer.

**Stop:** Will instantly “Pause” the cut at any point in the cycle. The blade will remain either plunged into the mat or retracted, depending on the point in time the Stop button was clicked. Click Start to resume cutting at any time.

**Terminate Cut Cycle:** Aborts or ends the Cut cycle. Click this command to return to the design screen when a mat has been completed, or during a panic stop or other situation. Click OK on the “Terminate Cut Cycle” window which appears after clicking this command (or when pushing the Emergency Stop knob inward). The clamps will release the mat(s), and the cutting head will automatically return to the Home position.



## Cutting - Screen Prompts

Depending on the type of design being cut, one or more of the following screen prompts will be shown during the cut cycle:

### **Adjust Blade Depth for V-Groove:**

Turn the blade depth knob to the appropriate setting on the dial, usually ~1mm for a 4-ply mat.

**ADJUST BLADE Depth for V Groove.**

**Press START to continue.**

### **Adjust Blade Depth for Opening:**

Turn the blade depth knob to the appropriate setting on the dial, usually ~1.5mm for a 4-ply mat.

**ADJUST BLADE Depth for Mat Opening.(0.06 mm)**

**Press START to continue.**

### **Remove Scrap Cut-Outs:**

Allows you to remove any V-groove or mat opening scraps prior to executing the next cut.

**REMOVE SCRAP CUT-OUTS.**

**Press START to continue.**



### Cutting “Face Down” (optional)

Each of the three (3) Cut Types may be executed by cutting from the back surface of the mat, such as when there is a delicate surface paper that may be marred by the rubber roller on the cutting head. Cutting from the back-side, or “Face Down,” proceeds in much the same manner as the standard face-up cut, except for the way that the mat is placed on the machine. However, multiple layer mats cannot be pre-adhered together before cutting as with the standard “Face Up” method. The Cut Commands window will also display the Cut Face Down icon as a reminder (Figure 2.54).

**Note:** Face Down cutting is done with a counter-clockwise cut direction. Slight overcuts will be visible from the back surface of the mat only. To cut a reverse-bevel mat from the back of the mat, select BOTH the “Reverse Bevel” and “Face Down” buttons.

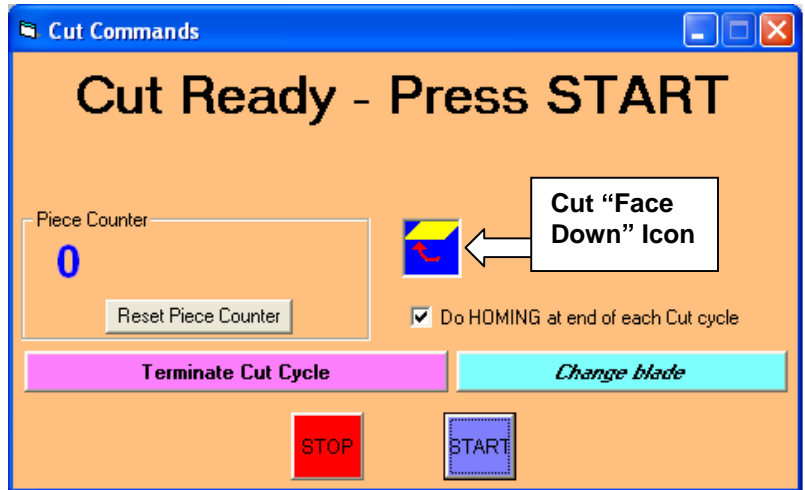
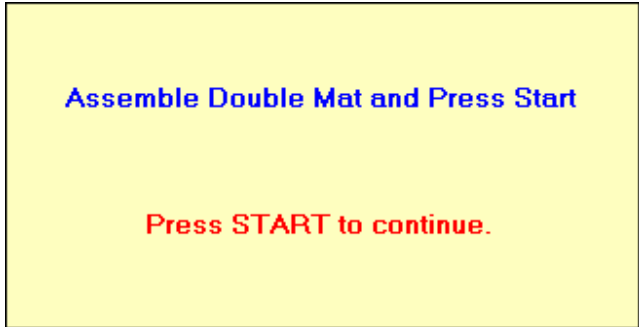


Figure 2.54

### Cut Face Down; Multiple Mat Layers:

When cutting from the back surface of the mat with double or triple layers, you will be prompted to assemble the subsequent layers together at the appropriate time. Adhere the mats with ATG and press start to proceed to the next mat.





### Cut Option 2; Single Shape with Outside Cut

This Cut Type window contains the following options (Figure 2.55):

**Starting Point – Shape:** Designates the X and Y minimum distance from the Home position at the lower left corner of the mat, or the point at which the Outside (sizing), cuts will be made. This distance will vary depending on whether a clockwise or counterclockwise outside cut is made.

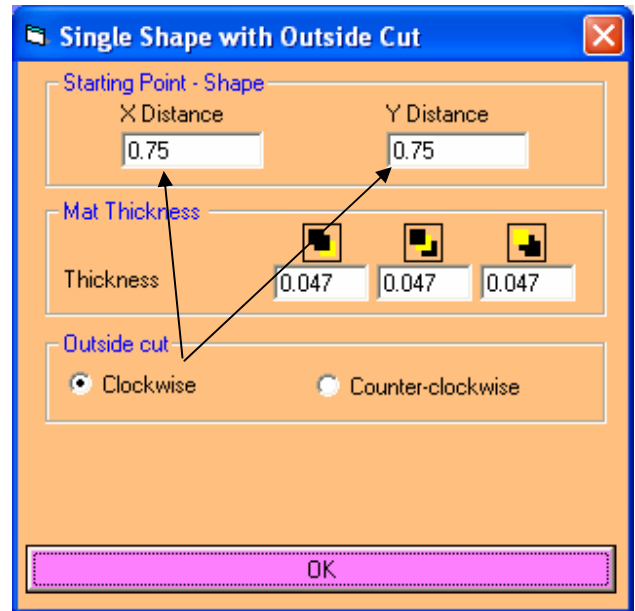


Figure 2.55

**Mat Thickness:** Designates the mat thickness for any and all mat layers being cut. Change these values only if the matboard thickness varies significantly from the default setting (see Figure 2.60, page 86).

**Outside Cut - Clockwise / Counter-clockwise:** Select the appropriate direction for the outside cut, depending on whether you want the bevel to be visible from the mat face or not. Note that the amount of mat wasted (Starting Point – Shape), is greater when the counterclockwise sizing cut direction is selected (Figure 2.56).

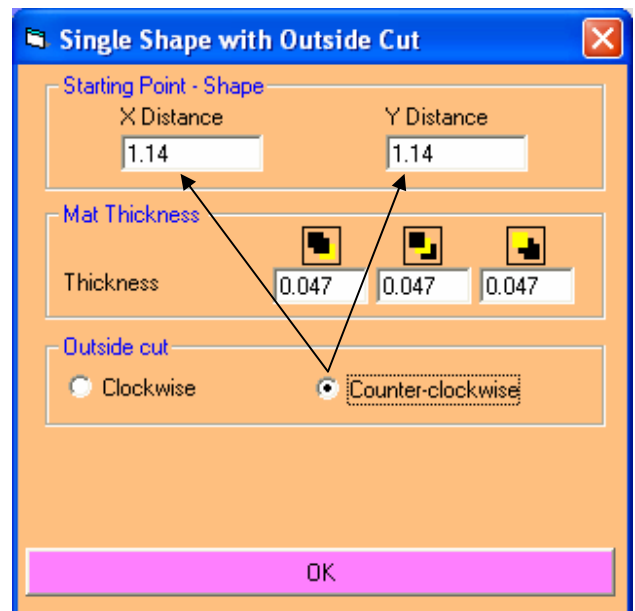
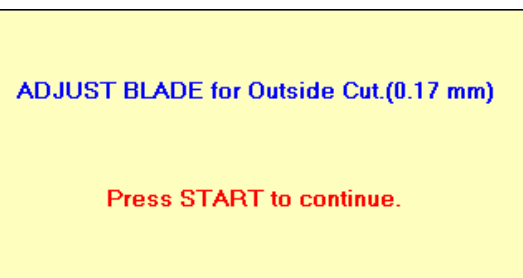


Figure 2.56

### Adjust Blade Depth for Outside Cuts:

Turn the blade depth knob to the appropriate setting on the dial. This setting will depend on the *number* of mat layers and *thickness* of each mat layer (see Figure 2.60, *Mat Thickness chart*.)





### Cut Option 3 – Multi-Mat Array

The Multi-Mat Array cut option screen contains the following inputs and parameters (Figure 2.57):

**Mat Thickness:** The thickness of each mat layer being cut. Normal default thickness is .047” for a 4-ply mat.

**External Mat Dimensions:** Enter the X and Y mat dimensions (width and height respectively) of the sheet of mat being cut.

**Cut Type:** The multiple mat cuts will be arranged on the available mat area so that the maximum quantity of mats can be cut. You may select from either of the two priorities:

- **Maximum Precision:** Cuts each mat precisely as designed regardless of the amount of waste produced when sizing cuts are made.
- **Maximum Optimization:** Cuts the mats within the available mat area so that the greatest number of mats can be cut. Minor sizing allowances may be made to achieve a greater number of mats per sheet.

**Outside Cut:** The sizing cuts may be done with either a clockwise or counterclockwise cut direction. This option will depend on whether you are cutting the mat face up or face down, and whether or not you want the mat bevel to be visible.

**Delete Outside Cut of All Mats:** If this box is checked *only the mat openings* will be cut. The outside or “sizing” cuts must be done manually.



**Preview/Optimization:** Click this button in the Multi-Mat Array window to preview the program’s layout of the how the mats will be cut within the available mat area. You may decide to change any of the above parameters in order to alter the optimization of mat cuts. Figure 2.58 shows the

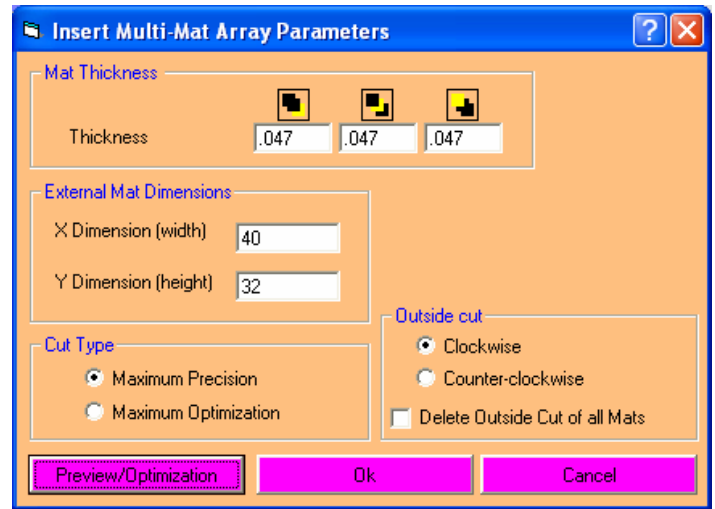


Figure 2.57

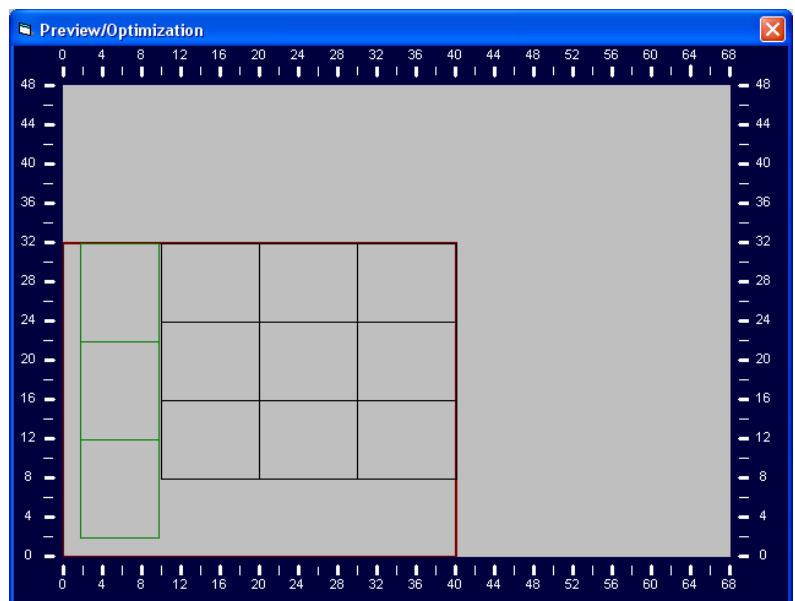


Figure 2.58

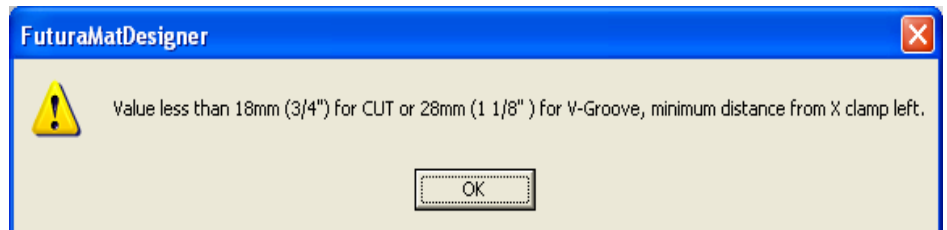
mat layout for 8"x10" mats within a 32"x 40" board.

## Cut Warning Messages

At certain times a warning message box may pop up, indicating either a mechanical or pneumatic fault, or a procedural error in the cut cycle.

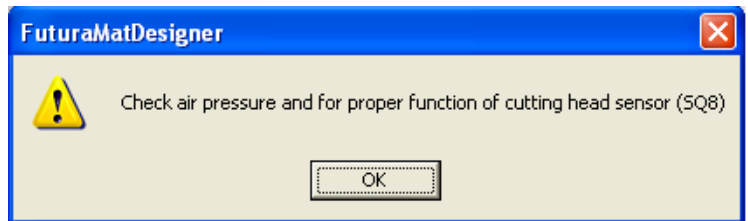
### Minimum Borders:

This warning will pop up if the minimum border for either an opening or V-groove / CCW cut is called for in the design. Make any necessary changes to the left and bottom edge borders before proceeding with the cut.



### Air Pressure / Sensor Warnings:

These warnings will appear if the air compressor is off or at too low a pressure setting, or if there is a faulty electrical contact to a cutting head or X/Y axis Home sensor. Verify the proper compressor and air pressure settings before proceeding further. **Warning! Damage to the cutting head or clamp rails may occur if the machine attempts to Home or cut while the air pressure is off or at too low a setting!**



## 2.12 Manual Operation



The Future Lite and MatPro CMC machines may be manually operated with the on-screen control panel (Figure 2.59). This is helpful when troubleshooting, as you can operate each electrical or pneumatic sub-system of the machine individually. It is also helpful if you need to set the blade depth and/or air pressure precisely for a different mat type or thickness.

A description of each Manual Control Panel button follows:

**Power/Speed Bar:** Can be clicked and dragged with the mouse to reduce/increase power to the drive motors. This is useful when precise manual positioning with the Manual control buttons is required.

**MAN:** Activates the Manual control function of the on-screen control panel, indicated by the green "On" light.

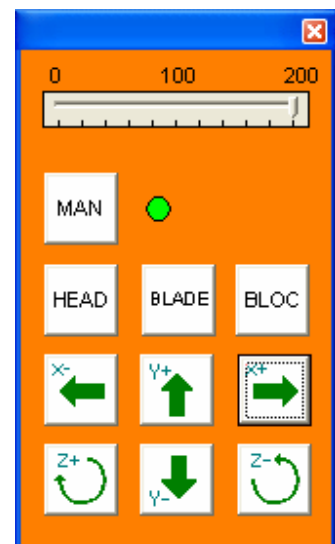


Figure 2.59

**HEAD:** Lowers the cutting head/roller down to the mat when pressed.

**BLADE:** Plunges and retracts the blade; will only function when the cutting head is in the down position.

**BLOC:** Activates/deactivates the mat clamps.

**X+** : Moves the cutting head to the right. ⇒

**X-** : Moves the cutting head to the left. ⇐

**Y+** : Moves the cutting head up. ↑

**Y-** : Moves the cutting head down. ↓

**Z+** : Rotates the cutting head/blade clockwise.

**Z-** : Rotates the cutting head/blade counterclockwise.

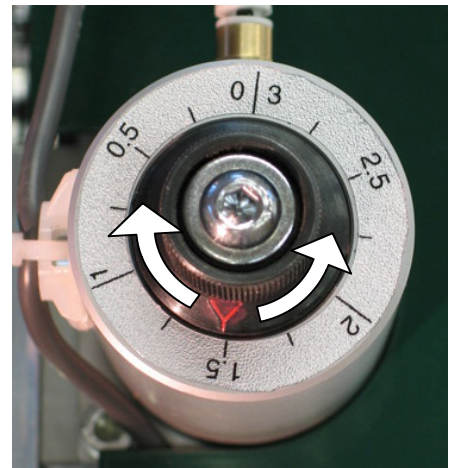
### Setting Blade Depth – Manual Control

If you are uncertain of the precise blade depth setting that should be used for a given mat, follow this procedure using the Manual Controls:



1. Open the Control Panel by clicking the toolbar button. Place a sheet of the type of matboard to be cut under the clamps.
2. Activate the Manual controls by clicking the “**MAN**” button. Click “**BLOC**” to clamp the board.
3. Slide the Power indicator on the Speed bar to about half-power (or lower). This will make it easier to move the cutting head into the precise location required.
4. Click the **+Y** button to move the cutting head up approximately 1 foot (30cm).
5. Click the **+X** button to move the cutting head to the right. Visually align the rubber roller so that it is above the right side edge of the clamped mat.
6. Click the **-Z** button to rotate the head/blade ~90 degrees. The Roller should be on the left, the blade to the right.
7. Click the **HEAD** button to lower the roller onto the mat. The entire roller surface should be on the mat being cut, while the blade should be extended above the slip-sheet only. It may be necessary to raise the head and move it left or right slightly to achieve the correct position.
8. Click the **BLADE** button to plunge the blade down into the slip-sheet. Visually check for the tip of the blade plunging only slightly into the slip-sheet surface.

**Note:** Make sure that the blade depth is not set too deep initially, such as when gauging the thickness of a 2-ply or foil mat when the blade is set for normal 4-ply mat depth (1.5mm). This will prevent inadvertent gouging of the machine cutting board under the slip-sheet.



**Blade depth adjustment knob**

9. Turn the blade depth knob on the cutting head to increase or decrease the blade depth as needed. You may click the **-Y** button briefly to make a small score mark on the slip-sheet to verify that blade depth is correct.
10. Disable Manual mode and make a test cut in the mat. Increase or decrease depth if necessary. Be aware that it may be necessary to increase the cutting head air pressure as well when cutting thick or dense board such as 8-ply rag (3mm thick). Record the depth *and* pressure settings for the mat type for future use.

### Cutting Head Blade Depth Settings

The chart below illustrates the relative thickness of the most common mat types with their inch and metric depths. This chart (Figure 2.60) is for quick reference only, and does not reflect the full range of different mat thicknesses for each matboard manufacturer and type.

	Fraction & Decimal inch	Matboard Type	Metric - mm
1/8"	.125	8-ply rag	4
3/32"	.09375	6-ply rag	3
1/16"	.0625	4-ply	2
1/32"	.03125	2-ply	1

**Figure 2.60 – Blade Depth: Inch and Metric equivalents**

#### Common Blade Depths, Dial setting in Millimeters (Software Setting, decimal inch):

- V-groove: 1mm (N/A)
- Standard 4-ply: 1.5mm / (~.047-.050")
- 4-ply rag, Color-core: 1.75 – 2mm (~.050-.053")
- Suede/Fabric: 1.75 – 2mm (~.050-.054")
- 6-ply rag: 2.25 – 2.5mm (~.078-.83")
- 8-ply rag: 3 – 3.25mm (~.095-.11")

#### Air Pressure Settings

Source air pressure (from the compressor) should be a minimum of 7 Bar, or ~100 PSI (pounds per square inch). The main regulator on the machine should be factory pre-set to 6 – 7 Bar (see Figure 2.61 for Bar/PSI equivalents).

BAR	PSI
10	145
9	130.5
8	116
7	101.5
6	87
5	72.5
4	58
3	43.5
2	29
1	14.5

**Figure 2.61 – Bar/PSI Conversion**

**Note:** Cutting head pressure should be set on the regulator to the left of the cutting head. Normal (4-ply) cutting head pressure is .2 - .3 MPa. Head pressure can only be viewed when the cutting head is in the down position. *Adjust the head air pressure in the Manual Control mode only.*