

## PathTrace and the Oval Inset Mat

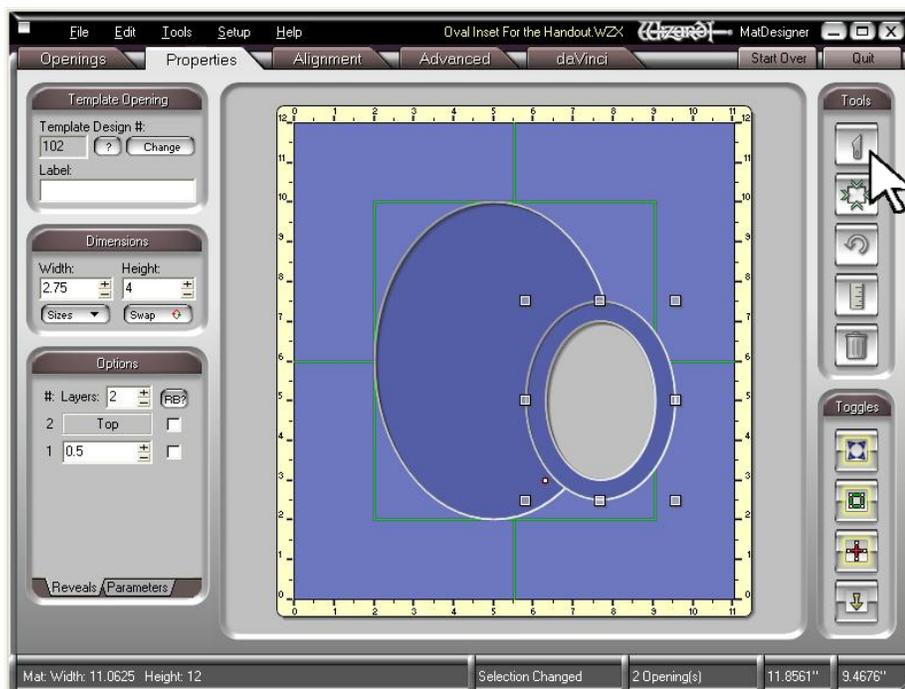
This is a mat that framers are called upon to do from time to time: an array of smaller ovals inset around a larger one. We will design the arrangement of ovals we want in the MatDesigner™ program and we will do the alteration to create the separations between the openings using PathTrace.

PathTrace is one of the WizTools. Normally we use it to translate a CADD drawing into a mat the Wizard will cut. It will specify bevel type, cut order, and layers.

PathTrace also has some cleanup functions for CADD drawings. Most drawings have a few untrimmed lines and open circuits that need correction.

Send a design into PathTrace by clicking the **PathTrace** tab at the top of the Cut Preview screen.

Learn more about it by reading over the **PathTrace** section in the manual. The easiest place to find the manual is to open up the PDF version on your computer by clicking on the **Help** button along the top of the PathTrace screen.



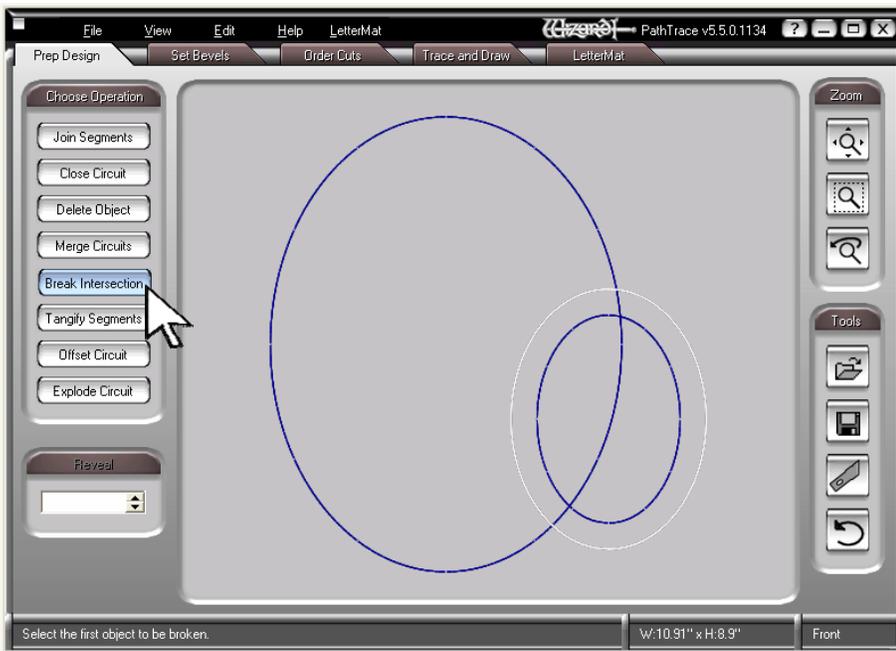
## Making the Inset Oval Mat

Start with two ovals. Make the large one a single layer. The smaller one needs to be two layers. The size of the reveal needs to be the width of the channel that will separate the two openings. In this example it is half an inch.

Move the small one so that it intrudes into the large one.

Click the **Cut Mat** button to send the design to the Cut Preview screen.

Then send the design into PathTrace by clicking the **PathTrace** tab at the top of the Cut Preview screen.



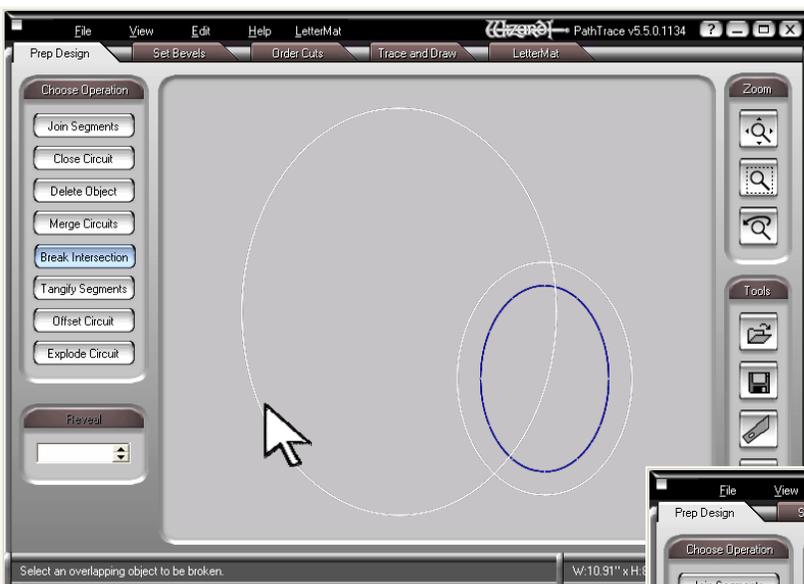
## Making the Inset Shapes in PathTrace

Click on the **Prep Design** tab at the top left.

Under **Choose Operation** at the left, click on **Break Intersection**.

Before we actually do anything, it is wise to become accustomed to what will happen and how to work things. Run the mouse around slowly and you will see that as the cursor passes over an item, it turns white. That means that item is selected.

Whichever function at the left is turned on, that is the fate that will befall the selected item if you click. Practice moving around and selecting items because it is not always as direct as you'd like, especially if the screen is crowded with lots of openings. Fortunately, there is an **Undo** button at the lower right and you can undo an unlimited number of things.



## Breaking the Intersections

Click on **Break Intersection**.

Look at the large oval and the outer ring of the inset oval. We want to break the intersections they have with each other then reconnect various parts of them to form the final shape.

See the illustration above.

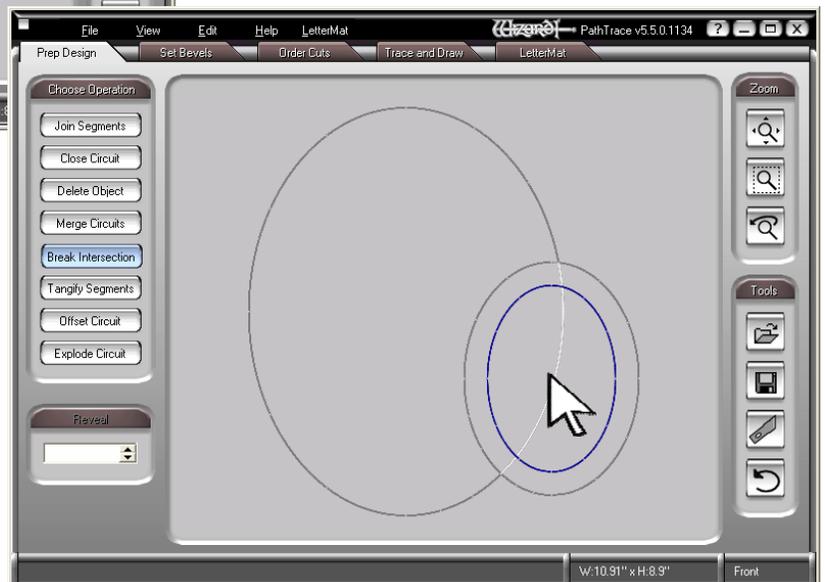
Select the outer ring of the small oval.

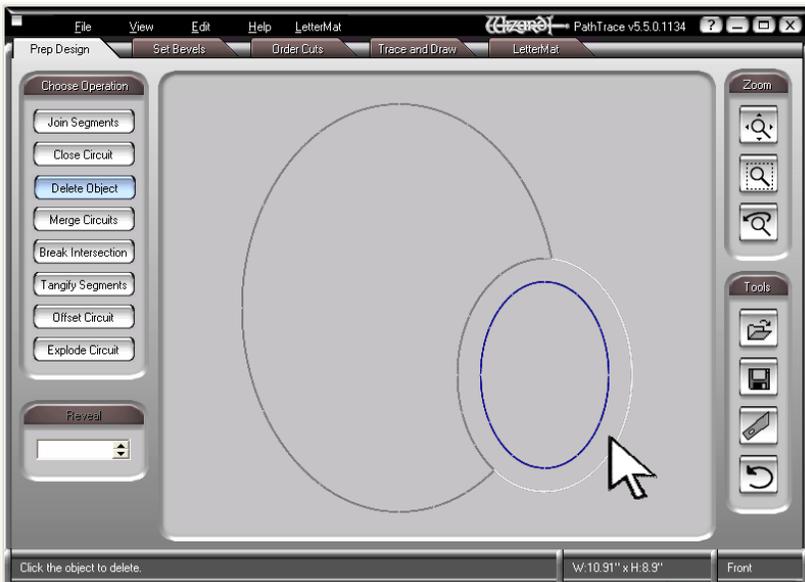
When it turns white, click.

It will remain white.

Now select the large oval.  
When it turns white, click.  
Both of the ovals will turn grey.

Run the cursor around the screen and you will see that the ovals are now in pieces and each piece will now turn white as the cursor moves.





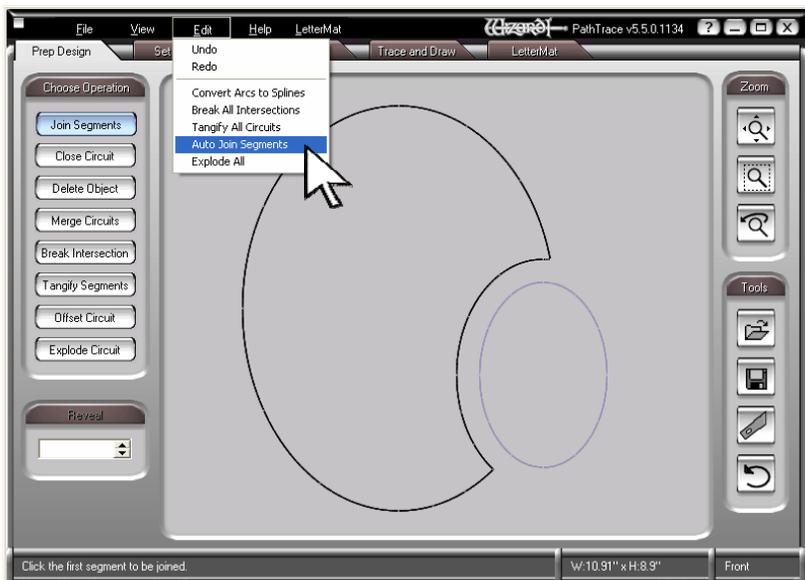
### Joining the Segments

We need to form the new shape that insets the small oval into the large one.

Click on **Delete Object**.

Delete the segment of the large oval that runs through the small one. This is already done in the illustration.

Then delete the outer segment of the small oval - the white segment in the illustration.

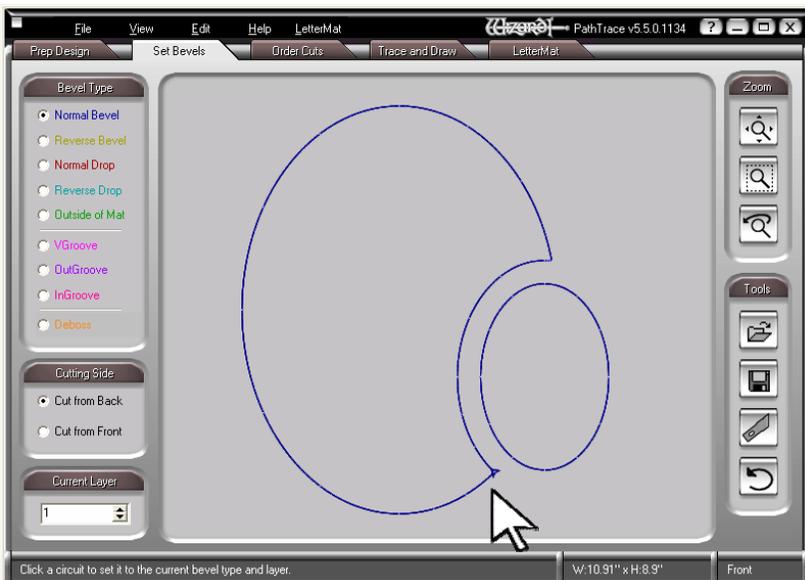


We could join the segments manually and that would be instructive, but there is a more efficient way.

Click on **Edit** along the top.

Click on **Auto Join Segments** from the drop down box. All the segments that are just touching will be joined.

The circuit turns black indicating that it is ready for cutting instructions.



### Setting the Bevels

The next step is to tell the machine how to cut the new shape.

Click the **Set Bevels** tab at the top. Select **Normal Bevel** under **Bevel Type** at the left. checked for this project.

As you move the cursor around the screen, you will see a blue arrow changing places as you move. Click at any point and it tells the machine to begin cutting this opening at this point.

## A Few Rules for Setting Bevels

First, begin cutting at a corner rather than in the middle of a curve.

Pick a starting point where the last cut will be nice and long. If you leave the fallout tethered into the mat by a quarter inch of matboard, if the fallout drops a little, that last cut will be less than perfect.

Begin new cuts close to cuts that have already been made so that there is sturdy matboard to the outside, providing structure for the area about to be cut.

Normally, we cut the lower openings first so that if a fallout falls down behind the mat, it will not be in the way of the openings yet to be cut.

When the blue arrow is at the bottom corner of the large oval shape, click it. The arrow will continue to move around as the cursor moves around, but don't be alarmed, the bevel remains set where you clicked.

## Saving the Mat

Once the mat is altered and the bevels are set, you may save it in its new form.

Either click on **File** at the top left or click on the **Save File** button under tools at the lower right. It is the one that looks like a floppy disk.

From the drop down menu under **File**, select **Save File**.

The **Save As** window opens up. At the top is the **Save in:** field. Put it somewhere easy to find, **My Documents**, for instance.

At the bottom, there is a **Save as Type:** field. PathTrace defaults to saving files as Wizard CutArt. But click the drop down arrow and you'll see that you can choose to save the mat as a Cadd file, a Wizard CutArt file, or as a Wizard Path file.

The easiest and most flexible type is the Wizard CutArt file. You can load a CutArt through the MatDesigner™ program, you can add items to it, you can move it around the work area, you can change the border widths, you can even change the size.

Give it a name and click **Save**.

## Cutting the Mat

If you choose not to save the design, you may cut it immediately by clicking the **Cut Current Design** button under **Tools** at the lower right. It is the one that looks like a blade.

It will open a dialog box regarding the outside size, just click **OK** and you will be on the Cut Preview screen, ready to go.

If you have saved the design as a CutArt, proceed as if it was any other CutArt.

Open up **MatDesigner™**. Cancel out of the **New Openings** screen.

On the edit screen, under the **Openings** tab, under **Other Openings** near the bottom there is the **Add CutArt** button.

Click it and the **Load CutArt** window will open up.

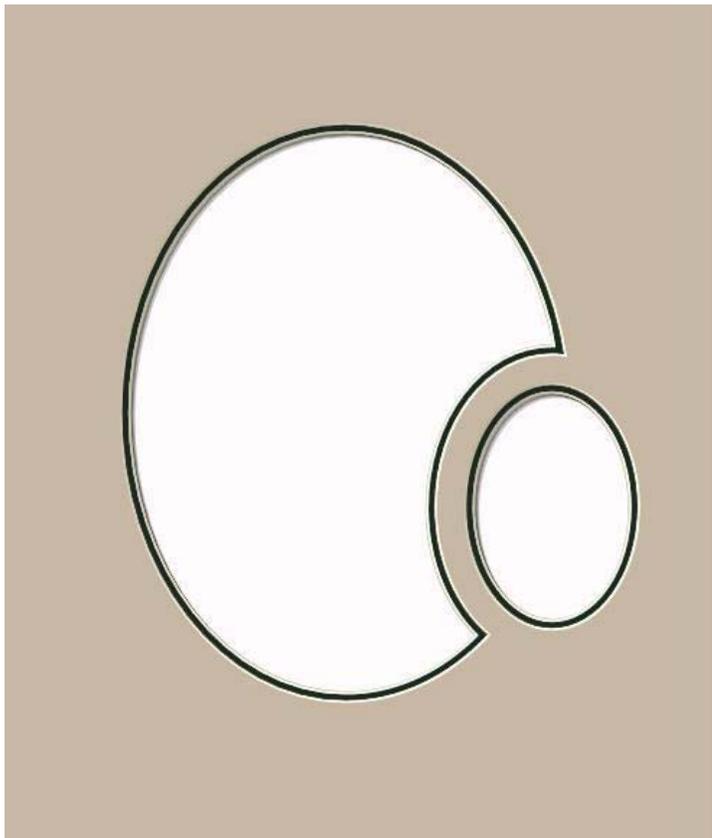
Click the drop down arrow under **Browse For CutArt Files** at the top left.

Select **My Documents** (or wherever you've saved it) and click on the mat you just saved. It will appear in the browser on the right. Click **OK** and it will appear in the work area.

Under the **Properties** tab there is a **Use Original Size** button at the bottom left. Although after MatDesigner™ 5.1, CutArt pops into the edit screen already at its original size.

Once the mat is in the edit screen you can change the border sizes or add other openings to the design.

You can change the size, too, but all the elements enlarge and reduce proportionately. As you shrink the opening size, the half inch ribbon between the openings shrinks, too.

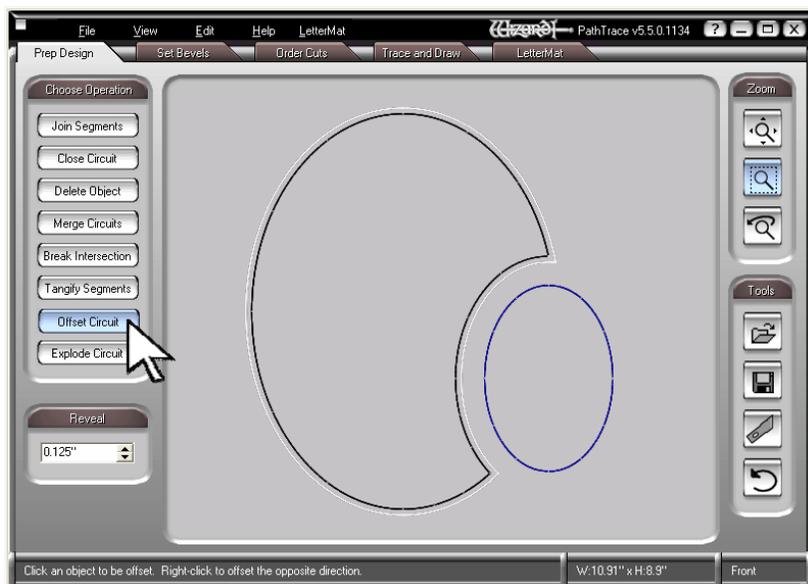


## Making the Design a Double Mat

Following this section is an explanation of the proper - read: old - way to make double mats out of these inset designs. It will be instructive and sometimes helpful because there will be times when you will need a more accurate look at the placement.

Now, however, we have a few new PathTrace functions that make double mats a snap. There is an Offset Circuit function that instantly creates a new parallel path to whatever item we want.

We will need to plan ahead a little. Because we will offset to the inside of the shapes, we will need to begin with the openings larger than we ultimately want. We will increase their size by twice the offset distance. If we want a quarter inch reveal, increase the sizes by half an inch before we send the design to PathTrace.



In this design we want an eighth inch inner mat, so we increased both the opening sizes by a quarter inch. The channel between the openings remains half an inch.

Click **Offset Circuit** under **Prep Design**. Under **Reveal** below enter 0.125 inch.

Highlight the large inset oval shape and right-click to make the new parallel shape to the inside.

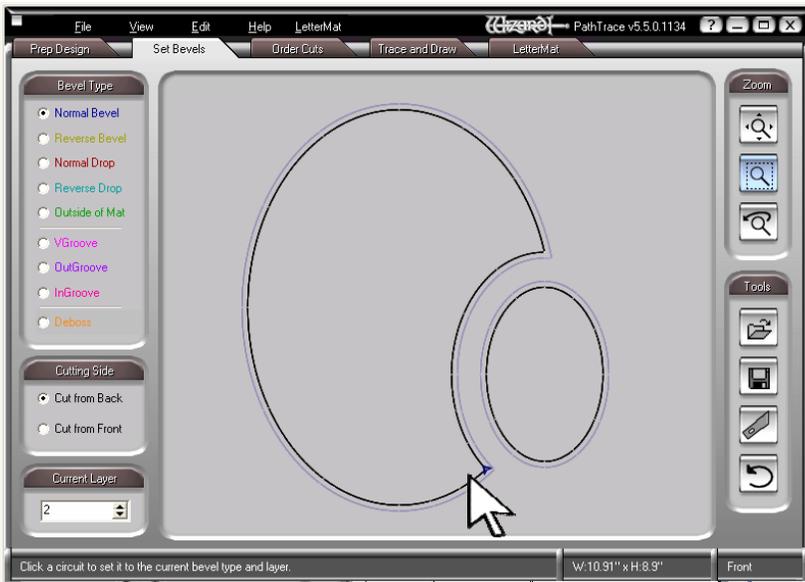
Note the instructions at the bottom left of the PathTrace screen: "Click an Object to be offset. Right-click to offset the opposite direction." If we offset to the

outside of the original opening, then the channel between the openings becomes smaller.

You choose which is easier: starting with openings a little larger then offsetting them to the inside, or changing the size of the channel and offsetting to the outside.

Decide on the basis of which way gives you a better view of what the final design will look like as you are moving openings around in MatDesigner™, how many openings are involved, and how much arithmetic you'd like to do.

While we are looking at the offset function it is fair to warn you that once in a while there will be strange leftovers at a corner and you will need to repair it. Typically you will need to explode the shape, break the intersections of the offending lines, delete the leftovers, and rejoin the segments.



Setting the Inner Layer to Cut  
Click the **Set Bevels** tab.

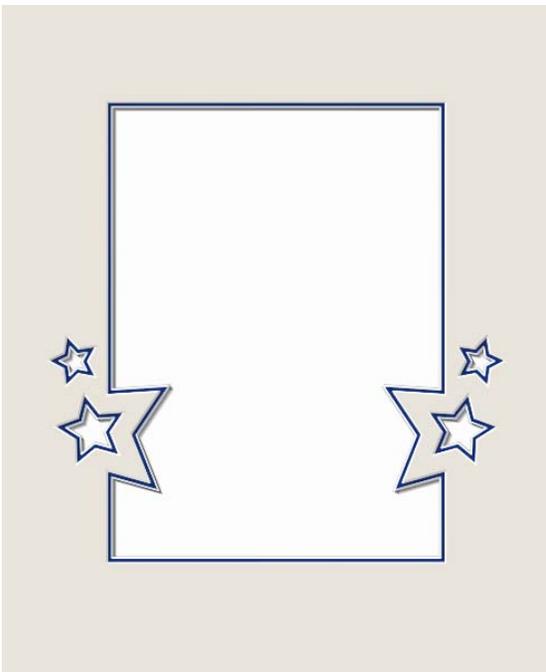
Select **Normal Bevel**.

Set **Current Layer** at the bottom to **2**.  
Set the two new shapes to cut on the  
new layer.

Click the **Cut Current Design** button  
and cut the mat.

Normally in PathTrace Layer 1 is the bottom. If you save this as you have done it and load the CutArt into MatDesigner™, it will be upside down. You will only see one layer on the edit screen, but there will be 2 layers on the cut screen.

If you'd like to do this correctly, reset the bottom layer openings to cut on Layer 1 and the top openings to cut on Layer 2. Now save it and it will show up correctly.

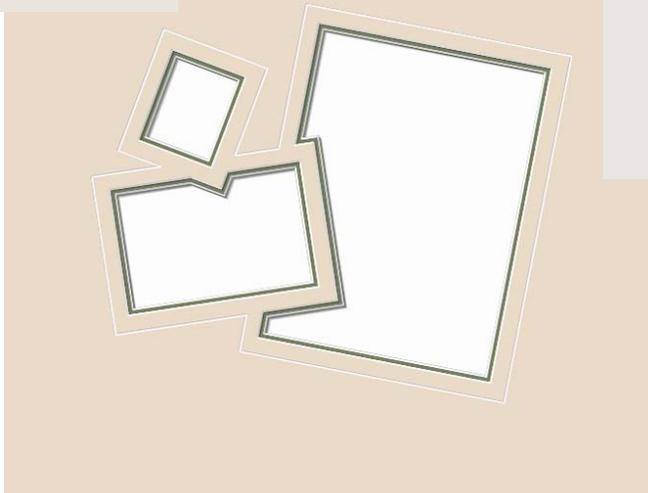
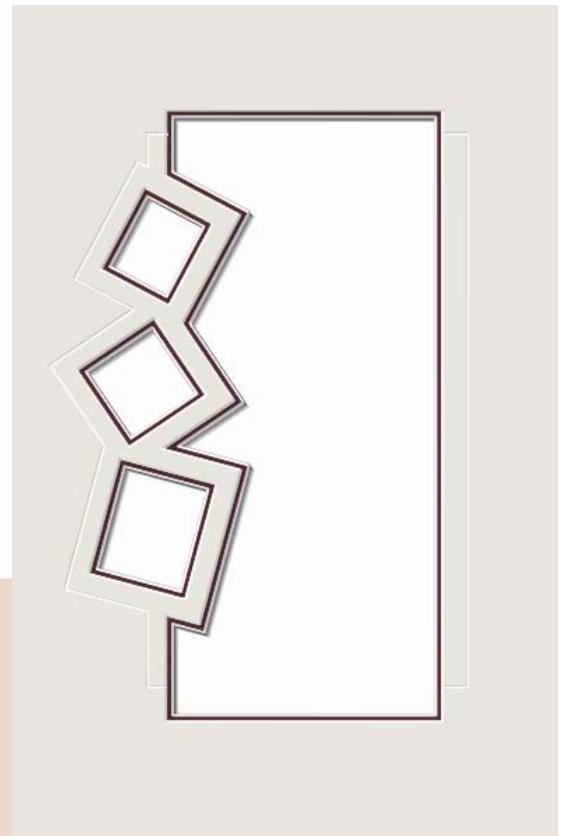


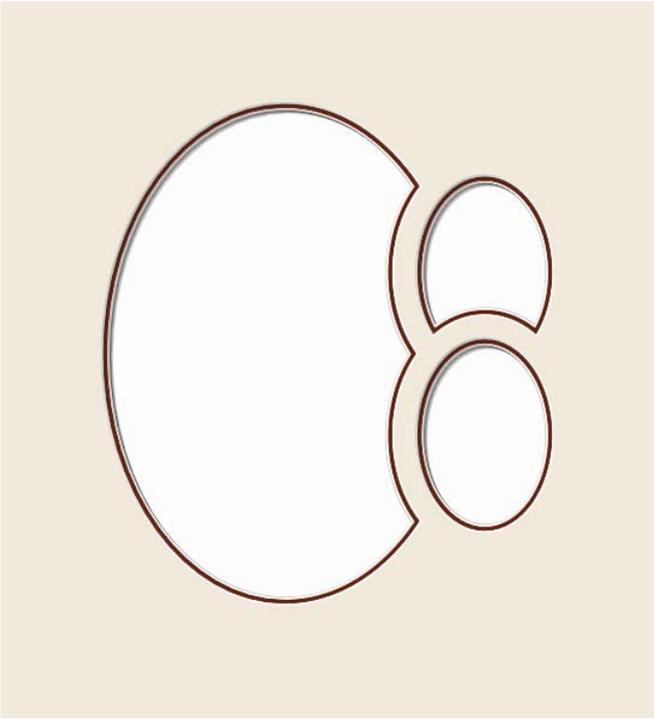
### Other Ideas

In addition to inseting ovals,  
try other shapes – both as  
decorative elements and for  
more pictures.

V-Grooves are a great device to  
unify multiple openings.

Look at the following section.  
However much work it may  
seem, there are some  
advantages – you can use the  
leftover pieces of broken layers  
to create these grooves.

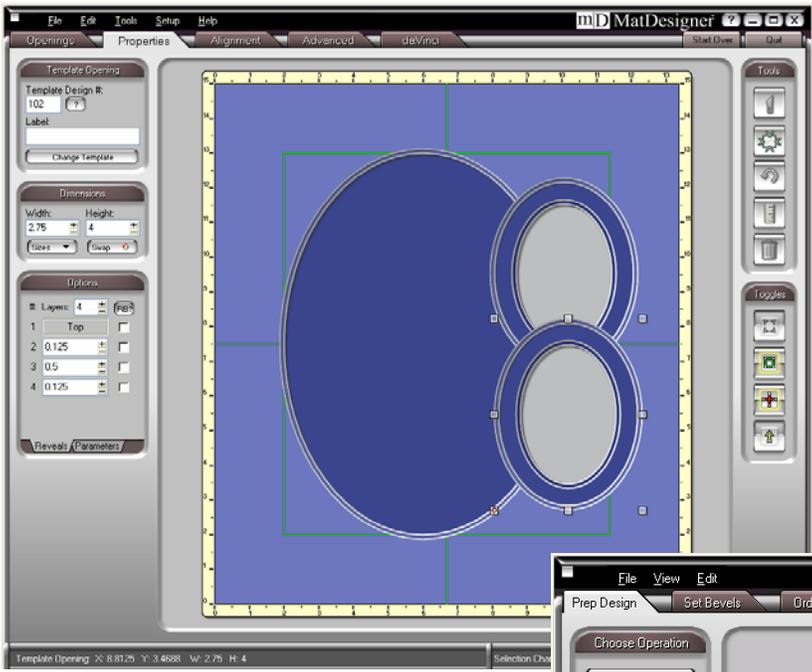




### Designing a Double Mat with Two Ovals Inset – Without Offset

As the design becomes more and more involved, more and more thought and planning is required. To make this a double mat, the larger oval will need to be two layers and the inset ovals will each need to be four layers. The width of the inner reveal will be how much of the inner mat shows, just like always. Set the middle reveal to the width of the channel between the two openings. The outer reveal will be the inner mat of the bridge on the large opening side.

While all the ovals are on the PathTrace screen, it will be confusing as you try to figure out which pieces join to become which openings. Make a drawing and trace the final cut paths in a darker color and refer to it as you are breaking intersections and joining segments.



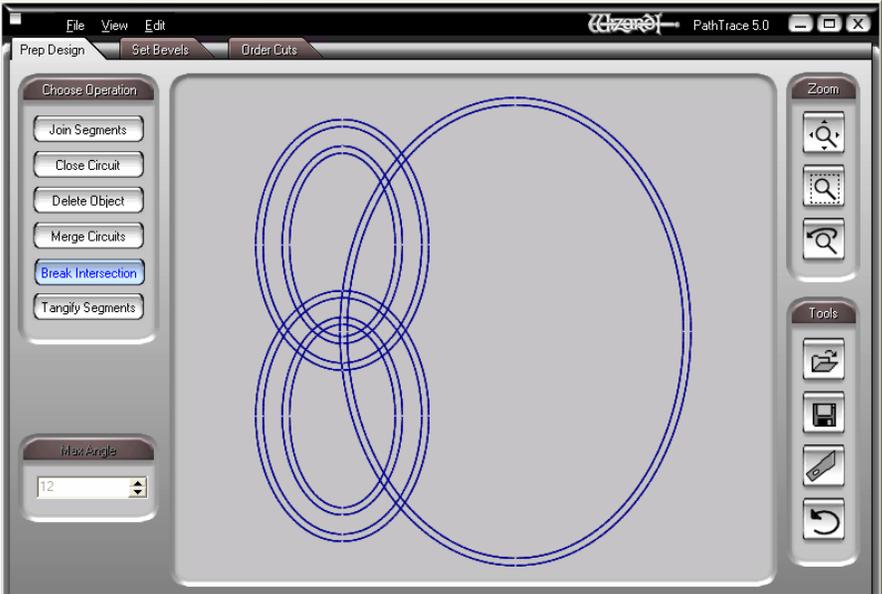
### The Openings

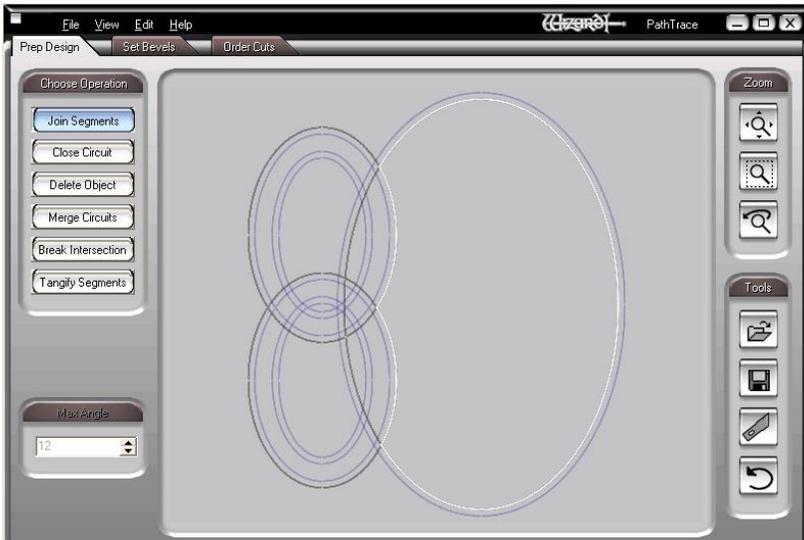
The larger oval needs to be 2 layers.  
The two smaller ovals need to be 4 layers each.

The inner and outer reveals of the smaller ovals need to be the size of the inner mat reveal. The middle reveal needs to be the size of the channel between the openings.

Send the design to PathTrace.

Look at the picture and begin breaking intersections and deleting items you will no longer need. Remember that there is an **Undo** button.





## Making the Inset Shapes of the Double Mat

In this example, we will need to join segments of all three ovals together to make a couple of the shapes.

With the Break Intersection function, we can only deal with two items at a time, so creating all the pieces we need will involve many more steps.

We will begin by making the inner opening of the large oval.

We will need a piece of the large inner oval and a piece of the outermost rings of each small oval. Click the **Prep Design** tab and select **Break Intersection**. There will be three Break Intersection operations to get the pieces we need.

First, break the outermost ring of the top small oval with the outermost ring of the bottom small oval.

Next, break the outermost ring of the top small oval with the inner ring of the large oval.

Then, break the outermost ring of the bottom small oval with the inner ring of the large oval.

Click on **Join Segments** and select the three segments that will make the inner opening of the large oval. Each of them will stay white after you've clicked them.

Right click and the shape turns black indicating that it is a complete, joined circuit.

Repeat these steps to make the outer opening of the large oval.

Making the inset into the top small oval is same procedure as we did for the single mat above.

Figure out which ovals have the parts you need, break the intersections, and then join the parts.

Refer to your drawing and make the inner and outer openings of the top oval.

## Setting the Bevels

No matter how you have made the design, follow the steps above for setting the bevels.