



WIZARD UNIVERSITY

WCAF Expo 2024

INTEGRATING DECORATIVE CUTOUTS INTO A DESIGN

The possibilities in Trace hold endless fascination and mystery for all of us. Even after mastering Trace, the question remains – Now that you’ve drawn something, what will you do with it? How will you make it part of the design?

There are sections here on how to begin drawing, things to watch with designing and cutting, and ideas for making cutout designs more distinctive.

Part 1: Reminders of Drawing Limitations

Part 2: Making CutArt into a Simple Vignette

Part 3: Decorative Shapes Overlapping the Opening

Part 4: Divided Shapes

Part 5: Shapes Joined Inside an Opening

Part 6: Making the Most of Multiple Layers

The examples focus on cutouts. Everything here will be cut with the blade at a 45° bevel. Attention to size is important to cutting quality. Keep in mind that the listings of sizes and spacing alongside the projects are intended to be hints to get started in a workable range. Experiment to find the sizes that work for you on your projects according to your standards.

Part 1: Reminders of Drawing Limitations

We want to draw cutout shapes that are representational figures. To make shapes accurate, there must be small segments – but they can lead to cutting problems.

This illustration shows most of the common drawing problem situations.

Look at the three arrows on the darker tower at the left.

Top Arrow

This is a narrow protrusion of matboard.

Is it too narrow to be cut?

Will its connection be too weak to keep it in place?

These protrusions should be about 0.2 inch wide to be sturdy and to stay connected.

Middle Arrow

This is a space between two shapes.

Is this space wide enough so that the two bevels at the sides of the space will be distinct.

These spaces should be about 0.1 inch wide.

Bottom Arrow

This is a sharp angle close to a line.

Is the angle's apex too close to the line?

The overcuts at the angled end may be so long that they nick the bevels of the vertical line.

These separations should typically be about 0.06 inch, but assess each design.



Now look at the arrows on the lighter building on the right.

Top Arrow

This is an arc that protrudes into a blank area.

Is its diameter too small?

Protruding arcs should be about 0.5 inch in diameter.

Middle Arrow

This is an arc that is cut out of the matboard.

Is its diameter too small? Will the transition from the line to the arc be too abrupt?

Interior arcs like this should be about 0.7 inch in diameter.

Bottom Arrow

This is a narrow strip of matboard between two cutout areas.

Is this strip of matboard wide enough to be sturdy?

Does the strip of surface paper on the strip look wide enough for the design?

Are the connection points sturdy?

Narrow strips of matboard like this should be about 0.2 inch wide.

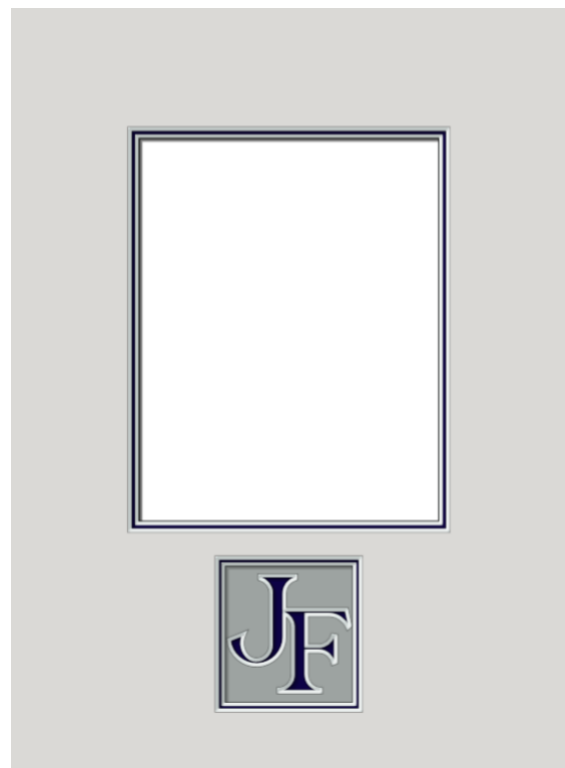
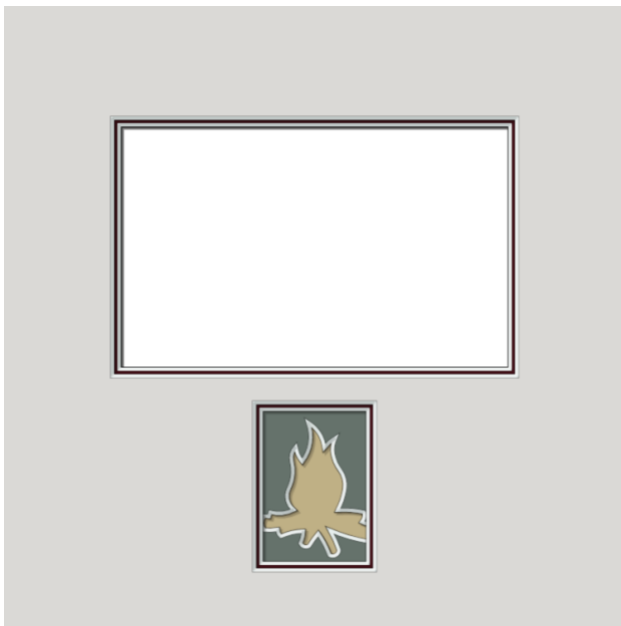
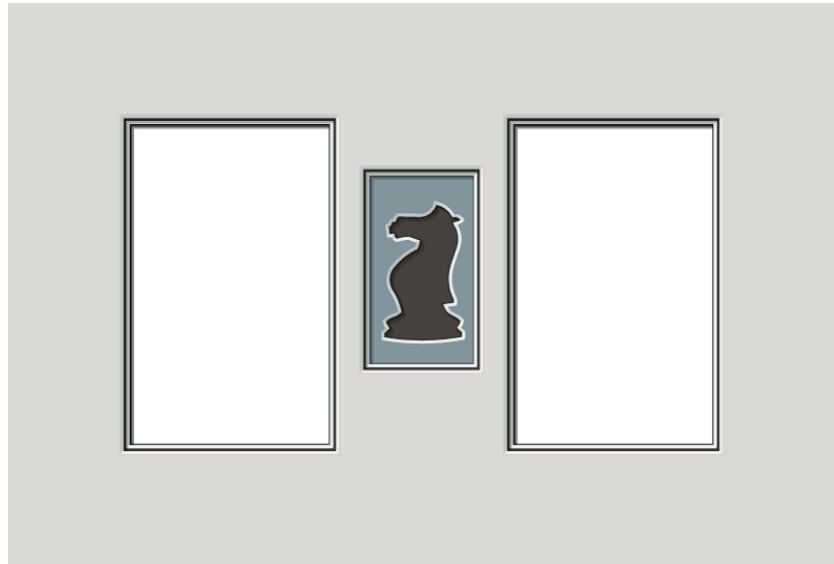
Part 2: Making CutArt into a Simple Vignette

The CutArt in these examples are from the Wizard CutArt Library. Rather than cutting the shape in a blank spot on the top mat, it is made into another image in the presentation by adding an opening in the arrangement for it.

The advantage to including CutArt as a vignette is that there is added color and depth to add interest.

Cut just the CutArt using the color you choose.
Then cut the mat.

In the assembly, mount the piece of matboard with the CutArt into its opening.
Then mount any color behind the CutArt to show an additional color.



Part 3: Decorative Shapes Overlapping the Opening

The most natural formula for making decorative cutouts part of the presentation is to overlap them with the openings.

Then in FrameShop, the overlapped shapes can be joined into one continuous shape.

Select the overlapping items.

Then click the **Group Selection** button under **Tools** at the upper right of the design screen.

The CutArt Library is full of shapes that can be overlapped and grouped with openings.



Overlapped Monograms

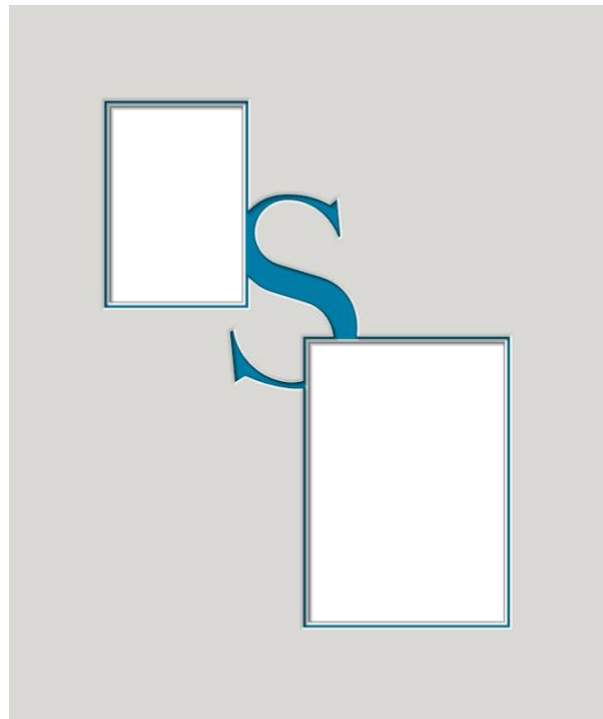
Letters can be decorative additions, too. They are seen as less decorative, almost informative.

The letters in the Roman and Greek Capitals font are nicely formed classical serif characters – each with a variety of points to overlap.

Though we usually wish to cut letters as small as possible, when the presentation is relatively large, monograms that are 4 to 14 inches tall look good - and there are no cutting problems arising from the small curves and close spaces that are ever present in 2-inch-high letters.

This example illustrates two easy overlapping ideas using a letter without an enclosed inside shape.

The top opening simply overlaps part of a wide stroke. The corner of the bottom opening overlaps the entire width of the stroke.

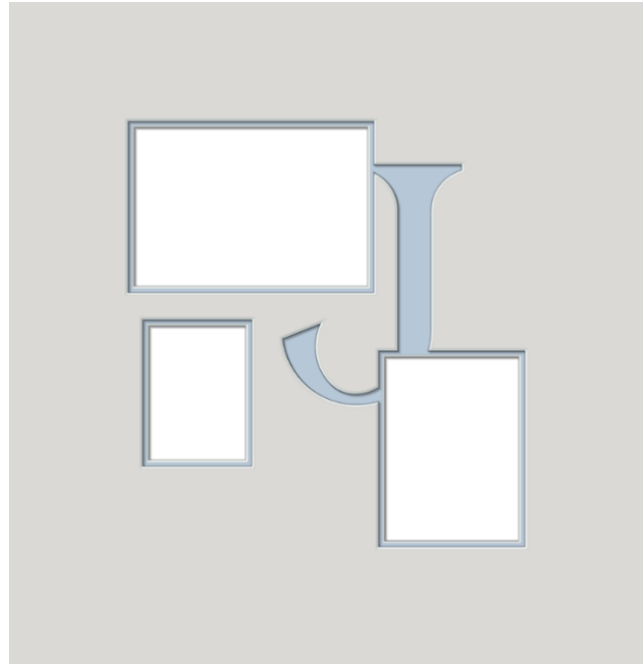


Overlapping a Letter's Serifs

This font has a wide variety of elements. Thick strokes, thin strokes, curved strokes, and serifs – those short horizontal lines at the ends of the strokes. Serifs are great spots for overlapping openings. Note the top left opening in the example. They are delicate connecting points that keep the openings very close and do not blank out any significant parts of the letters.

Set the letter's Height to 4.5 inches.

Overlap the opening about a sixteenth inch onto the serif. This makes a connection point that is about 0.2 inch wide.

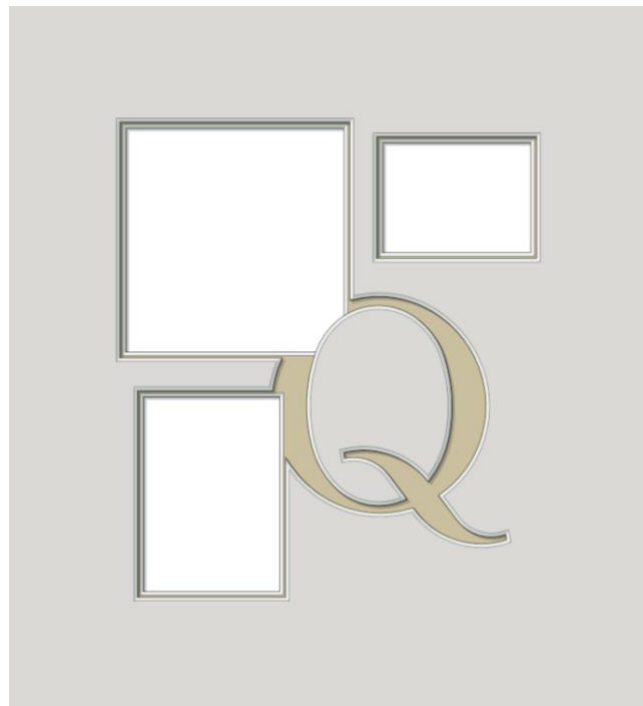


Overlapping Across an Enclosed Internal Shape

The corner of the top left opening here overlaps into the letter's enclosed shape. The illustration shows how Grouping finishes the overlapped design. It creates a shape by joining the outer layer of the opening and the outer circuit of the letter – leaving the enclosed shape intact, overlapping the corner of the opening.

Some find this to be a pleasing design, others wish the entire corner of the opening was present.

This can easily be done in Trace.



Part 4: Divided Shapes

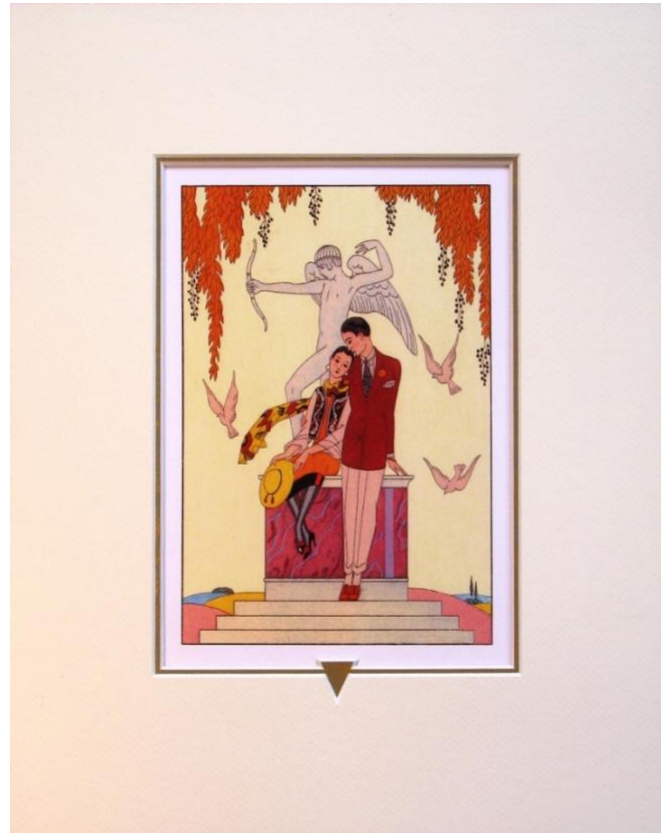
One formula for including a decorative cutout in a mat design is to overlap the decorative shape across the top two layers of the opening. Attach half the decorative shape to the top layer, and attach the other half to the next layer.

The decorative cutout becomes a wide spot in the narrow reveal.

In this example, there is just one simple geometric ornament centered at the bottom, so the outline of the steps can then focus strictly on the dividing process.

Begin on the design screen with the opening, then add the triangle centered at the bottom of the opening. About an eighth inch of the triangle extends above the inner layer of the opening.

Send the design to Trace.



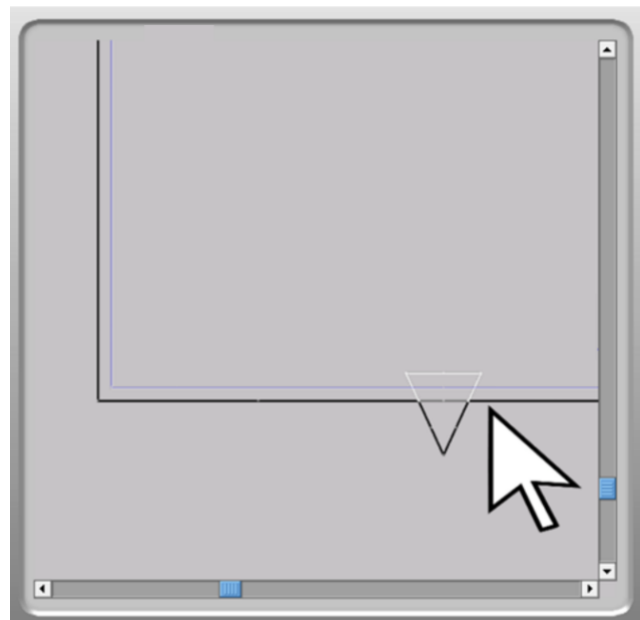
In Trace: Forming the New Outer Layer

Select the triangle and the outer circuit of the opening.

Break their intersections.

To form the new shape for the outer layer of the opening, join the bottom portion of the triangle with the broken outer circuit of the opening.

The arrow in this illustration points to the completed black outer circuit.



Preparations Before Forming the New Inner Layer

The next step is to join the inner portion of the triangle to the bottom layer of the mat. But keep in mind that when the layers of the mat are assembled, it is the colored surface paper of the narrow reveal that will ultimately form the nice-looking triangle.

Look closely at the photograph of the finished design. Look at the top layer of the opening. Its portion of the triangle is outlined by the bottom of the top layer's bevel.

Now look at the bottom layer. Its portion of the triangle is outlined by the top of the bottom layer's bevel.

Understand that in Trace, every line is the line at the bottom of the bevel. So, to form a triangle on the surface of the inner layer - with straight continuous sides – the top portion of the triangle needs to be wider.



Offsetting

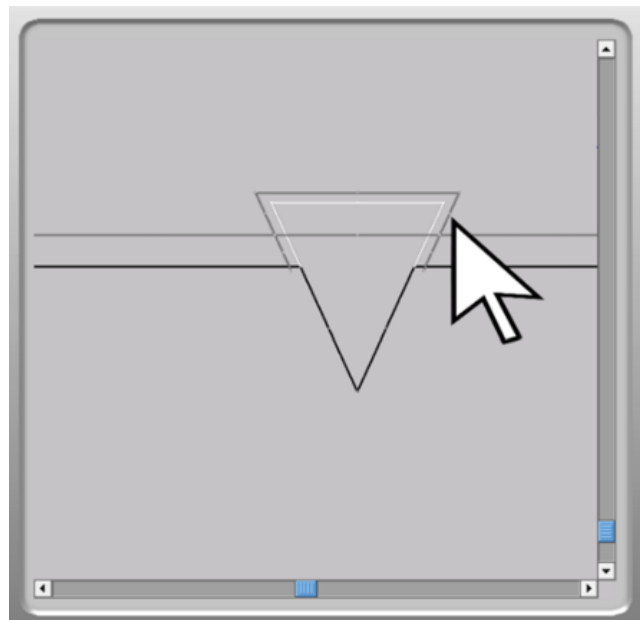
We will use the **Offset** function in Trace to widen the top portion of the triangle.

In theory, the lines need to be wider by the width of the bevel – usually about 0.55 inch. In practice, though, the lines can be wider by between 0.03 and 0.05 inch.

Offset the top portion of the triangle. Here it is offset 0.04 inch.

In this illustration, the gray piece of the triangle is the newly offset path.

The white piece of the triangle is the broken piece from the original triangle.



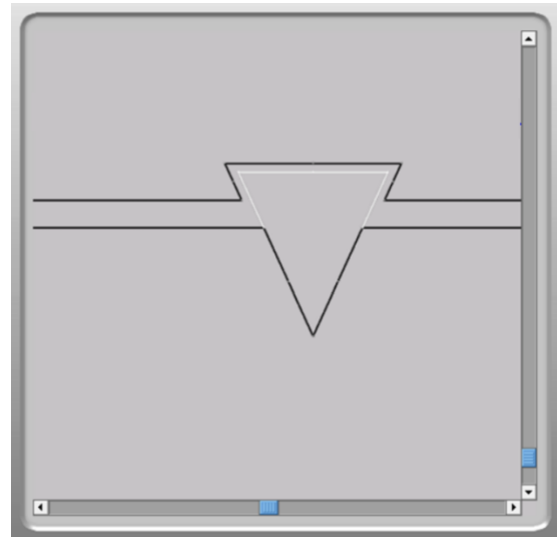
Forming the New Inner Layer

Select the newly offset top part of the triangle and the inner rectangular circuit of the opening. Break their intersections.

Then join the pieces to form the new shape for the inner layer. This illustration shows the completed inner layer.

Do not be troubled that the triangle now looks as if its sides will not be continuous.

When the design is cut out of matboard and assembled, the bevels will line up properly and the triangle shape will be formed by the colored surface of the inner layer.



Setting the Bevels

Set the outer circuit of the drawing to be a **Normal Bevel** on **Layer 1** of the mat. Remember that Layer 1 is always the top layer of any design in Trace.

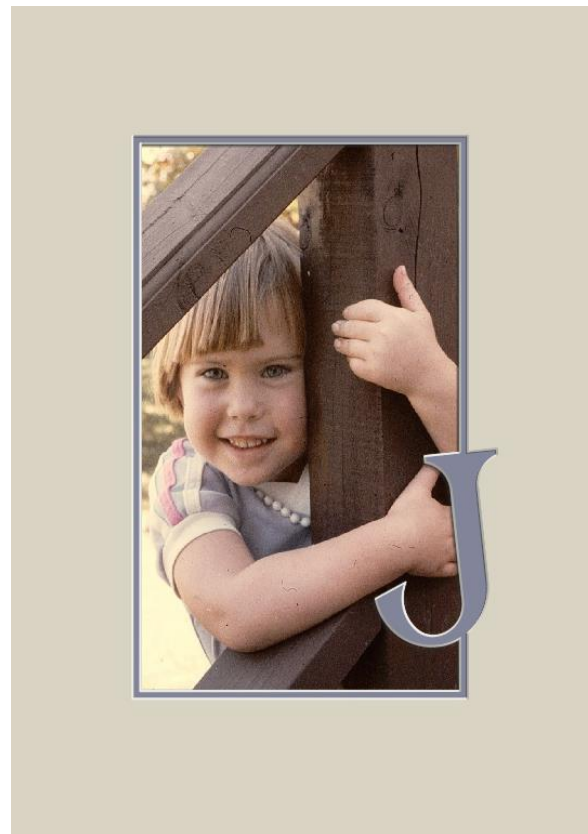
Set the inner circuit of the drawing to be a **Normal Bevel** on **Layer 2** of the mat.

The project is ready to cut.

Remember, too, that anything drawn, altered, then saved from Trace becomes a CutArt. When this project is back on the design screen, this opening will now have the properties and options of a CutArt – not the properties and options of a template opening.

Letters can be made into divided shapes, too. Their construction with two layers is interesting enough that the letters can be larger.

In this example, the letter is not quite 4 inches high.



Part 5: Shapes Joined Inside an Opening

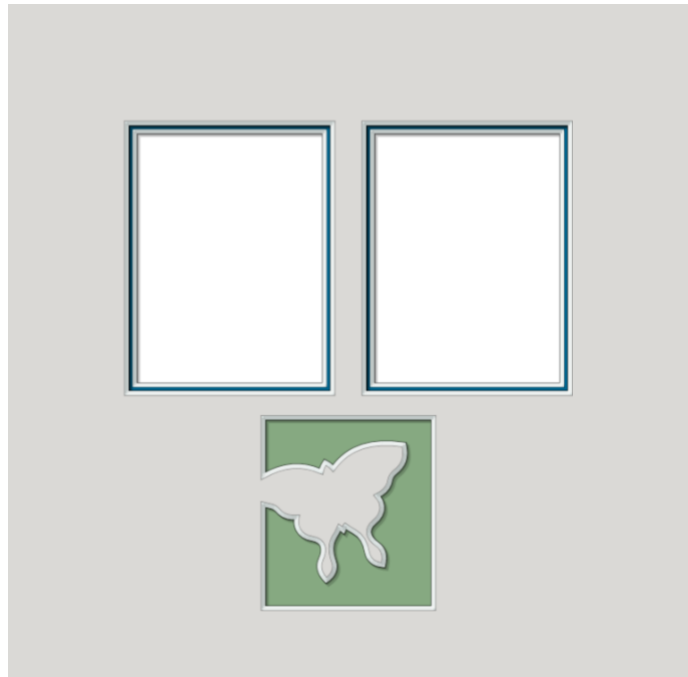
The next formula for including decorative cutouts in a matting project combines the look of a vignette with the Trace process for divided shapes.

The decorative shape is joined to the inside of its rectangular frame.

This is the steppingstone to making vignettes more detailed – and simplifying assembly. Stacking up the layers is less trouble than mounting and aligning the extra piece.

The process for joining the shapes inside the rectangles follows the steps we saw for the inside layer in the divided shape project.

Following are a few more specific hints.



On the design screen, add the CutArt and a rectangular shape. Grooves work well because you can see through them.

Overlap the decorative shape with structure in mind. A delicate connection point may look artistic, but cutting and handling will be easier if the connection is around half an inch wide.

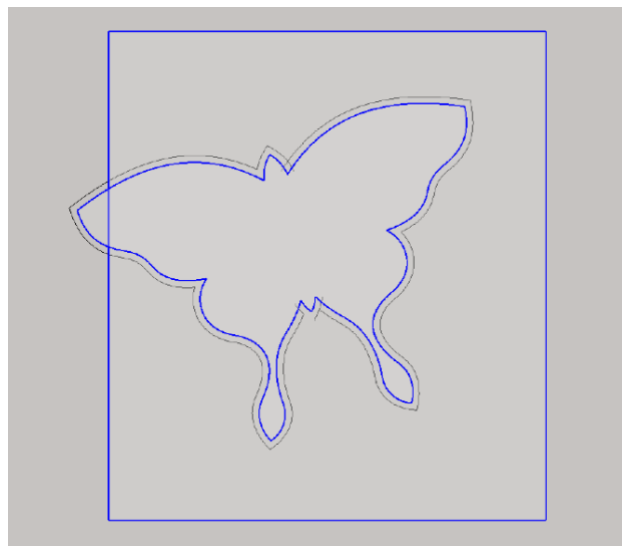
Send the design to Trace.

The first step is to **Offset** the decorative shape. In this example, it is offset 0.05 inch.

Look closely at the bottom of the butterfly's body. The arcs there did not offset correctly.

Explode the shape and join the segments one by one.

This is a common problem when offsetting shapes that have many curved and angled segments.

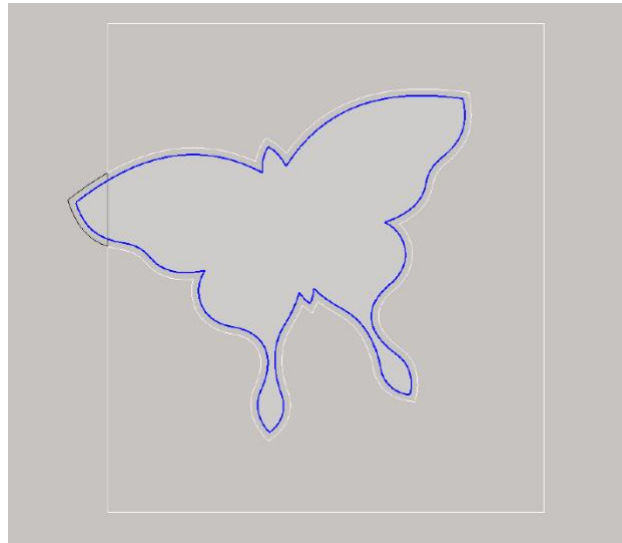


Break the intersections of the newly offset butterfly and the outer rectangle.

To form the final shape, **Join** the inside portion of the butterfly with the larger part of the outside rectangle.

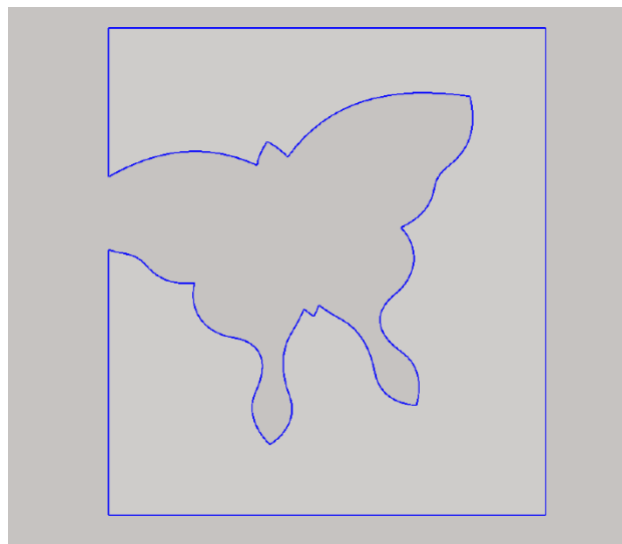
Before deleting the unnecessary leftover pieces, observe that the blue butterfly shape – the original CutArt – will be the shape on the surface of the matboard. Note the slender swallowtails.

The white outer butterfly shape – the offset shape – looks rather coarse, but it will be the shape at the bottom of the bevel.



Delete the unnecessary leftover pieces and set the new shape to cut as a **Normal Bevel**.

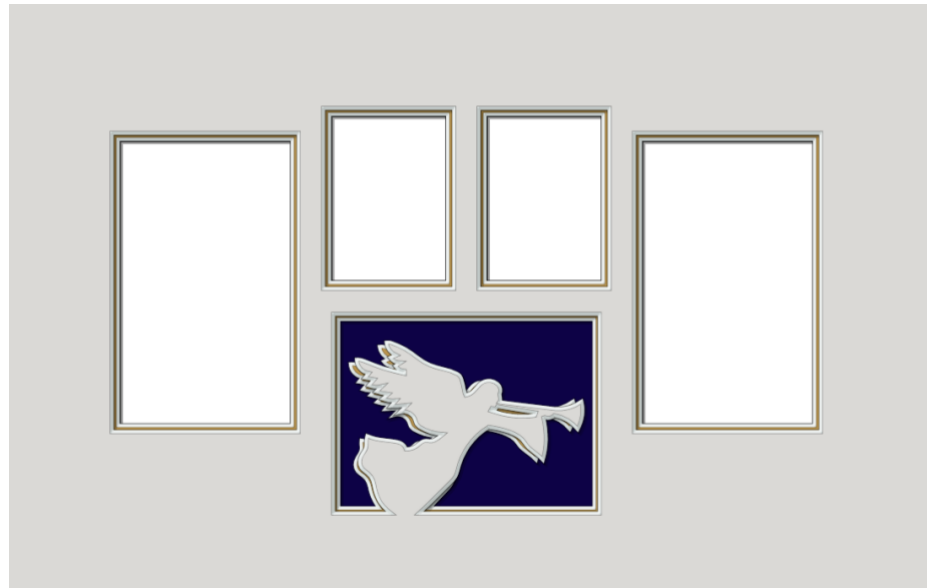
It is always a good idea to make a test cut of these projects. Sometimes, changes need to be made to improve poor cutting. Other times changes can be made to make the shape smaller or more elegant.



A Variation – Shadowed Shapes

Just as there are drop shadow letters, there can be drop shadow figures.

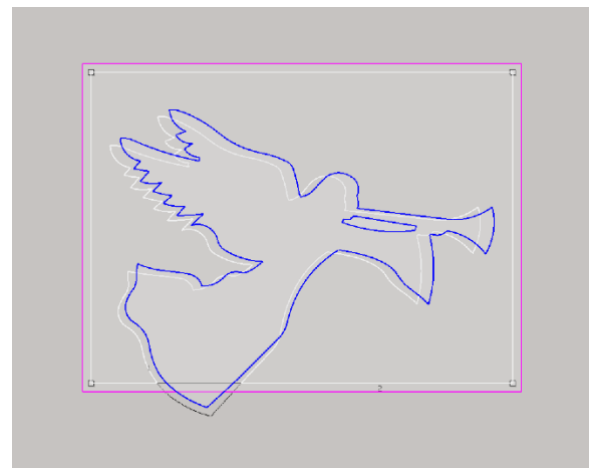
This is two-layer vignette is little more than a second copy of the CutArt shape moved down and to the left, then joined with a second rectangle.



The angel CutArt is from the Holiday folder of the Wizard CutArt Library.

It is about 15% larger, and there are several moved pieces to make the shadow more prominent.

This is the first step in Trace.
Break the intersections of the inner rectangle with the angel that will become the shadow on the bottom layer.



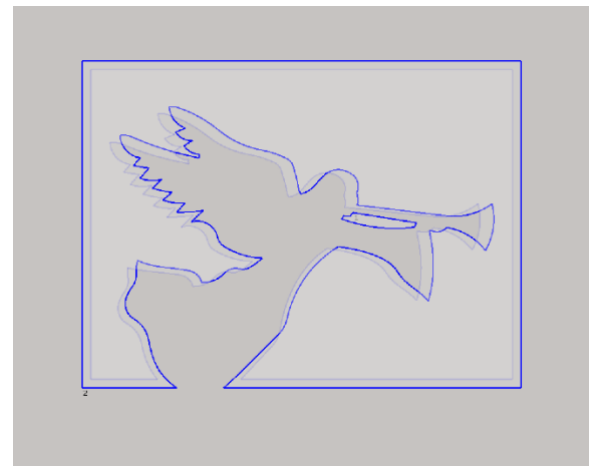
The second step is to break the intersections of the outer rectangle with the angel for the top layer.

Delete all the unnecessary leftover segments.
Join the appropriate parts to form the two layers.

Set the bevels.

The bright blue circuits in this illustration are the items on Layer 1 - the top layer.

The faint blue circuit is the item on Layer 2 - the bottom layer.

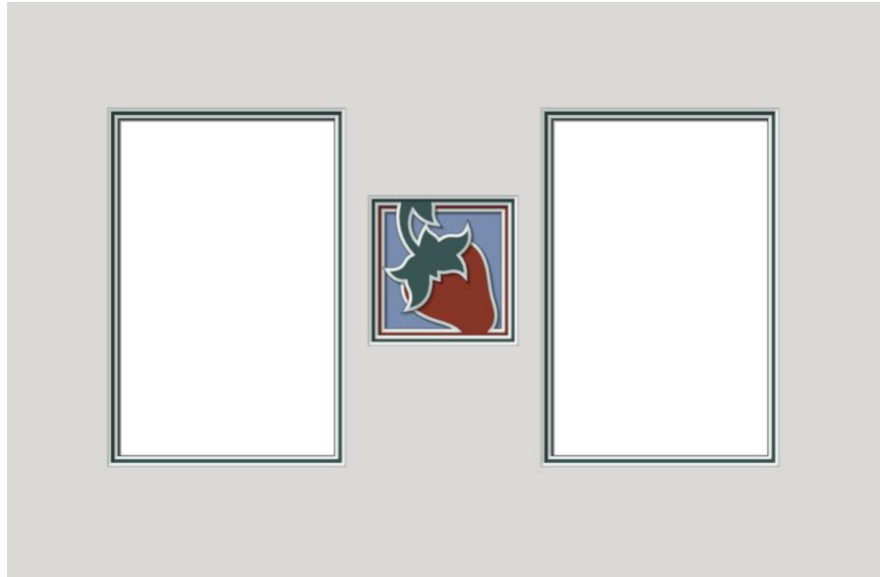


Another Variation - Added Detail, Added Color

We have drawn this strawberry, and the question becomes – How can it be included in the mat design?

It is clear that in everyone's mind, strawberries are red, and leaves are green. It would be possible to cut all the parts in their appropriate colors, then glue them together.

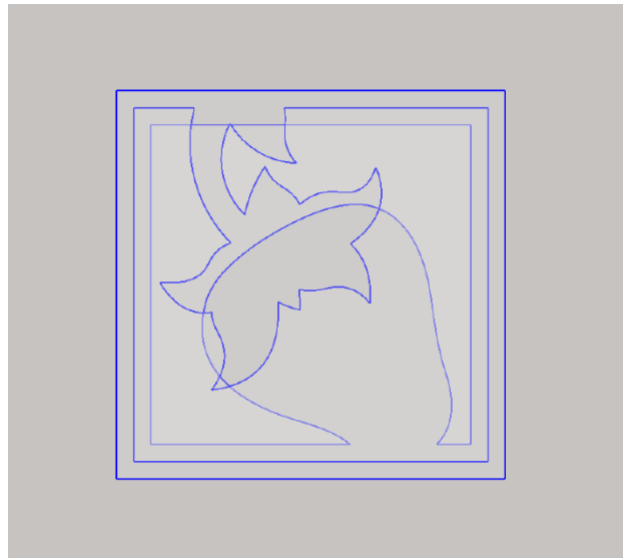
But assembly will be far more accurate if each color's parts are connected inside opening shapes – like these rectangles. Once they are cut, the layers will be stacked up, and all the parts of the strawberry will be in their places without further artistic effort.



Follow the steps from the previous projects.

This is a three-layer vignette.

The top layer is a plain rectangle so that the top layer of the mat does not need to be dark green (so that the leaves will be the correct color).



Part 6: Making the Most of Multiple Layers

It is always gratifying when a project appears to be more complex than it actually is. The next projects have multiple items connected to the insides of two layers.

The separate items are arranged in a pattern so that during assembly, part of an item from the bottom layer might be on top of an item that is connected on the top layer.

As an example, note in this project how the upper right corners of each flower shape are over the left corners of the next flower – whether each flower shape is connected to the top layer or the bottom layer.

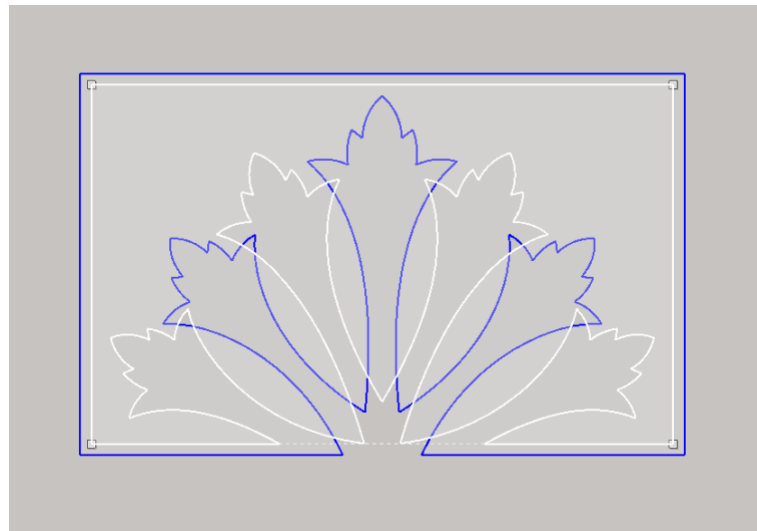
The illusion is that there might be seven layers – not just two.



This illustration from Trace shows the inner workings of both layers.

Note how the long connecting stem of each flower shape narrows in the middle so that it will be flexible enough to bend and twist a little. As the items are interleaved during assembly, each item can be worked into its proper spot more easily.

Note, too, how the stems widen toward the connection points so that the flowers' connections to the rectangles are sturdy.



Letters...also on Stems

By now, everyone realizes that letters are candidates for decorative elements – using all the ideas we employ for other decorative shapes quite effectively.

The letters are from the Roman and Greek Capitals font in the Wizard library.

In Trace, each letter was offset 0.06 inch so that the narrow strokes would be sturdier.

To set each letter's vertical position, the angled pedestals at the bottom were drawn, and the letters were connected.

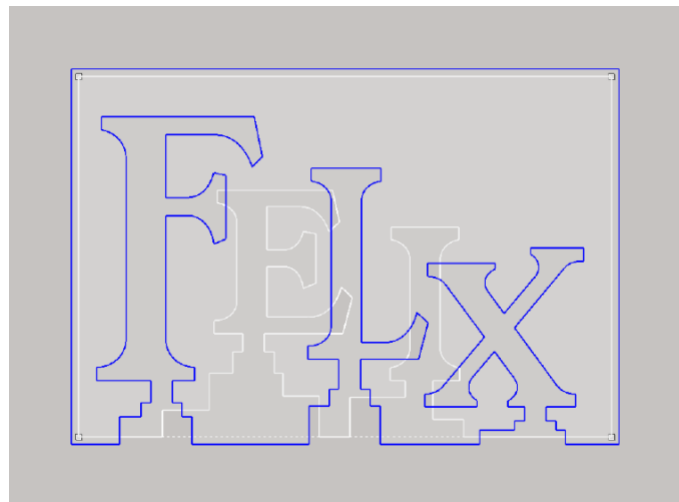
The connection points are 0.4 inch wide.

For reference, the **F** is 5 inches high, the **E** and **X** are 2.75 inches high.



Compare the finished piece with the design in Trace.

To give the construction a more shuffled look – and to see the details of the letters better, the left parts of the **E** are lifted to be on top of the **L**, even though the **E** is on the bottom layer.



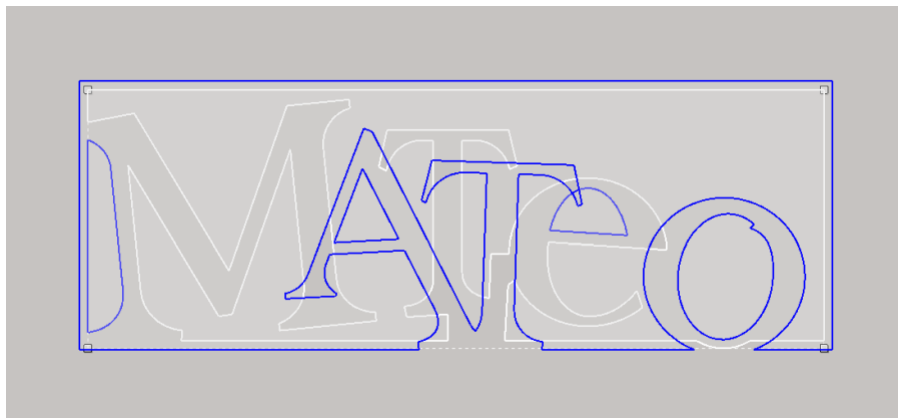
Rotated Letters

These letters are also from the Roman and Greek Capitals font. The letters were fanned to rotate them, but then each letter was eventually moved to make their connections with the rectangles more natural.

Look at the illustration from Trace below to see how the connections were made behind some of the letters – without the obvious pedestals as in the previous project.



For size references, the **M** is 3.75 inches high, the first **T** is 3 inches high, and the **O** is 2.5 inches high.



Again, note the letters that were lifted to be on top of other letters to make the arrangement less sedate and more jumbled.

The Three Layers of the Chrysler Building

Few projects will be this elaborate, but it might be informative to see the project that inspired this notion to multiply the layers' effect. By overlapping and interleaving the elements on each layer, all this detail is made with only three layers in the mat.

The top of the Chrysler building has those 7 semicircular levels with the radiating triangular windows - but a 7 layer design is out of the question. The idea is to connect all the pieces of the image onto different layers of a mat using Trace. Then when the layers are cut and stacked up, the pieces of the image will be automatically in proper alignment.

The trickery here is that each semicircular level of the building is shaped so that four of them can be attached to one layer, and the three others can be attached to the layer underneath it. Cloud shapes coming from the left and right are used as the connecting elements to suspend 4 of the levels in the correct spots in the middle of the design.



Then during assembly, the levels are interleaved so that each layer's bottom is covered by the next layer's top.

In the photo of the project in progress it is easy to see how each of these levels are incorporated into the 2 layers - and how they will slip over and under each other in the assembly.

On top of it all there is a third layer on top that holds the final elements that complete the building's details. This top layer also adds a second layer to the clouds to shroud the mechanics of the understructure.

