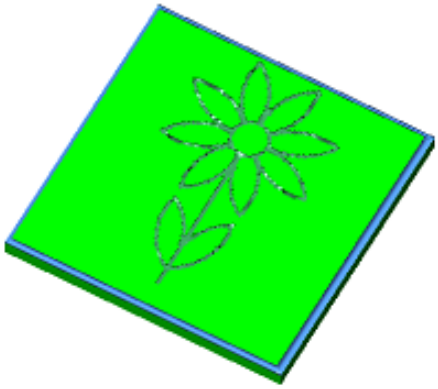
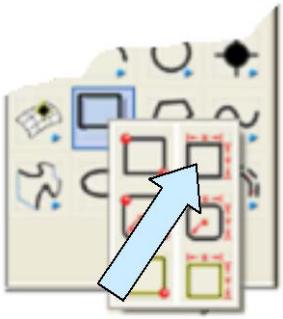
KeyCreator Lesson KC8252

Designer Panel- Machining Artwork



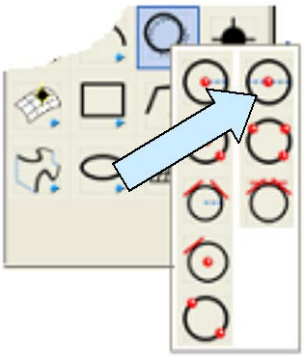
In this lesson we'll review how to quickly create basic tool paths for machining a line drawing on a panel. We'll also quickly create a simple edge treatment running a standard ball mill along the top, outside edge of the panel.



Start with a new file in View 1. (The Top View.)
Click on the CREATE RECTANGLE BY WIDTH HEIGHT Icon. Use the MidCtr Anchor Option.

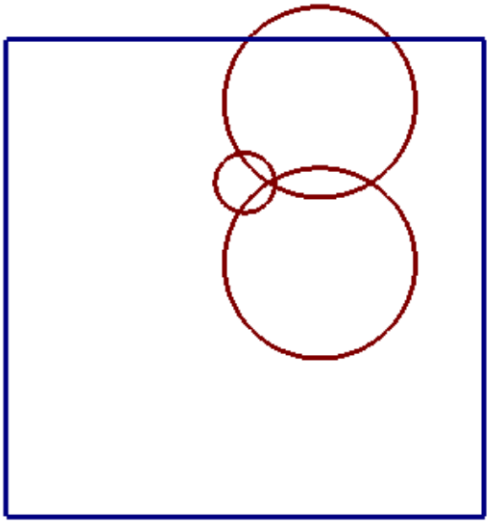
Type 10 for the Width and 10 for the Height.
Click on the KeyIn Option and hit the ENTER Key three times to place the rectangle centered at the origin.

Select a new construction color.



Click on the CREATE CIRCLE BY DIAMETER Icon.
Type 1.25 for the Diameter.
Using the KeyIn Option, type 0 for the X value, 2 for the Y value, and 0 for the Z value.

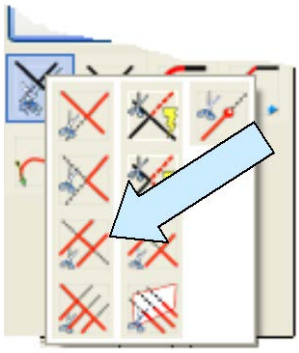
Click on the BACKUP Button. Type 2 for the Diameter.



Using the KeyIn Option, place two more circles. Place the first one at X=1.563, Y=1.689, and Z=0

Place the second one at X=1.563, Y= -1.689, and Z=0

Your screen should look like this:

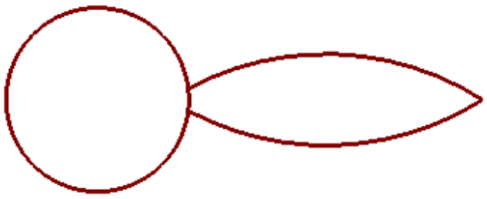


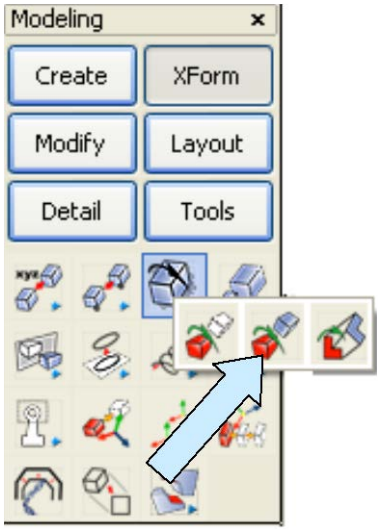
Now, click on the TRIM DOUBLE Icon.

Click on the top 2 inch circle at the 6 O'Clock position. Then, click on the bottom 2 inch circle at the 3 O'Clock position and on the 1.25 circle at the 5 O'Clock Position.

Click on the bottom 2 inch circle at the 12 O'Clock position. Then, click on the right end of the arc you just created and on the 1.25 circle at the 2 O'Clock Position.

Your trims will give you this:





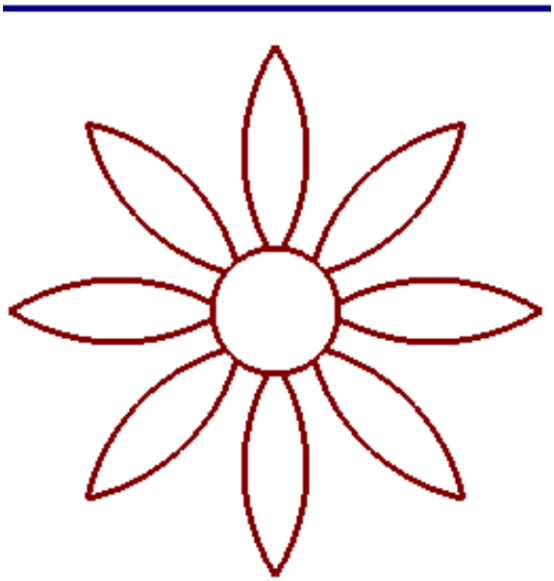
Click on the XFORM ROTATE COPY Icon.
Select the two arcs and hit the ENTER Key.

Type 7 for the Number of Copies.

Using the CtrMid Option, click on the 1.25 inch circle and hit the ENTER Key.

Type 45 for the Angle and hit the ENTER Key.

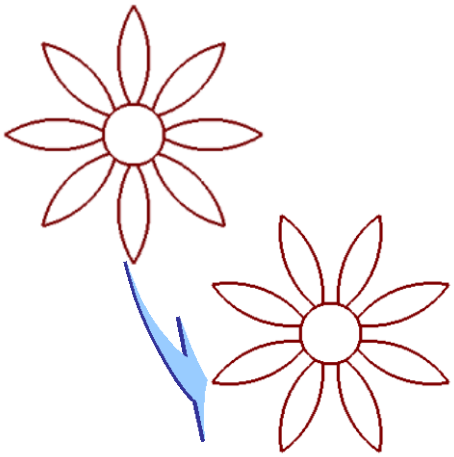
Your screen should look like this:



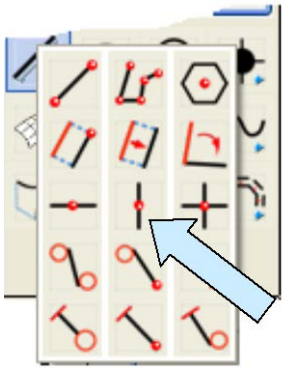
Next, click on the XFORM ROTATE MOVE Icon.

Select the eight “Petals” and hit the ENTER Key.
Using the CtrMid Option, click on the circle.
Then, hit the ENTER Key.

Type 22.5 for the Angle and hit the ENTER Key.



This rotates the “flower” so none of the petals lie on the horizontal or vertical.



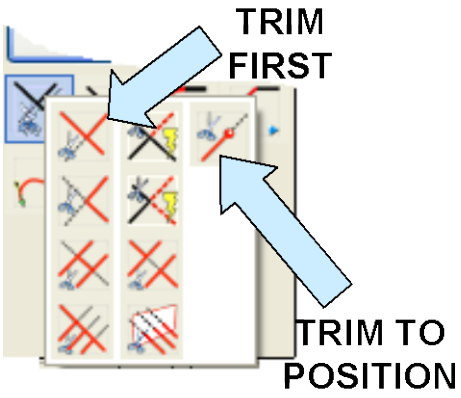
Now, click on the CREATE VERTICAL LINE Icon.

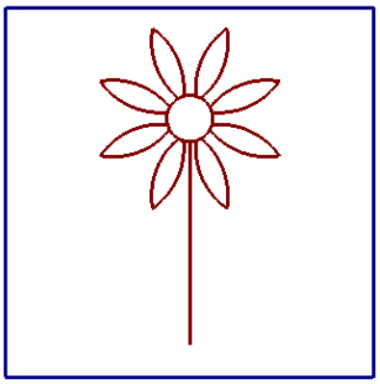
Using the CtrMid Option, click on the circle.

Click on the TRIM FIRST Icon.

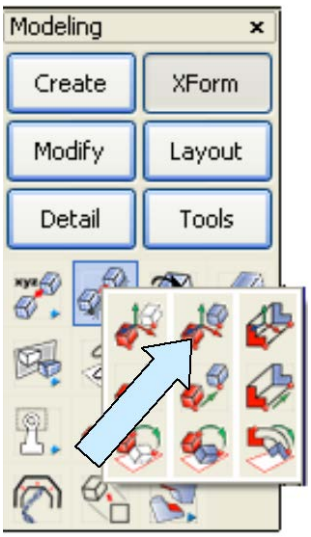
Click on the vertical line below the circle and then on the bottom of the circle.

Next, click on the TRIM TO POSITION, click on the vertical line and then about ½ inch above the bottom edge of the square.

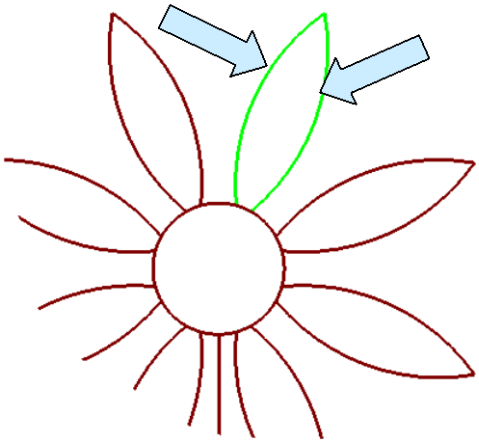




Your screen should look like this:

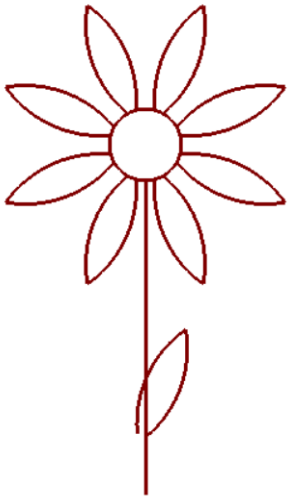


Click on the XFORM OLD-NEW COPY Icon.

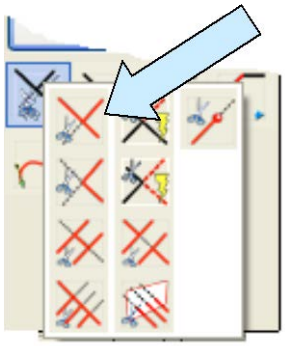


Select the two arcs indicated by arrows in the illustration to the left and then hit the ENTER Key.

Type 1 for the Number of Copies.



Using the EndEnt Option, click on the bottom end of the right arc. Hit the ENTER Key. Click on the AlongE Option. Click on the bottom end of the vertical line and type 1.



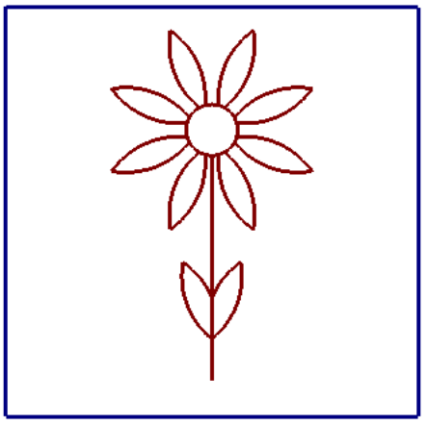
Your construction should look like this:

Now, click on the TRIM FIRST Icon.
Click on the right side of the upper, copied arc and then on the vertical line.

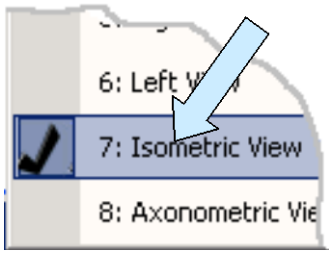
Finally, click on the XFORM MIRROR COPY Icon.

Select the two arcs that you copied to the lower section of the vertical line and hit the ENTER Key.

Click on the 1 Pos V Option.
Using the EndEnt Option, click on the vertical line.



Your completed sketch should look like this:

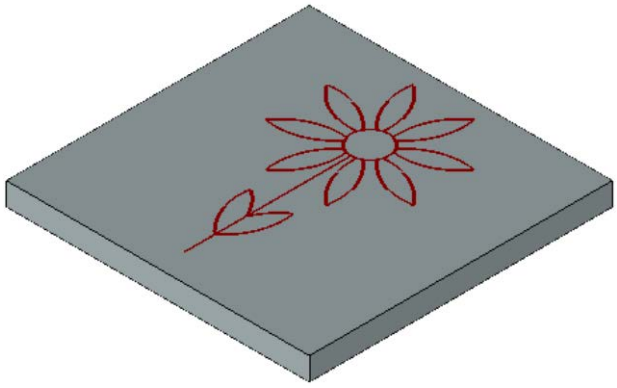


Switch to the Isometric View. (View 7.)

Click on the EXTRUDE Icon.
A Dialog Box appears.

Type 0.75 for the Length and hit the ENTER Key.

Now, select the square and hit the ENTER Key.
Click on the downward-facing vector.

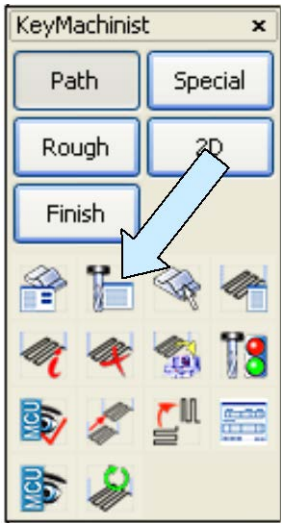


Your screen should look like this:

Creating the Tool Paths

We'll create two tool paths in this exercise. The first one will create a fillet around the entire top edge of the panel. We'll do this with a ball mill. (Note: By replacing the ball mil with a fancy profile cutter this tool path could just as easily create a much more dramatic edge treatment.)

The second tool path will machine the picture of the flower. We'll use a ball mill for this also. This could just as readily be done with a veining bit or even a flat end mill.



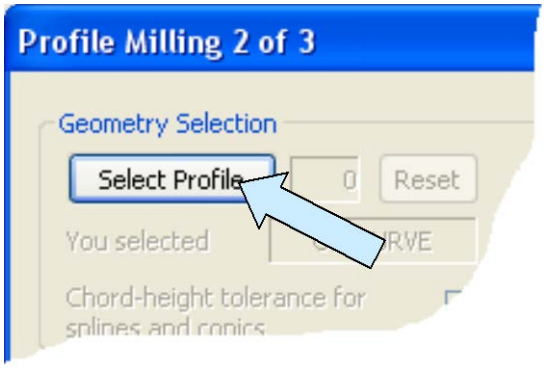
Click on the TOOL LIST Icon.

A Dialog Box appears. We're going to define two tools for this project if you don't already have them available. The first tool is a 0.375 diameter ball mill.

The second tool is a 0.125 diameter ball mill. When you are done, select the 0.375 ball mill as the active tool.

Click on the 2D PROFILE Icon.

Sheet 1 of the Profile Milling Dialog Box appears. Our tool is already selected, so click on the NEXT Button.



Click on the Select Profile Button.

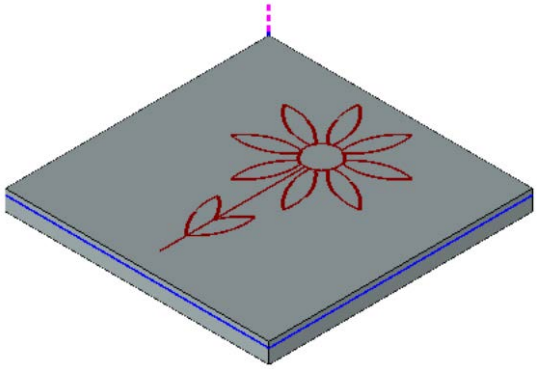
Using the Single Option, select the four top edges of the panel and hit the ENTER Key.

You are asked if you want to change the machining direction. Click on the NO Option.

Next, click on the OnCurve Option.
Then, hit the ENTER Key.

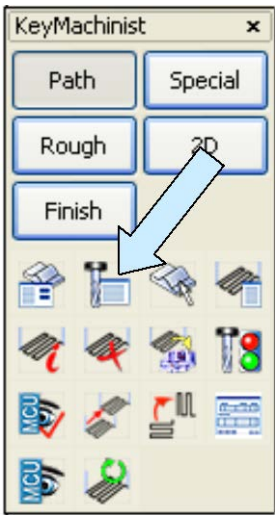
Click on the NEXT Button.

Sheet 3 of the Profile Milling Dialog Box appears.
Click in the Z-Floor Field and type 0.188 for the value.



The value in the Z-Surf field should be 0.
We want 1 finish pass.
Click on the CREATE PATH Button.

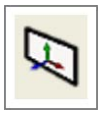
Type “EdgeMill” for the path name and click on the CREATE Button. You will now have a tool path that travels around the perimeter of the panel.



Click on the TOOL LIST Icon. A Dialog Box appears.
Select the 0.125 Ball Mill and click on the DONE Button.

Now, we’re going to use the Geometry to Tool Path Function to generate the tool path that creates the flower. We’ll want the tip of the mill to travel along a path that lies 0.063 below the top surface of the panel.

We can control this easily by first moving all of the entities in the flower pattern downward 0.063 inches.

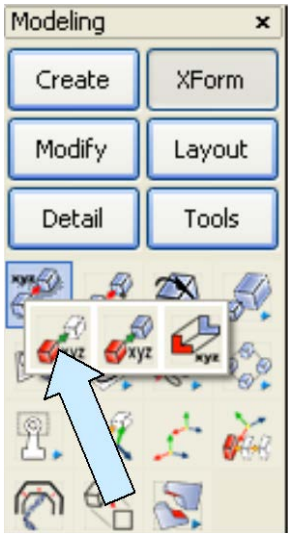


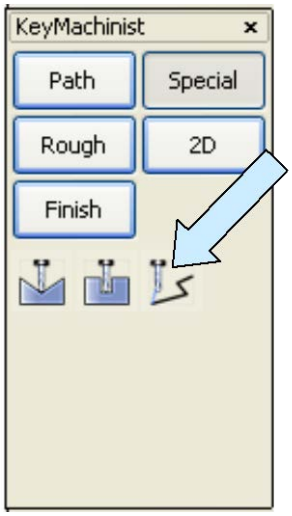
To do this, first click on the CONSTRUCTION PLANE Icon. Type 1 for the Construction Plane.

Click on the XFORM DELTA MOVE Icon.

Select all of the entities in the flower pattern and hit the ENTER Key.

Hit the ENTER Key twice. Type -.063 for the Z Value and hit the ENTER Key.



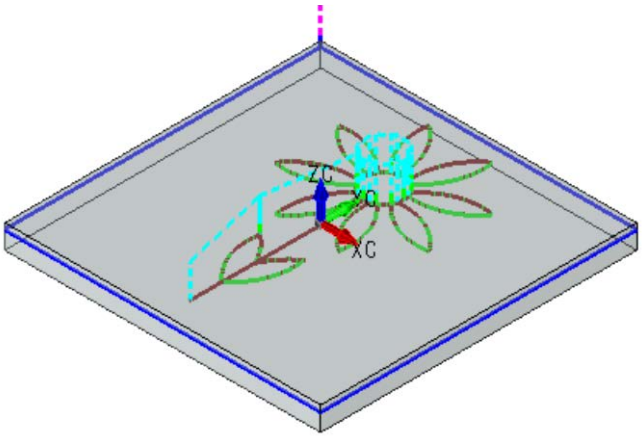


Click on the GEOMETRY TO TOOL PATH Icon.

A Dialog Box appears.

Type “Flower” for the name of the tool path.
Select all of the entities in the flower pattern and hit the ENTER Key.

You are asked to select a pivot point. Using the CtrMid Option, click on the circle.

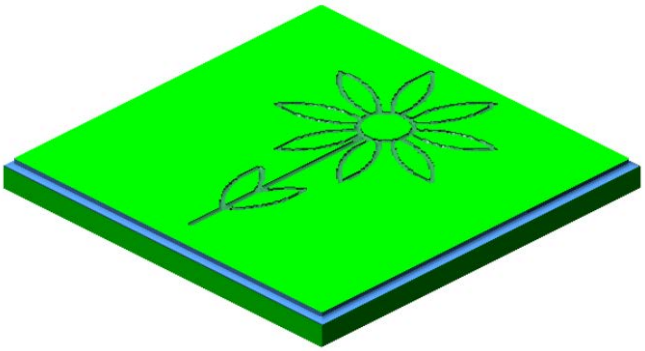


You will now have a tool path to machine the flower.

Click on the VERIFY TOOL PATH Icon.

Select the edge mill tool path and the flower tool path and hit the ENTER Key. You are asked to define the stock. Click on the Corners Option.

Using the EndEnt Option, click on the top, left, front corner of the panel and then on the bottom, right rear corner. Hit the ENTER Key.



The MetaCut Utilities screen appears. Hit the Play Button and your machined panel should look like this: