180° Popup Card Designing in PCS

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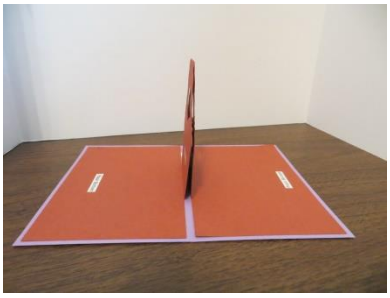
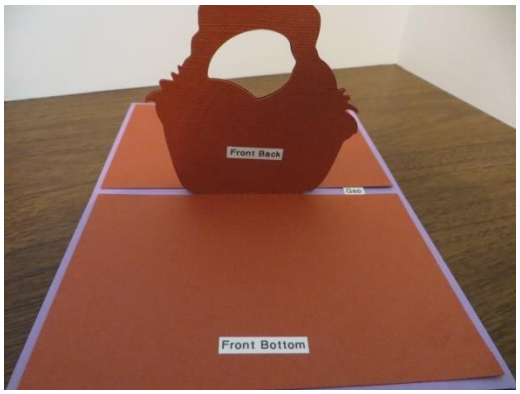
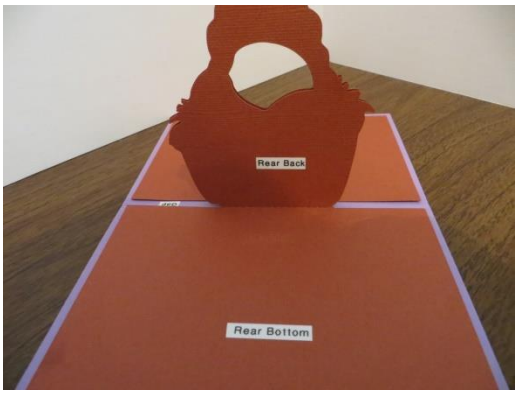
A. Description

- A 180˚ popup card consists of four panels. The two outside panels are adhered to the inside of a card base and the two inside panels form the popup section.



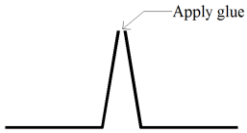
- In PCS, the two outside panels are referred to as the Front Bottom and the Rear Bottom. The two inside panels are referred to as the Front Back and the Rear Back. The strip between the outside panels, after they are glued to the base card, is referred to as the Gap:





B. Two Types of Construction

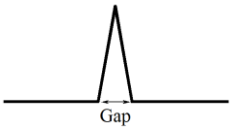
- One Piece Cut 
  - ◊ Has a fold at the center top of the popup (where the Front Back joins the Rear Back), thus all four panels are connected.
  - ◊ Requires cardstock to be ~ 4 times the height of your card, thus the card design typically needs to be small (< 3” high to cut from 12” x 12” cardstock).

- Two Piece Cut 

    - ◊ The Front Back and Front Bottom is one piece, while the Rear Back and Rear Bottom are another piece. Glue is applied at the top of the popup to adhere the two inner panels together.
    - ◊ Only requires ~ 2 times the height of your card, thus a better choice for 12 x 12 cardstock.

C. Determine the Dimensions

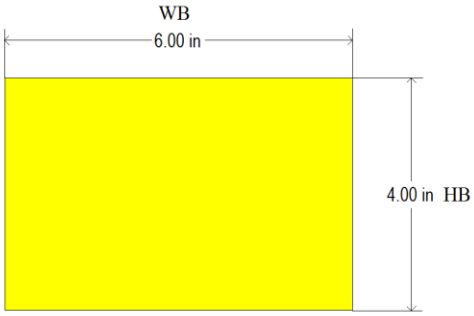
- Dimensions are Important
    - ◊ Use the following instructions to determine the Width, Height, and Gap, based on your final card dimensions.
    - ◊ The gap is the space between the Front Bottom and the Rear Bottom panels glued to the inside of the base card.



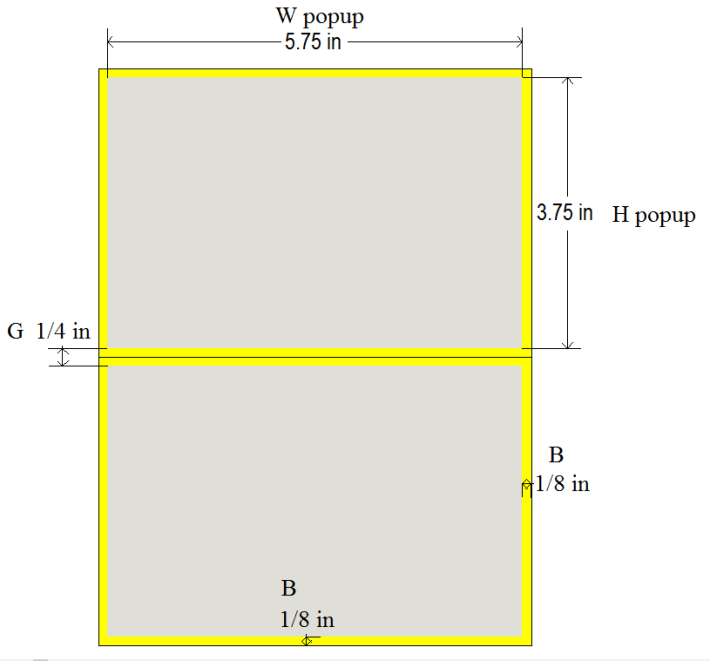
    - ◊ A gap that's too small will result in the popup possibly flopping to one side, especially after being folded and opened numerous times. A gap that's too large will possibly result in buckling.
    - ◊ Default for the gap is 0.25". Susan Bluerobot uses 0.35" in her videos. It depends on the design itself and the material being used, thus you may need to experiment.

- Instructions for Determining the Width and Height to enter into PCS

1. Select the overall size of the base card, closed. In this example the width of the base card (WB) will be 6" wide and the height of the base case (HB) will be 4":



2. Select the gap (G) size: e.g. ¼" (0.25")
3. Select a border (B) size. This border will be how far you want the cut pieces positioned from the outside edges of the base card: e.g. 1/8".
4. In the following diagram, the yellow portion is the card opened up flat. The gray parts represent the popup sections that will be glued down to inside of the base card. The dimensions of the gray rectangles will be needed for PCS.



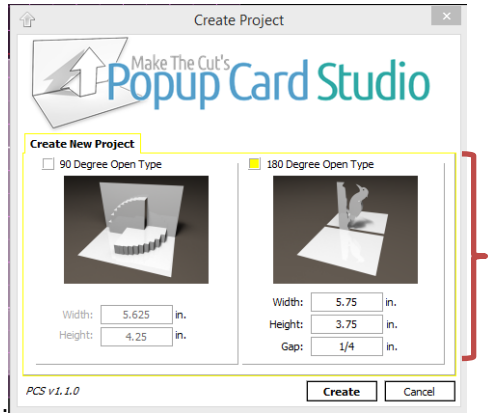
5. Formulas to use for calculating the width and height of the gray rectangles are:

   ◊ W popup = WB – (2 x B) In this example: 6” – ¼” = 5.75”

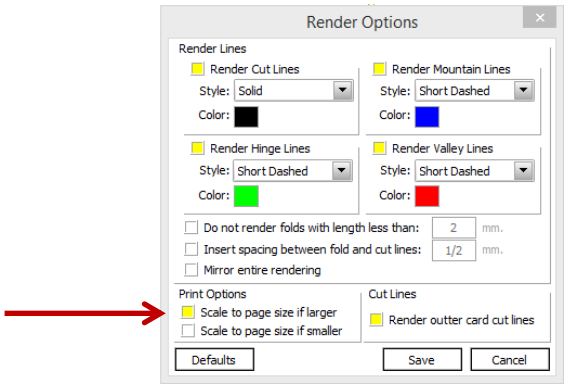
   ◊ H popup = ((2 x HB) - G - (2 x B)) / 2 In this example: (8” - ¼” - ¼”) / 2 = 3.75”

D. Designing the Card

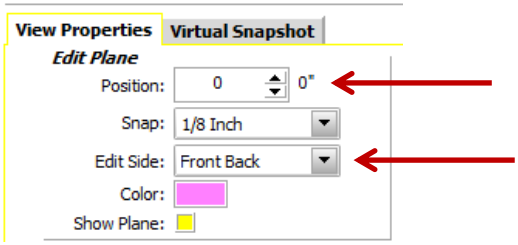
1. Open PCS and mark the option: **180 Degree Open Type**.
2. Enter the **Width**, **Height,** and **Gap** and click on **Create**. In this example, those would be 5.75, 3.75, and ¼”.



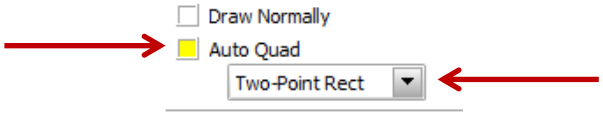
3. Go to **File>Project Rendering** and mark the option: **Scale to page size if larger**. Click on **Save.** This will allow you to see the entire card in the **File>Print Preview** screen:



4. Go to **0" Position** and **Front Back** panel:



5. On left side, choose the **Bezier/Straight Line Tool**:  . On the right side, mark the option: **Auto Quad** and select **Two-Point Rect**:



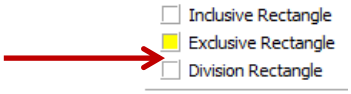
6. Move the mouse to the lower left corner of the **Front Back** panel until the red and blue dotted lines appear. Click once and then move the mouse to the upper right corner of the **Front Back** panel, again, until the red and blue dotted lines appear. Click again. A rectangle the size of the panel will be created.

7. Under **Edit Side**: switch from **Front Back** panel to **Rear Back** panel. Repeat Step 6.

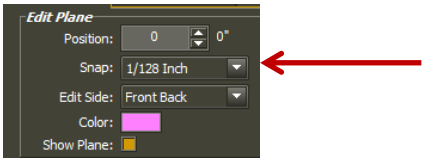
8. On the left side, click on the **Selection Tool**  to return to normal mode. Also, switch to **Front Back** panel.

9. Import the shape for the card. In this example, it is a copy from MTC and a paste in PCS  . Note that you may need to zoom out to locate the pasted shape.

10. Select the shape and then, on the left side, click on the **Crop Tool** .  On the right side, mark the option for **Exclusive Rectangle**:



11. Change the **Snap Position** from 1/8” to 1/128”:



12. Drag the mouse to crop off the bottom of the shape, so as to provide a flat spot for the fold. Repeat on the top of the shape. However, if you will be doing a Two Piece cut, it’s not necessary to crop at the top:

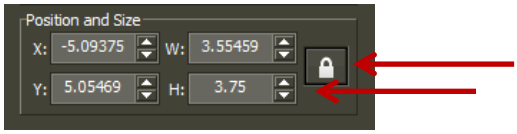
Before cropping

For a Two Piece cut

For a One Piece cut

13. On the left side, click on the **Selection Tool**  to return to normal mode.

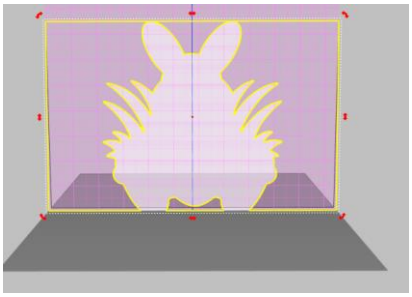
14. Select the cropped shape and resize **H** to match height of the panel, making sure the **Aspect Ratio** is locked. In the example being used, change **H** to 3.75:



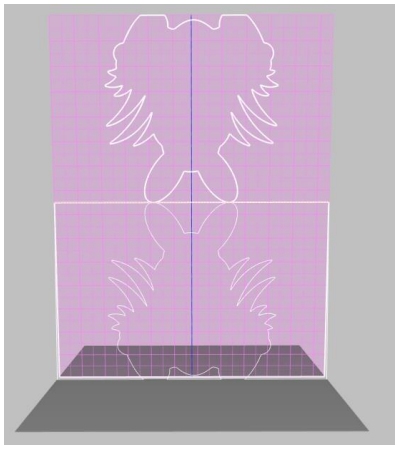
15. Arrange the shape to the desired left/right position and then click on the icon to **Align to Bottom Plane**  .

16. Select the shape and click on the **Copy** icon.  But wait until after the next step to **Paste**.

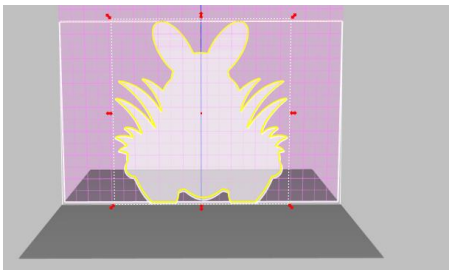
17. Marquee-select both the rectangle and the shape that are on the **Front Back** panel. Then click on the **Boolean Join** icon  , select **Difference** from the drop down menu, and click on **Apply**. The panel should now appear like this:



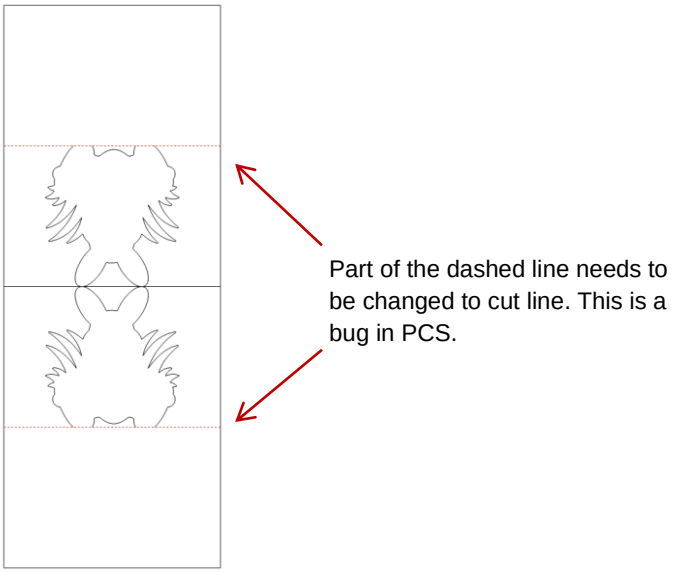
18. Switch to the **Rear Back** panel and then click on the **Paste** icon  . The copy will appear upside down and above the other one:



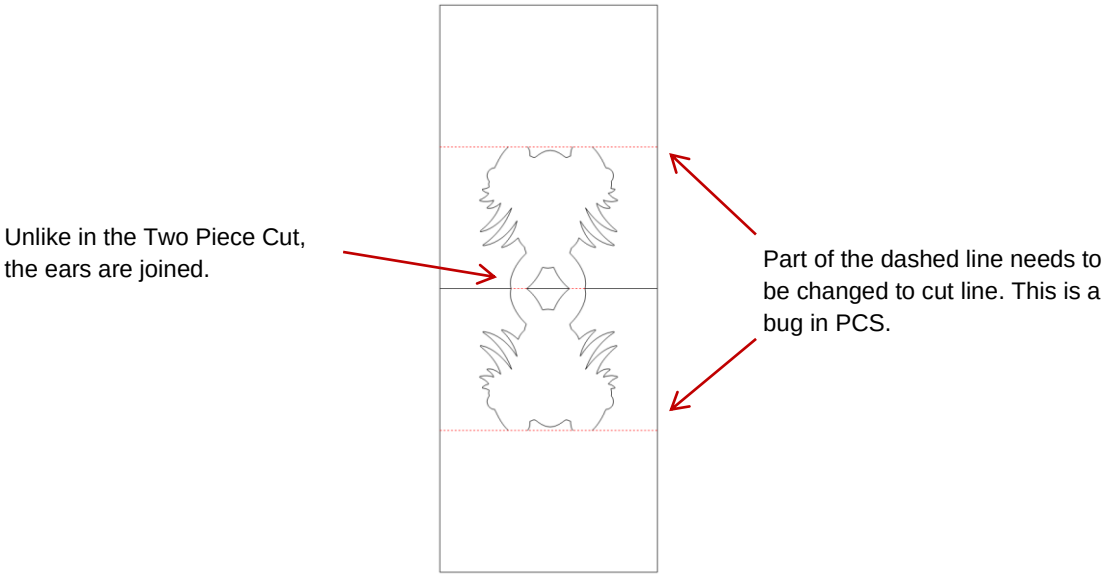
19. With that new copy selected, click on the **Flip** icon at the bottom  , followed by the **Align to Bottom Plane** 



20. Go to **File>Print Preview**. Note that some editing will need to be done in MTC to correct a bug with the software:



21. If you plan to do a One Piece Cut and use the shape that was cropped at the top and at the bottom, repeat the same steps 13 – 20. The final **Print Preview** will appear with a fold line where the ears meet:

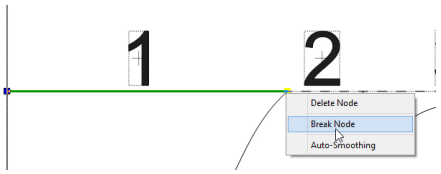


E. Edit the Card in MTC

1. Go to **File>Export>Project Rendering>As SVG File,** select a location for saving and name the file. Click on **Save**. Your computer may flash open the file using Internet Explorer (or some other application). Close that window.
2. Don't forget to save as a PCS file, as well.
3. In MTC, click on the SVG import button at the top of the screen and import the SVG file you just exported.

4. Zooming in on the dashed line that needs to be edited, you'll see five numbered sections. The sections that need to be converted to cut lines are 1, 3, and 5. The two sections where the feet attached to the base card, need to remain dashed.

5. Select the **Edit Paths** icon  on the **Node Edit** toolbar. Click on section 1 so that it turns green. Then right click on the node where it joins section 2. Select **Break Node** from the menu. Then do the same thing by selecting section 2 and then breaking the node where it joins section 3. Repeat along each section, breaking the node where the line needs to change from a cut line to a dashed line.

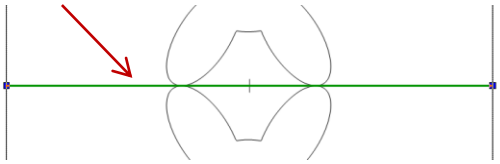


6. Repeat at the bottom.
7. Click on the **Edit Project Normally** icon  . Then, with your project selected, click on the **Break** icon: 
8. Now the small sections that need to be converted to cut lines can be selected and changed. At this point, you may wish to reorganize the dashed lines and cut lines onto their own layers.
9. Last step is to separate the card in the middle so that one section can be moved to a different location for cutting. Otherwise, you would need a sheet of cardstock that's 15" long.
10. On the **Virtual Mat** settings, change **Snap to Position** to ¼". Then move the entire project (make sure no layers are turned off) so that the center snaps to a horizontal grid line.

At this point the editing will be slightly different, depending on whether you're creating a Two Piece Cut or a One Piece Cut, thus refer to the appropriate section:

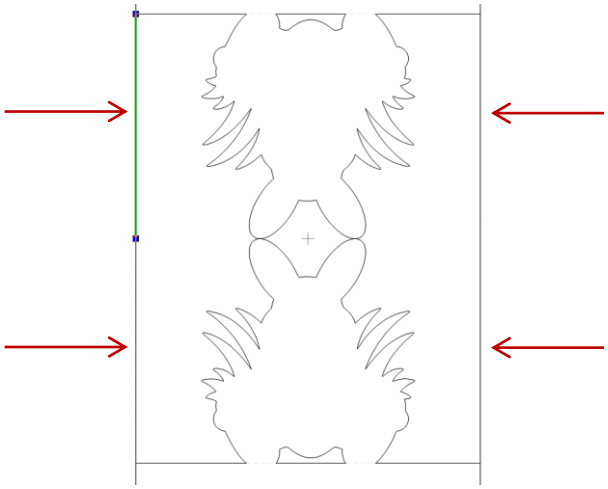
<u>Two Piece Cut</u>

1. Select the **Edit Paths** icon  on the **Node Edit** toolbar. Click the middle horizontal line in the project and press the **Delete** key:



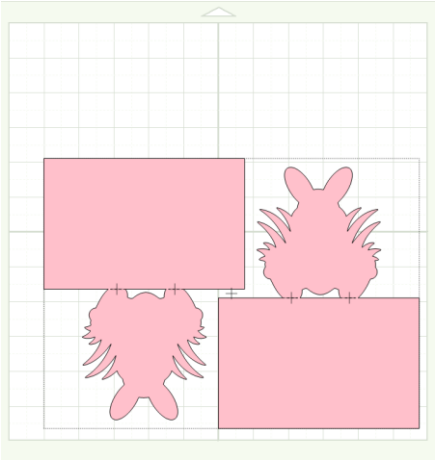
2. You also do not need the vertical cut lines in this middle section, so delete those as well.

Select each of four lines and press **Delete**



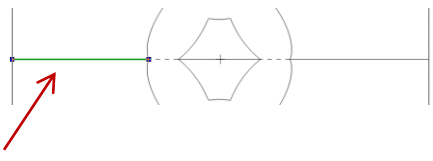
3. Click on the **Edit Project Normally** icon . Then, with your project selected, click on the **Break** icon:

4. Marquee-select one entire section and move to a different location for cutting. Pay close attention to the selection to make sure you pick up fold lines, as well as cut lines.

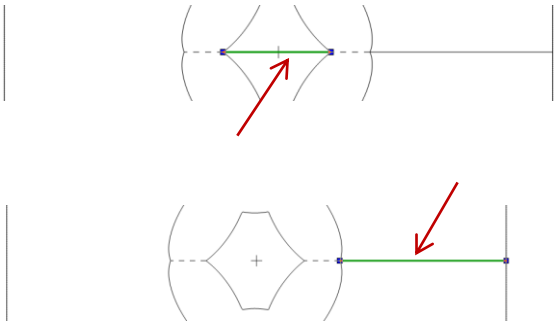


<u>One Piece Cut</u>

1. Again, select the **Edit Paths** icon on the **Node Edit** toolbar. Click the left center horizontal line in the project and press the **Delete** key.

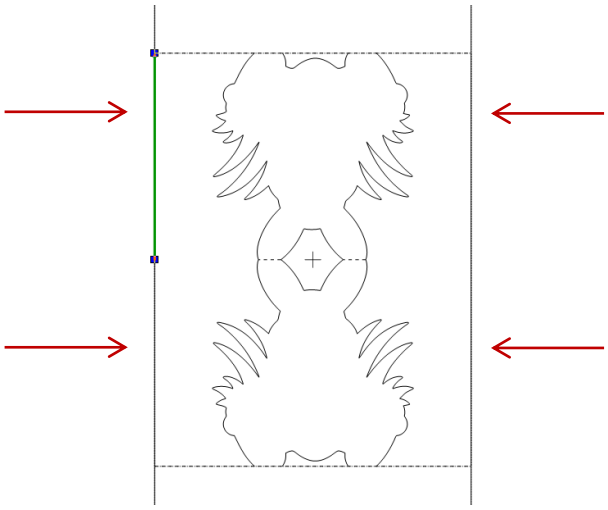


2. Repeat for the other two center horizontal lines:

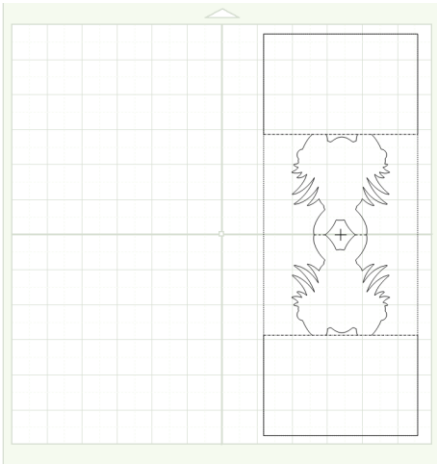


3. You also do not need the vertical cut lines in this middle section, so delete those as well.

Select each of four lines and press **Delete**



4. Click on the **Edit Project Normally** icon  . Verify that the dimensions of your project will fit the material you are using. Resize if necessary.



F. Final Notes

- If you want additional popup elements (i.e. the types used in a 90 popup card), then add those normally. Just remember to partially overlap the portions of your image where the fold line is located: