

TUTORIAL 5

Custom Practice

Learning Objectives

After completing this tutorial, you will be able to:

- Use the new 3D modeling tools in AutoCAD 2007 for freeform sculpting.

Required Competencies

Before starting this tutorial, you should have been able to:

- Use AutoCAD at an intermediate to advanced level
- Manipulate the UCS
- Imprint Solid Faces
- Loft Surfaces.

The new 3D modeling tools in AutoCAD 2007 allow you to model complex freeform shapes that previously were not possible to model in AutoCAD. This tutorial assumes that the user is completely familiar with creating precise 2D sketches of arcs, lines, polylines, and splines in any location as well as the 3D tools from previous releases.

In this tutorial the model is only partly finished. Experiment with adding your own custom designs to the model.



Game Pad

1. Open the file named Tutorial 5 Game Pad.dwg.

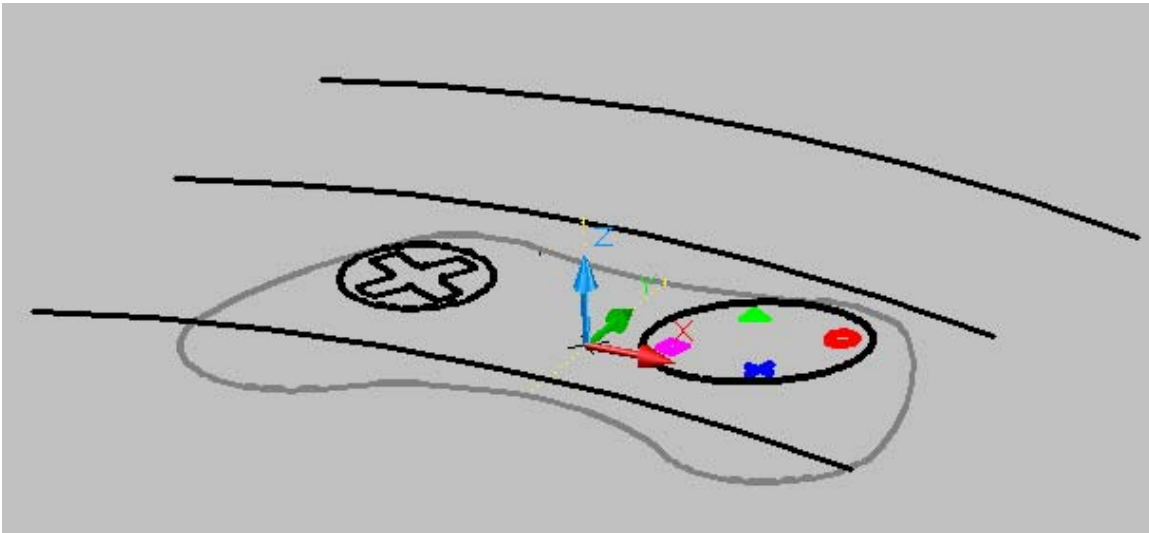


Figure 1

2. Turn off all of the layers except the Base Sketch and the Solid layers. Make the Solid layer the active layer. The first sketch is simply a series of arcs joined into a polyline.



Figure 2

3. Set the “delobj” variable to 0 so that the sketches will not be consumed. That way if you make a mistake you can go back to the original geometry. Extrude the base sketch a distance of 50 with a 7° taper. Turn off the Base Sketch layer.

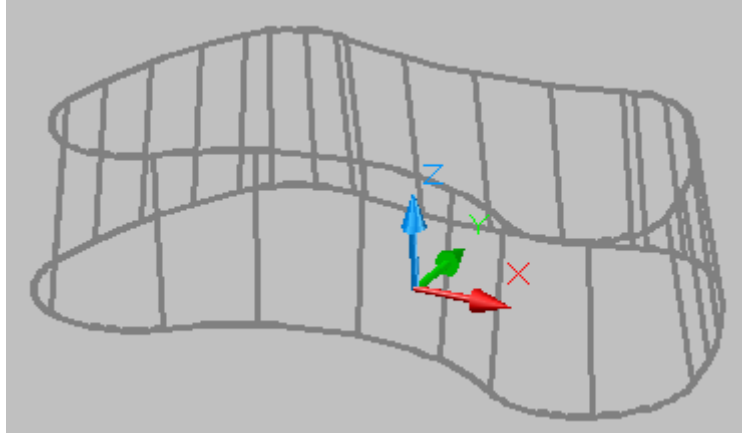


Figure 3

4. Make the Loft Surface layer visible. Loft a surface selecting the three splines in order. Accept the Cross-sections only option and the default smooth fit transition.

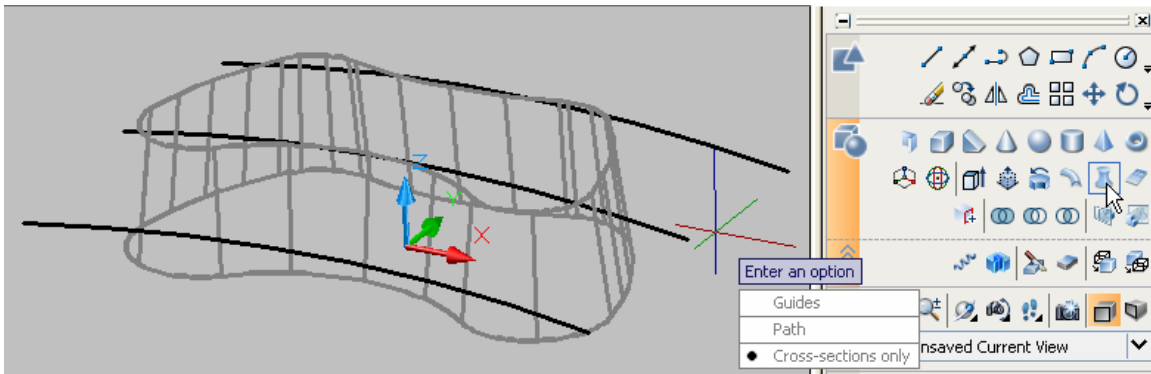


Figure 4

5. Start the Slice function and use the Lofted Surface to slice away the top of the solid.

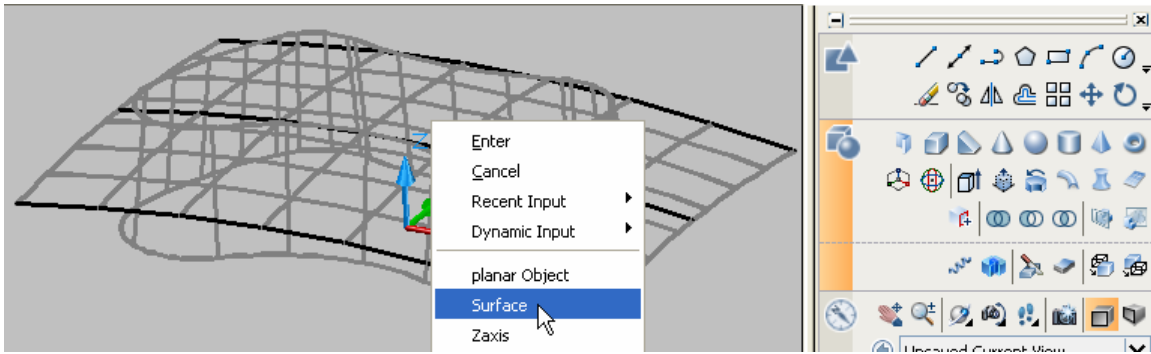


Figure 5

6. Copy the lofted surface up the z-axis a distance of 4. Then put the original lofted surface on the Hide Surfaces layer.

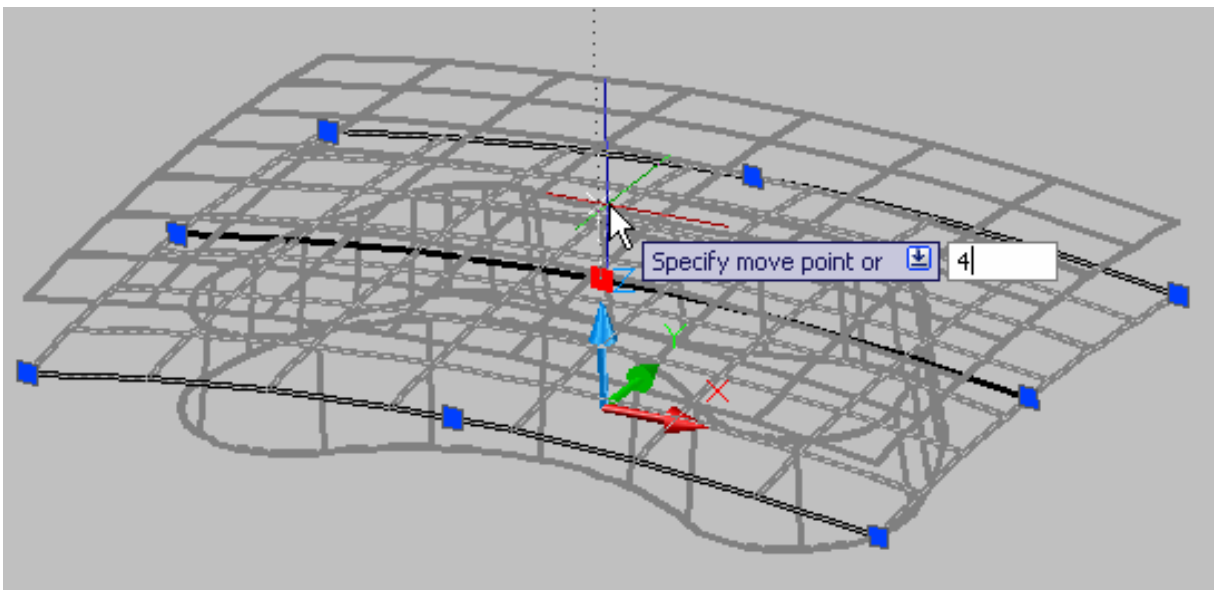


Figure 6

7. Make the Left Button Sketch and the Right Button Sketch layers visible. Extrude the circle and ellipse a distance of 40 with a taper of 7° .

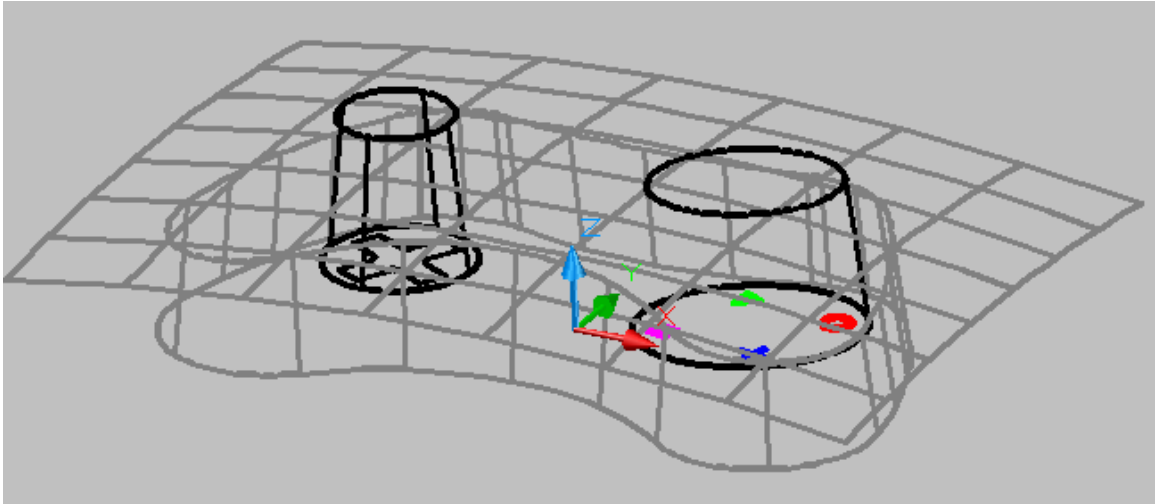


Figure 7

8. Union the Button solids to the Base solid and then use the offset lofted surface to Slice the excess off of the top of the buttons. Move the lofted surface to the Hidden Surfaces layer (which should be turned off). I prefer to keep all construction geometry rather than erase it.

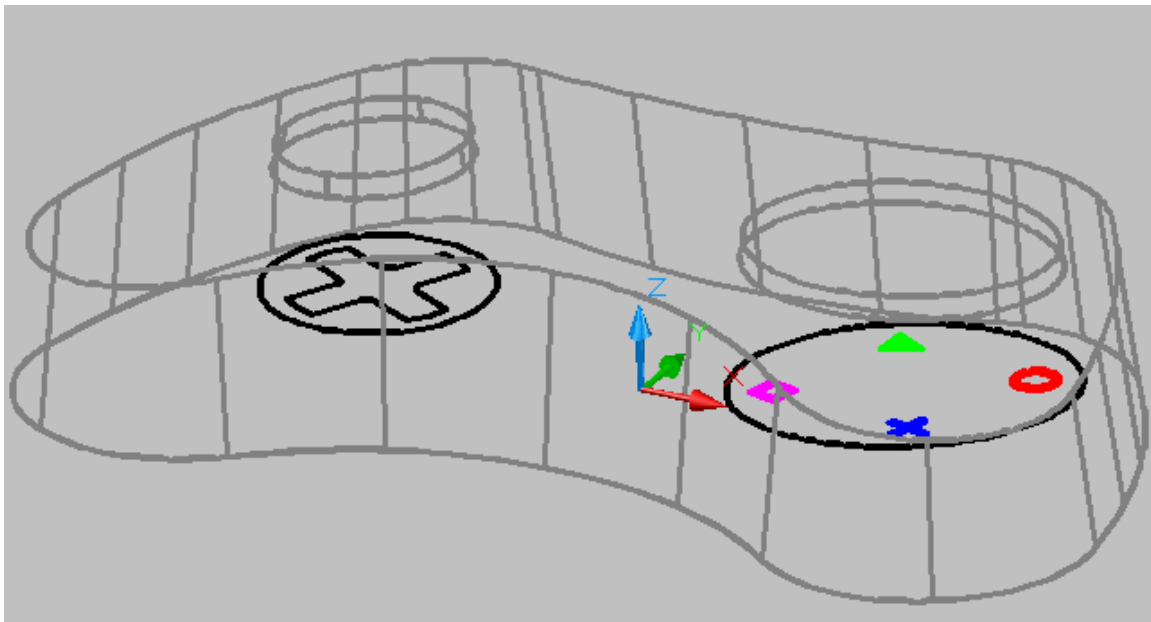


Figure 8

9. Extrude the Button details 30mm with no taper.

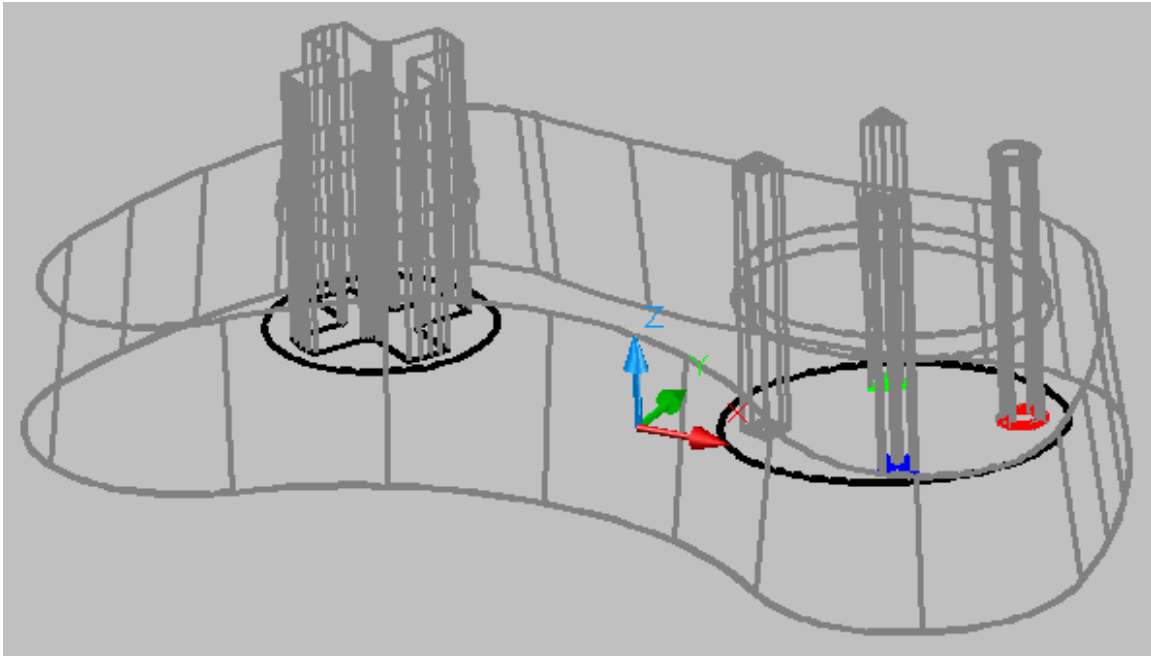


Figure 9

10. In the 3D Make control panel of the Dashboard select the Imprint tool and then the solid base. Select each of the button details to imprint deleting the source solids. (You may wish to opt to keep the imprinting solids on a hidden layer.) To use the imprint command you need only select the base solid one time, DO NOT press enter, then select each imprinting object. Follow the prompts.

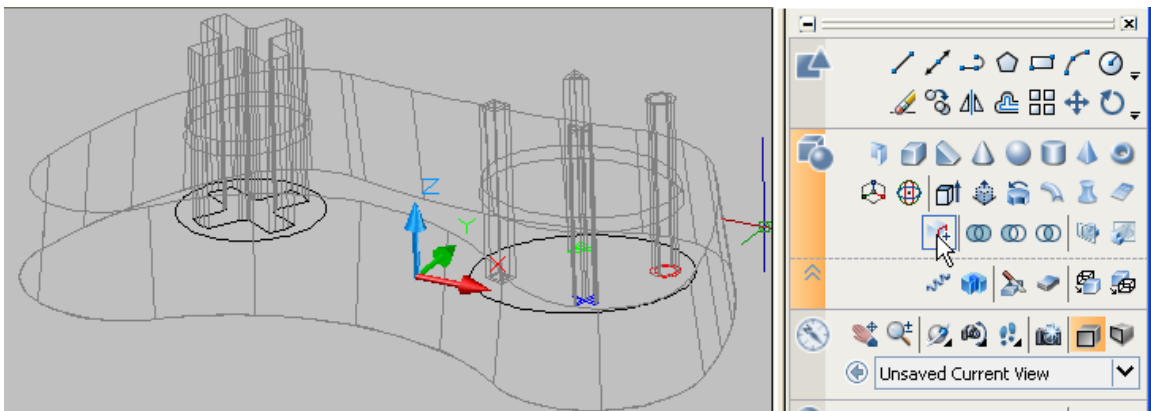


Figure 10

11. From the Solids Editing toolbar select the Color Faces tool and color the faces as desired.

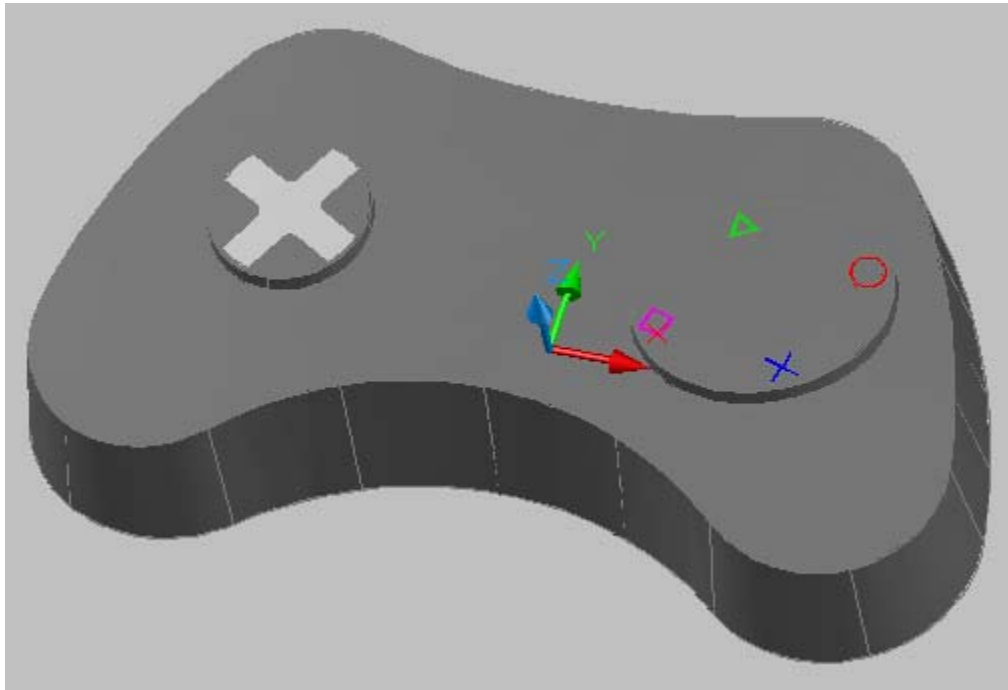


Figure 11

12. Add a 10mm Chain fillet around the bottom of the base.

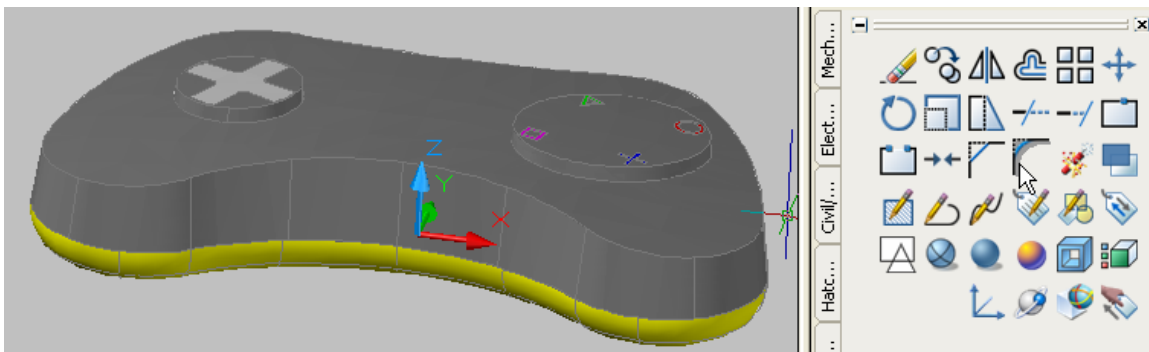


Figure 12

13. Add a 6mm Chain fillet around the top of the base.

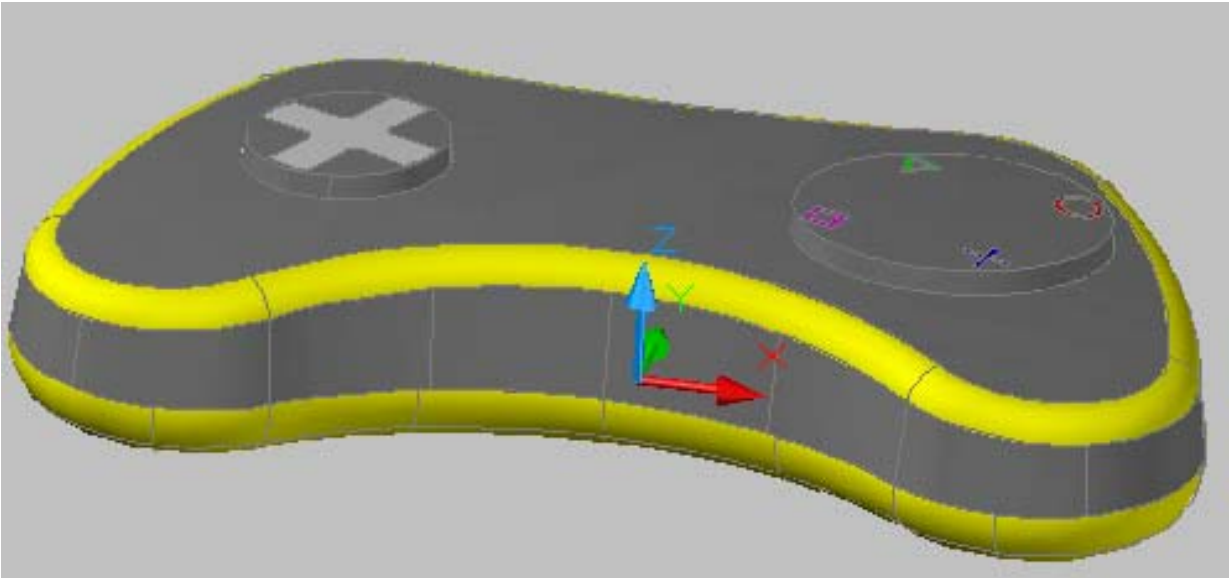


Figure 13

14. Add 2mm fillets between the buttons and the base.

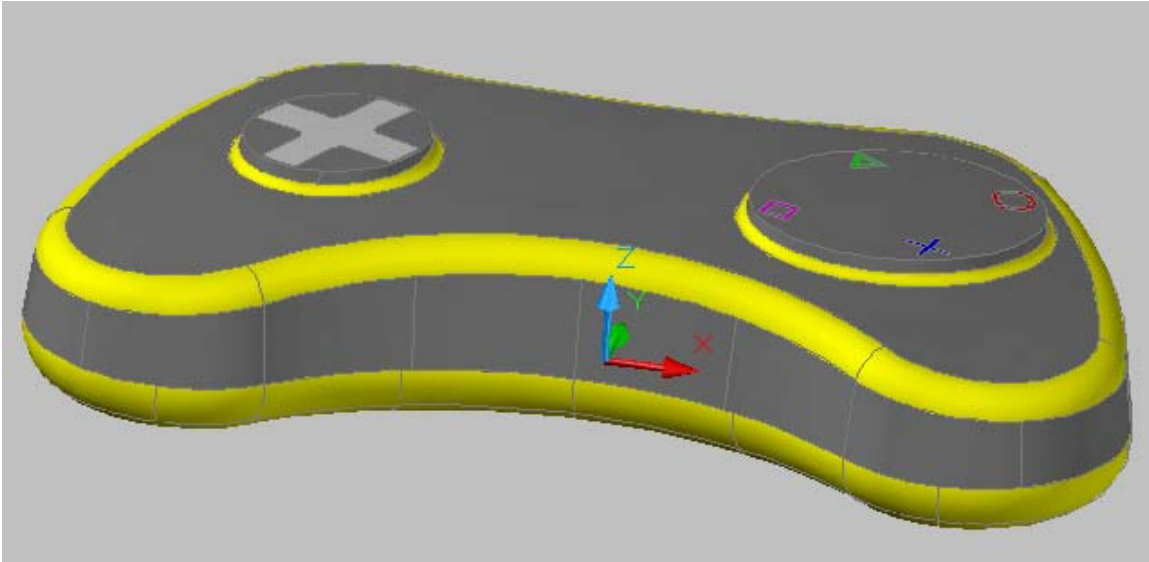


Figure 14

15. Add 0.5mm fillets to the top edges of the buttons.

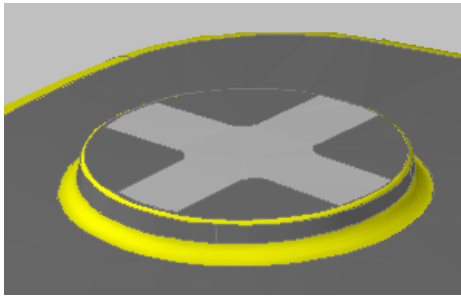


Figure 15a

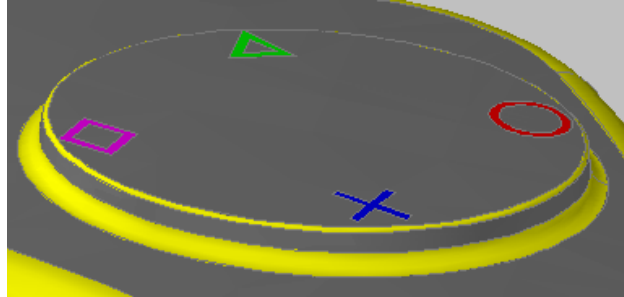


Figure 15b

16. Continue to customize your game pad as desired.

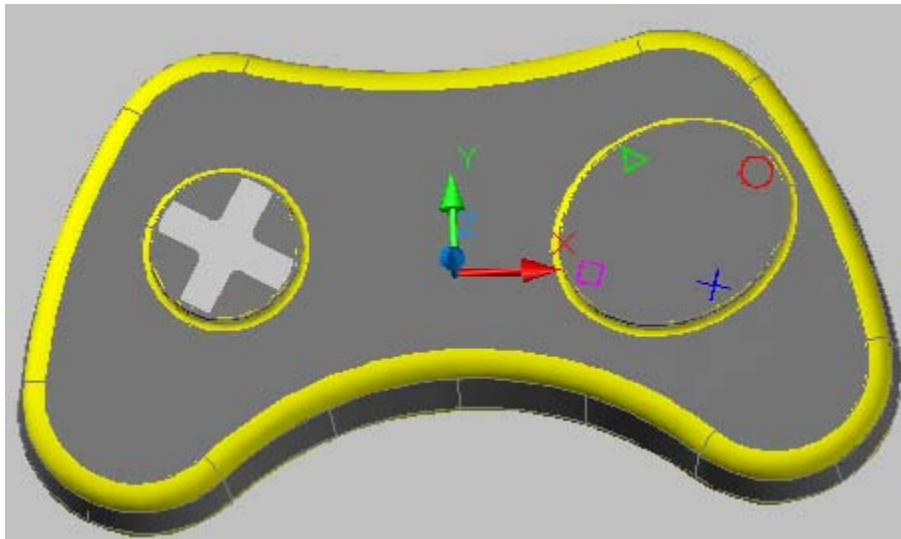


Figure 16