

1

Sweep

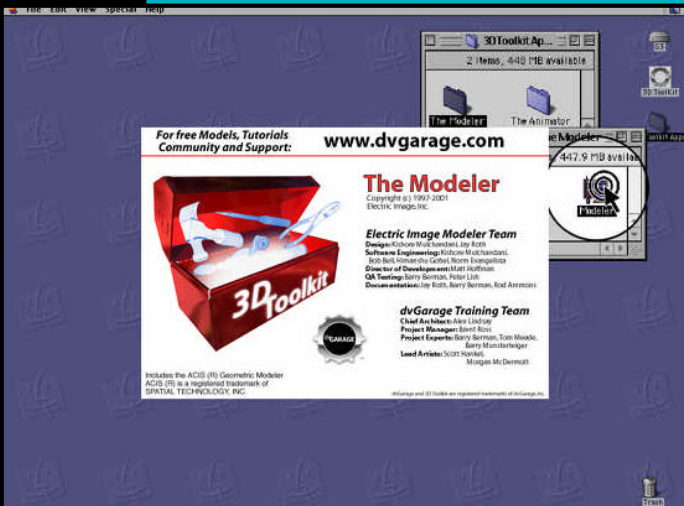


Sweeping is a basic modeling technique that uses 2D surfaces to create a single 3D object. A sweep starts with a path, which can be a simple line. The path is used as a guide for another shape that gets strung along the path, creating a surface. The sweep is a very versatile tool and can be used as a starting point for much more complex objects.



Overview





[DBL+CLK] the Universe Toolkit Modeler application program to launch the EI Modeler.

Note: Macintosh keyboard commands are indicated in **red**.
Windows keyboard commands are indicated in **blue**.

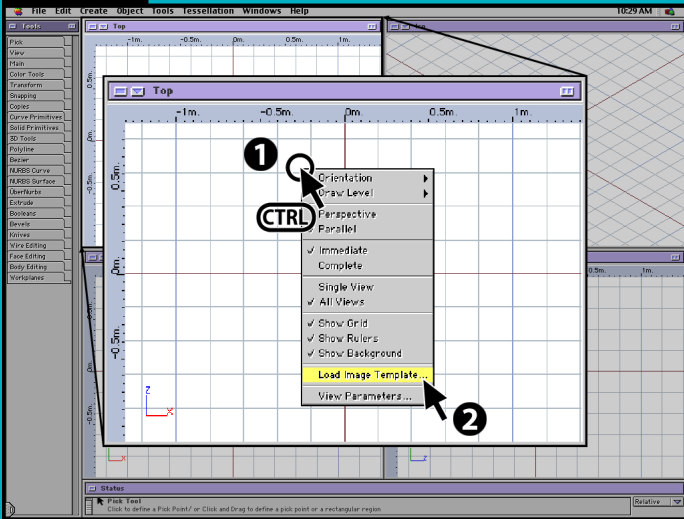


Sweep



3

Loading the Underlay



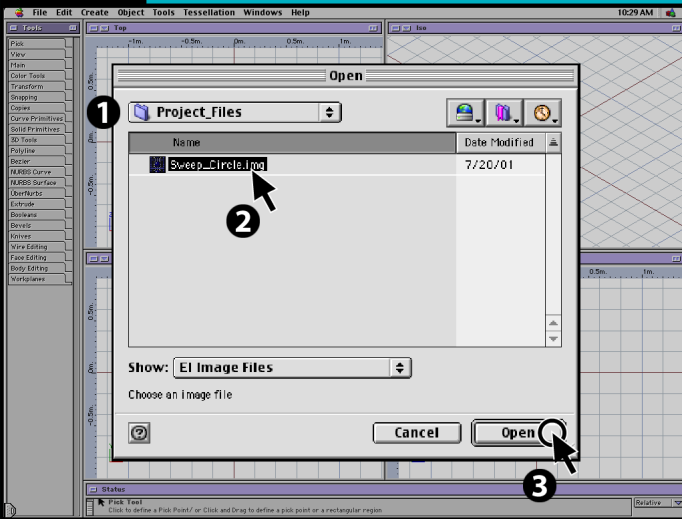
In the Top view window, [**CTRL/R+CLK**] in the window and in the pop up menu select “Load Image Template...”

Note: We are going to use an underlay, or template to assist us in creating our shapes.



Sweep



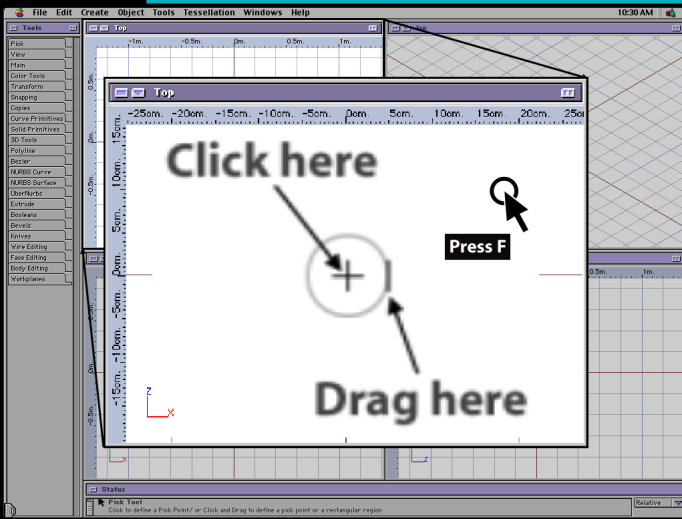


Navigate to the Sweep Project file folder.

Select the Sweep_Circle.img file.

[DBL+CLK] the file name, or [CLK] and press [RTRN] to open the file.





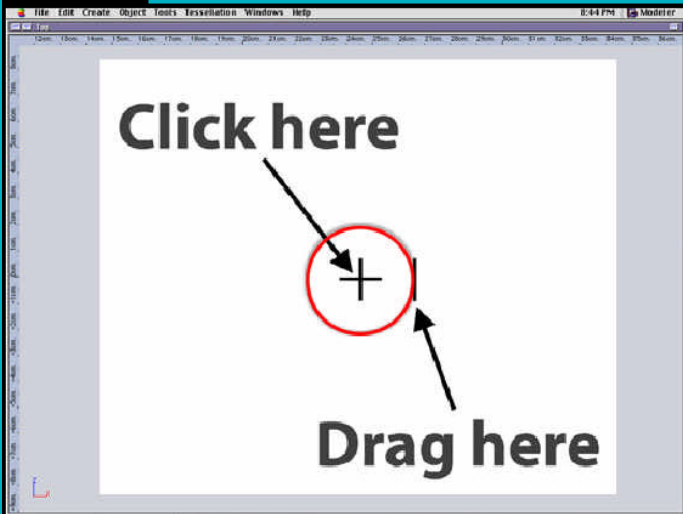
In the Top view window, press and hold the **[F]** key and with the mouse, **[CLK]** in the window.

Note: Doing this sets the view of this window to all of the objects in the scene.



6

Creating a Sweep Shape

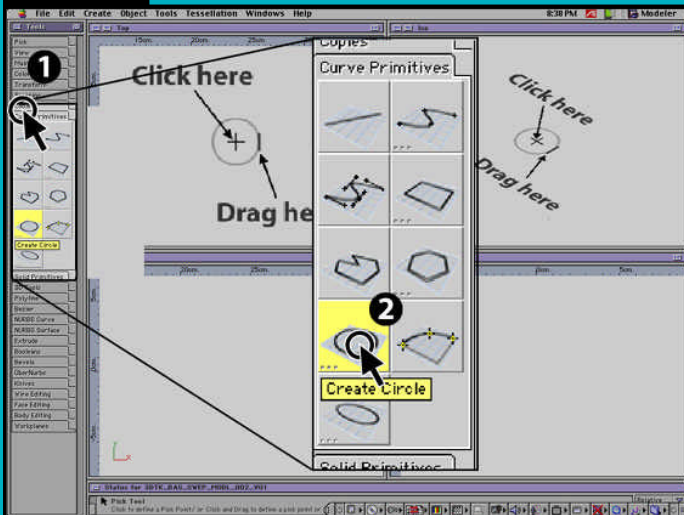


The initial shape we will be creating, a circle, will eventually be used as the sweep object.



Overview

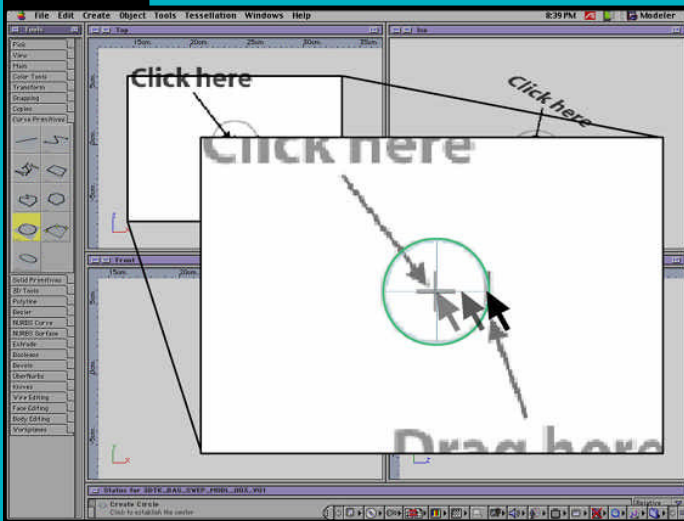




Open the Curve Primitives palette.

Select the Create Circle tool.

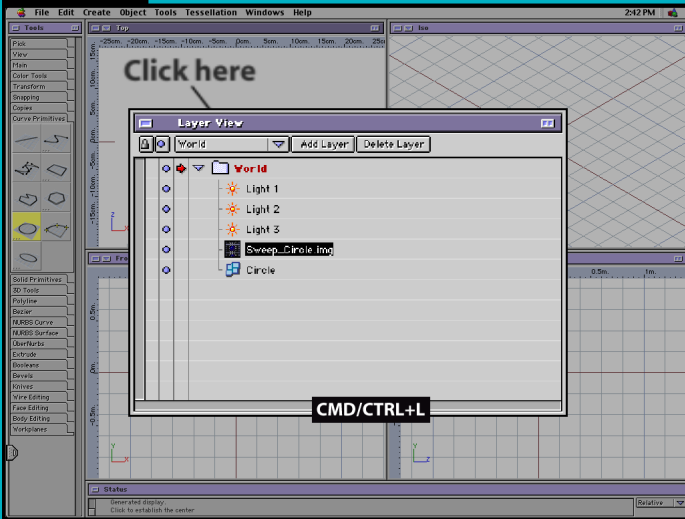




In the Top view window, **[CLK+DRG]** from left to right, starting in the center of the crosshairs and finishing on the outside of the circle template then release it.

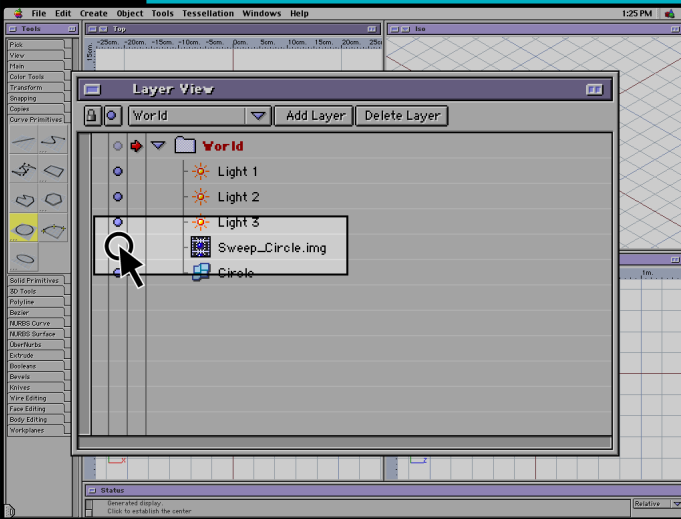
Note: After drawing the circle, the circle vanished. Why? The circle and because of this, the circle is "hidden." The underlay is on the same plane as the circle and because of such, it is hiding it. Since we do not need the underlay anymore, we will hide it. Normally though, if we were tracing lots of objects on a complex underlay, we would want to move the underlay back away for the view that we were drawing in, in this case along the Y axis.





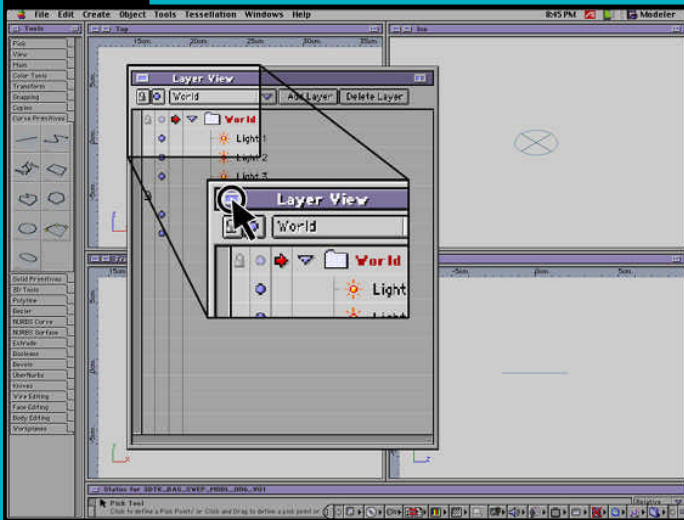
Press [**CMD/CTRL+L**] to open the Layer View window.





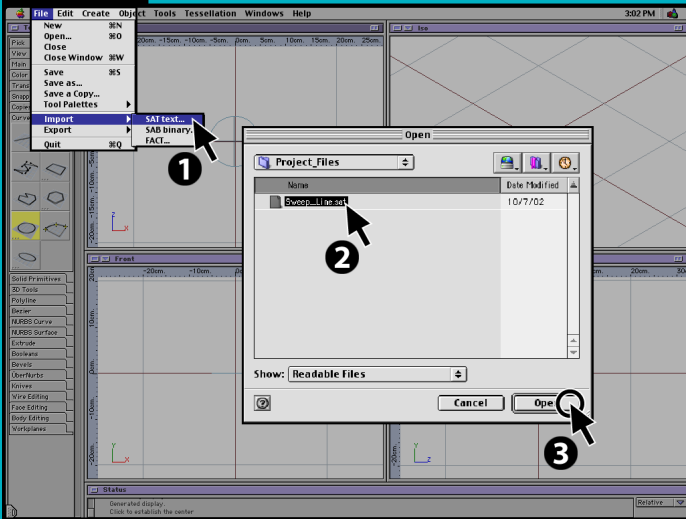
[CLK] the small blue dot to the left of the Sweep_Circle.img file to make it invisible.





[CLK] in the upper left corner of the Layer View window to close it.





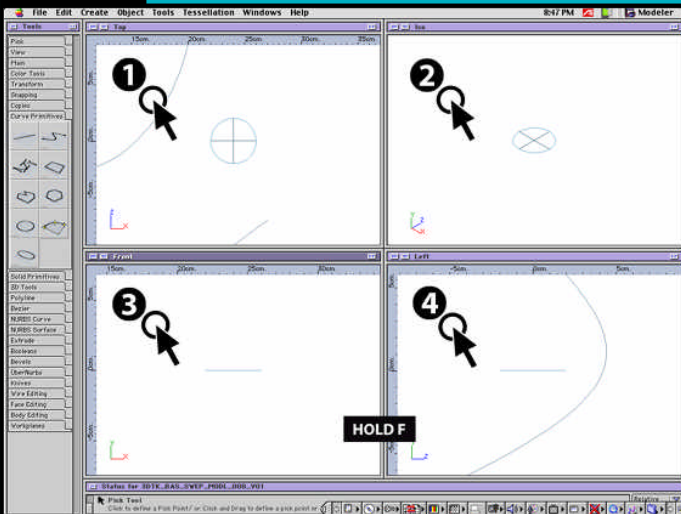
In the main menu, select File > Import > SAT* text...

In the Open window, locate the SWEEP_LINE.sat file and select it...

[DBL+CLK] the file name, or [CLK] and press [RTRN] to open the file.

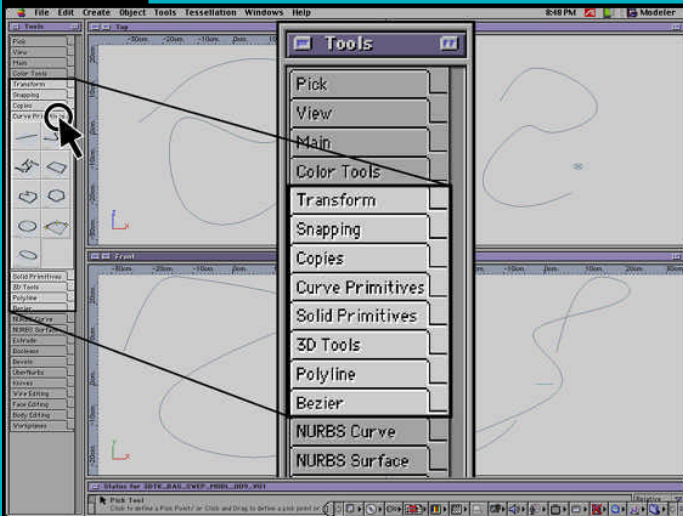
Note: "SAT" is an ACIS, CAD based file format that is fairly reliable.





Hold down the **[F]** and **[CLK]** in each window.



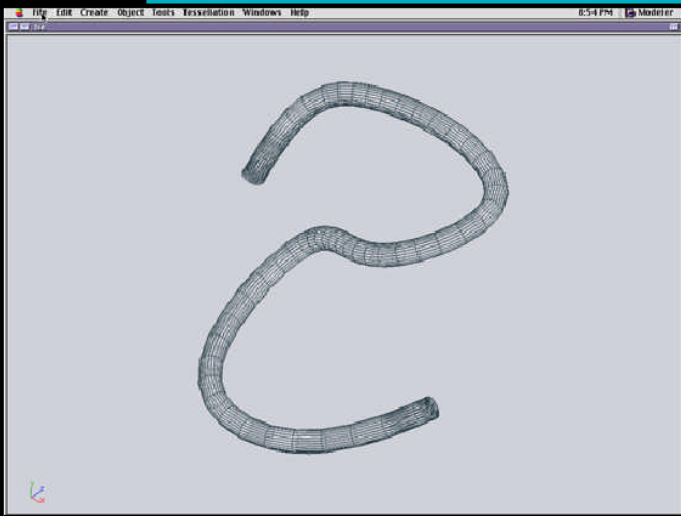


[CLK] on the Curve Primitives tab to close the palette.



15

Performing the Sweep

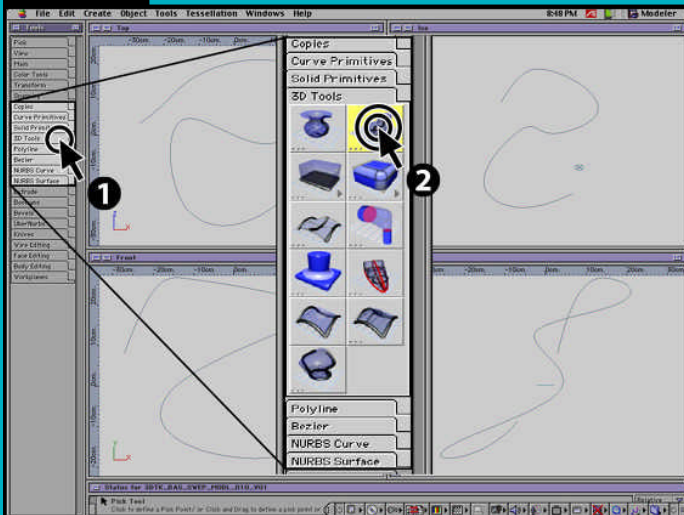


We will now perform the sweep using the sweep cross-section along path tool. We will also experiment using the Ridged Sweep and Cap Ends settings.



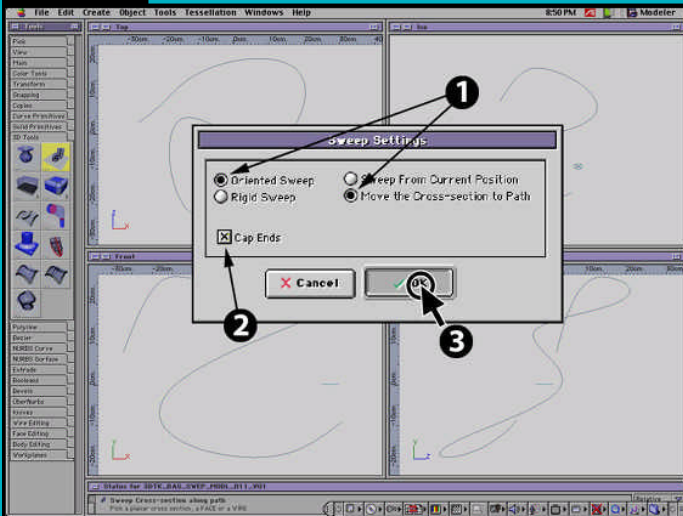
Overview





Open the 3D Tools palette and **[DBL+CLK]** on the Sweep Cross-section along path tool.



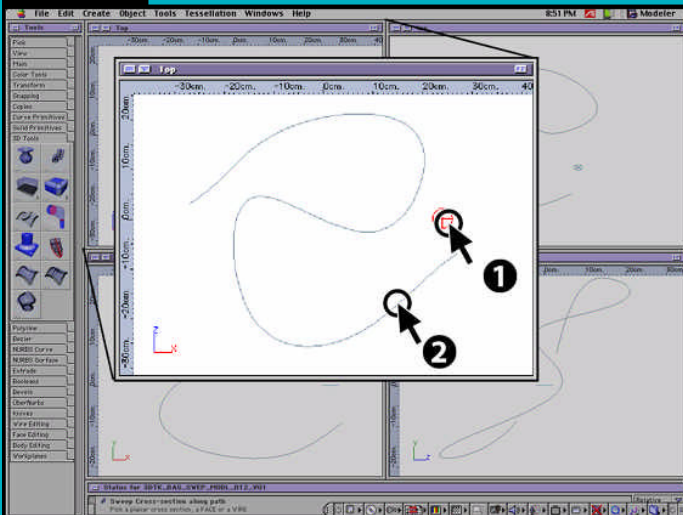


In the dialog box, make sure the Oriented Sweep and the Move the Cross-section to Path radio buttons are selected.

Make sure Cap Ends is selected.

[CLK] OK or press [RTRN] to exit the dialog box.

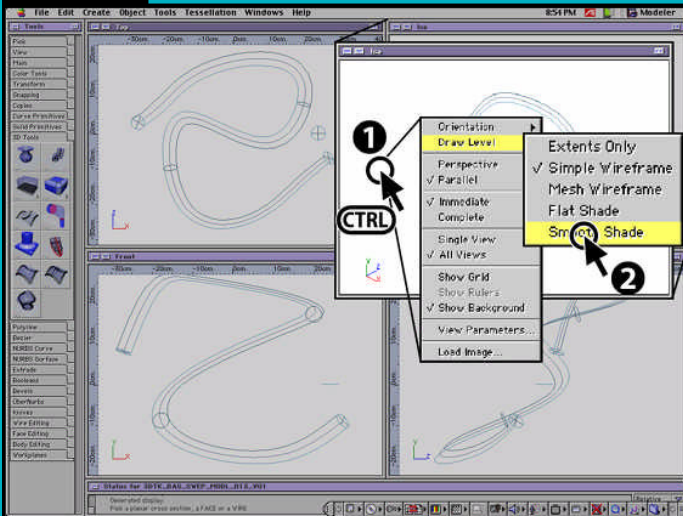




In the Top view window, **[CLK]** on the circle to select it.

[CLK] on the Sweep Path.

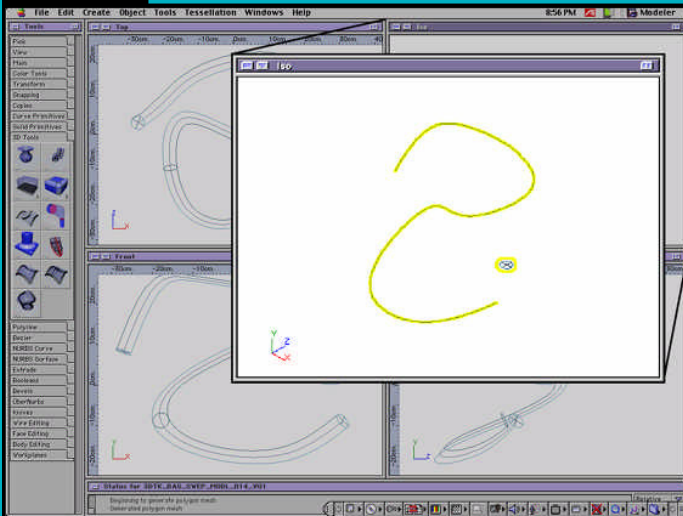




In the Iso view window, [**CTRL/R+CLK**] and hold.

Select Draw Level and then Smooth Shade from the pop up list.





Observe the Shaded preview. Oriented sweep aligns the cross section with the wire while the calculation is being made.

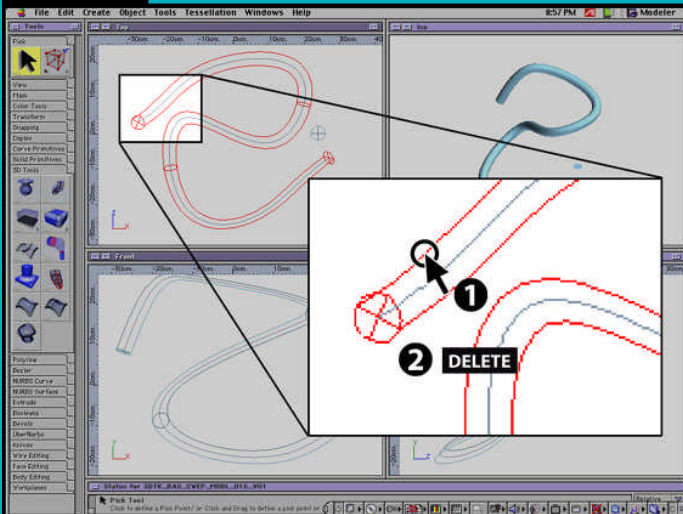




Open the Pick palette.

Select the Pick Tool; [**CMD/CTRL+P**].

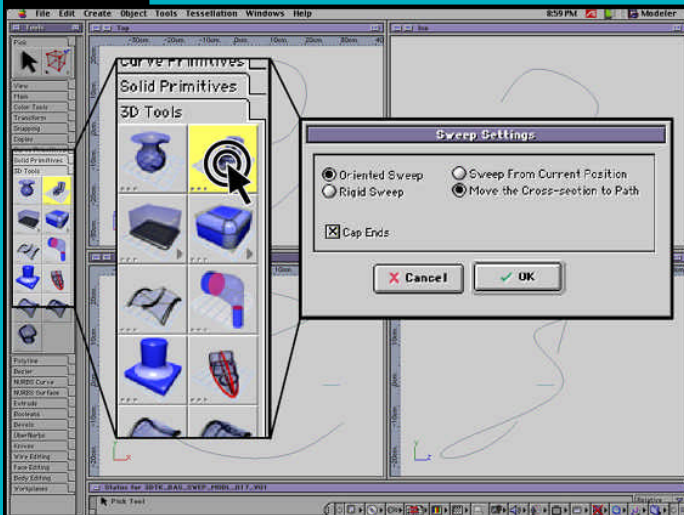




In the Top view window, **[CLK]** on the edge of the object we just created and press the **[DELETE/BACKSPACE]** key.

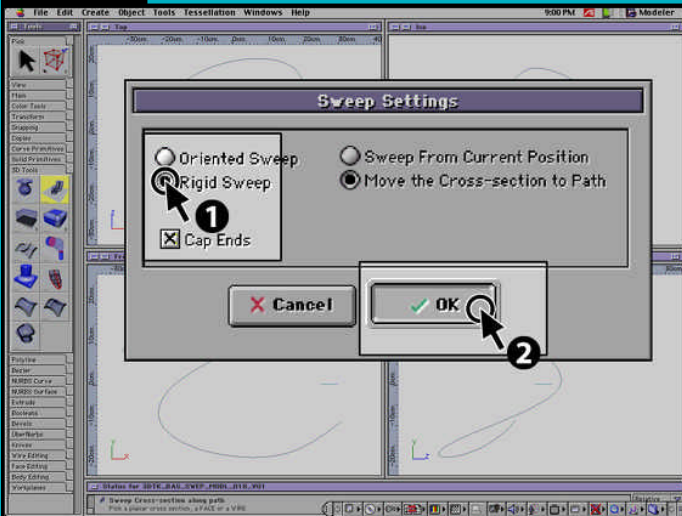
IMPORTANT: Make sure that the line in the middle of the object is NOT Highlighted when you press the delete key. If it is, **[SHIFT+CLK]** on the line to deselect it.





[DBL+CLK] the Sweep Cross-section along path tool in the 3D Tools palette.

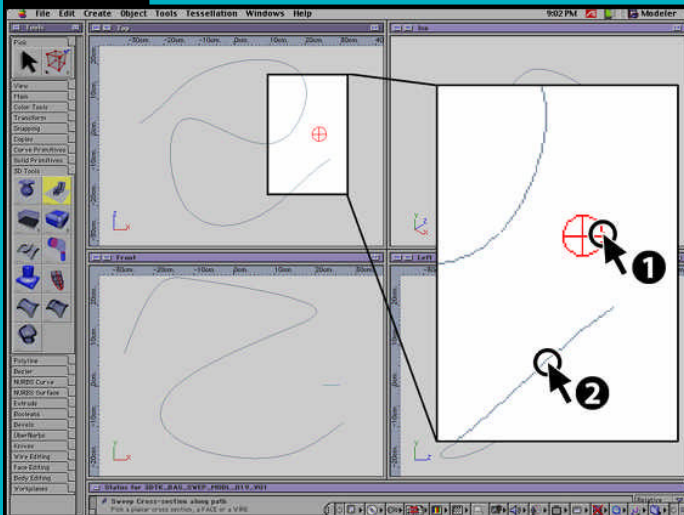




Select the Rigid Sweep radio button and leave the other settings as before.

[CLK] OK or press [RTRN] to exit the dialog box.



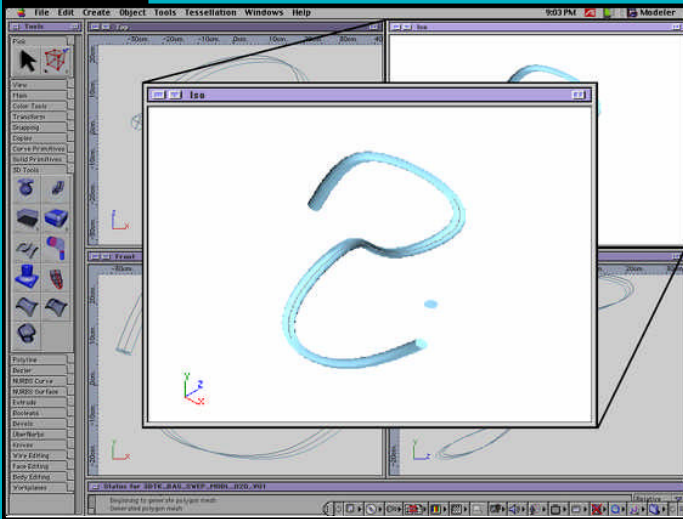


In the Top view window, **[CLK]** on the circle.

[CLK] on the sweep path.

You should now see a 3D object.

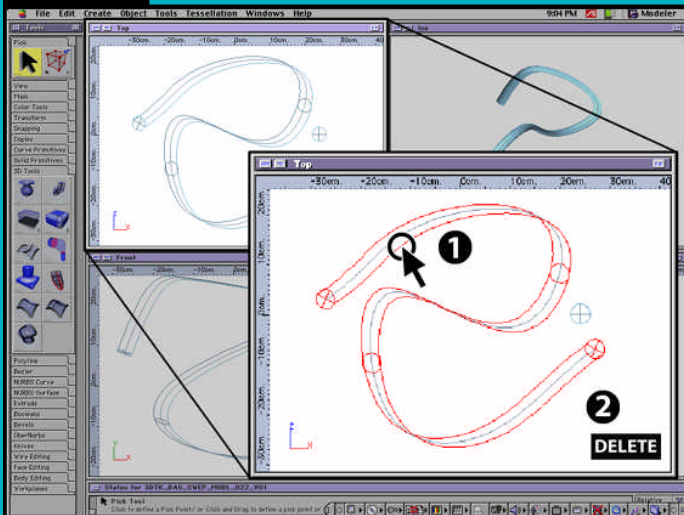




In the Iso View window, notice that the shape is somewhat flattened.

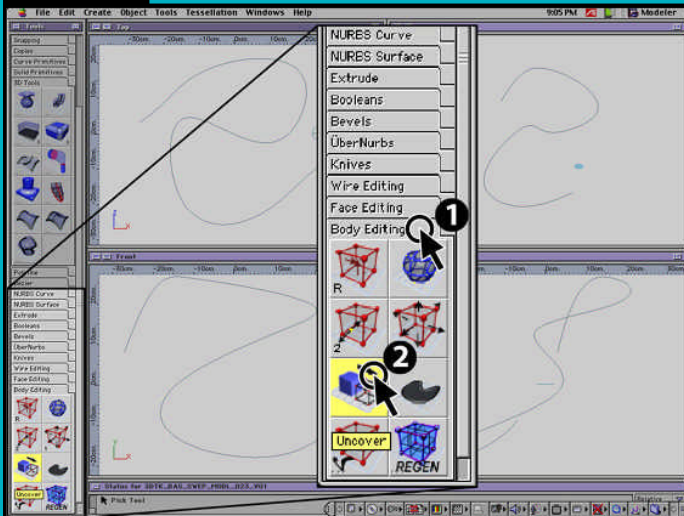
This happens because we instructed the circle not to rotate or move along the shape of the path. It remains rigid. This is especially noticeable at points where the path curves and bends.





In the Top View window, **[CLK]** on the edge of this new object and press the **[DELETE]** key.

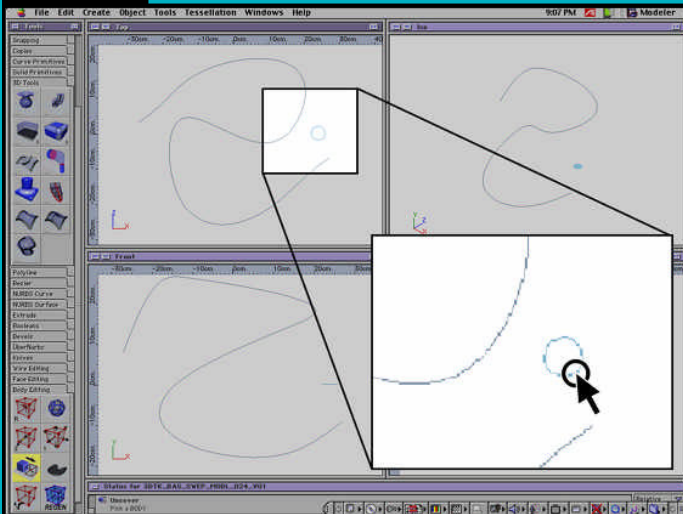




Open the Body Editing palette.

Select the Uncover tool.

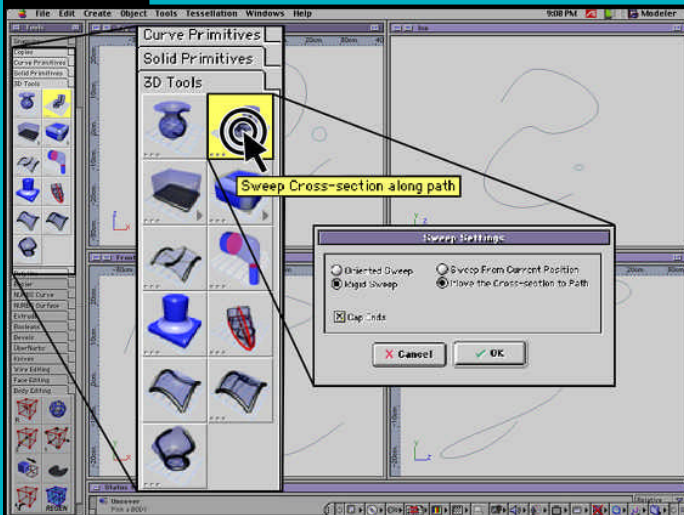




In the Top View window, **[CLK]** on the circle. Notice that the center lines in the circle vanished.

Note: We have just uncovered the face of the circle.

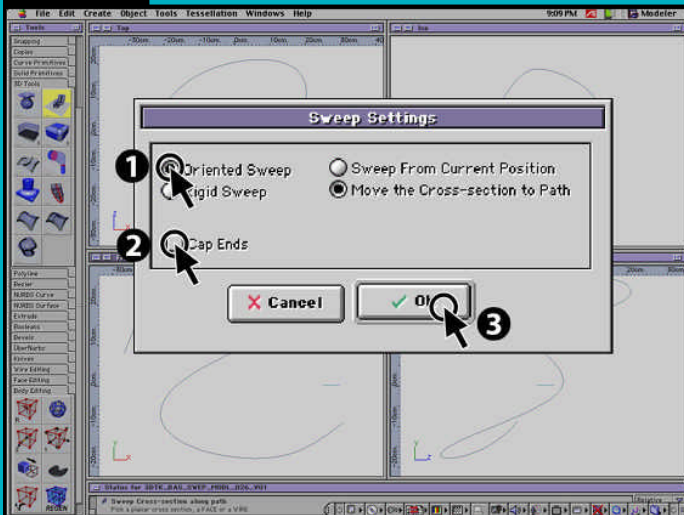




Open the 3D Tools palette.

[DBL+CLK] the Sweep Cross-section along Path tool.



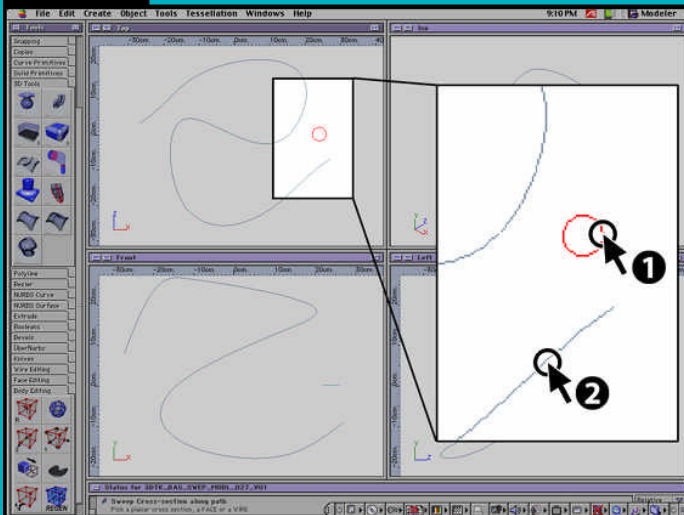


[CLK] the radio button for Oriented Sweep.

Deselect the Cap Ends checkbox.

[CLK] OK or press [RTRN] to exit this box.

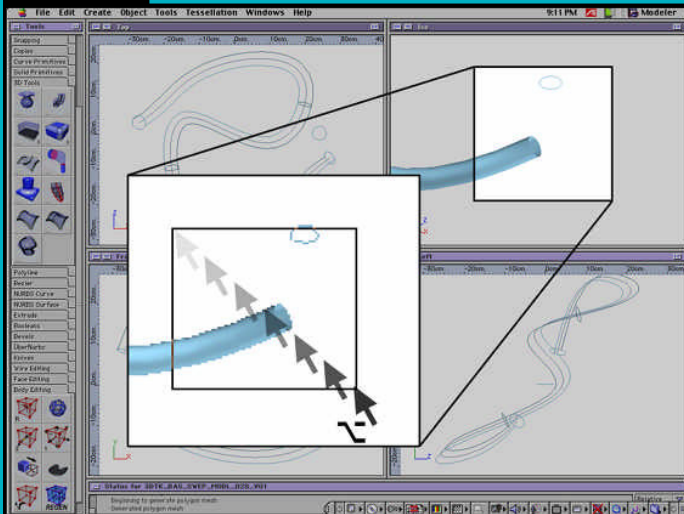




In the Top view window, **[CLK]** on the circle.

[CLK] on the Sweep Path.



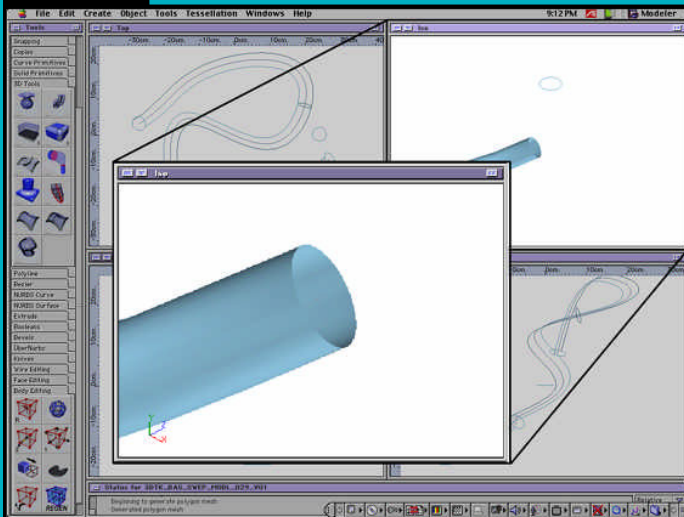


In the Iso view window, [**OPT/ALT+CLK+DRG**] a rectangle around the bottom end of the swept object.



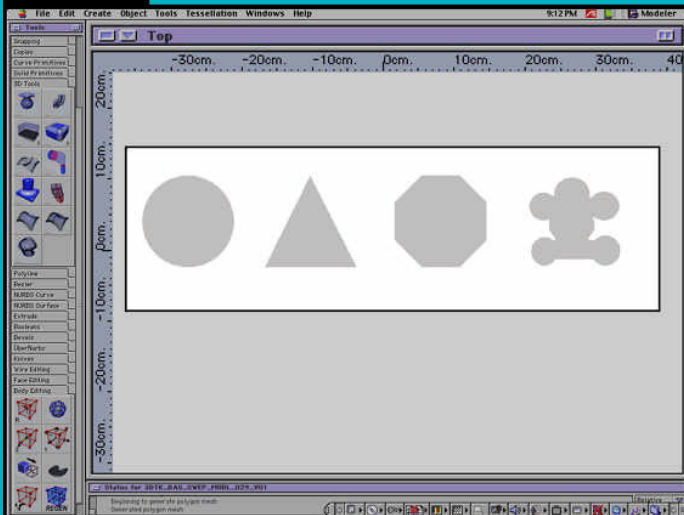
Wrapping up





This object is now hollow on the inside like a hose. With the Cap Ends unselected, we can see the inside of it.





Just about any planar shape can be used to sweep about a path.



Wrapping up

