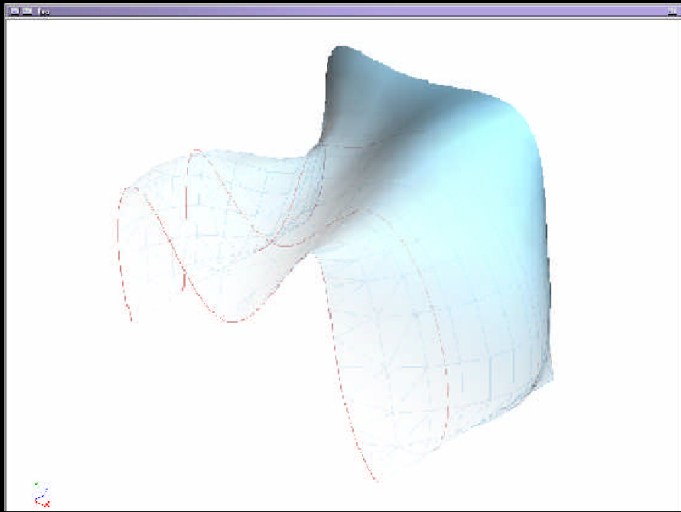


1

Skinning



Skinning is a modeling technique that is useful for forming complex organic shapes. A good way to think of skinning is to think of an object as a series of cross sections or ribs. Once these cross sections are made and positioned properly, the Skin tool will construct a surface that stretches from rib to rib, blending the shape as it goes. While the skin tool takes a little practice to master, it can provide an excellent starting point for shapes that require complex curved surfaces.



Overview





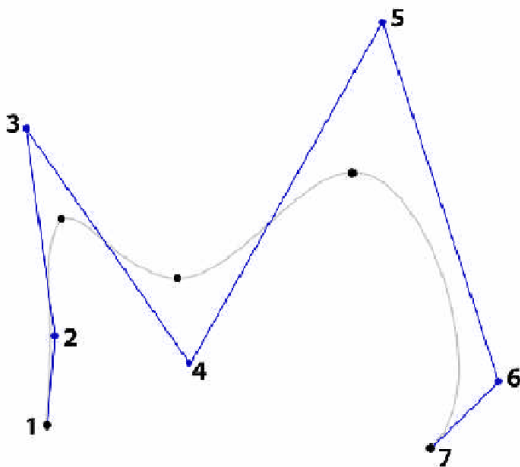
[DBL+CLK] the Universe Toolkit Modeler application program to launch the EI Modeler.

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



3

Setting the Underlays



One technique that will make the skinning a lot easier is using underlays. We'll be loading in several underlays that will be the templates for the hulls of our skin.

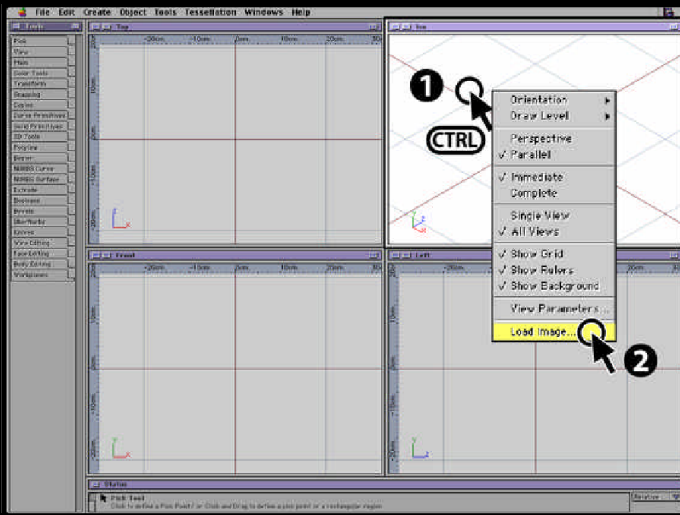


Overview



4

Loading the First Underlay

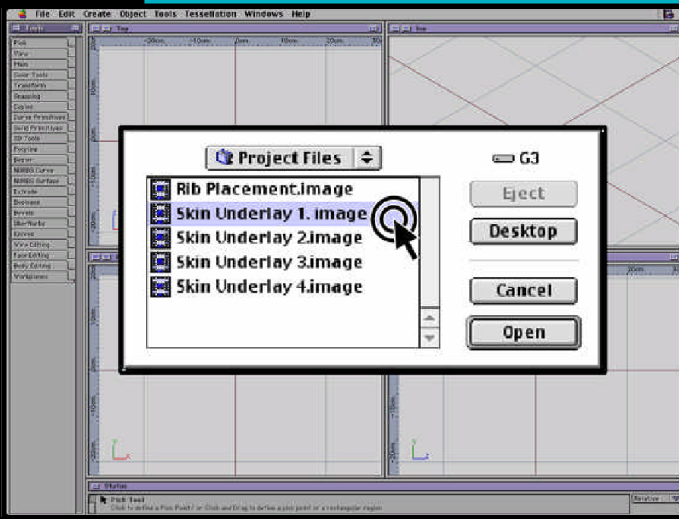


In the Front view window, press **[CTRL/R+CLK]** and in the pop up menu choose Load Image.



Setting the Underlays



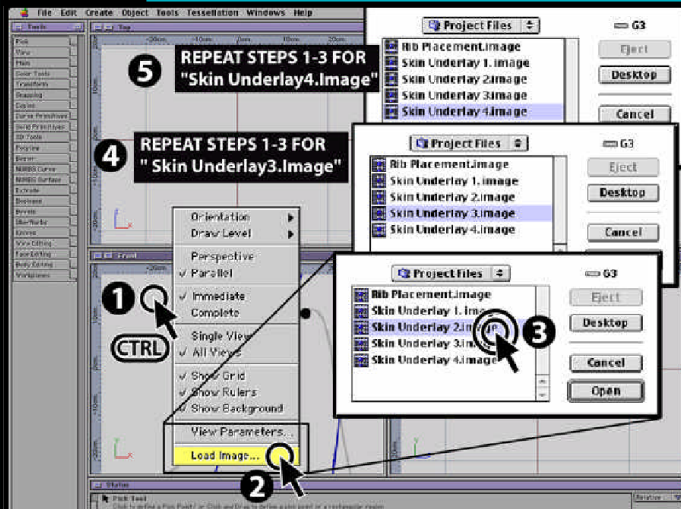


[DBL+CLK] the Skin_Underlay_1.img.



6

Loading The Other Underlays



In the Front view window, **[CTRL/R+CLK]** again and load the next Skin_Underlay image.

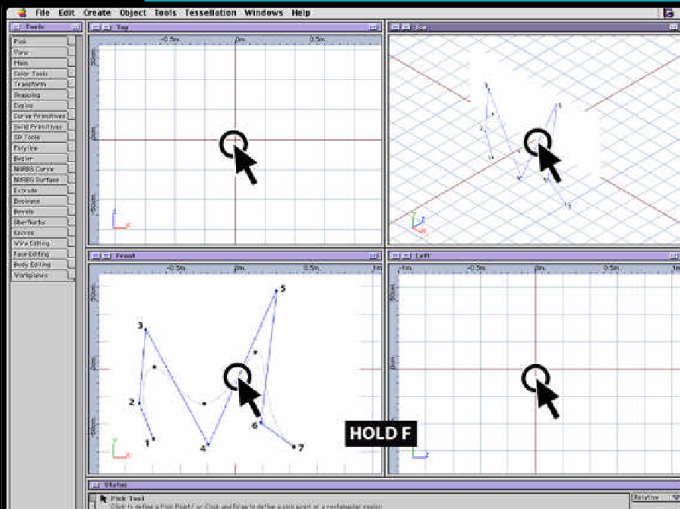
Perform this two more times loading the remaining Skin_Underlay images.



Setting the Underlays



Fitting the Underlays to Each Window

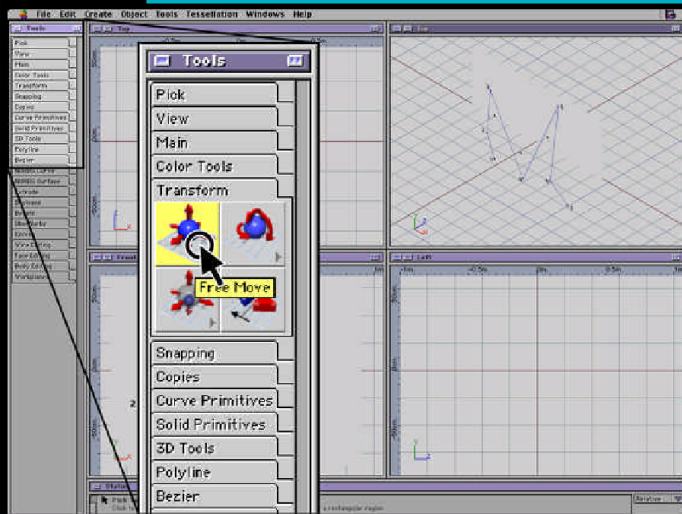


Press **[F]** Key and **[CLK]** in each window.



Setting the Underlays

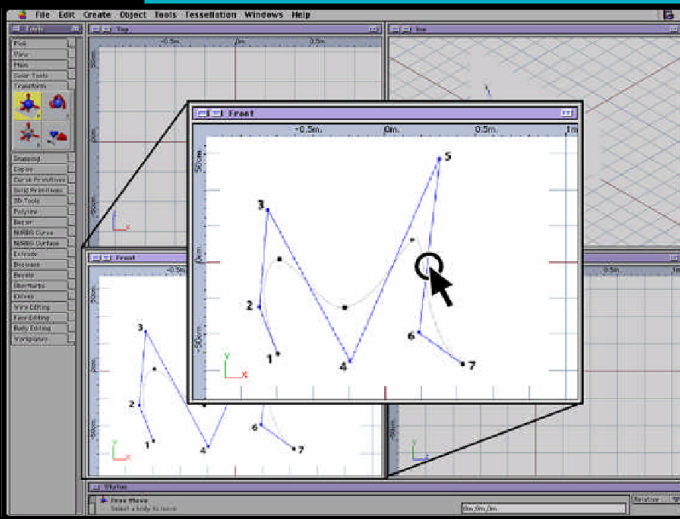




[CLK] the Transform palette.

Select the Free Move tool.





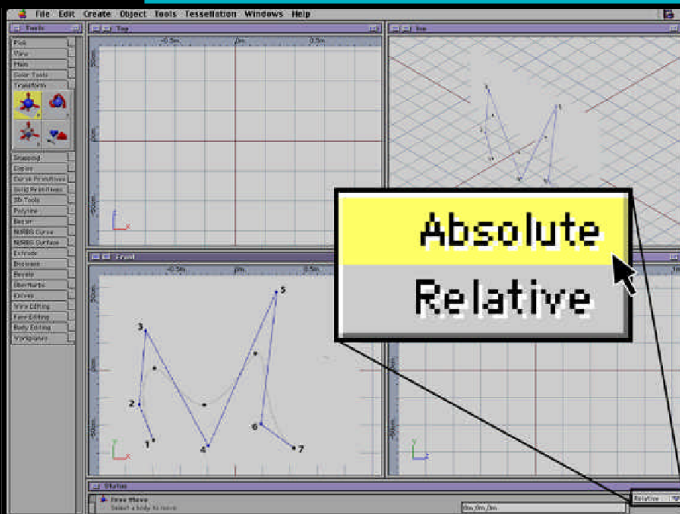
In the Front view window, **[CLK]** on the image.

Note: With this step, we just selected all of the images at once.



10

Setting Absolute Positioning

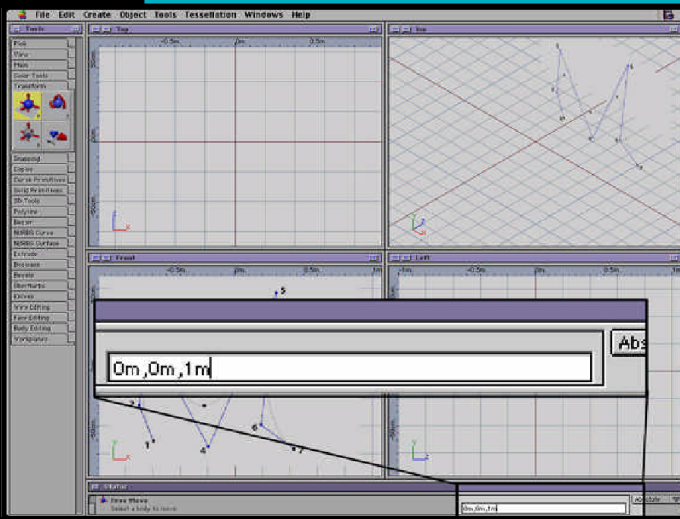


In the Status window at the bottom of the screen, there is a numerical input box that has X,Y,Z coordinates. Next to this box is a pull down menu. In the pull down menu, select Absolute. Absolute is world space while relative is simply relative to the selected element.



Setting the Underlays

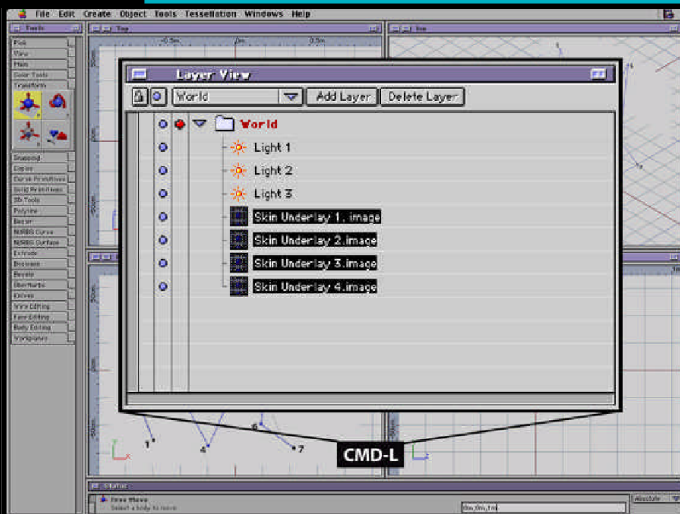




In the Status window, enter 1m for the Z value. It should look like: 0m, 0m, 1m and press **[RTRN]**.

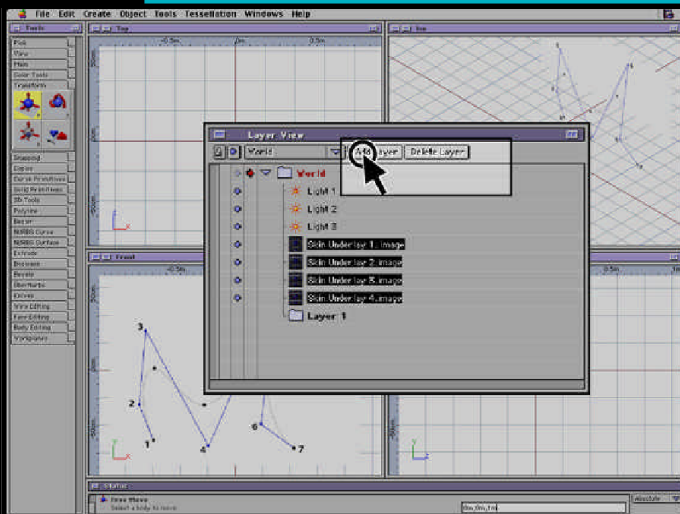
Note: We just moved all of the images back, away from us in the Front view window so that we can see splines that we will be creating later on.





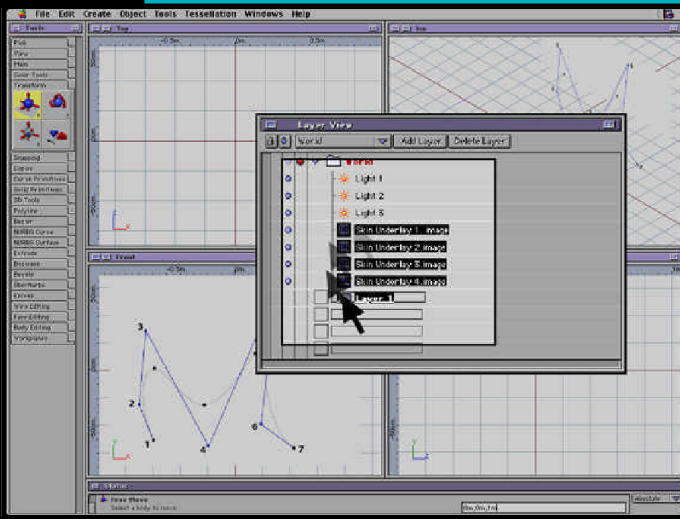
Press [**CMD/CTRL+L**] to open the Layer View window.





[CLK] on the Add Layer button.

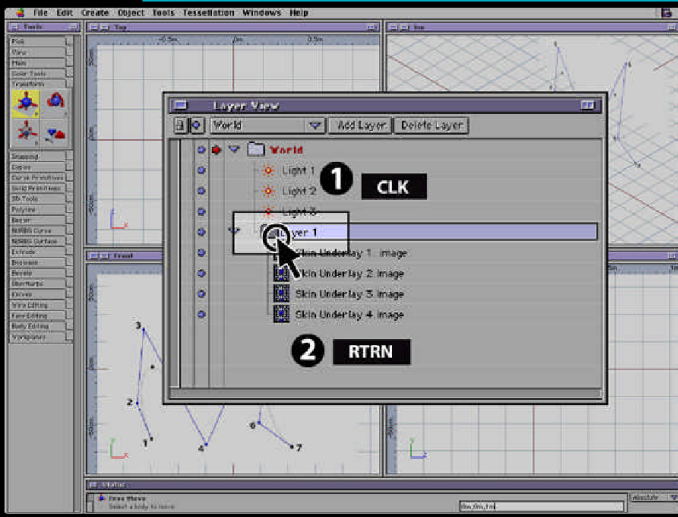




[CLK+DRG] on each image and move them on top of the Layer 1 folder.

Note: This will place these images with in the Layer 1 folder.



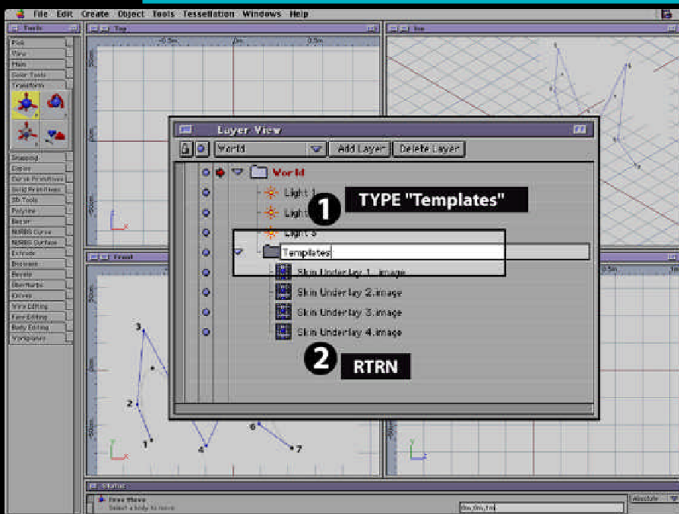


[CLK] on the Layer 1 folder and press [RTRN].



16

Renaming the Layer 1 Folder



Type the word Templates into the text box for the folder and press **[RTRN]**.

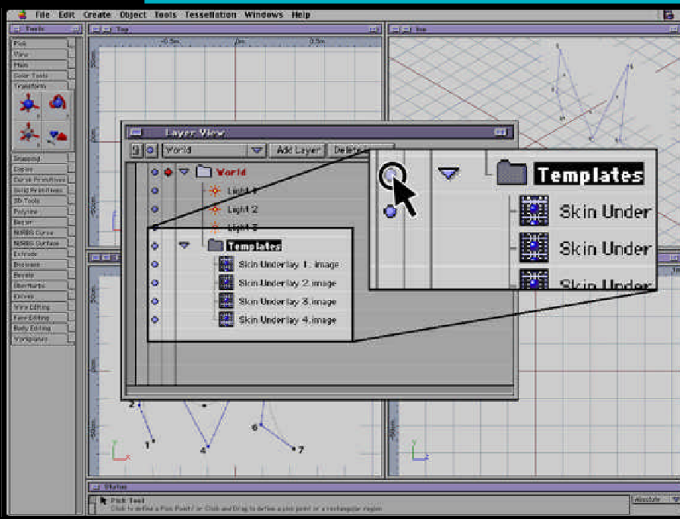


Setting the Underlays



17

Turning Off Image Visibility



Turn off the visibility of all the images except for the Skin_Underlay_1.img.

To turn off the visibility, **[CLK]** on the blue ball on the left of the name you wish to make invisible.

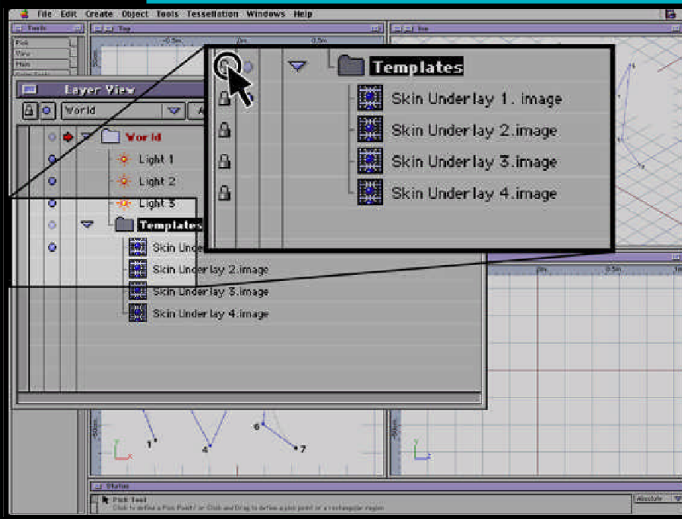


Setting the Underlays



18

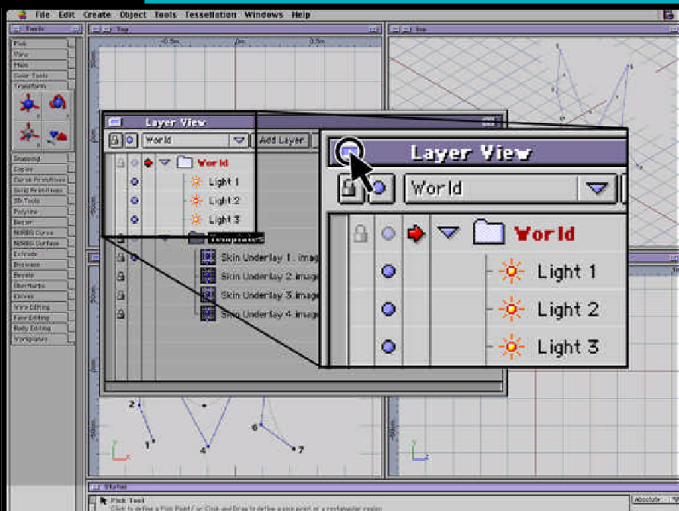
Locking the Folder



[CLK] in the far left column for the Templates folder. A lock should appear.

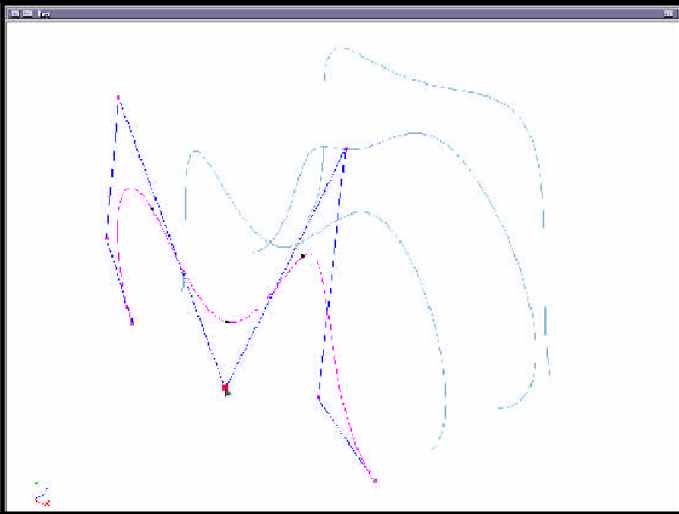
Note: This will keep the templates from moving in 3D space if accidentally selected.





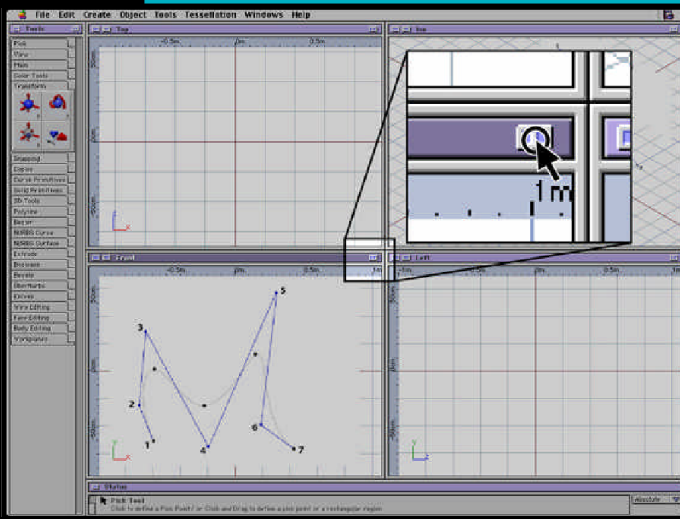
[CLK] on the left button in the window title bar.





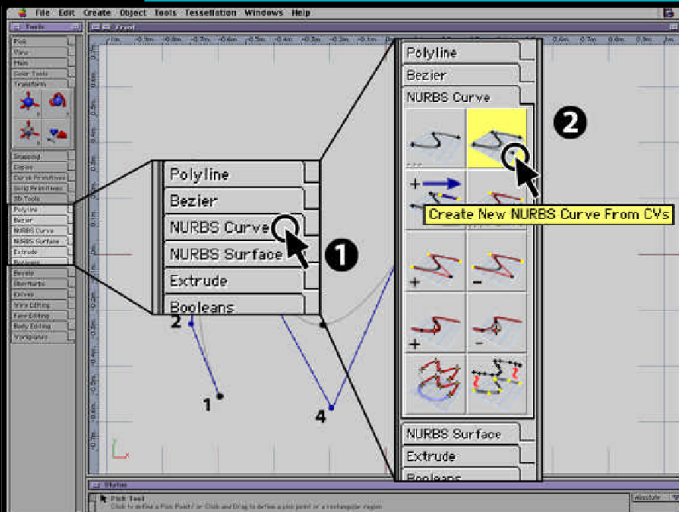
Once our underlays are set, we can begin to create our hulls. We'll be using NURBS curves. Once we create our curves, we'll position them so that they'll be ready to be skinned.





[CLK] the right hand button in the window title bar.

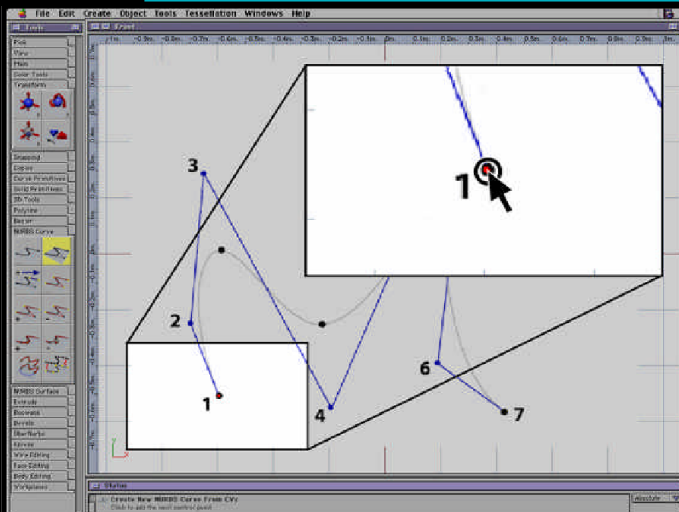




[CLK] on the NURBS Curve palette.

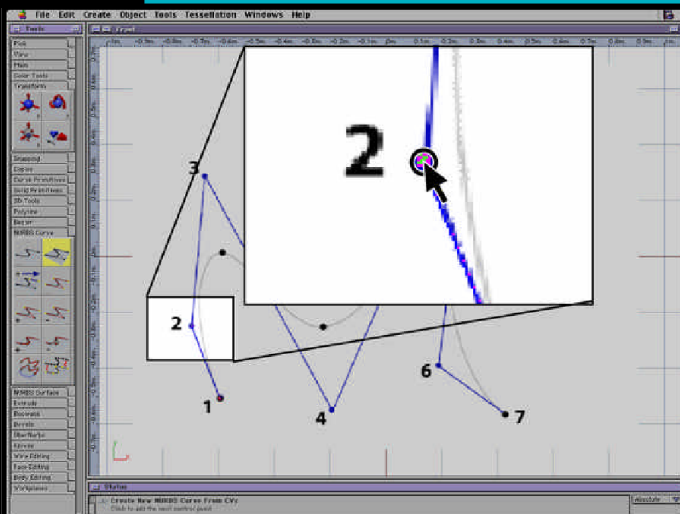
Select the Create New NURBS Curve From CV's.





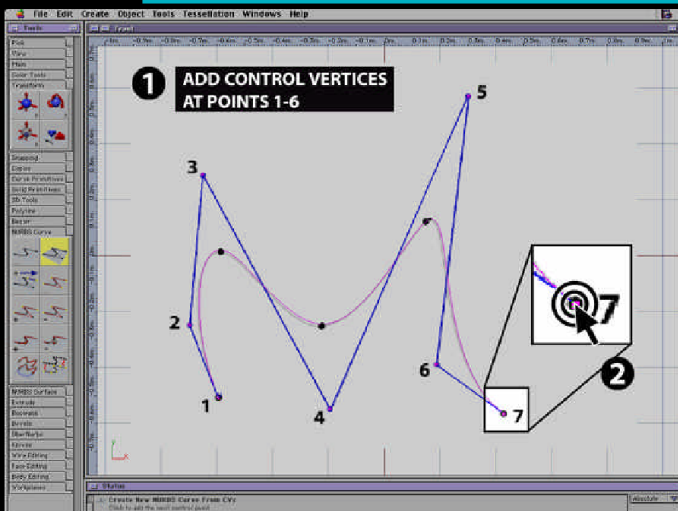
In the Front view window, on the Skin Underlay image where the number 1 position is, [**CLK**] to add a CV on the black dot.





At the number 2 position, [**CLK**] on the blue dot.



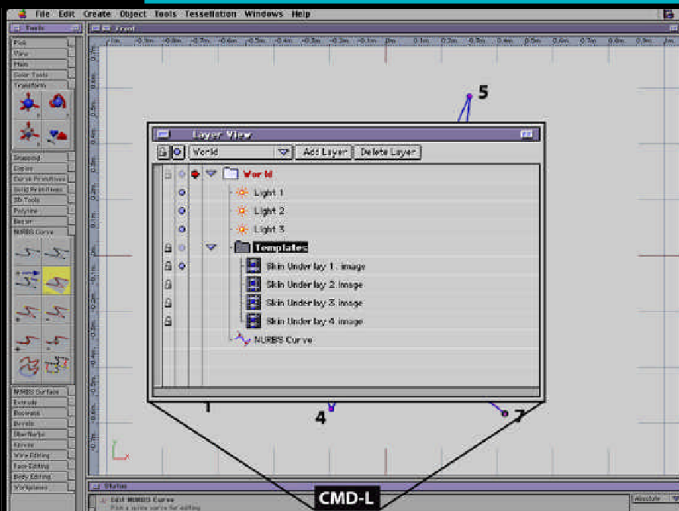


Follow the template and add CV's in the order they are numbered up to point 6.

[DBL+CLK] on the last point (#7).

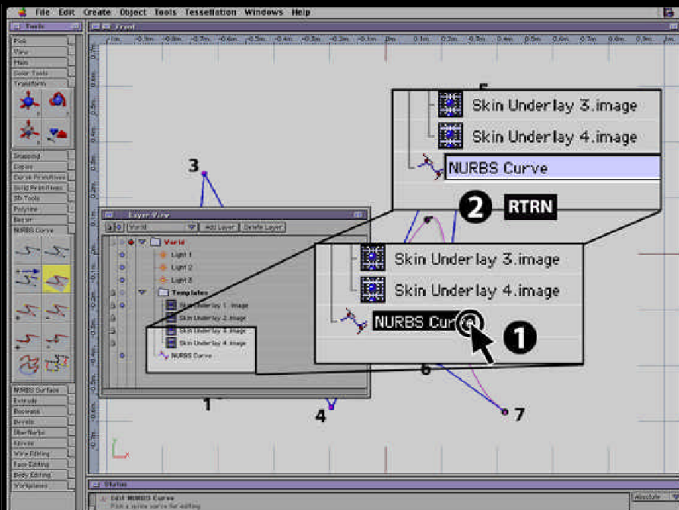
Note: It is important to **[DBL+CLK]** to add the last knot. We do this so that we tell the computer that our line ends here and to commit what we have done.





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

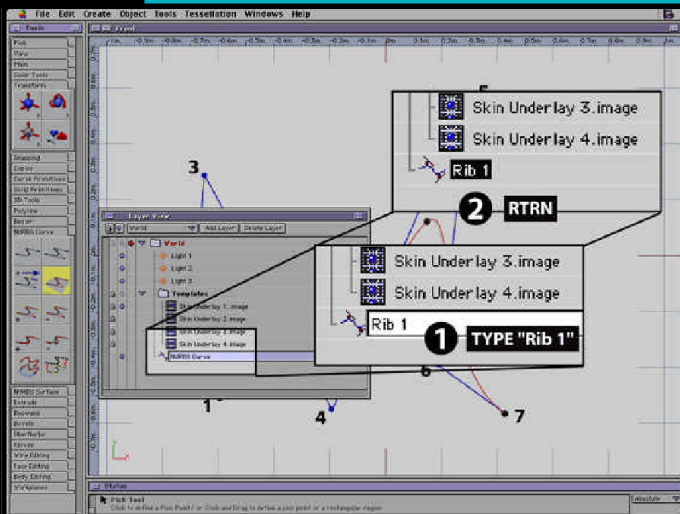




In the Layer View, **[CLK]** on the NURBS Curve object to highlight its title.

Press **[RTRN]**.

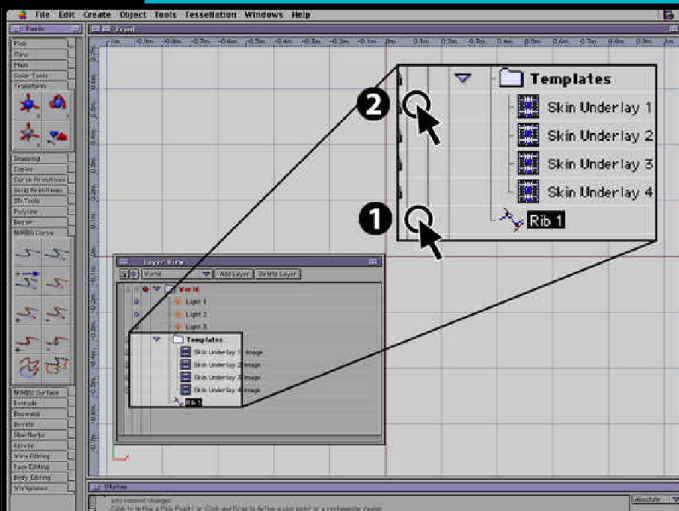




Name this object Rib 1.

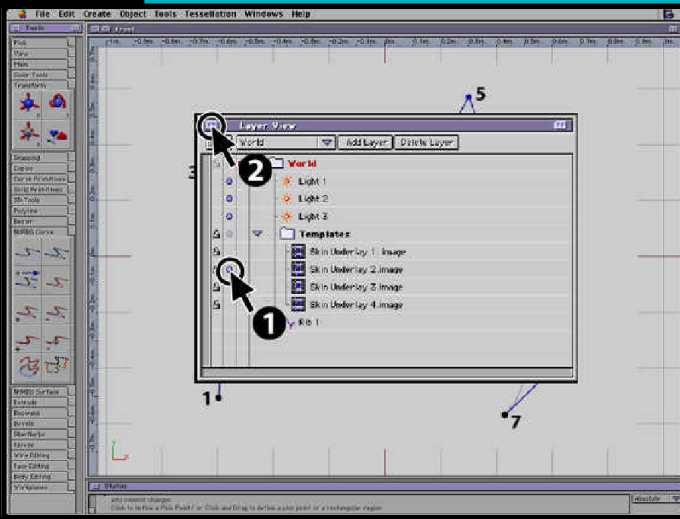
Press **[RTRN]**.





[CLK] on the blue dot for both Rib 1 and the Skin_Underlay_1.img.

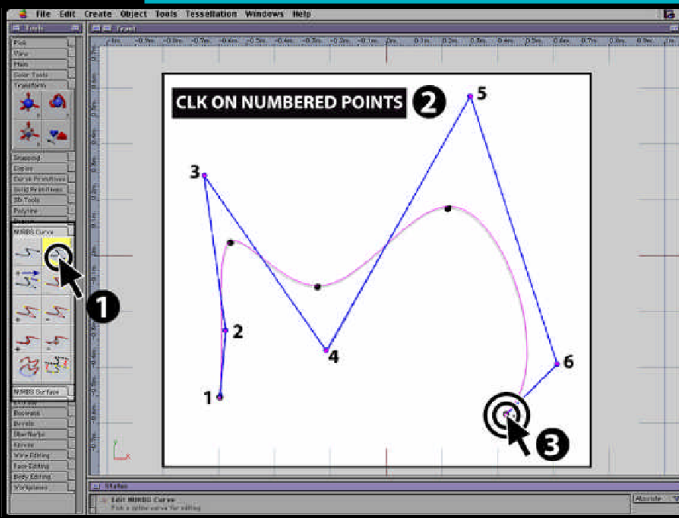




Turn on the visibility for the Skin_Underlay_2.img.

Close the Layer View window.



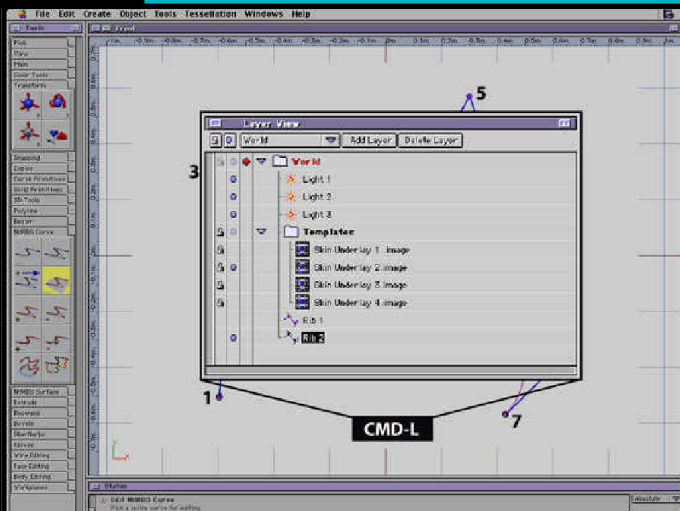


Select the Create New NURBS Curve From CVs tool.

As before, outline this shape using the Create New NURBS Curve From CVs tool.

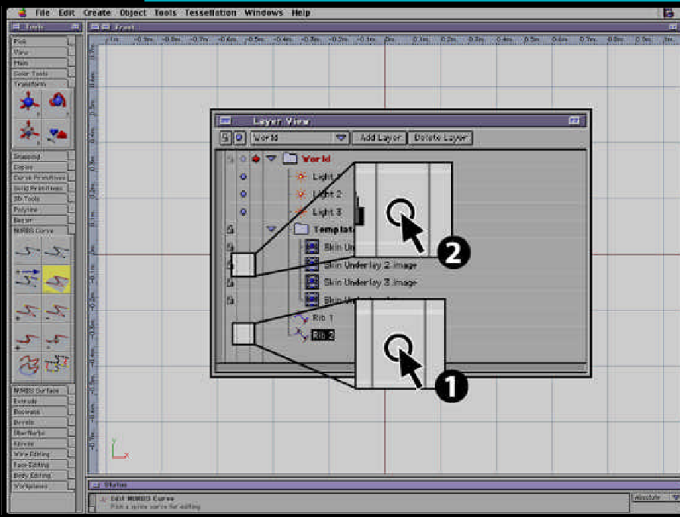
Remember to **[DBL+CLK]** when adding the last CV to finish the spline.





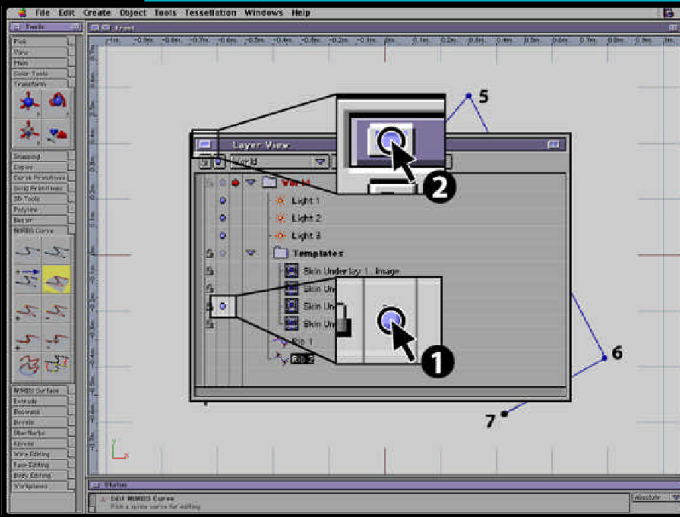
Press [**CMD/CTRL+L**] and rename this new NURBS Curve object to Rib 2.





Turn off the Visibility of the Rib 2 object and the Skin_Underlay_2.img.

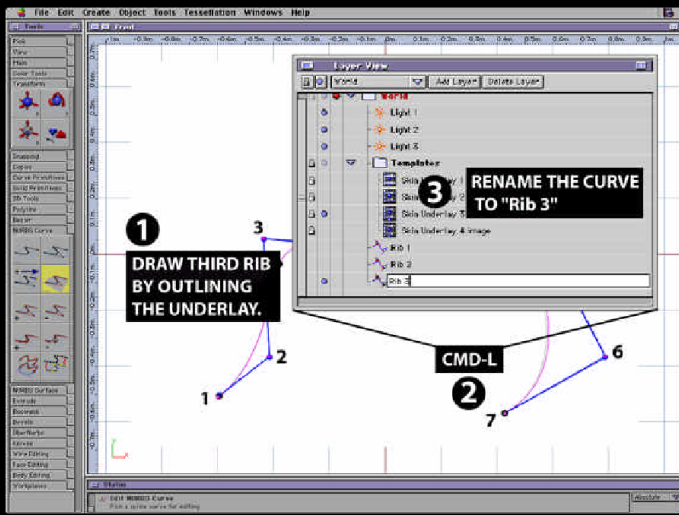




[CLK] in the visibility column to turn on the visibility of the Skin_Underlay_3.img.

Close this window.





Draw the third rib by outlining the underlay.

Open the Layer View window.

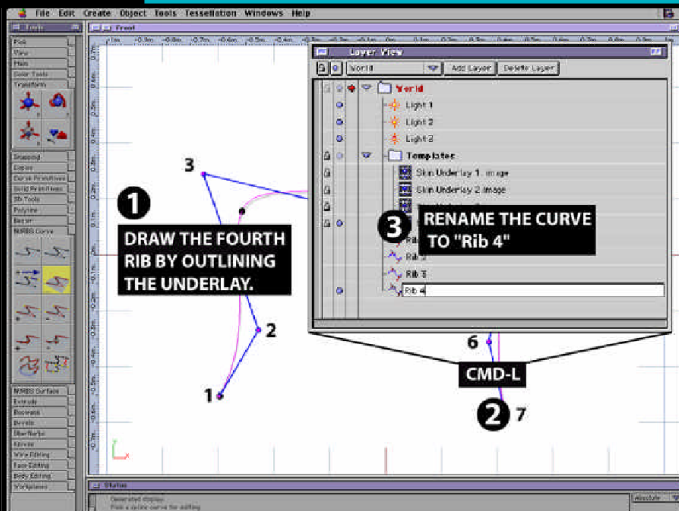
Rename this shape to Rib 3.

Hide the visibility of this object and the Skin_Underlay_3.img.

Turn on the Visibility for Skin_Underlay_4.img

Close the window.

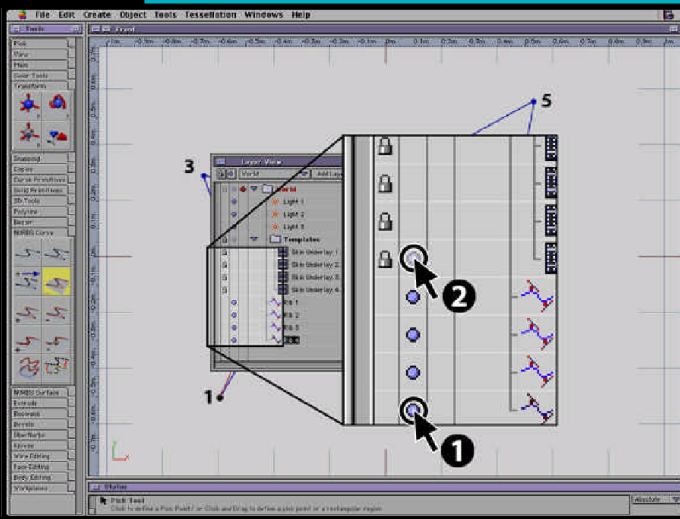




Again with the Create New NURBS From CVs tool, draw the last rib by outlining the underlay.

Rename the object Rib 4.

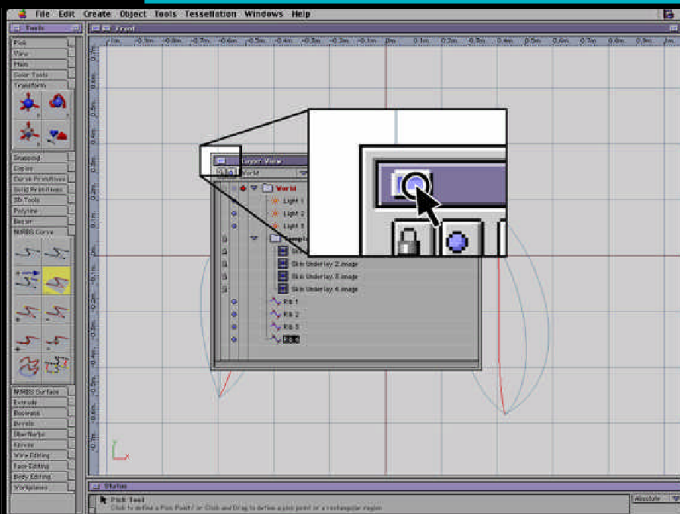




Turn on the Visibility of all of the Rib objects.

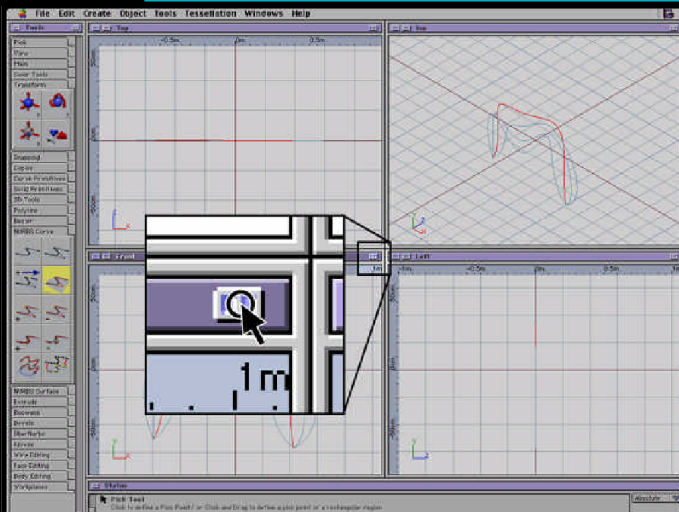
Turn off the Visibility of any images still visible.





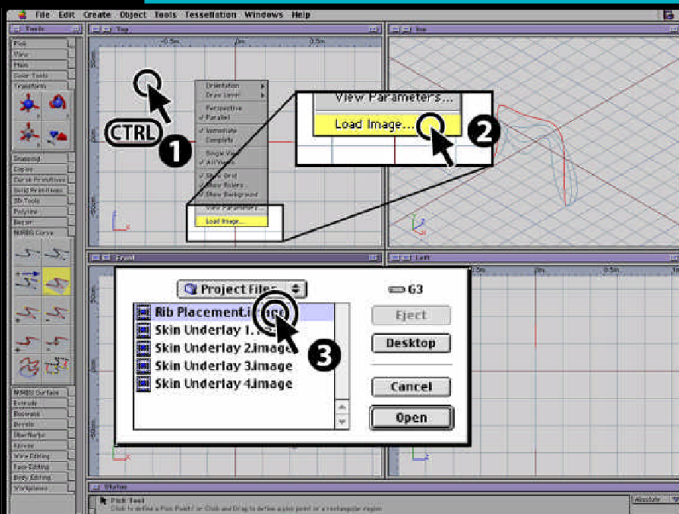
[CLK] in the upper left hand box to close the Layer View.





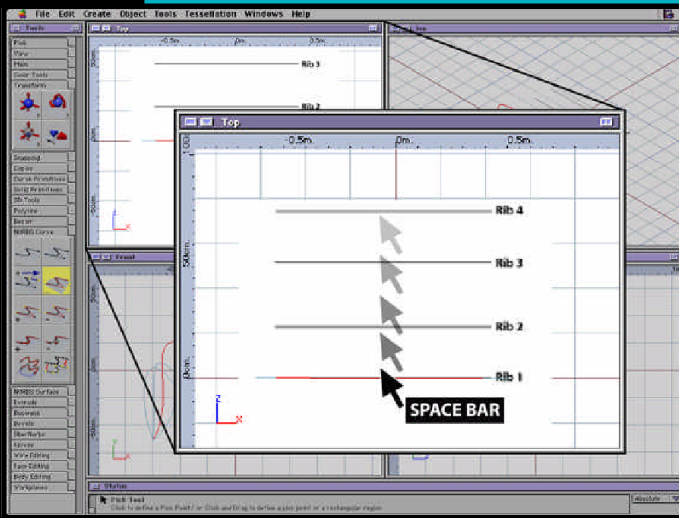
[CLK] on the button in the upper right of the Front View window.





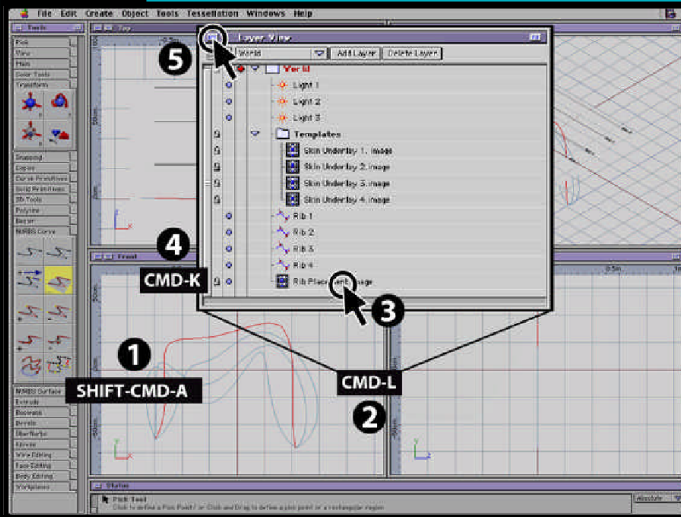
In the Top View window, [**CTRL/R+CLK**] and load the Rib_Placement.img.





In the Top View window, press **[SPACE]** and **[CLK+DRG]** downward in the window to position the underlay so that you can see all 4 position markers. We'll use this underlay to position our Ribs in Z-Space.





Deselect any images that are highlighted by pressing **[SHIFT+CMD/CTRL+A]**.

Open the Layer View window.

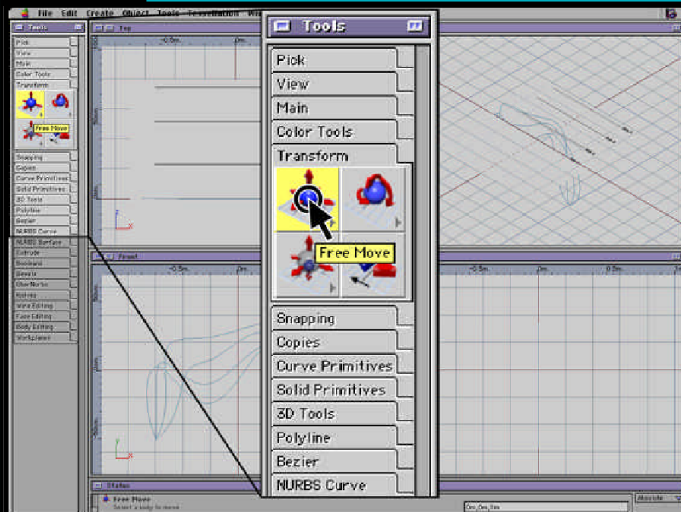
Select the Rib_Placement.img.

Press **[CMD/CTRL+K]** to lock this image*.

Close the Layer View window.

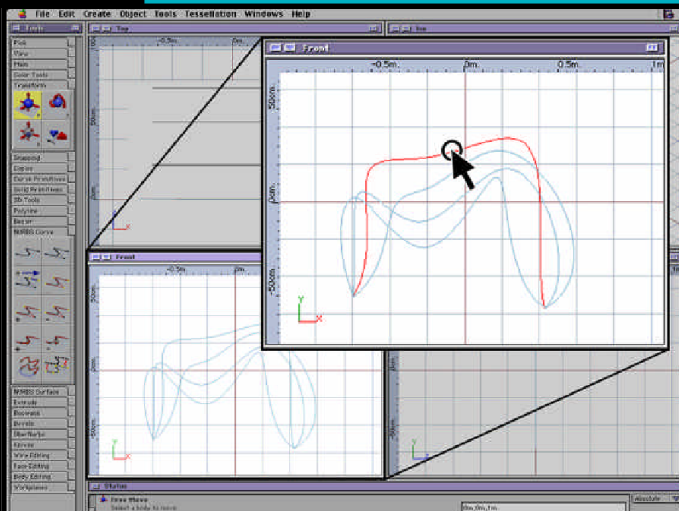
*Note: To verify that this worked, make sure that a lock appears in the Layer View window, if not, **[CLK]** on the lock to lock it.





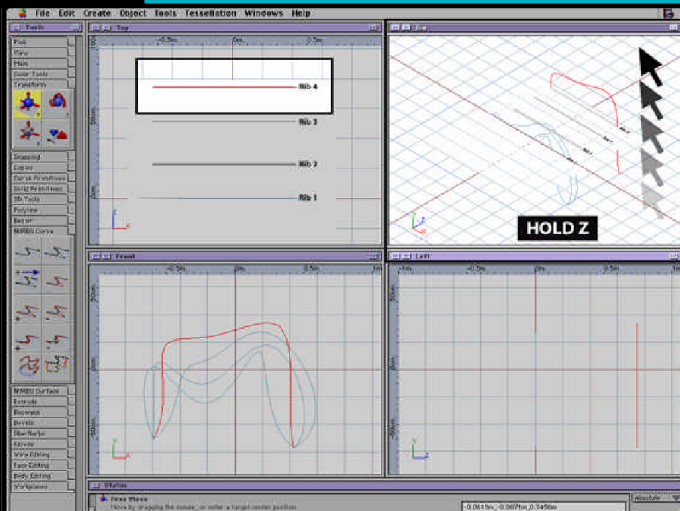
In the Tools palette, select the Free Move tool from the Transform palette.





In the Front View window, **[CLK]** on the Top most spline which is Rib 4.

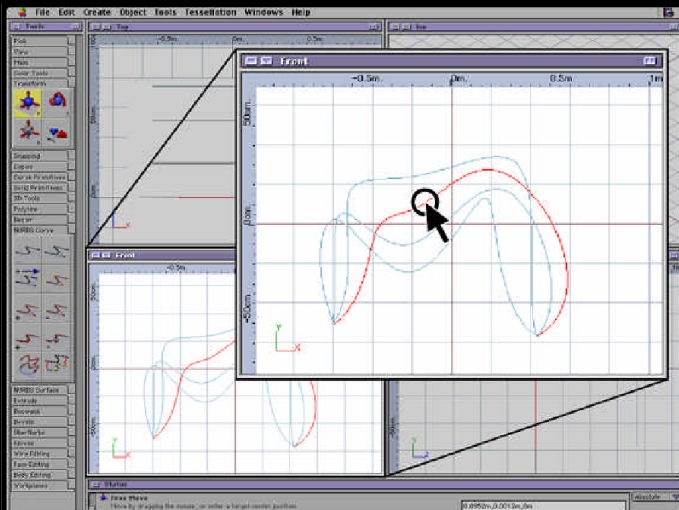




In the Iso view window, hold down the **[Z]** key.

In the lower part of the window on the right, **[CLK+DRG]** to the top of the window. As you are doing this watch the Top view window and position Rib 4 on the Rib 4 line.

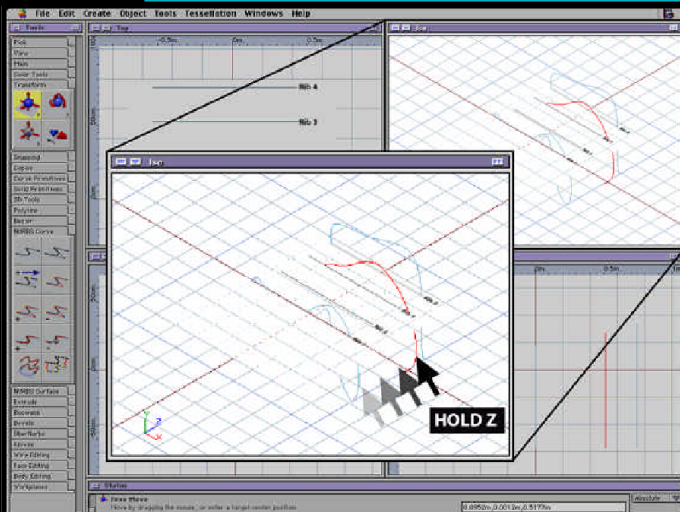




In the Front view window, **[CLK]** on the second line down. This is Rib 3.

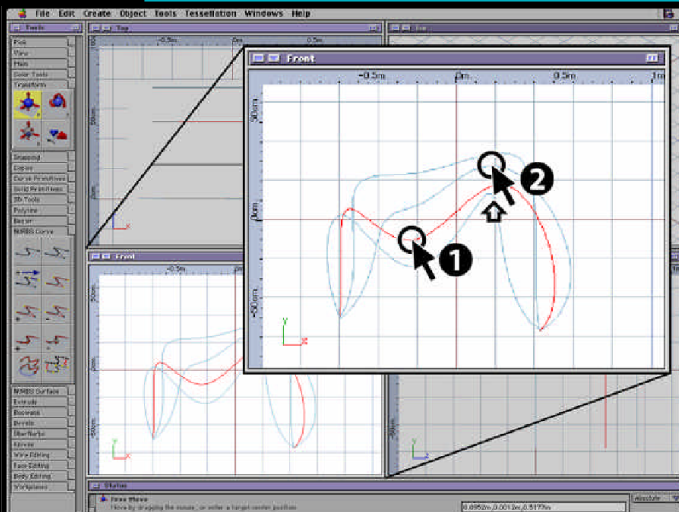
If Rib 4 is still selected, **[SHIFT+CLK]** on this line (the top one) to deselect it.





In the Iso view window, hold down the **[Z]** key and **[CLK+DRG]** from bottom to top, positioning this Rib into the Rib 3 position by looking at the underlay in the Top View window.

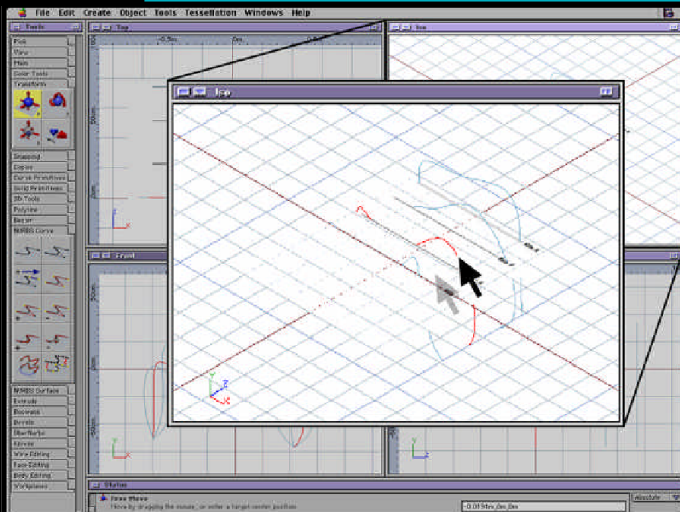




In the Front View window, **[CLK]** on the third line down, Rib 2.

[SHIFT+CLK] on Rib 3 (the one we just moved) to deselect it.

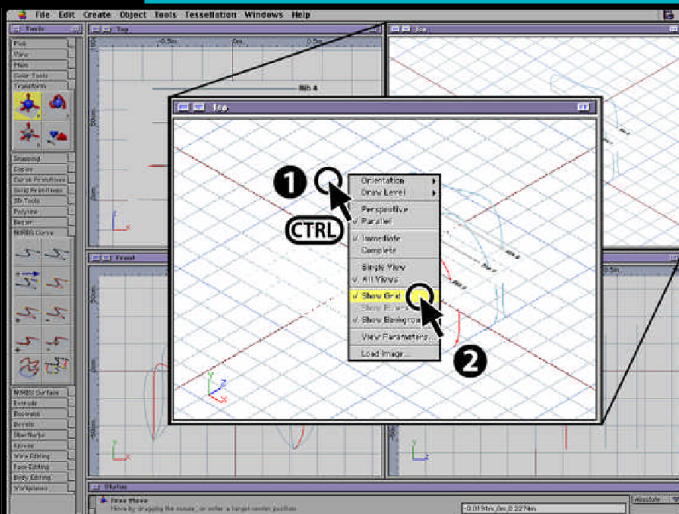




In the ISO view window, **[CLK+DRG]** Rib 2 into the Rib 2 position.

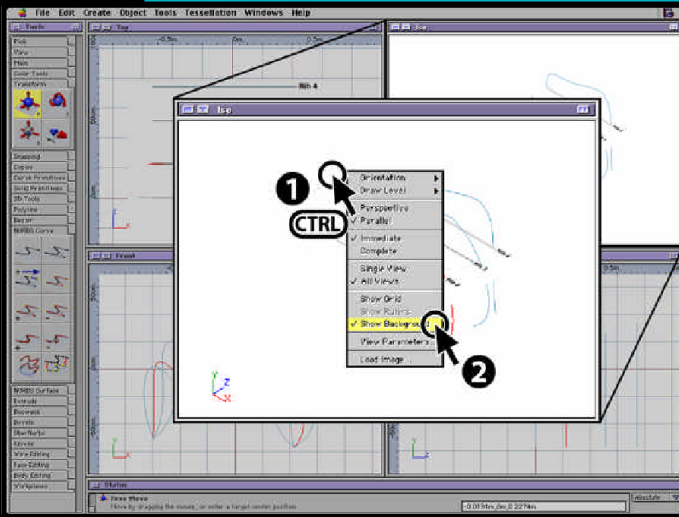
Note: Rib 1 is already in its position so we do not need to move this rib at all.





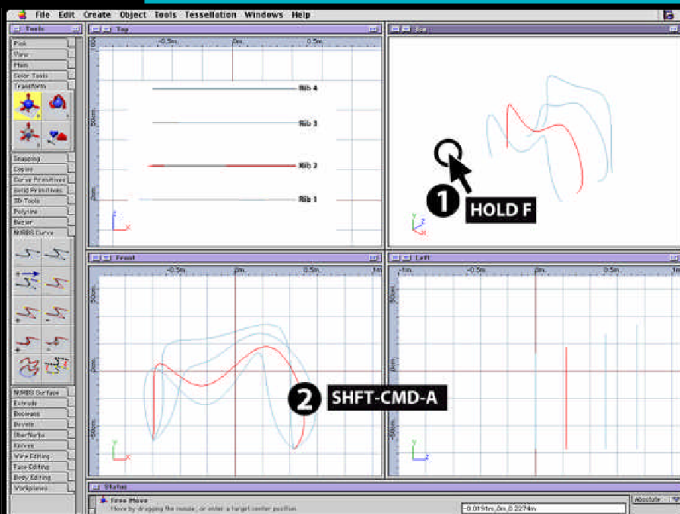
In the Iso view window, [**CTRL**/**R**+**CLK**] in the window and select the Show Grid option to turn it off.





In the Iso window, [**CTRL/R+CLK**] and select the Show Background option to turn that off.

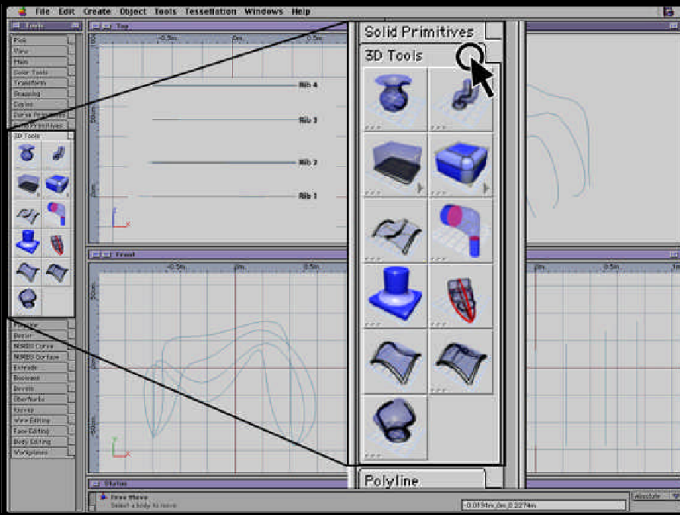




In the Iso window, Press the **[F]** key and **[CLK]**.

Press **[SHIFT+CMD/CTRL+A]** to deselect anything that may still be highlighted.

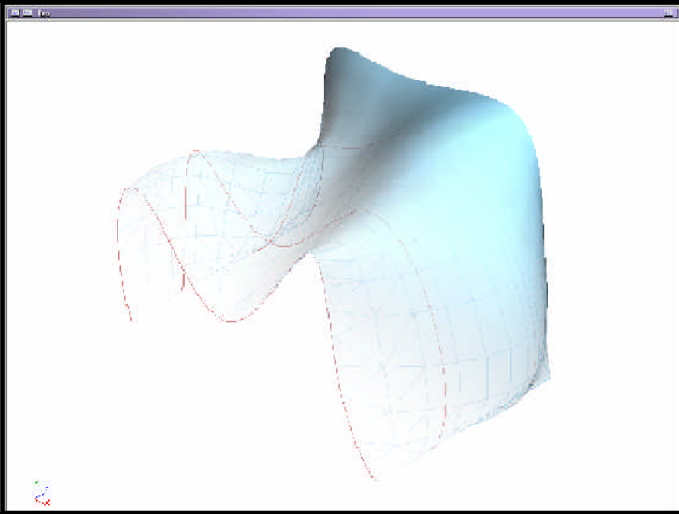




In the Tool Palette, **[CLK]** on the expanded tool folders tabbed name to collapse the folder.

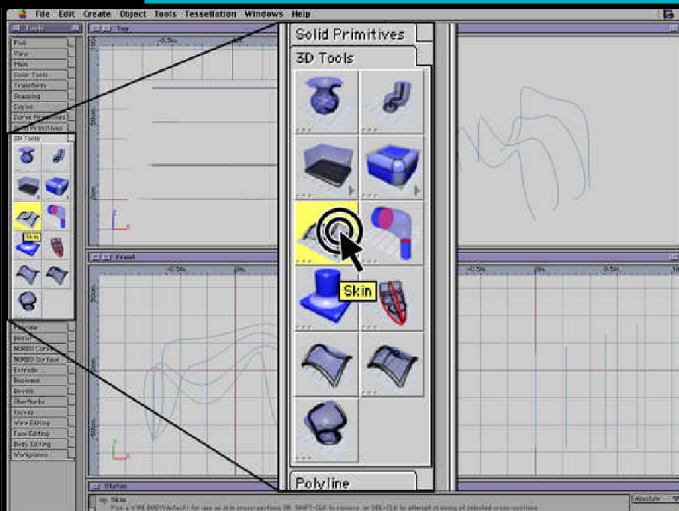
Open the 3D Tools palette.





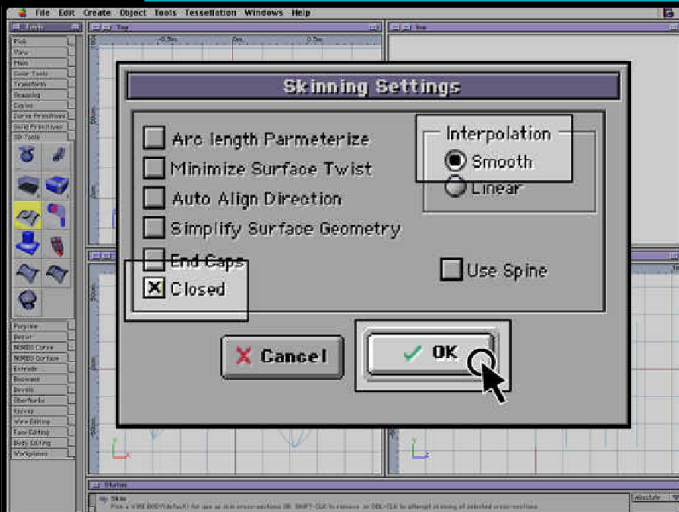
The next step is to select the skin tool and set the correct settings of the tool. We'll look at creating a skin with open ended curves first. Later, we will modify the curves to be closed shapes and examine the results. Key concepts here include selection order and the fact that all the NURBS curves are going the same direction.





[DBL+CLK] the Skin tool.



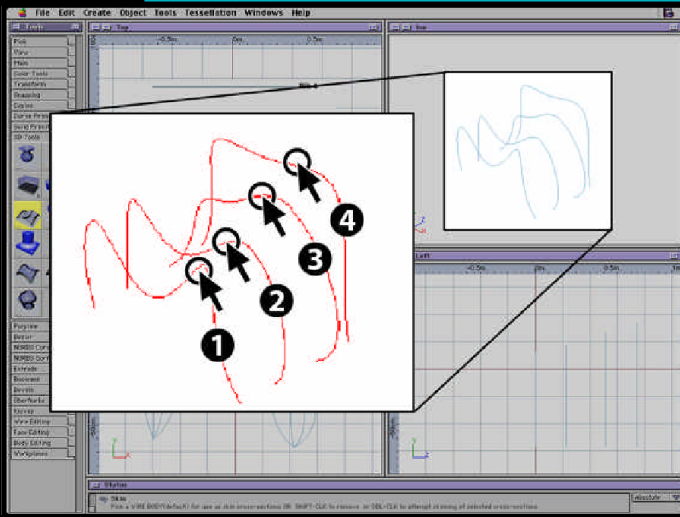


In the Skinning Settings dialogue box, make sure that Closed is checked and that Interpolation is set to Smooth.

No other options should be selected.

[CLK] OK or press [RTRN].

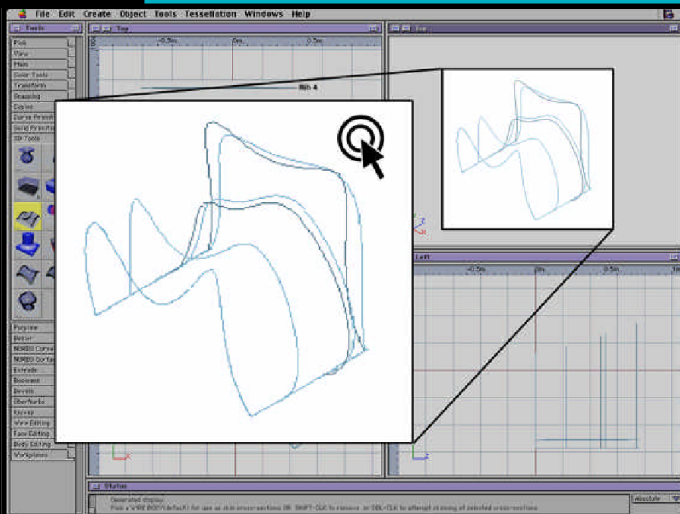




In the Iso view window, from left to right, **[CLK]** on each rib in order.

Note: If you accidentally selected a Rib out of order, hold down the **[SHFT]** key and **[CLK]** on that Rib to deselect it. Then continue on selecting the next rib in order.



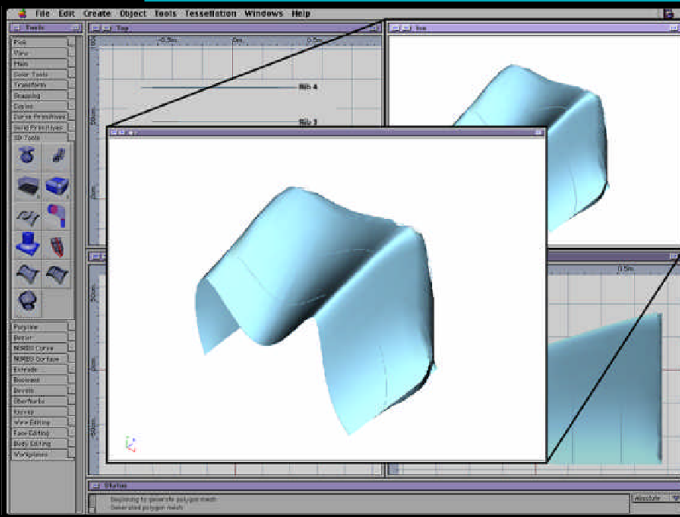


After selecting the last rib, **[DBL+CLK]** in the empty space away from the object.



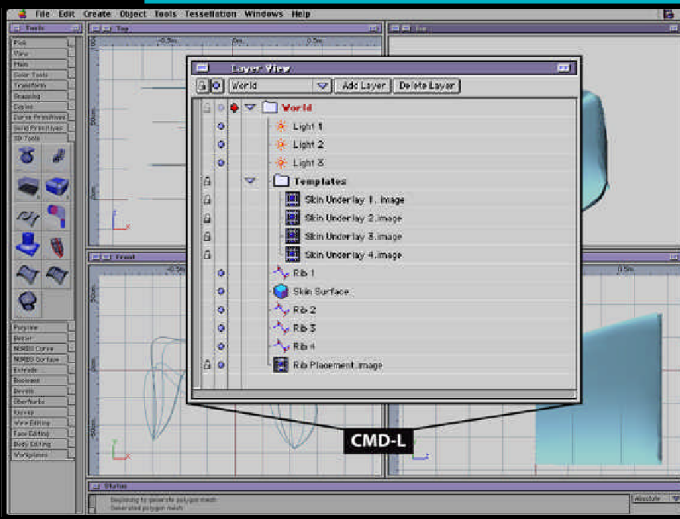
Shading the Object





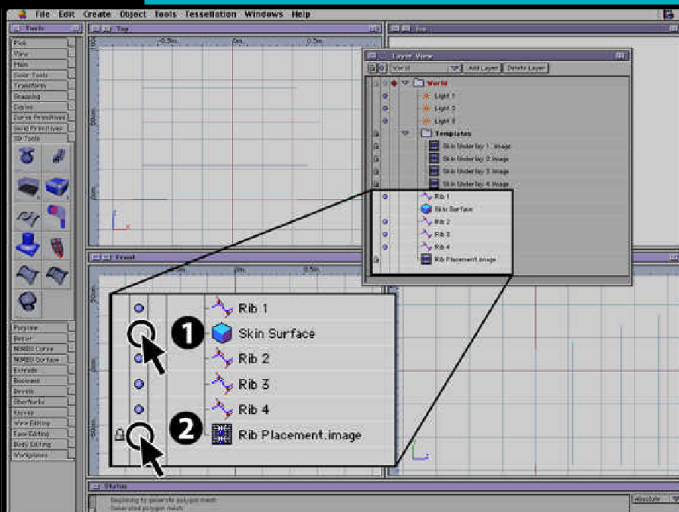
Examine the shaded view of your model. In the Iso view, press and hold **[O]** and **[CLK+DRG]** in the window to orbit around the model.





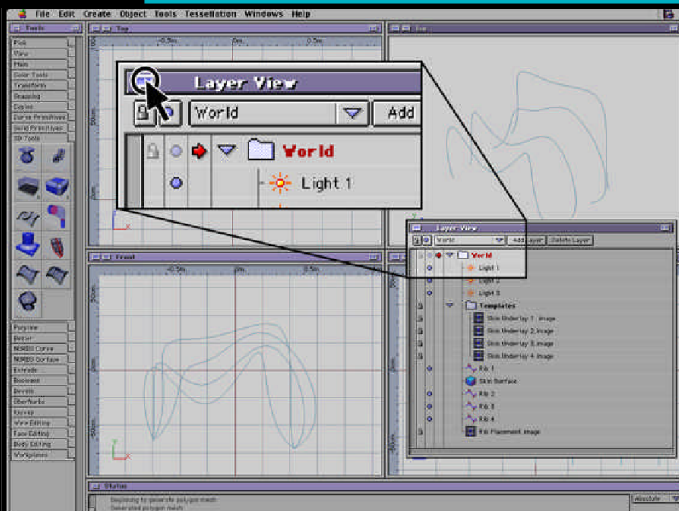
Press [**CMD/CTRL+L**] to open the Layer View window.





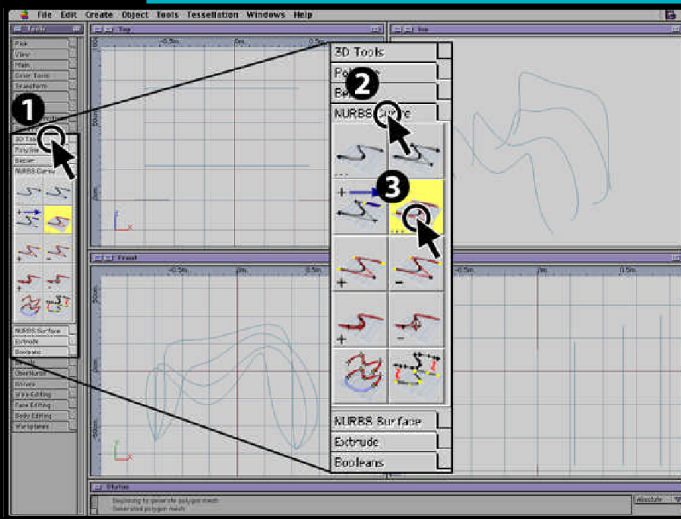
Turn off the visibility for the Skin Surface object and the Rib_Placement.img.





[CLK] the box in the upper left corner of the Layer View Window

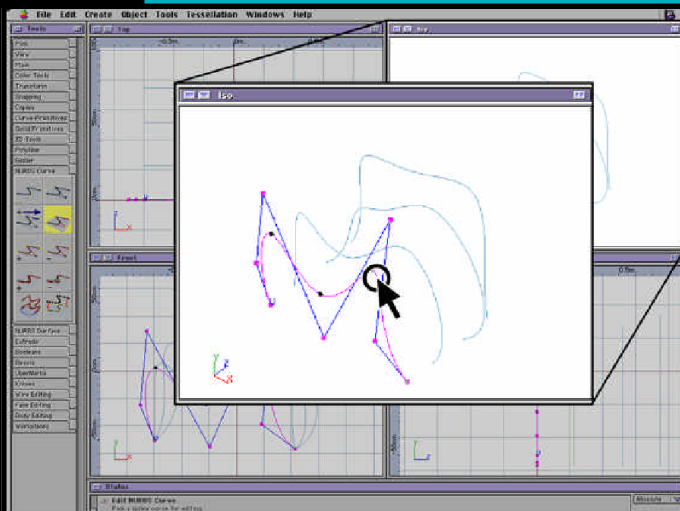




[CLK] on the 3D Tools name tab to close the palette.

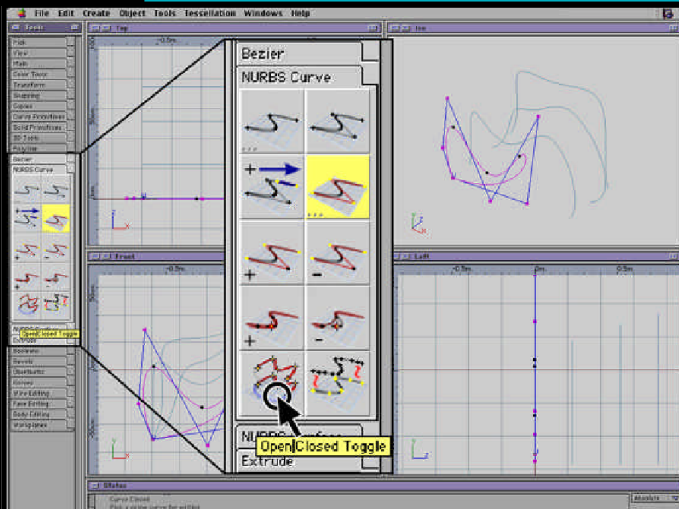
Open the NURBS Curve palette and select the Edit NURBS Curve tool.





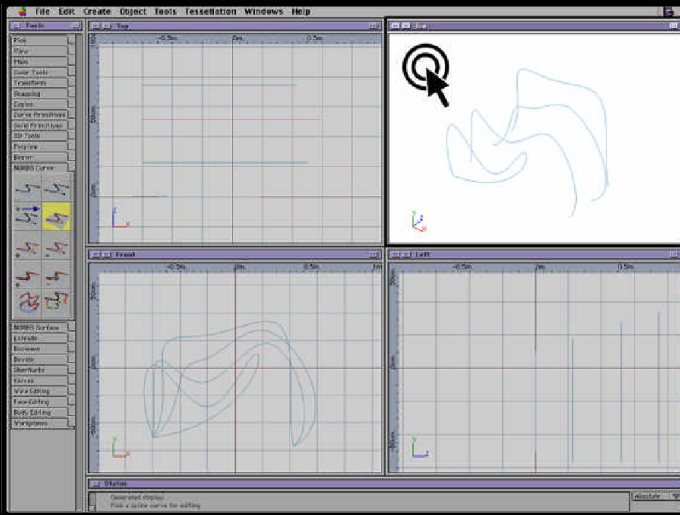
In the Iso view window, [**CLK**] on Rib 1.





In the NURBS Curve palette, **[CLK]** on the Open/Closed Toggle button.

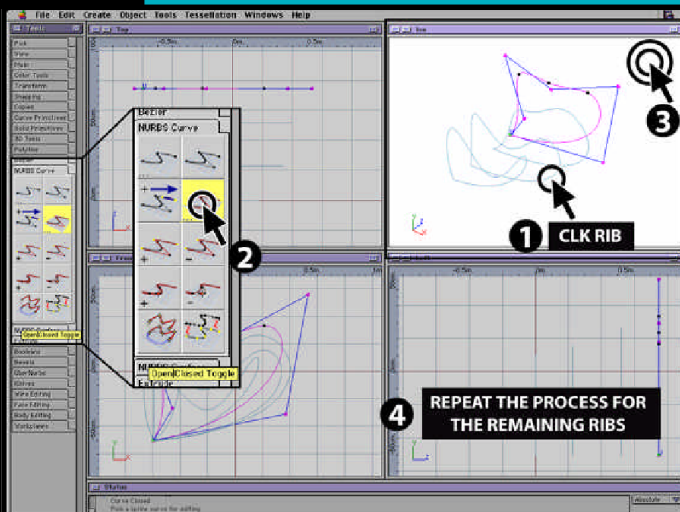




In the Iso view window, notice that the NURBS Curve is now closed.

[DBL+CLK] in empty space to commit to this action.



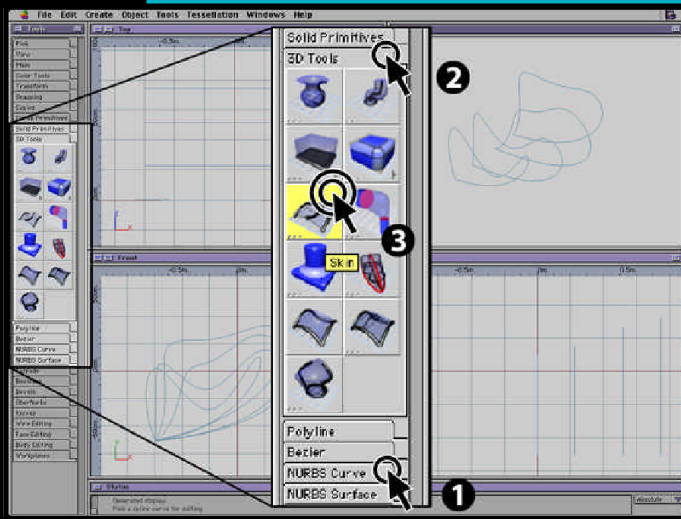


[CLK] each of the remaining ribs.

[CLK] the Open/Close Toggle button.

[DBL+CLK] in empty space to commit the operation.



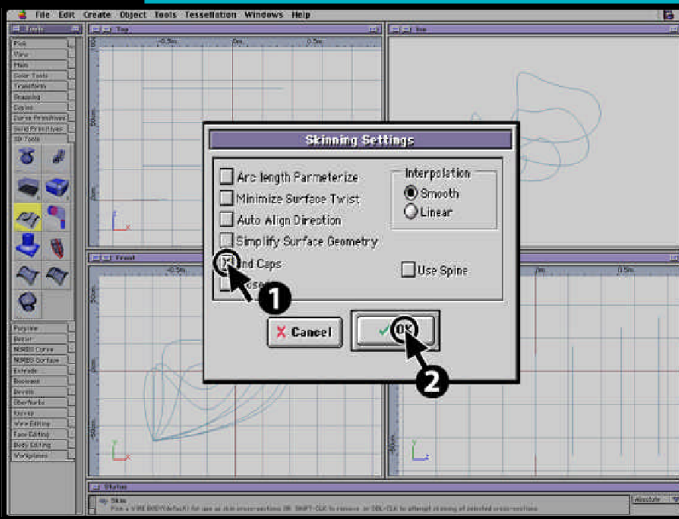


Close the NURBS palette.

Open the 3D Tools palette.

[DBL+CLK] the Skin tool.



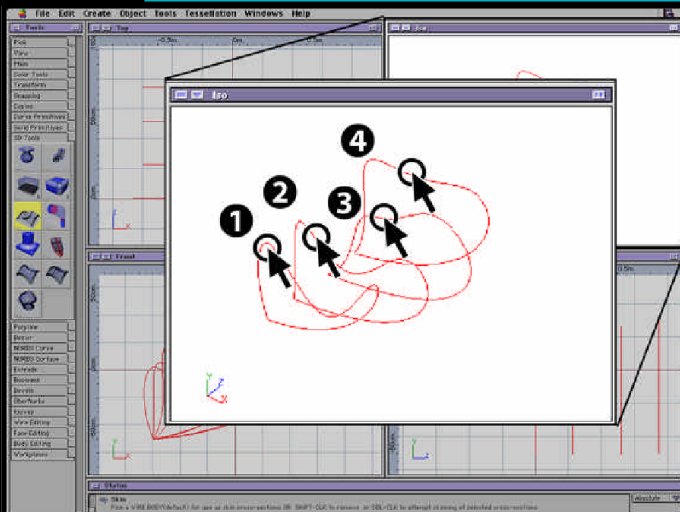


Uncheck the Closed option and Check the End Caps option.

Again, leave the rest of the options alone.

[CLK] OK or press [RTRN].

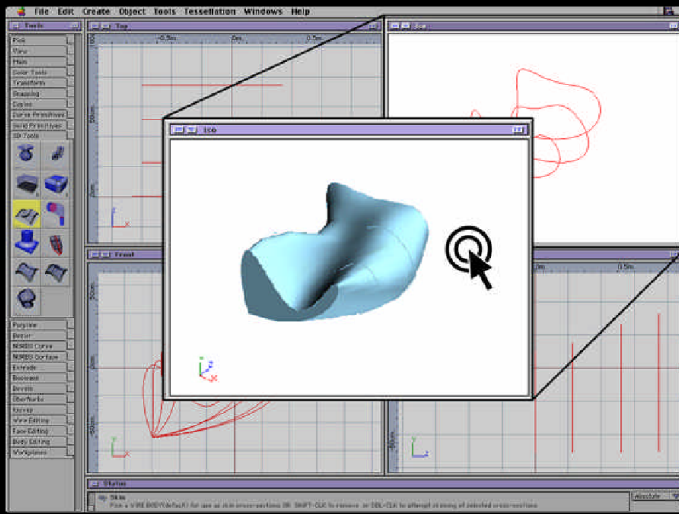




In the Iso view window, starting on the far left Rib, **[CLK]** on each Rib in order.

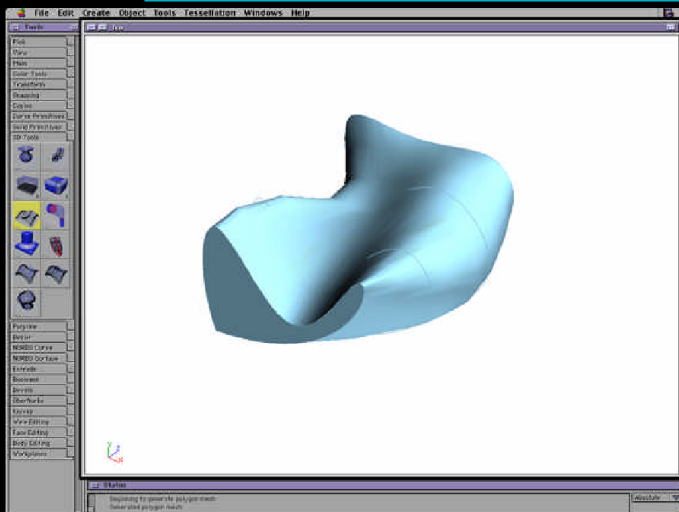
If you select a Rib out of order, **[SHIFT+CLK]** on the unwanted Rib.





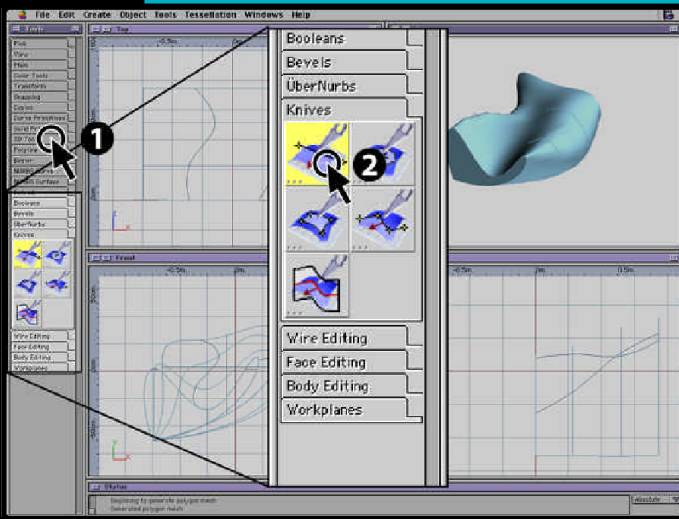
[DBL+CLK] in empty space to perform the operation.





You should now have a solid, skinned object.

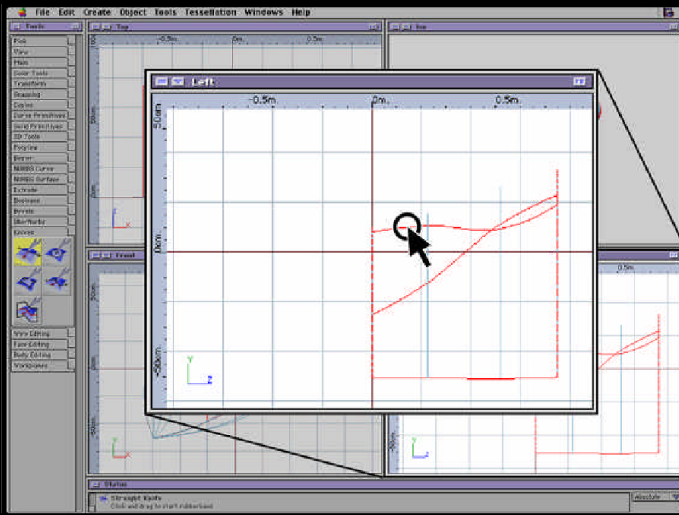




Close the 3D Tools palette.

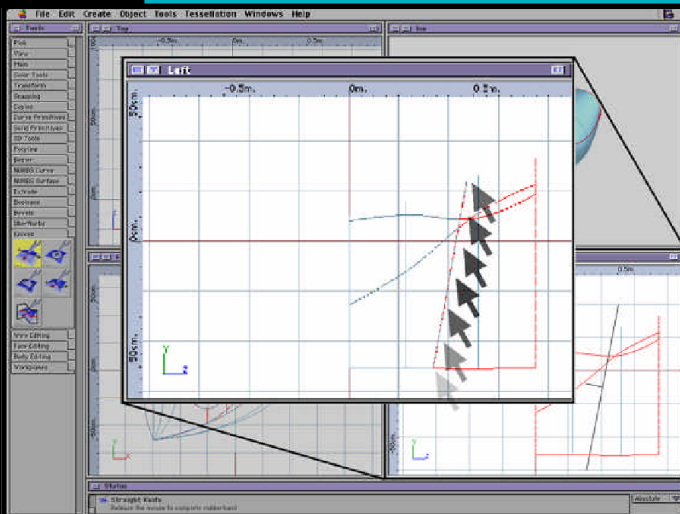
Open the Knives palette, and select the Straight Knife Tool.





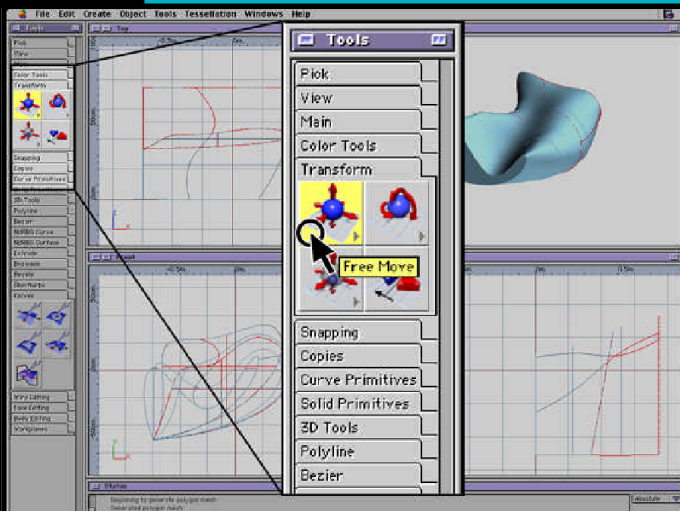
In the Left view window, **[CLK]** on the skinned object to select it.





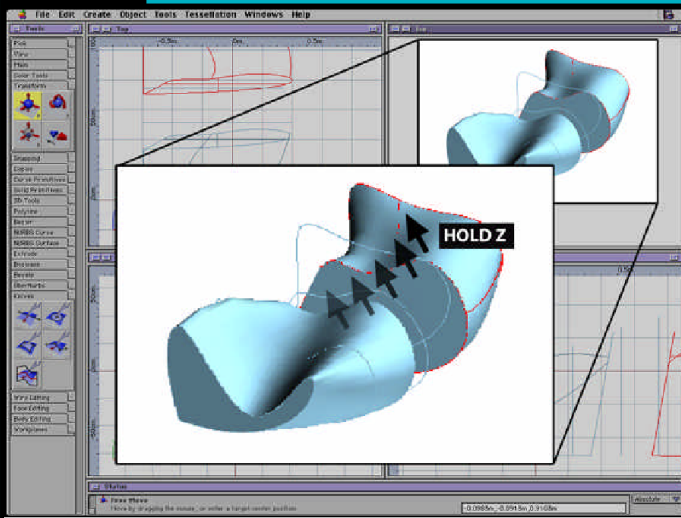
Then drag a diagonal line through the middle of it, slicing the object in half.





Select the Free Move tool [**CMD/CTRL+M**] from the Transform palette.





In the Iso view window, hold down the **[Z]** key.

[CLK] in empty space and **[DRG]** the knifed body away from the other half.

You should now see that your skinned object is now solid.

