How to texture map multiple objects to one bitmap.

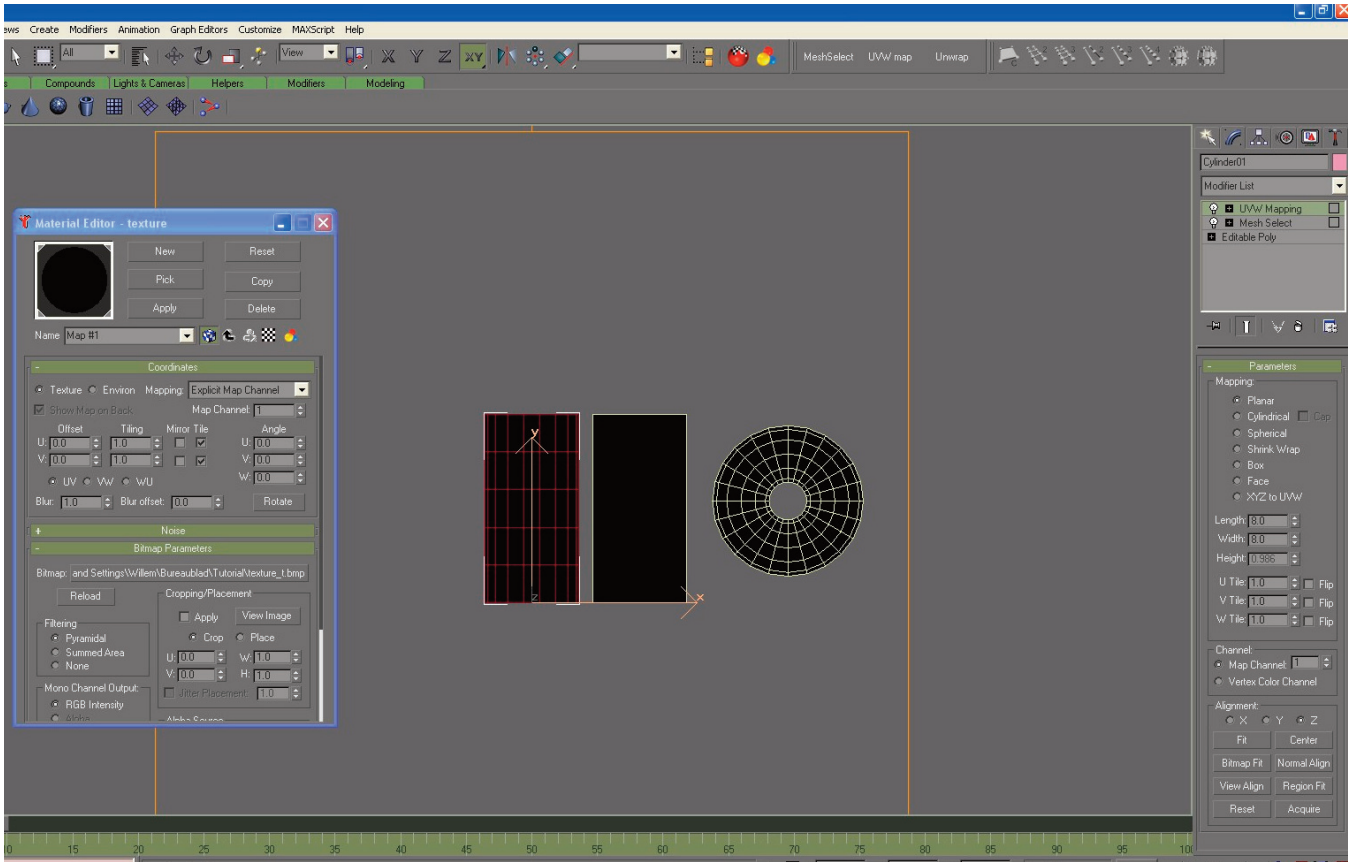
By Willem Bruijns nov 2007.

If you look at the texture files of the default MS aircraft, it is obvious that they have used the entire canvas for mapping as many parts as possible to one bitmap.
Performance wise it is a good thing to map as efficiently as possible.

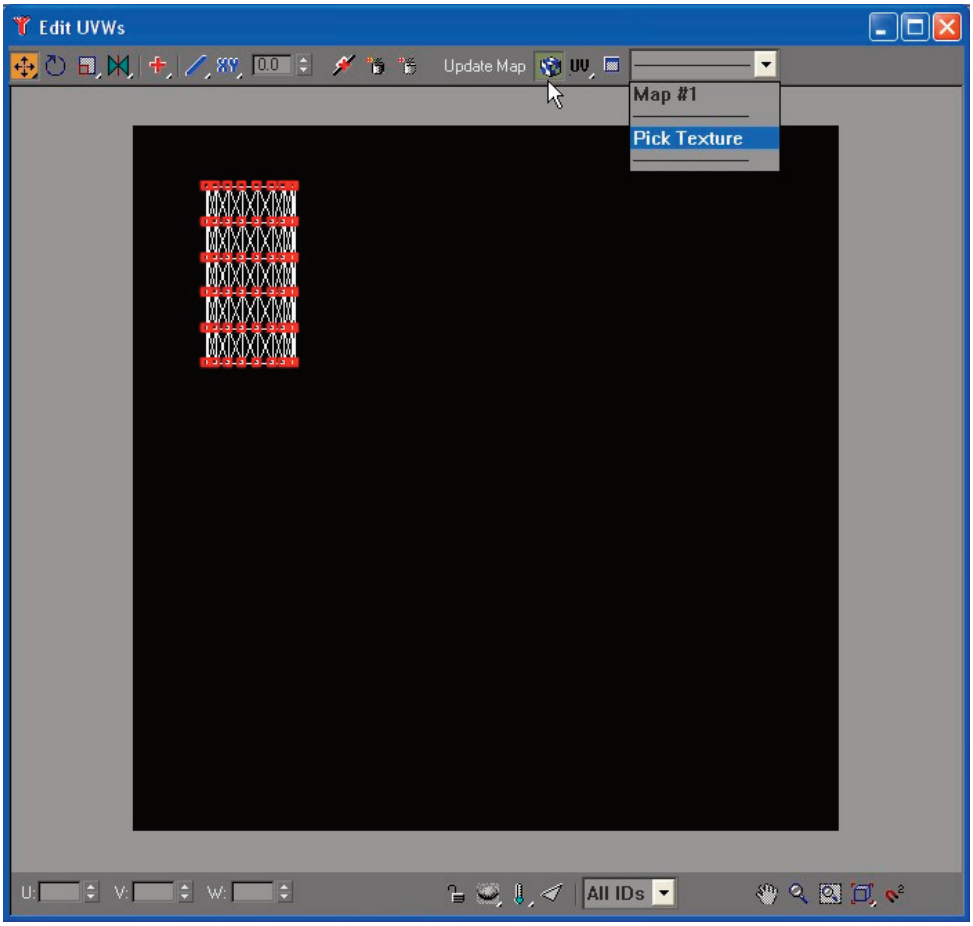
This tutorial shows you how you can also achieve this. I assume that you already know how to aply a material to an object, and that you are not unfamiliar with the concept of UVW mapping and Unwrapping. There are many superb tutorials on these subjects around here, so i decided to skip that for the most part.
For this tutorial you need Lithunwrap, which is still available as freeware in version 1.3 and the quake 3 exporter plug in for Gmax. You can find this as md3exp.dle on internet and it should be put in the Gmax-Plugins folder. Lithunwrap can read the quake 3 format.

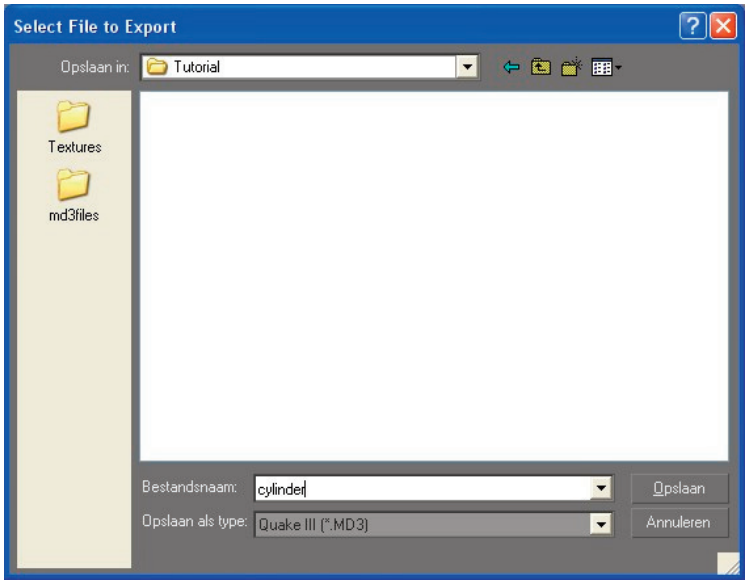
For this tutorial you create a cylinder (radius 0.5m,height 1m) a box (1x1x0.5m) , and a torus (radius 0.5 and 0.3 m) and apply a material to them.
Material name is texture and the assigned bitmap is texture_t.bmp.
That bitmap is black 1024x1024 for now.
If you choose so, you can also use different materials that use the same bitmap, or you can also use a multi-material (a “master” material that consists of any number of submaterials that in this case also use the same bitmap, i find this a very powerfull means of texturing because it allows you to texture parts of an object independantly of each other.), but we keep things simple for now so we go for the first option.

You select the cylinder and add a Mesh Select modifier, select all poly’s and apply a UVW mapping modifier. Length and Width of the UVW map you can change to for instance 8.0 both. Making sure you have the correct view selected (in this case Front (hit K key)) you select View Align in order to align the UVW map to that view.



Now you add an Unwrap UVW modifier and hit Edit in the parameters roll out.
The UVW editor will open showing the mesh. At the drop down box at the top you can select pick texture. Browse to texture_t.bmp and make sure that the blue and white box is ticked otherwise the bmp will not show in the editor. Select the vertices of the mesh in the editor and move them to a place in the workspace you see fit. (you can move, scale, rotate, flip the UVW mesh or part of that mesh if you like. Just play around and see what happens if you like)
In this case move it to the top left corner. This effectively tells the system that the texture for the cylinder is to be taken exactly from that area of the bitmap.

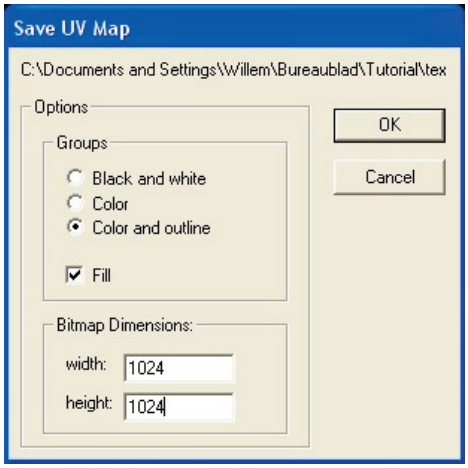




Now it is time to export the model to Lithunwrap. For that the quake 3 format or .md3 is used.
Since the other 2 objects have not been mapped yet, use the export selected function of Gmax.
(the cylinder should still be selected, otherwise select it). Name it cylinder and continue.

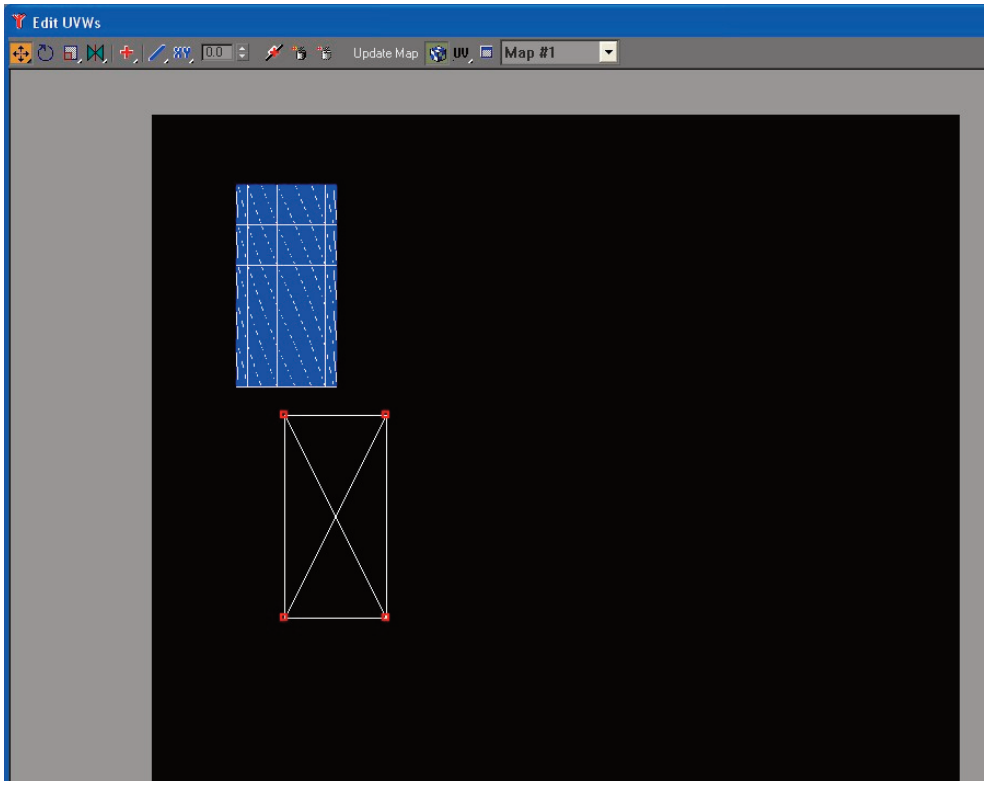
In the dialog box that pops up next, just insert 0 (zero) at “The Following Frames” and hit export now. Sometimes some warnings pop up, just click them away. You can now save the progress and close Gmax.

Now open up Lithunwrap, choose File-model-open and browse to the cylinder.md3 file. Select it and another dialog opens. Just click Import and the mesh of the cylinder appears.
Next, select File-UV Map-Save. Browse to the texture_t.bmp and select that, click ok to replace the original one. The Save UV map dialog opens. Select Color and Outline and check Fill. Make sure that the size is set to 1024 x 1024.



Now the texture_t.bmp is updated and should show the mesh of the cylinder right in the position where you put it in de UVW editor in Gmax.

Time to add another object to that same texture_t.bmp.
Open your Gmax file again and select the box, apply a UVW Map and Unwrap modifier in the same fashion you did for the cylinder.
By the way, if you have several objects that are aligned and for convenience should be aligned on the texture as well (for example a stabilizer and a rudder sharing a tail logo), it is good practice to have the same size of UVW map and the same view direction when aplying the UVW Map. In this case 8x8 meters and Front view (K key). This minimizes mapping error.

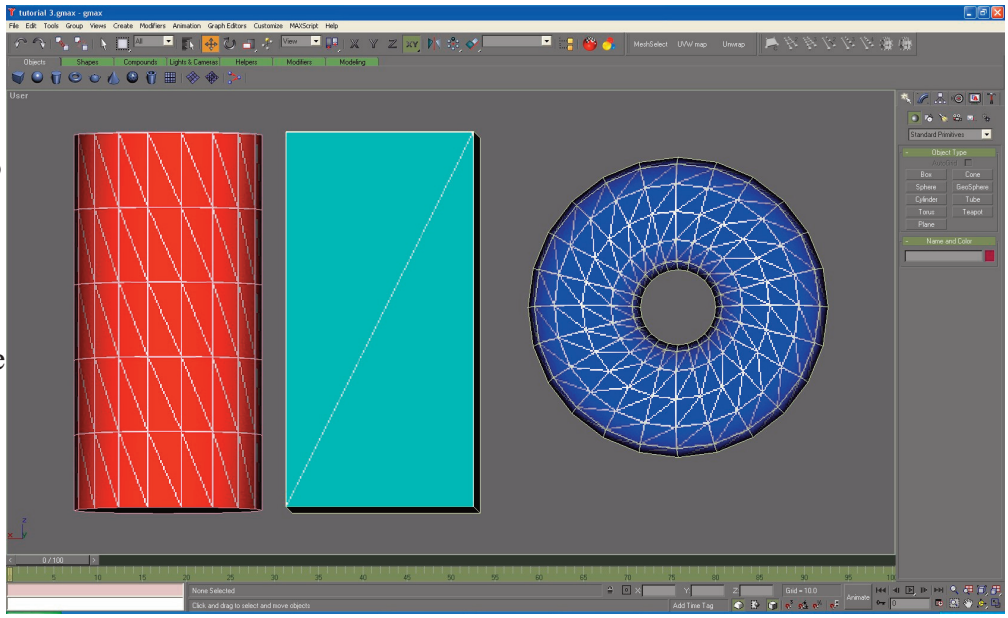


Ok, click Edit on the parameters rollout. This opens the UVW editor. If necessary call up the texture_t.bmp. You can now see to which position the cylinder was mapped to (shown in blue here) and position the box accordingly. In this case i choose to put it below the cylinder. The reason that i made you close and reopen Gmax was that (on my system anyway) the “update map” in the editor does not work. It does not refresh the bitmap, while restarting Gmax does.

Time to export for Lithunwrap again. Follow the same procedure you did for the cylinder, naming it box.md3
Open the box.md3 in Lithunwrap. Select File-Model-Merge and merge the cylinder to this scene. If you plan to have many different objects on one bitmap it might be good practice to save this scene, otherwise you need to merge many objects again and again.
To do this select File-Model-Save. Lithunwrap by default uses a.lum extension which is ok to use. For now save as merge_1.lum.
We still need to create the bitmap, so select File-UV map- Save and replace the texture_t.bmp again. Use the same settings as above (1024x1024 etc).

Now we have 2 objects mapped to one bitmap. You catch my drift by now....
In Gmax Mesh Select, UVW map, Unwrap, Edit and move the object in the editor to the desired position.
Export the torus as torus.md3, and open that in Lithunwrap.
Now you can merge the other two objects to this one by merging torus.md3 with merge_1.lum. Save as merge_2.lum should you want to add even more objects.
Save the UV map as texture_t.bmp.

In Gmax you can now see the texture_t.bmp being applied to the 3 objects, if the blue and white box in the gmax material editor is selected. If all is well, the grid lines of the texture align with the edges of the objects.



Side note:
Due to the fact that we applied the UVW maps from the front, you can still see grey areas at top, bottom and sides of for instance the box if you rotate it in Gmax. As you may or may not know already, in effect the texture is “projected” onto the objects from the front in this case (you selected that view prior to UVW mapping the objects), that is the function of the UVW mapping. The use of multi-materials is ideal to fix this situation. The principle of what was described in this tutorial still stands, however. Even for multi-materials.

Now you can use the texture_t.bmp as a template for repainting the objects very accurately while still working on only one bitmap, because you now know exactly where the objects are mapped to on the bitmap.

Hopefully you find this tutorial usefull. Should you have any comments, remarks etc you can contact me via email via kanogek@hotmail.com.

