Preparations

This tutorial was made with the following programs
-3D Studio Max 8.0
-BIS O2 PE
-BIS TexView 2
-Adobe Photosohop CS
-nvidia DDS plugin for photshop
-A good C++ text editor (UltradEdit32, notpad++, MS Visual Studio)

This tutorial initiates considering that you have a model (3ds format), with the appropriate textures (already mapped). Some basic rules about ArmA that you need to consider before proceed to this tutorial.

   -Texture sizes are in powers of 2 that means, that each texture needs to be for example in 256X256,2048X2048, 4096X2048 etc. each texture aspect a power of two.

   -For your source image files better use .tga format (32 bit). Because it has the ability of storing alpha channel information (transparency).

CHAPTER 1
Importing a 3ds file to O2

1) Importing Preparations
2) Importing steps and calibration
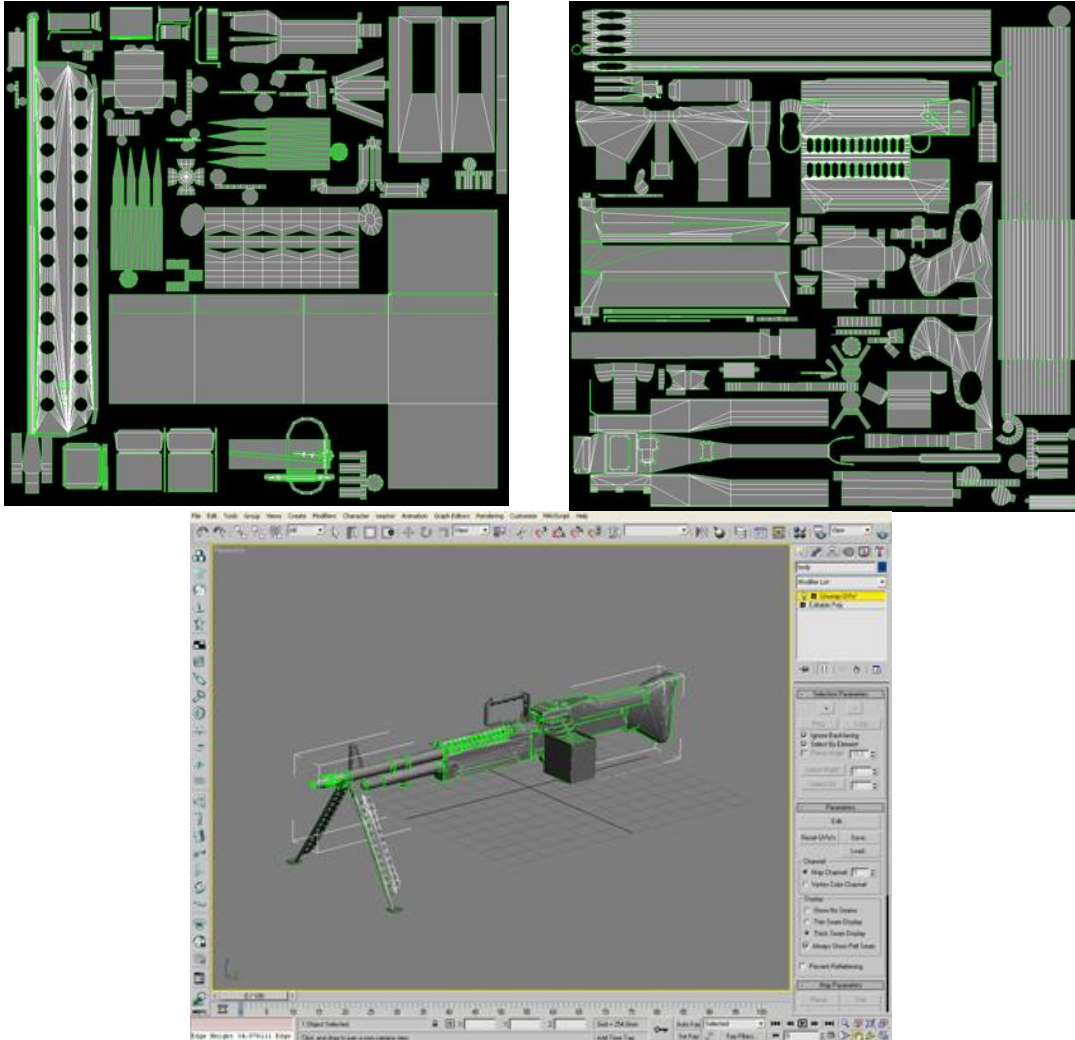
Pic 1.1 Our 3ds file with the 2 corresponding textures. Already mapped to the model. Original textures size 1024X1024 each

1. Importing Preparations

STEP 1: MODEL PREPARATION

There is one small step that you need to perform before exporting to 3ds and importing to O2.

Most of the times modeler creates his model under different objects in order to control better and work with more flexibility on the model. Remember though that before you export to 3ds all the objects of the model has to combine under one. This is necessary, otherwise when importing a model that consists of different objects O2 tries to recenter each one of them causing the whole objects of the model not to combine together.

So here we explain how to combine your objects under one. Take for example the M60 of the pic 1.1. in this example our model, consists of 2 objects. So let's get started.
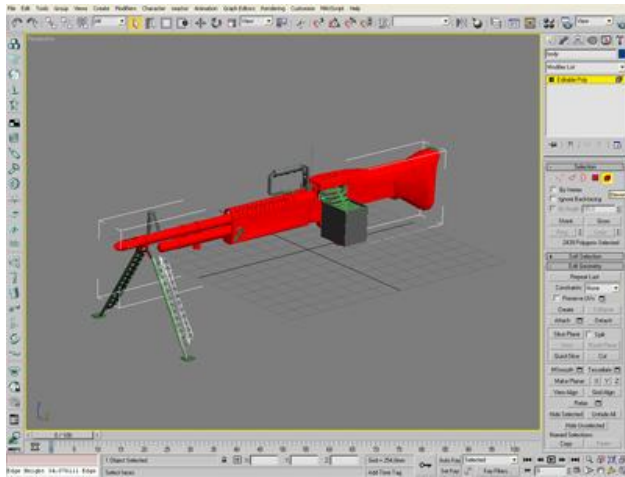
Pic1.2 object 1 selected elements.

First select object one, after click on the "select by element" and then ctrl+A, this way all elements of this object will selected (red color). Pic1.2.

Now, we need to put these object elements under a new material id. On your left of the program there is a selection tab, name "polygon properties", usually there (unless the user changes it) 3ds max puts value 1 for material id, for every object. Simply that means that if you attach all objects under one, without having change

1st the material ids, the uvw maps will be mixed. So we change the value on the field "set id" from 1 to 2, and then press Enter on the keyboard (pic 1.3). The material now is mapped under new id. You can easily attach objects together, since the other has as material id value 1 and this one 2, the attachment will not cause any problems. This process can be done for more materials.

After the attachment the desired part of the model can be easily selected by typing the appropriate number on the field "select id" and the pressing Select id.

Ok, now it's time for the export.

STEP 2: FOLDER PREPARATION

In order your addon to be working, it needs to meet some certain rules (ArmA). One of them is that you have to create a folder as base folder for your addon. When O2 installs on a fresh computer creates a virtual working space (usual a new Drive named P) , in this virtual working space create a folder (example P:\MyWeapons\data\) this is the structure that will be kept and after you create your pbo. We will talk about this in the last chapter.

You need to put your model there (p3d), but for start we need just to create these two empty folders

TIP: As noticed BIS uses a specific structures for its own addons a main base folder for the addon\addons. For example weapons there lay the p3d files and a folder named data inside this one with the textures, There are also other folders present depending on the addon. In this tutorial we will follow BIS folder structure, although it's up to the addon maker to create what ever folder structure desires, as long as it complies with the rule above.
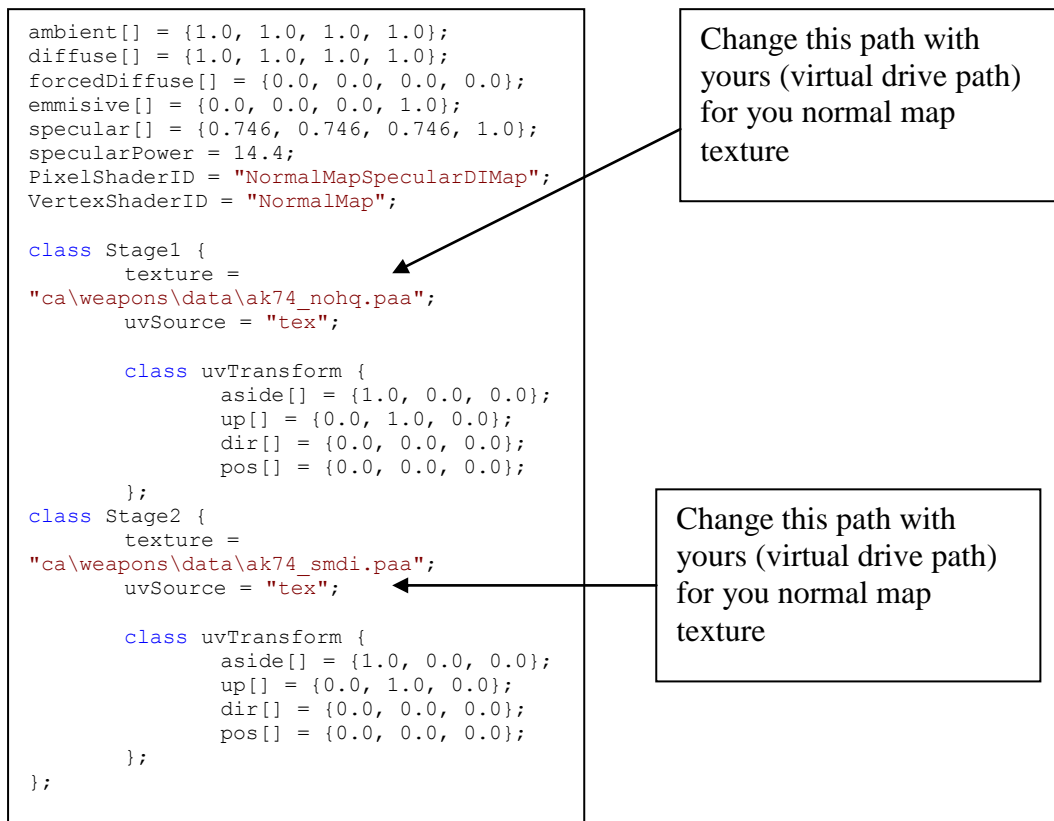
STEP 3: TEXTURES PREPARATION

As first stated ArmA works with textures with sizes of power of 2, so one thing that you need to do is to prepare you textures. In this case we use 2 textures sized 1024X1024 each. In order to convert them in paa format the best way is through BIS paa tool. I recommend tga format because it keeps high quality compression and supports alpha channel.

Open photoshop and LOD your texture save it in 32bit tga format under your desired named with _CO suffix after your name. (For a list of the supporting texture extensions refer to the readme that come with TexView2). Open TexView2 and load the texture save it as paa format in your folder that you have already create in your virtual drive. TexView2 will make the appropriate compression as long as you have correct suffix after the texture name in this case _CO.

STEP 4: CREATING EMPTY MATERIAL FILES (RVMAT)

One step that will help to have it already prepare is the material files, and that's why it's going to save us quite a few clicks if we do it now than later. One small issue is the difficulty of understanding how the material editor works. In order to create yours materials from scratch here is a way of how you can save a lot of time.

Open kegetys UnRap tool, select a BIS weapon material (it requires that you have already unpbo the appropriate pbo that has your desired material in it). In un raps question of generate separate files for root classes choose no, now this material should have been stored under a cpp extension, but that's not a problem at all, since unbinarised materials are nothing more than text files. Open this cpp, you should see something like this. In this example I have used BIS AK-47 RVMAT file. For start you don't need to worry much about anything that is there, the only thing that you need to do is change the appropriate paths with yours. And resave the file in your virtual drive under .rvmat extension. Keep note that this procedure should be repeated for every texture of your model.

```
ambient[] = {1.0, 1.0, 1.0, 1.0};
diffuse[] = {1.0, 1.0, 1.0, 1.0};
forcedDiffuse[] = {0.0, 0.0, 0.0, 0.0};
emmisive[] = {0.0, 0.0, 0.0, 1.0};
specular[] = {0.746, 0.746, 0.746, 1.0};
specularPower = 14.4;
PixelShaderID = "NormalMapSpecularDIMap";
VertexShaderID = "NormalMap";

class Stage1 {
      texture =
"ca\weapons\data\ak74_nohq.paa";
      uvSource = "tex";

      class uvTransform {
            aside[] = {1.0, 0.0, 0.0};
            up[] = {0.0, 1.0, 0.0};
            dir[] = {0.0, 0.0, 0.0};
            pos[] = {0.0, 0.0, 0.0};
      };
class Stage2 {
      texture =
"ca\weapons\data\ak74_smdi.paa";
      uvSource = "tex";

      class uvTransform {
            aside[] = {1.0, 0.0, 0.0};
            up[] = {0.0, 1.0, 0.0};
            dir[] = {0.0, 0.0, 0.0};
            pos[] = {0.0, 0.0, 0.0};
      };
};
```

Change this path with yours (virtual drive path) for you normal map texture

Change this path with yours (virtual drive path) for you normal map texture

Pic1.3 BIS AK-47 RVMAT file

STEP 5: CREATING NORMAL AND SPECULAR MAPS

Normal and specular maps are a wonderful feature that adds a really better feeling on the models, so it's quite a must to have them in your addons. We can see how you can create specular and normal maps in the Appendix X, but for start here is some basic info.

Normal maps are responsible for a bump on the models, it's far better that simple bump maps, in ArmA in order a normal map to work needs and a specular map, a specular map, does exactly what the name implies. Specular maps with high specularity producing better bumping on the model (normal map), but cause the model to shining more and more… so in order to have a best result you need to play with these two.

In ArmA specular maps have the _smdi suffix and normal maps the _nohq suffix. (For more texture types refer to the readme that comes with TexView2).
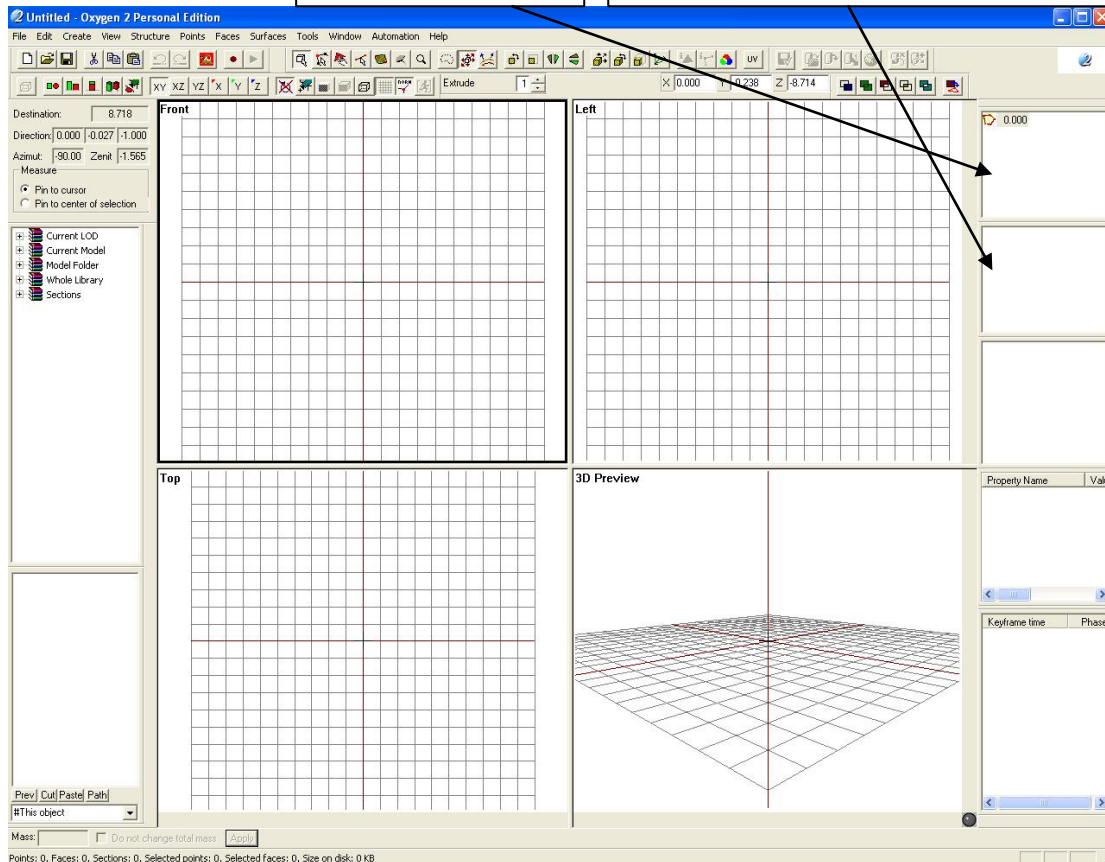
STEP 6: SUMMARIZE

By now you should have a folder in your virtual drive with a subfolder (P:\MyWeapons\data\). in folder data there should be for every texture with _CO suffix , an appropriate material file (.RVMT extension), two textures files with the same name as the _CO texture with the _NOHQ extension for normal map texture and _SMDI extension for specular map texture. Both of these textures should have their appropriate paths presented in the .RVMAT files in the appropriate fields.
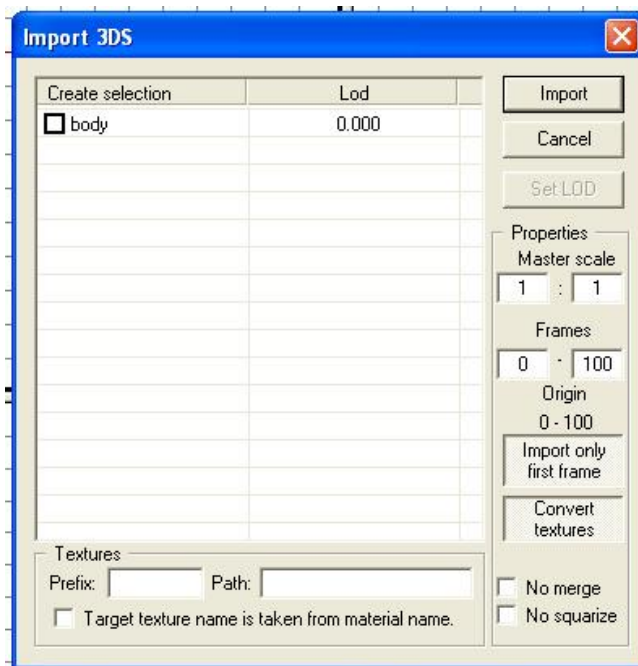
2. Importing steps and calibration

After these preparations the time for the actual 3d model import has come. The steps below explain how you can import the model and make the first calibaration steps (textures/materials etc). But first let's have a first tour on the main O2 program. In the picture below is shown the layout of the O2, you can activate and deactivate side panels by going in window menu, from main menu and selecting or deselecting an option.

The LOD panel. LODS are crutial for the addon in order to be portable into game

Named selection panel, here you can define selection parts on the model, ArmA engine uses selections in the model for applying animations and reserved selections for the model

STEP 1: IMPORTING

Open O2 go file->import->3d studio. A pop up window will open use the same adjustments like the picture below. And then click the import button. You can also import your model into a specific LOD, by clicking on the line on your right and then by clicking the set LOD button select your LOD.


Pic2.1 importing options.

Now the weapon should have appeared on O2 screen.

STEP 2: SCALING TO THE CORRECT PROPORTIONS

The model is extremely up scaled (the reason is cause we have selected a scale factor of 1:1 , BIS by default has a scale factor of 1:1000), so the 1st thing we need to do, is to scale our weapon in the correct proportions. In order to apply a general scale in all axis the fastest way is by selecting the whole model (ctrl+A) and then by holding left ctrl+shift and pushing the right mouse button while moving down or up you can have a scale down or up (depending on mouse movement down for scale down, up for scale up). Scale your model to the correct proportions, and then go structure->center all (in order O2 to put the model in center of the axis). After hit F5 button in order to recalculate the normals.
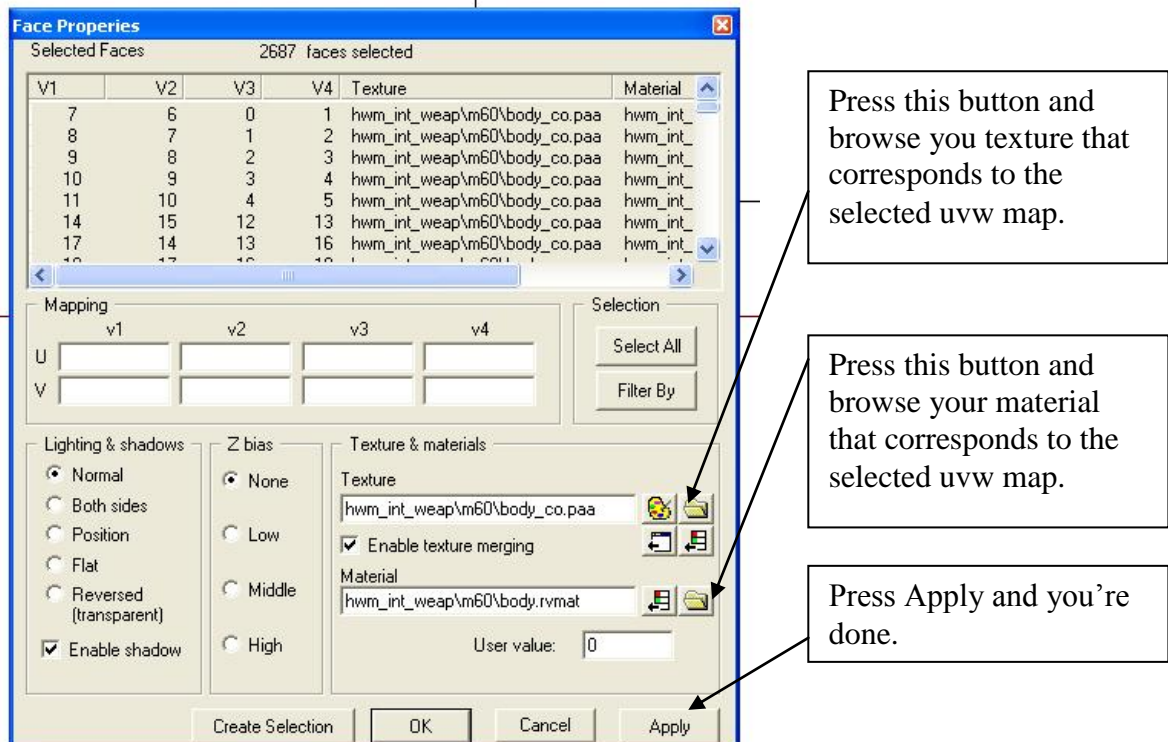
STEP 3: TEXTURES AND MATERIAL MAP

The model has been imported and corrected scaled but the textures are missing. Here I will explain how you can adjust the textures to the model. But for start textures should have been converted in paa format (see chapter 1.3 of how to do this). Go surfaces->UVsets->UV Editor from main menu, or click the   form O2 toolbar. The UV Edtor window will appear, with the uv maps mixed there (remember that in this example the weapon consists of 2 different uv maps mapped to a different channel) (pic 2.2 below). Now you need to separate the textures and map the correctly here is a way of how to.
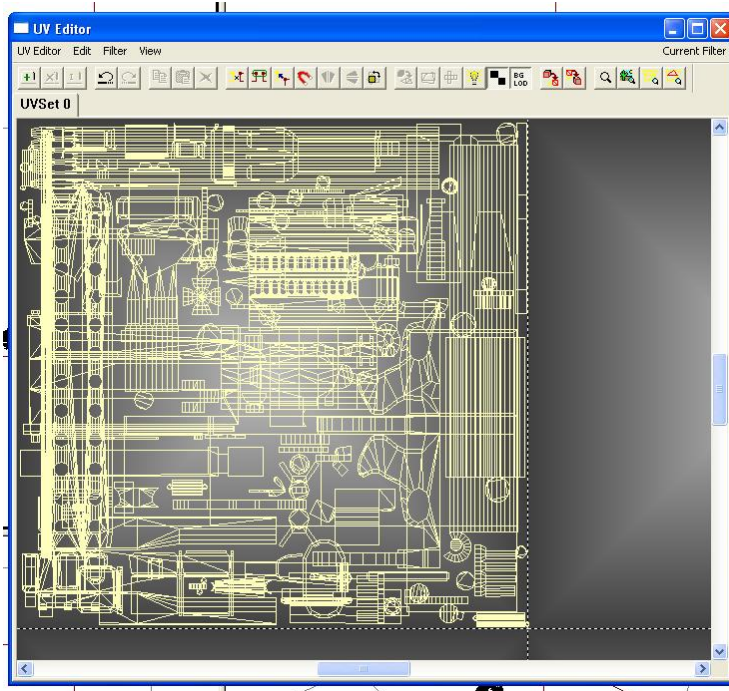
Pic2.2 The UV Editor Window

On the UV Editor Window go Filter->Filter By Main Texture -> "texture names" (keep note instead of "texture names" you should get a list with the texture names as was the name materials that you have already assign to your model before the import. So it's important that your model should have mapped materials on it). In this example we have 2 names, so select on from two. After the selection the UV Editor keeps only the appropriate uvw map that corresponds to the texture you have selected. Now select all the map (ctrl+A), and after go Edit->Autoselect in Object or by clicking this [icon] icon on the UV Editor Toolbar. Minimize the UV Editor window and you'll notice that the appropriate parts have been selected to the model. Now you can apply your texture by Faces->Face Properties from O2 main menu (E keyboard short cut button) or by clicking on this icon [icon] on O2 toolbar. A new pop up window should appear, (Pic 2.3)

Face Properies

Selected Faces   2687 faces selected

V1	V2	V3	V4	Texture	Material
7	6	0	1	hwm_int_weap\m60\body_co.paa	hwm_int_
8	7	1	2	hwm_int_weap\m60\body_co.paa	hwm_int_
9	8	2	3	hwm_int_weap\m60\body_co.paa	hwm_int_
10	9	3	4	hwm_int_weap\m60\body_co.paa	hwm_int_
11	10	4	5	hwm_int_weap\m60\body_co.paa	hwm_int_
14	15	12	13	hwm_int_weap\m60\body_co.paa	hwm_int_
17	14	13	16	hwm_int_weap\m60\body_co.paa	hwm_int_

Mapping

	v1	v2	v3	v4
U				
V				

Selection

Select All

Filter By

Lighting & shadows
- ● Normal
- ○ Both sides
- ○ Position
- ○ Flat
- ○ Reversed (transparent)
- ☑ Enable shadow

Z bias
- ● None
- ○ Low
- ○ Middle
- ○ High

Texture & materials

Texture

hwm_int_weap\m60\body_co.paa

☑ Enable texture merging

Material

hwm_int_weap\m60\body.rvmat

User value: 0

Create Selection   OK   Cancel   Apply

Pic2.3The Face Properties Window

Press this button and browse you texture that corresponds to the selected uvw map.

Press this button and browse your material that corresponds to the selected uvw map.

Press Apply and you're done.

STEP 4: FIXING IMPORT ERRORS

Unfortunately the importing procedure isn't flawless O2 during import try to recreate the faces, sometimes causing a face to consist of different vertexes and that has an effect of the UV map, since the unwrapping process was done under the model created in max, there is now a mismatch. This problem mostly is on Quad faces. Although it doesn't cause problem to the actual texture, it has bad effect on normal and specular map. In this step I will explain how to fix the ST point, non-Linear mapping and non-planar faces errors, using O2's UV editor.

For start go structure->check faces

You can see the result of the check faces process in the named selection panel

The textures applied on the