

The purpose of this small tutorial is to give an idea how to model your own unit and bring it in game. Most of the included informations are „reused“, also already posted in own tutorial or thread. So first thanks to all modelers who made the tutorials so far (C.Roland, Refar, Bernie14, dutchking, Rabbit White, Ekmek and all the others i did forget).

To give you an idea what kind of experience you can expect when reading this tutorial, my first steps to make a model was the P38 tutorial for Gmax, but without working UV map, than after a long pause i decided to try it again after founding this page and read some tutorials. Now i make models for 4 month, so don't expect an expert.

The necessary software to make the models are for free, so what you need:

a 3D modeling program, the tutorial will be based on *Blender 2.46*<sup>1</sup>, another free alternative is *Gmax*

the *niftools* / *nifscripts* for your used 3D program, necessary for im- and export

*nifviewer*<sup>2</sup> or *nifscope*, the second one is recommended (but also good to have both working)

a paint program with the ability to save as DDS, i use *Gimp* with dds plugin and *Paint.Net*

The elementary usage, eg. How to set the views, shortcuts, etc., of Blender is not part of this tutorial, a good tutorial is the wiki book „From Noob to Pro“. This tutorial will cover the creations of the „Skjold“ class ship, starting from the first vertices and stop with a working model for ingame use.<sup>3</sup>

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1 Blender also need Python installed to work correct with the scripts

2 Aka. Sceneviewer from the max tools, but works as stand alone

3 The necessary xml coding is not part of this tutorial

## Starting Preparations

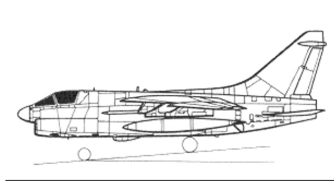
What you need before you start, first all programs installed, second knowing what you want to model, for your first model i would recommend an easy shaped object. Trying to start with a human being could also work, but i think a „quick“ success is also good motivation. Also expect to make errors. But the most important thing in my opinion is the will to make the model. Ok and a little free time could not harm (expect 5 to 15 hours for your first model, depends on the difficulty of the chosen object)

After you know what will be your model you need reference pics, i wouldn't start without them, the reference pics can be handmade or 3 side views from the net. Coloured pics of the object are also important to get later a good skin. When you have your 3 side view, for this model is used the pics and the 3 side view from this site: <http://www.knmskjold.org/english/index.html>

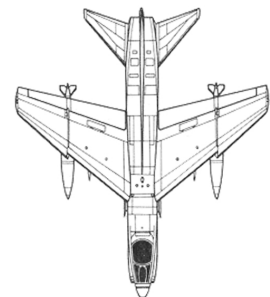
The 3 side view needs a certain structure to be useful, so in most cases its the first time to use one of the paint programs. The front view is normal, the side view should be with the front of the model to the left and the top view with the front of the looking down, see the examples i used for the A7 Corsair II



*front view*



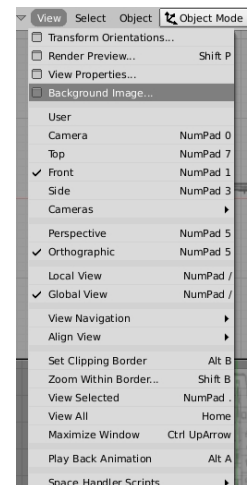
*side view*



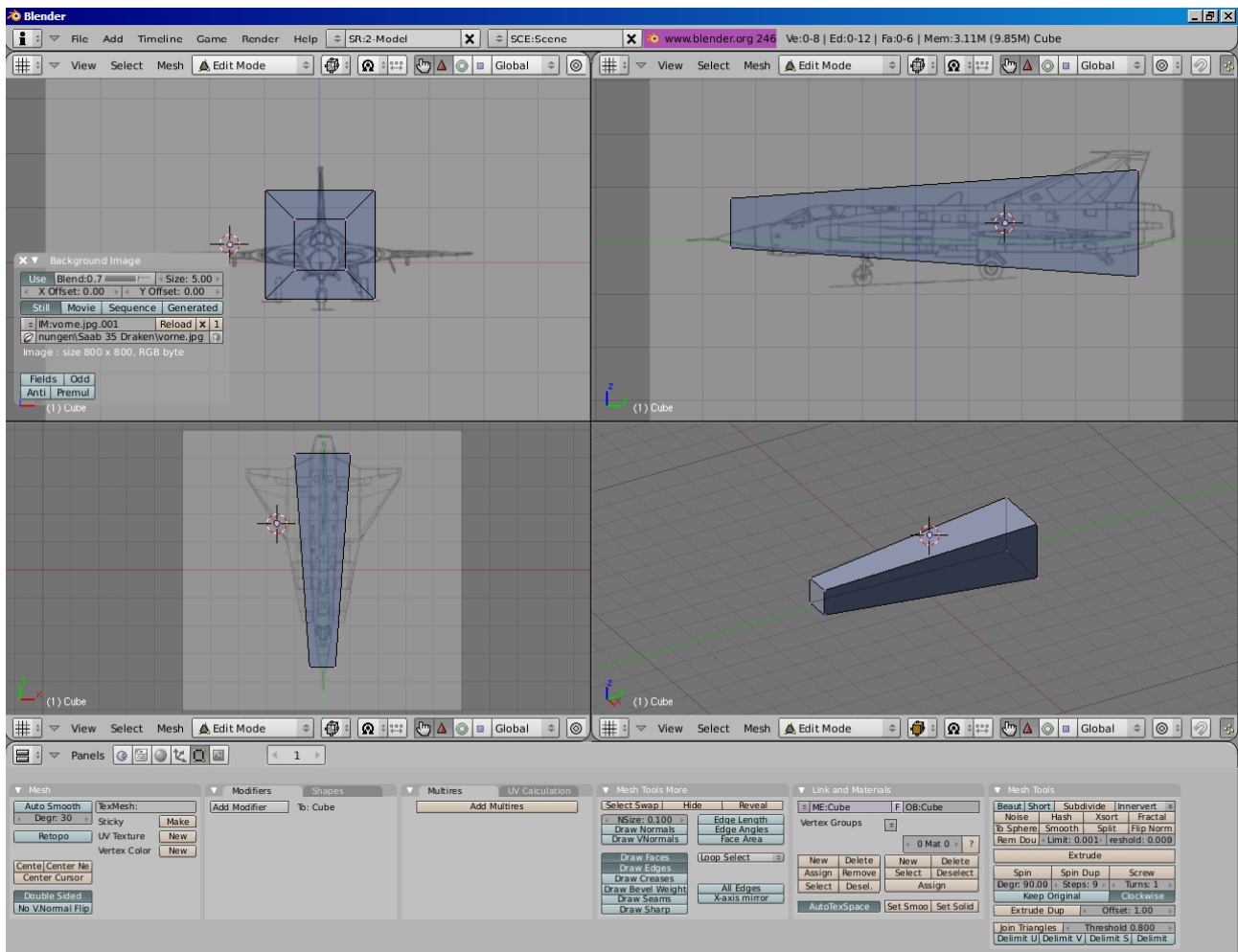
*top view*

Important for the 3 side view pictures is that they all are centered the same way and the model of the same size. The nose for example should have the same high in front and side view, and also the same distance from the border of the pic. For this purpose you can add help lines in Gimp and rescale and change the position until it fits. There won't be always perfect pics for this purpose, as you can see, my reference did not included a top view, only an isometric view, not ideal, but is can be enough to make the model.

The next step before really start to model is to bring this pics as reference in Blender, so start Blender. Under view -> background image it's possible to add the pictures, (see pic on the right). I usual work with four 3D views and one Button Window in Blender, top left is front (Num Block 1), top right is the side view (Num Block 3), bottom left the top view (Num Block 7). The bottom right 3D view is my isometric view. The Buttons View is under the 3D views. But this is only my configuration, you must find your own, which fits your style. But to go on, after selecting Background image a new windows pops up, in this window



In this window you will see a button load, here you can select the file used as background image, after loading all pics, it should look like the following pic



If you use the in the zip included pics of the Skjold, you must change the size of the front view from 5 to 1.6, as top view i used an picture in the web showing the ship almost from the top. With the symbol in front of the file name you can select another picture, with the „X“ next to reload, you delete the selected background image.

Now we can start with the modeling.

## How to make a model

Before we start with the actual model, there will be some basic information about how to make an model, based on how i work and what i found in the net. Some of the basics will be first complete clear when you read the entire modeling process or run in some problems. So don't worry if something is not clear even if the subsection is called basics.

## Basics

First some basic short keys for Blender which i often use, with „A“ you select all, or if something is selected you deselect all. „Space“ in the 3D view allows you to create a new standard object. „Ctrl“

+ „Z“ will be your best friend, because it undo the last changes. With „Control“ + „Tab“<sup>4</sup> a popup allows you to change between vertices, edges and faces. This are the three bases of every model. The vertices are the points, the edges the lines which connect the vertices and the faces makes the surface of the model. Faces are typical three or four sided.

There are different ways how you can get your model. Two of them i will explain short. One way is to use standard forms, eg planes, cubes or cones, as base and work with extrude and deformation of this forms to get the model. The second way is to draw the vertices in the 3D and connect them with edges and make the faces. I think both have his pro and cons, it depends on your favour. I personal prefer the „extrude style“.

There are also some tricks how to save time to get an model, if you have an symmetric model, or symmetric parts, only model one half, than the second half will be a mirrored copy of the first half. If you also don't care that there will be an symmetric skin, you can unwrap the half before you copy and mirror it. The same way you make parts you need multiple times, eg the wheels of a car. Only model one, than unwrap this one, the other wheels are copies of the first wheel.<sup>5</sup>

When you model always try to imagine if the face or the detail you want to model is visible in game, both cost resources, so try to avoid both. The first one is relativ easy to achieve, delete all faces inside the models or by models which did not rotate around their x-axis the never visible ground. Also the standard game models are a good reference which part is necessary which not. The second one, the unseen details, is more difficult but it's a question of experience (i still make errors). Also part of this problematic the number of vertices used to make round objects, 6 up to 10 vertices should be in most cases enough to from the circle, if it is a small detail, a box can be good enough for a round object. And you can always add smooth to an object.<sup>6</sup>

You can work with different objects, so make on part as object, the go to the object mode in Blender and create a new object, later if you desire you can merge them again, but sometimes it could be necessary to have different objects, because every objects will be later a NiTriShape (an individual object) in the nif, it can have different settings. So it's necessary for more complex models to have a plan what you want to do with your model, which modifiers you want to use, and make the model considering your plans.

So thinking before and when you model will save your time ;)

And to give a number, a single unit should have around 1000 faces, maximal 1500 when finished.

## Example

But now start with the example, i will make the model symmetric, also i will only model one half, second the skin will be non symmetric, so the UV will be done after the model is finished. I just added a box in Blender.<sup>7</sup> In the second pic i already extrude the top face, (select the face with face selection mode: „Ctrl“+„Tab“ and 3 or select the four vertices making the face when in vertice mode, than press „E“ and select region and move the the new face upwards. And this you repeat until the models fits your plan. There are some pics of the process.

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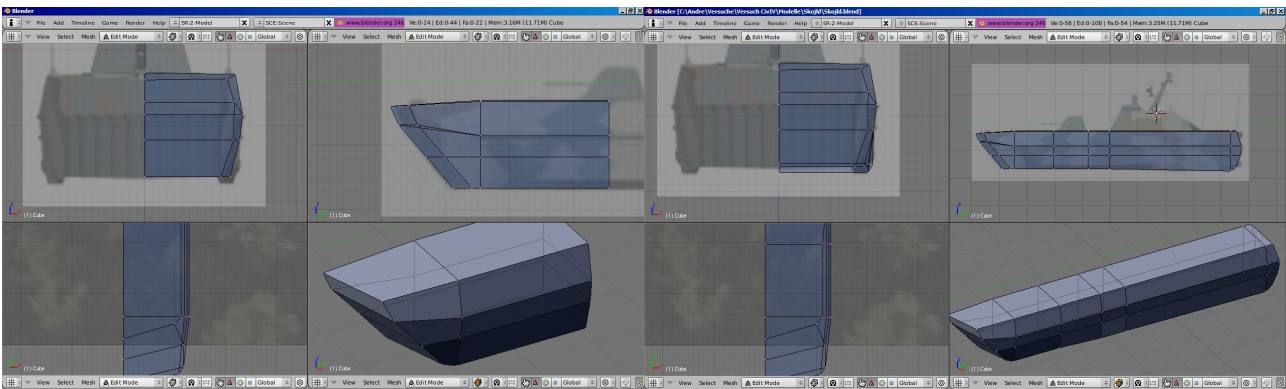
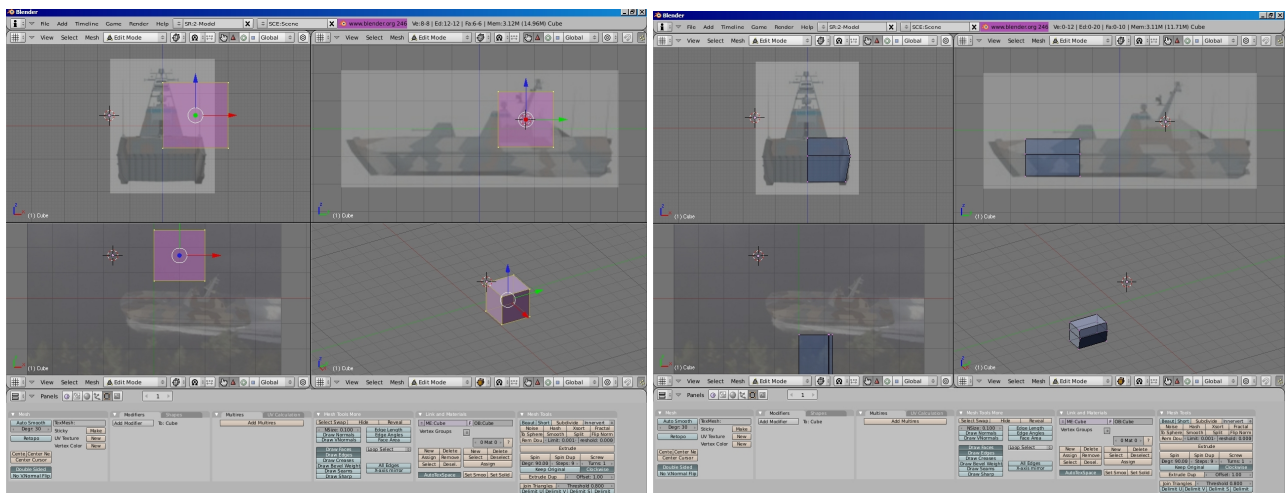
4 This are only some examples, look at a Blender tutorial for more shortcuts

5 Most likely with this method there will be some problems when using render to texture, even if you want different texture for the parts, it's possible to use this way, but after copying, select the entire copied object and move the UV of this object to a free spot in the UV map

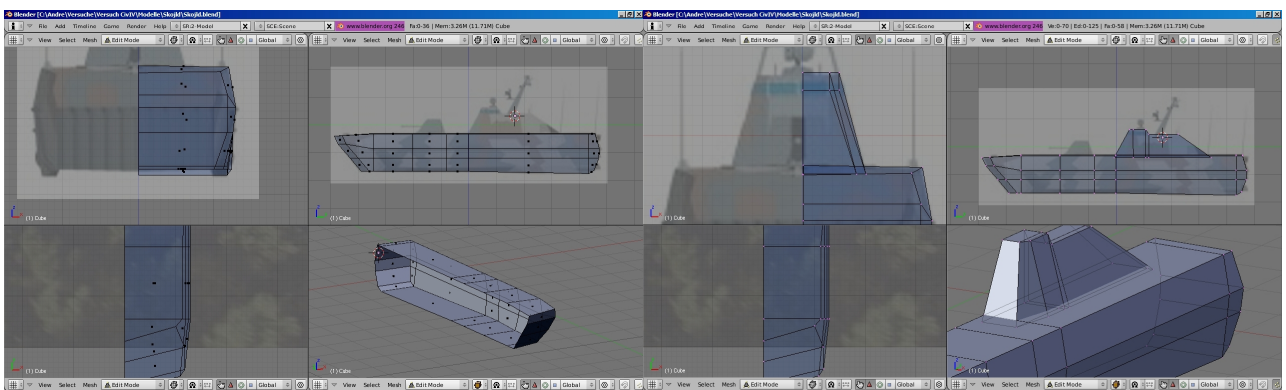
6 Will raise vertices by export, can be done under „Links and Materials“ in Editing Mode (F9) in the Button Window

7 Remember, space – add cube



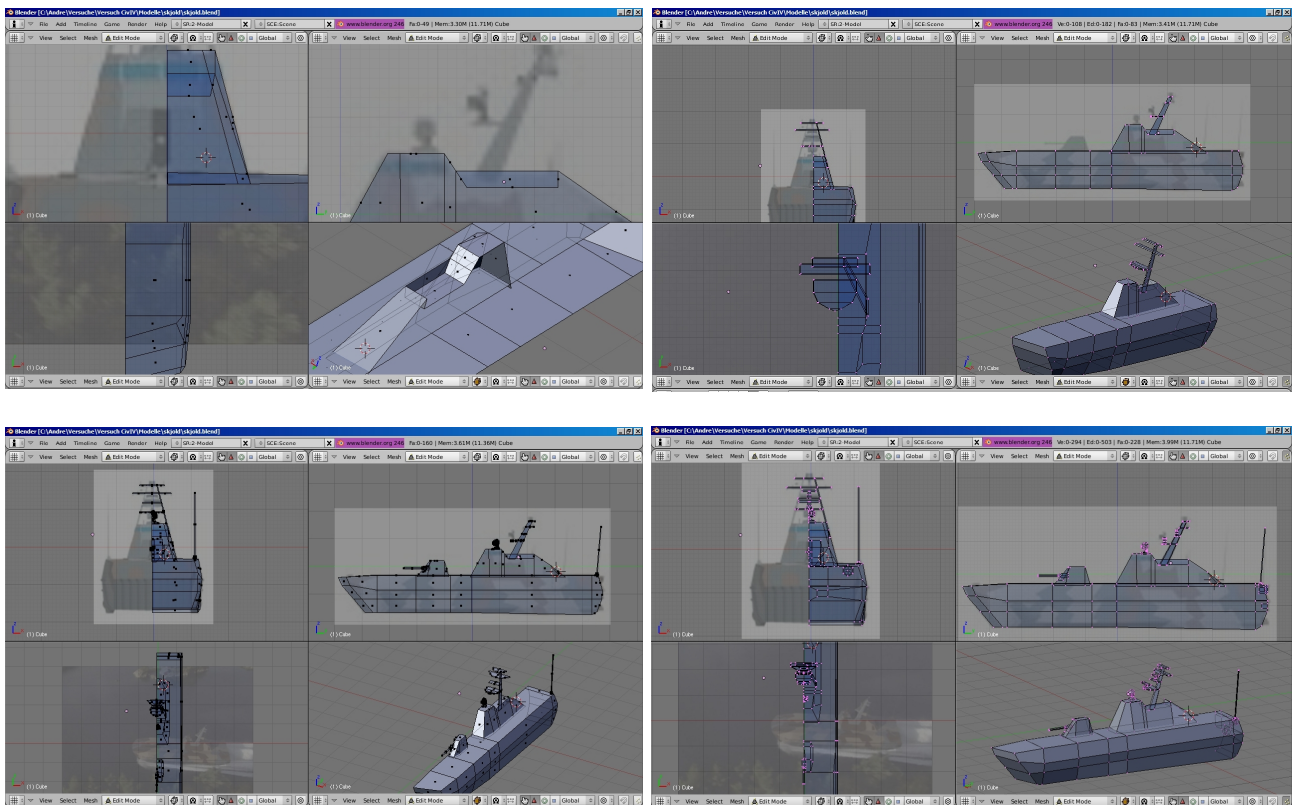


So after this steps the first delete in game unseen faces part comes, all faces of the left side of our half model will be in the object, so they can easily deleted, Change to faces mode, select all faces on the left side of our model and delete them (delete faces), after this start with the bridge.

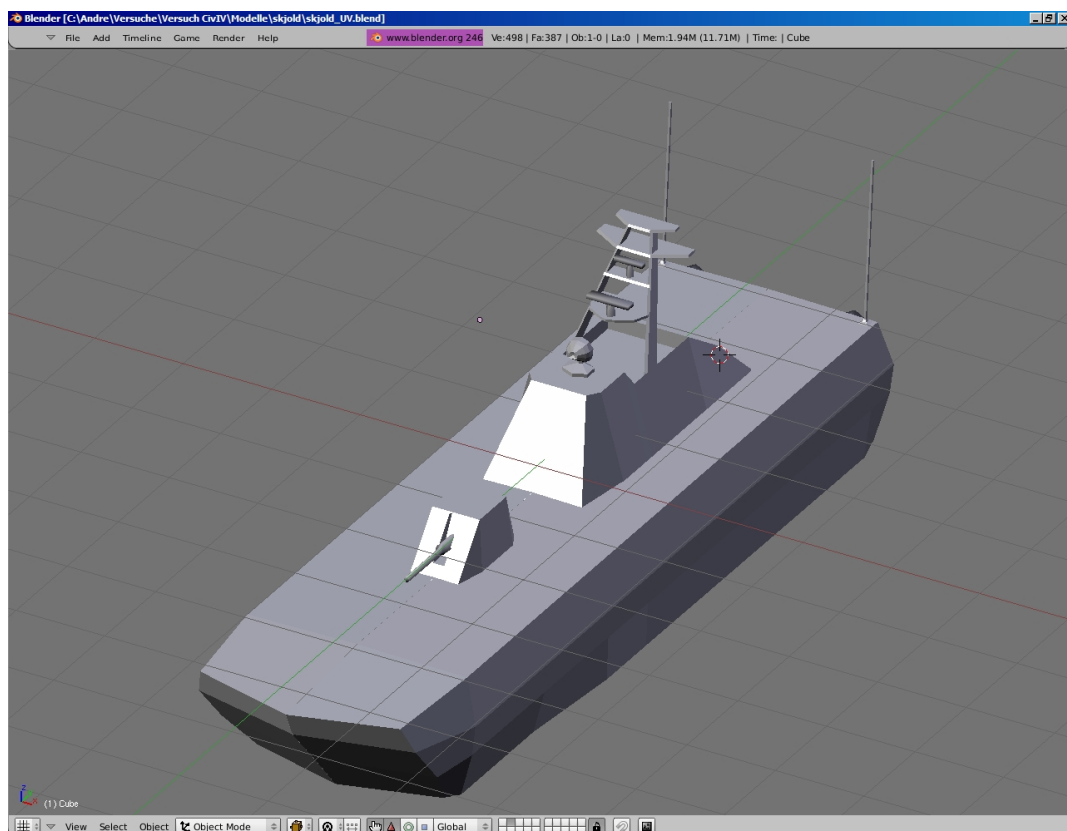


For such object details pics are very welcomed, because they are one of the most characteristic parts of the ship, try to follow your reference pics so good as possible, but never forget, don't model details which will be not seen ingame<sup>8</sup>, don't forget to save and don't forget to delete unseen faces.

<sup>8</sup> If a detail is only hard to see, you have to options, model it or paint it, what is best for your model will depend on your overall number of faces



After some more steps, adding the gun and a little detail work using other reference picture the general shape of the model is finished. Now as motivation and to control the proportions, make a copy of the half modeled object<sup>9</sup>, mirror it and move it that it seems you have only one object.



<sup>9</sup> This means, all parts which are already complete should be not copied

The model looks ok, so we can start with the next step, making a painting scheme – the UV map – of the ship but before undo the last steps, so that only the half model is visible again. It's helpful, because some parts will get the same texture and when first making the UV and then copy and mirror the object the UV is also copied.

## **Get it painted**

So now after the model is made, I must say only half of the work was done so far, now comes one of the most nerve-racking parts – at least for me – of making a model. Getting a good unwrap of the model and get it good texture. But again start with some basics.

## **Unwrap Basics**

The problem now to solve is, our model is 3D the texture we apply will be 2D, so there is obviously a dimension mismatch. This we try to solve when a model is unwrapped. The faces will be projected to 2D. This 2D projection will be where our texture is based, or in other words, the faces will get painted in the colours the texture has on the position of the 2D projection of it. Please consider the explained methods are only some of the possibilities and sometime not even the best. But the best I know.

I think there are two different methods to make an unwrap, the first you start with making the texture, for example because you had found good pics or texture. In the first case you try to get optimize use of the available place, the valuable „thing“ when unwrapping. In the second case you try to fit your unwrap to the existing pic or texture, to get it look real.

In Blender there are different methods to unwrap, it depends on the situation which fits better. One option is the unwrap from the view perspective, which means, the selected faces will be projected the way you see them, good for flat areas, the normal unwrap will try to get a good projection, sometime it is ok, in most cases I will rework the result a little. These two methods were enough to get all my unwraps done so far. Other methods are cubic based unwrap, cylindric based unwrap, best you play a little around and see with which method you can get familiar.

What you should consider before you start with unwrapping your model. Which part are important and which part are unimportant. The more important (detailed) part can be bigger than the unimportant part. For example I usually texture the up and downside of planes, but because the fact the downside can only be seen in the pedia and seldom in game, the UV is smaller than the upside. Again, because place is rare which parts can share the texture which another part of the model. How should the model look with texture. The last is important because if you want to add certain details to the model but the face where this part shall be added is distorted it will be hard or impossible.<sup>10</sup>

In older Blender version, before 2.46, to make the unwrap you had to select the unwrap mode, in 2.46 you can unwrap direct in the edit mode. The projection of the points can be changed, move on vertices, mirror, rotate and so on. Also one useful feature is to show the unselected or selected faces in the UV map in the views. Good to find faces missing an unwrap.<sup>11</sup>

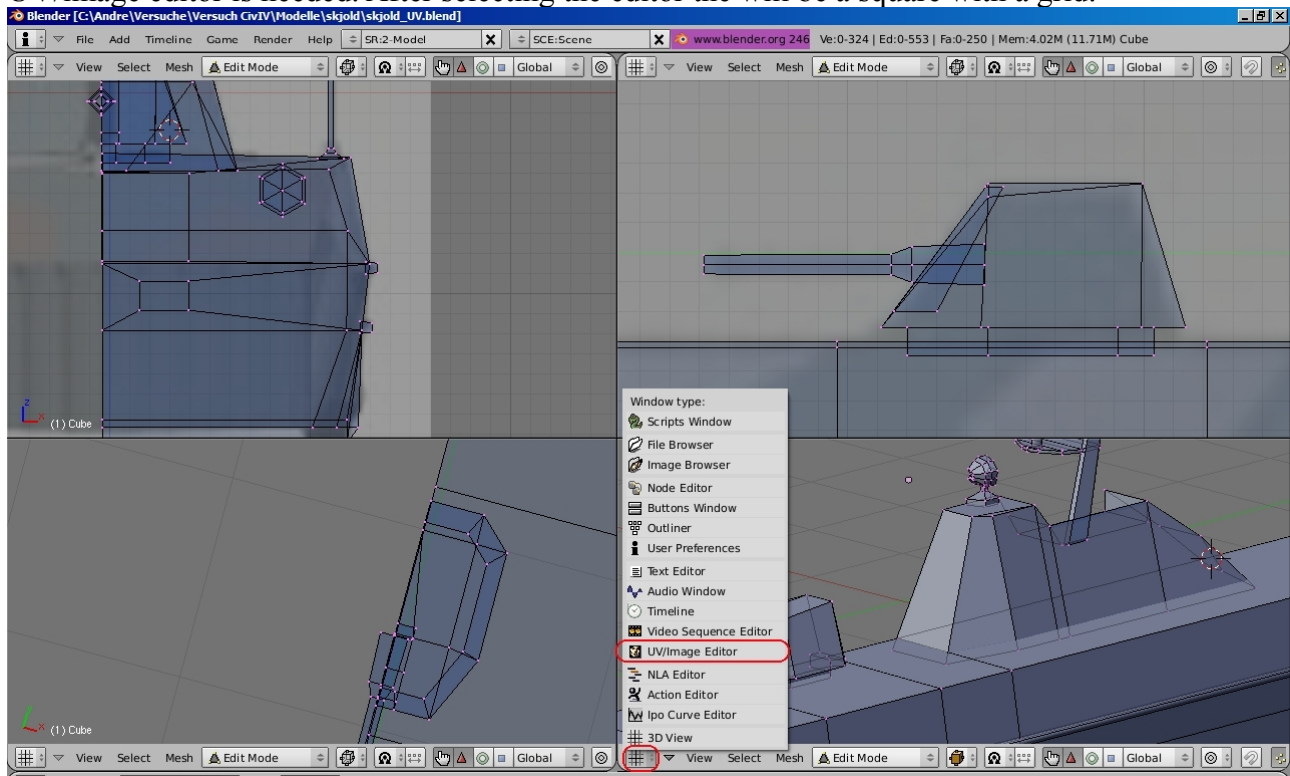
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<sup>10</sup> One disadvantage of a symmetric unwrap (unwrap on half and then mirror this half) is the mirror-inverted display of letters and numbers on one side, or why you think the number „88“ is used that often

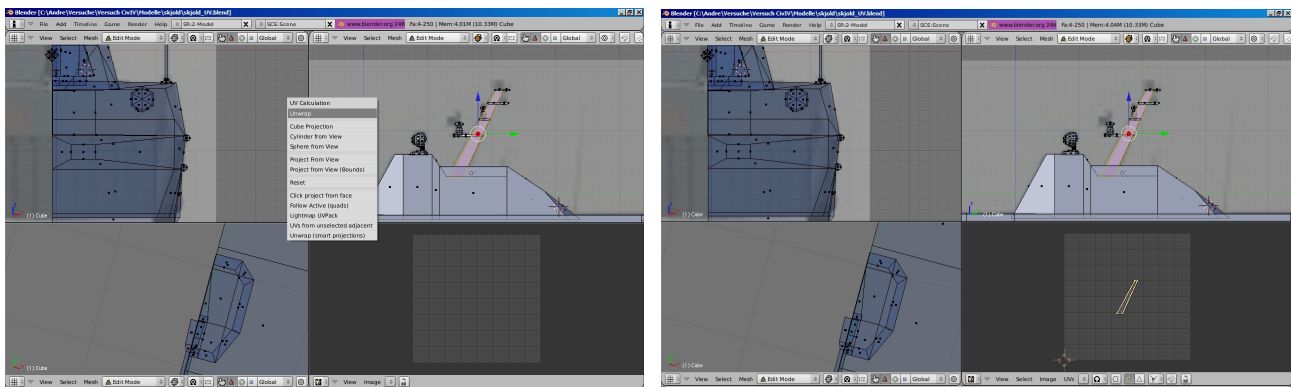
<sup>11</sup> Also good to find forgotten faces inside of the model

## Example

But now back to the example, the model should look like this.<sup>12</sup> Instead of the isometric view the UV/image editor is needed. After selecting the editor the will be a square with a grid.



Before starting to unwrap i should again say, that i don't want to make a symmetric skin, but even now there are parts which will be symmetric or already modeled. So first change to face select mode.

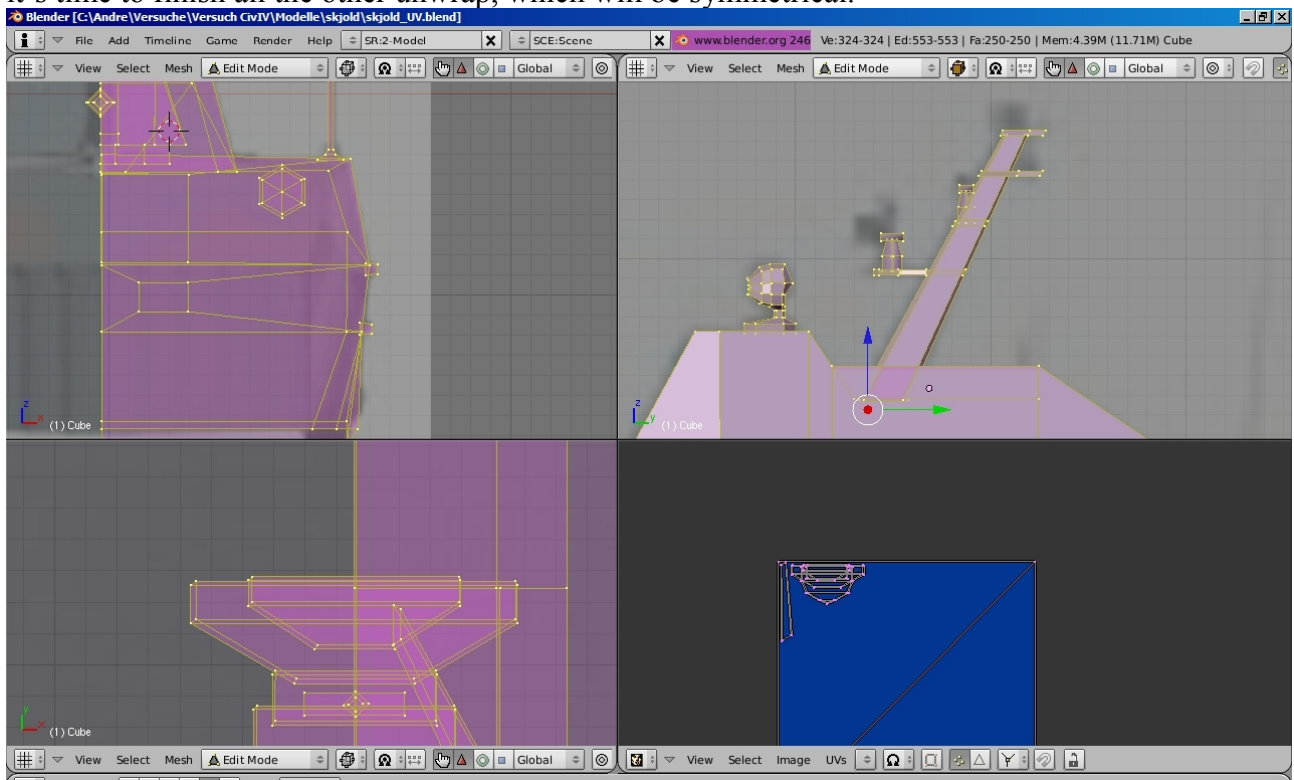


Pressing „U“ will open the unwrap pop up, in this case i selected all four faces of the part, because the backside will get the same colour like the visible parts, after unwrapping – i used „project from view“ in the UV/image editor a selected „structure“ appears, this is our unwrap, the projection of the faces. Now let move the UV to the border of the area. After some other unwraps my UV map look like this (picture on the following page). You can see that the new unwrapped faces are overlap each other, i made this because later they will get all the same colour, no part is planed to be individual painted. Also the are vertices on the corner of the UV. This is because i selected all faces and not unwrapped faces will be displayed this way. The edge in the middle is caused through 3

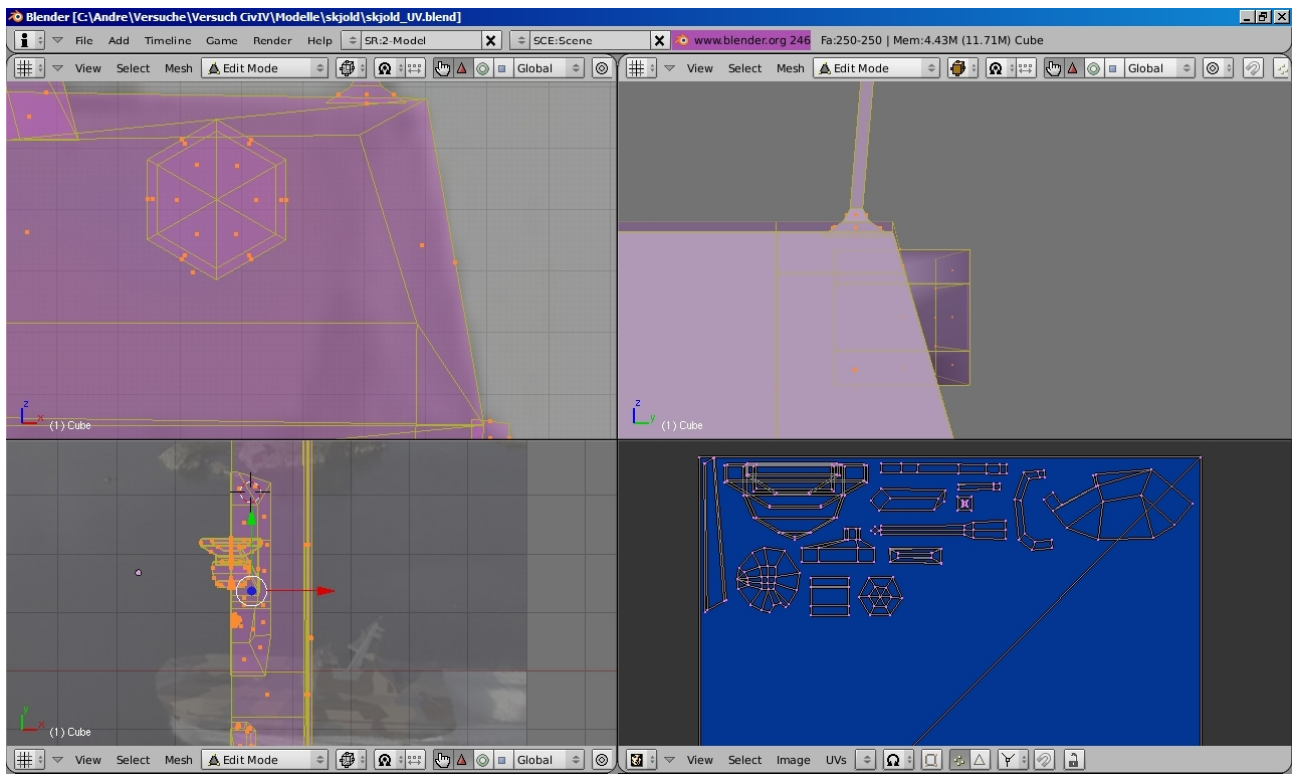
<sup>12</sup> I made some changes to the model compared with the last pic



sided faces. So it's good to select the corner points of the unwrap and under UV – Show/Hide faces to select hide unselected faces. If you do so, all still unwrapped faces are selected in the views. Now it's time to finish all the other unwrap, which will be symmetrical.



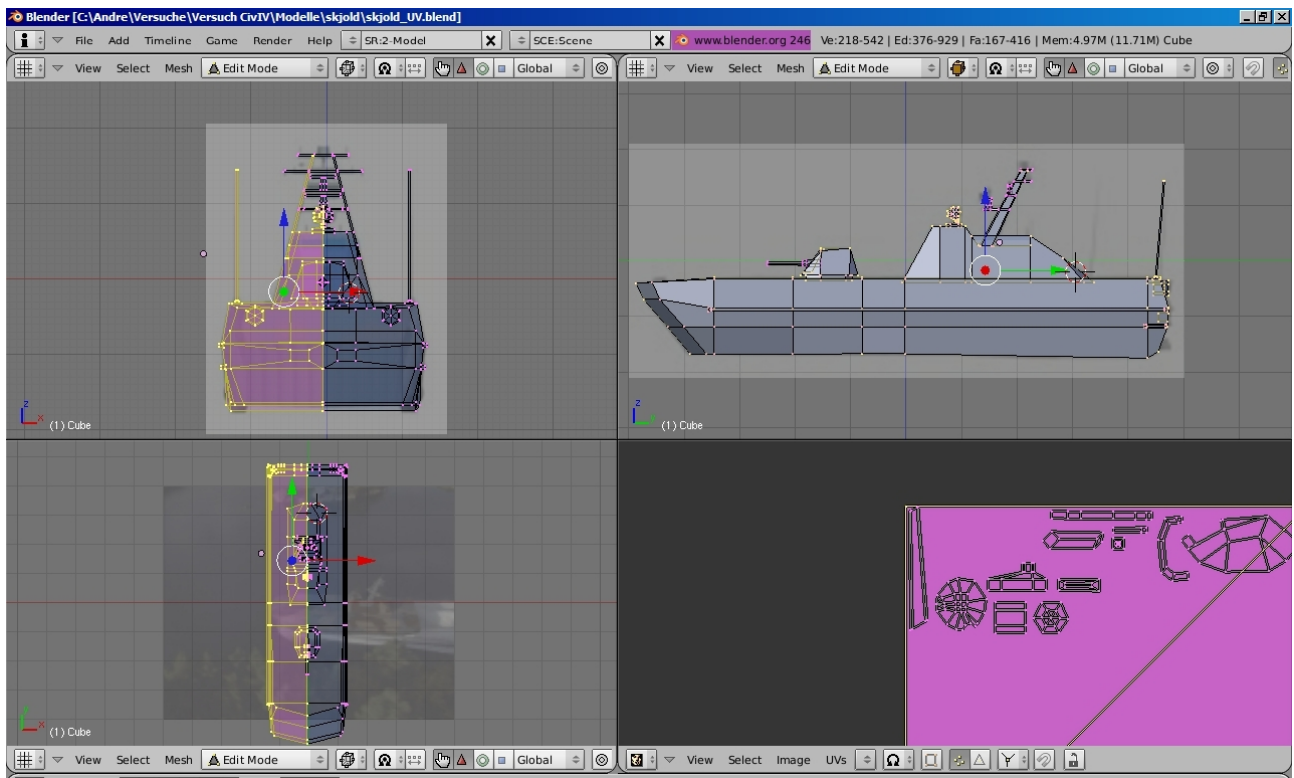
After some steps my result looks like this



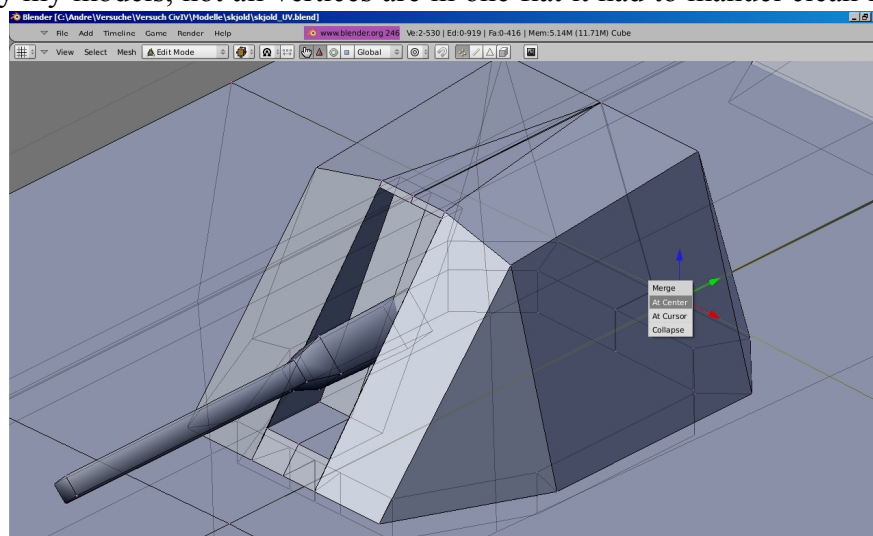
From this picture it should be clear that the result can look complicated, so try to remember where

which part was and if it could get difficult use trick like grouping the unwrap of one part in one region of the UV map, eg the gun is top middle and left. And always remember you can change the positions of the unwraps, something what i did often, especially when the UV get filled. After finishing the unwrap of the symmetric parts we will again copy the model and mirror it. But this time will merge both parts to one and than finish the unwrap.

After copying and mirror the half this time it's good to flip the normals (= faces), it can be done with the shortcut „Ctrl“ + „N“. It's necessary because of the mirroring the faces they are orientated in the „false“ direction and show inside the ship and without double sides faces they will be invisible from their back which would be the outside of the ship.

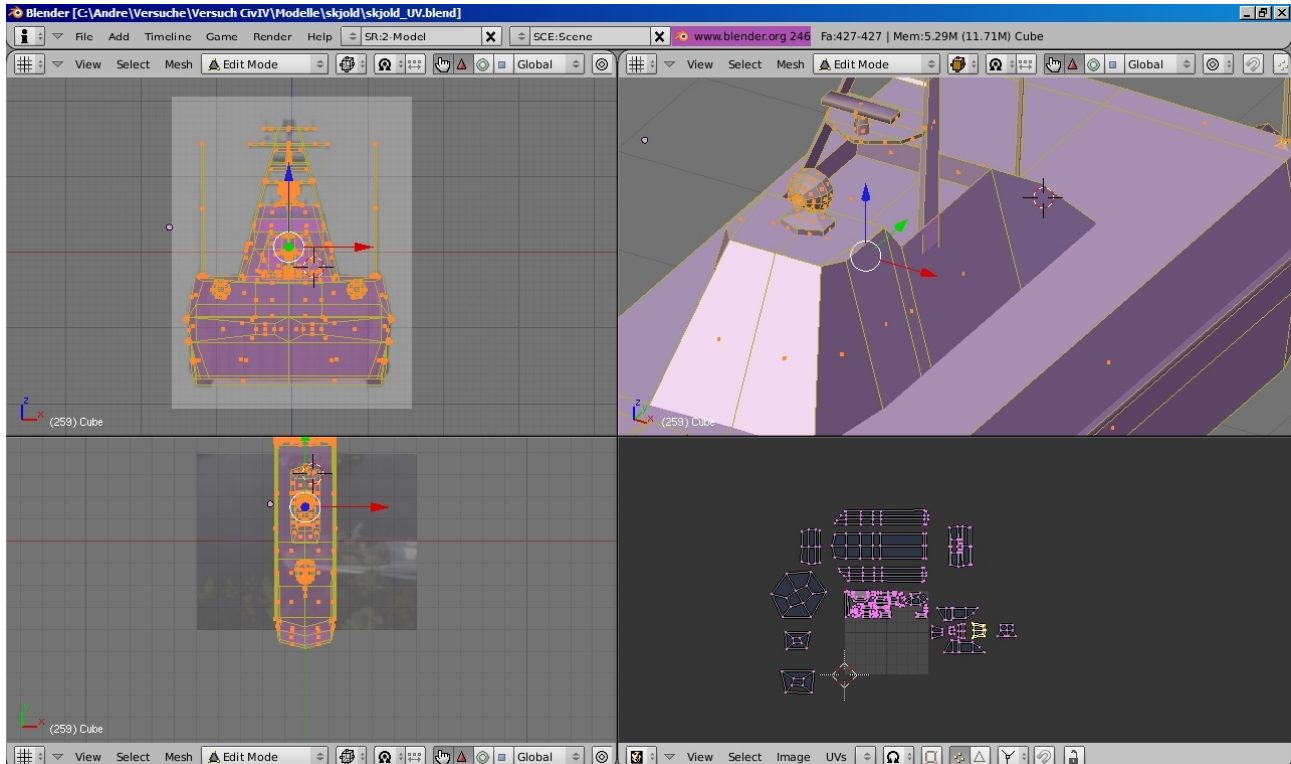


As next step before going on with unwrapping is to clean up the model, now in the middle there are two vertices, one of the left side and one of the right side. There is an option to remove doubles, but because at least by my models, not all vertices are in one flat it had to manuel clean it up after, so i

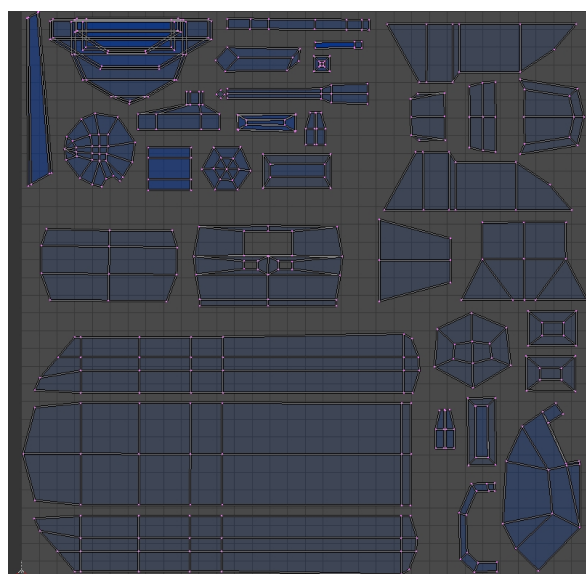


prefer it doing it manual. „Alt“ + „M“, use „at center“, will merge selected vertices. Make sure that

you only have wanted vertices selected, if not and you save seldom it could „destroy“ you the model. I also prefer it doing this in a big view, with „Ctrl“ + „Up-Arrow“ you can make the current view full screen, with „Ctrl“ + „Down-Arrow“ you come back to your normal view. After finishing the merging of our two half we will finish the unwrap, because our model is relativ quadratic, unwrapping from view should work good, the side from the side view and so on. The result should be no unwrapped face<sup>13</sup>:



Now the last job of the unwrap is the optimal use of the place, so now it's time to play a little bit tetris. (side note: When you have a texture you have to load the picture in the UV/image editor when the faces are all selected and then unwrap after your texture, eg. If you have a side picture, try to match the side faces of your model until your model looks right.). This is how my UV looked finally.



<sup>13</sup> If it was not necessary to unwrap the face, is it necessary to have it?

To save the UV layout go to UV – Scripts – Save UV Layout. Then select the resolution, i usual work with an working resolution of 1024\*1024, but you can choose number that you prefer.<sup>14</sup> Select the folder and save the file and the unwrapping is completed. Now finally we will bring colour on our model.

## Paint basics

There are two kind of modelers, the ones with painting background and the ones without painting background. I'm member of the second group. So texturing is still my biggest problem, not to get the model coloured but to get it good painted.

A very good tutorial in the net can be founded here: [http://www.colacola.se/howto\\_texttut.htm](http://www.colacola.se/howto_texttut.htm)

But nevertheless some basic infos, textures in CivIV are saved as DDS<sup>15</sup>, DXT3 (explicit alpha), the standard sizes for models are 256\*256 or 128\*128<sup>16</sup>, i usual use 256\*256. But your working texture can be bigger, i start with a 1024\*1024 texture and after finishing the work i resize it to 256\*256. Try also to link one model to one texture, you can use different textures for different parts, like a small texture for the weapon, but the weapon should be in this case a different model, later added in nifscope.

Work with layers, not only it make it easier for you make changes, also new skin are easier, because you only have to change the affected layer, some of my textures have up to 25 layers in the final version, because almost „everything“ gets a new layer. The last could go a little over the top but it's the way i work.

To avoid an unrealistic too clean effect don't use only one colour for a single coloured area, better is adding the base colour and than, with a soft brush, add slightly darker and brighter areas.

The alpha channel control visible and not visible parts of your texture, even semi transparency is possible, with the „right“ adjustments in Nifscope. The alpha channel is also used to define the area of your texture where later teamcolour should be applied. Natural only one of both is possible to the same time.

I usual have Blender loaded in the background and control there the progres of the texture when making a texture. My main program for texturing is Gimp, with a little help from Paint.Net,

But now let start to paint our ship.

## Example

First open the exported UV, it should look like the unwrap in Blender, but now with a white background and black lines showing the edges of the unwrapped faces. First it's good to add transparency to this layer (white to transparency<sup>17</sup>), because after doing this, we can still see the structure of the UV when painting. After adding the transparency to the UV layer, the white should be gone and be replaced by gray – black chessboard.

Now add the first colour layer, move the new layer under the old one in the layer staple. To do this

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<sup>14</sup> Quadratic and a power of 2

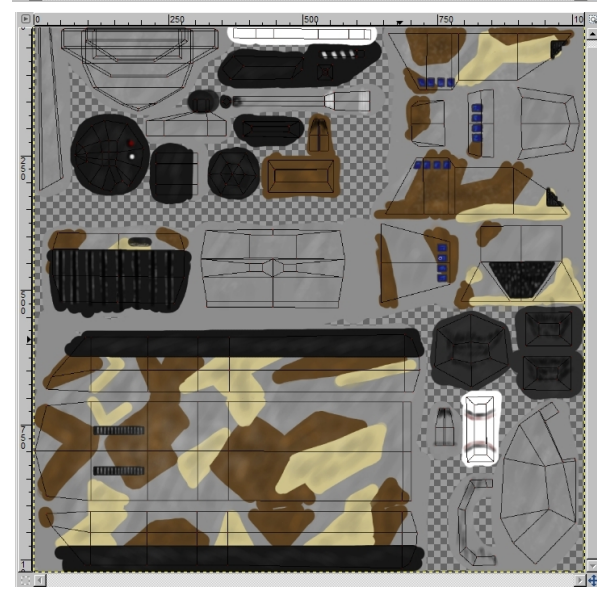
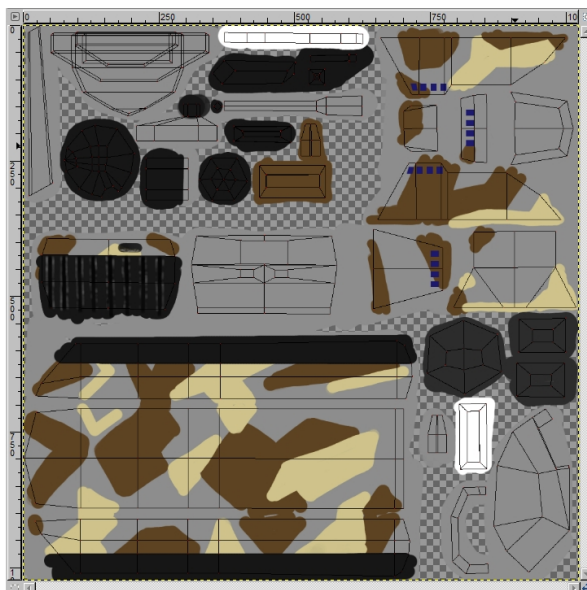
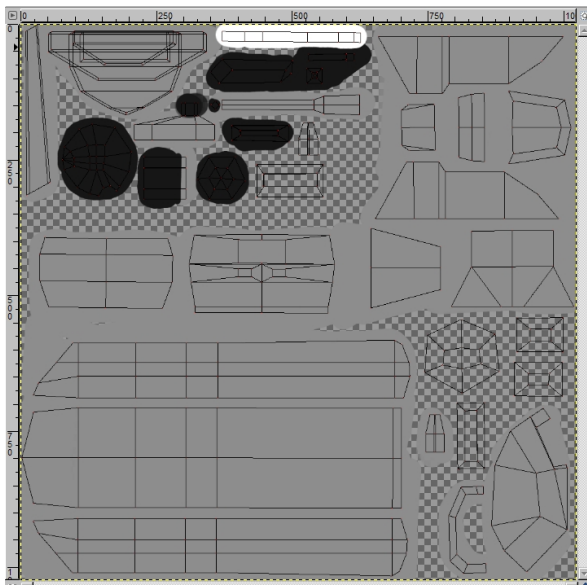
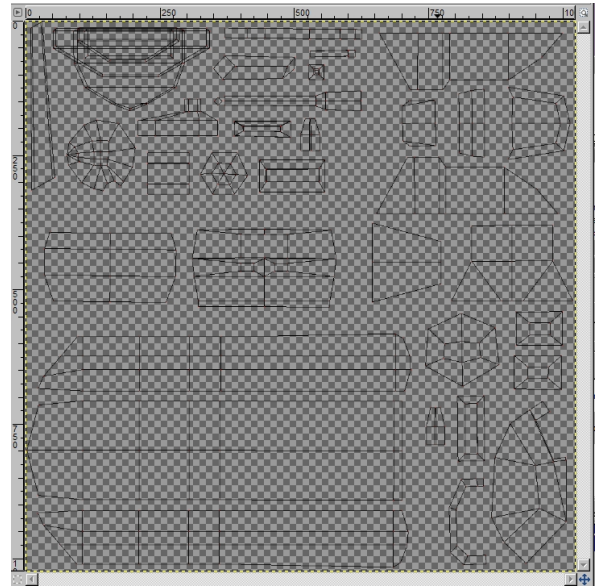
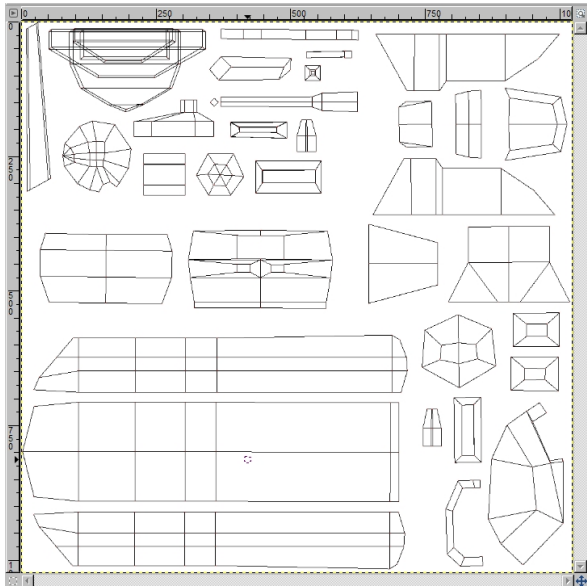
<sup>15</sup> Blender 2.46 supports and displays dds textures, older version don't

<sup>16</sup> General the texture should be quadratic and the side length a power of 2

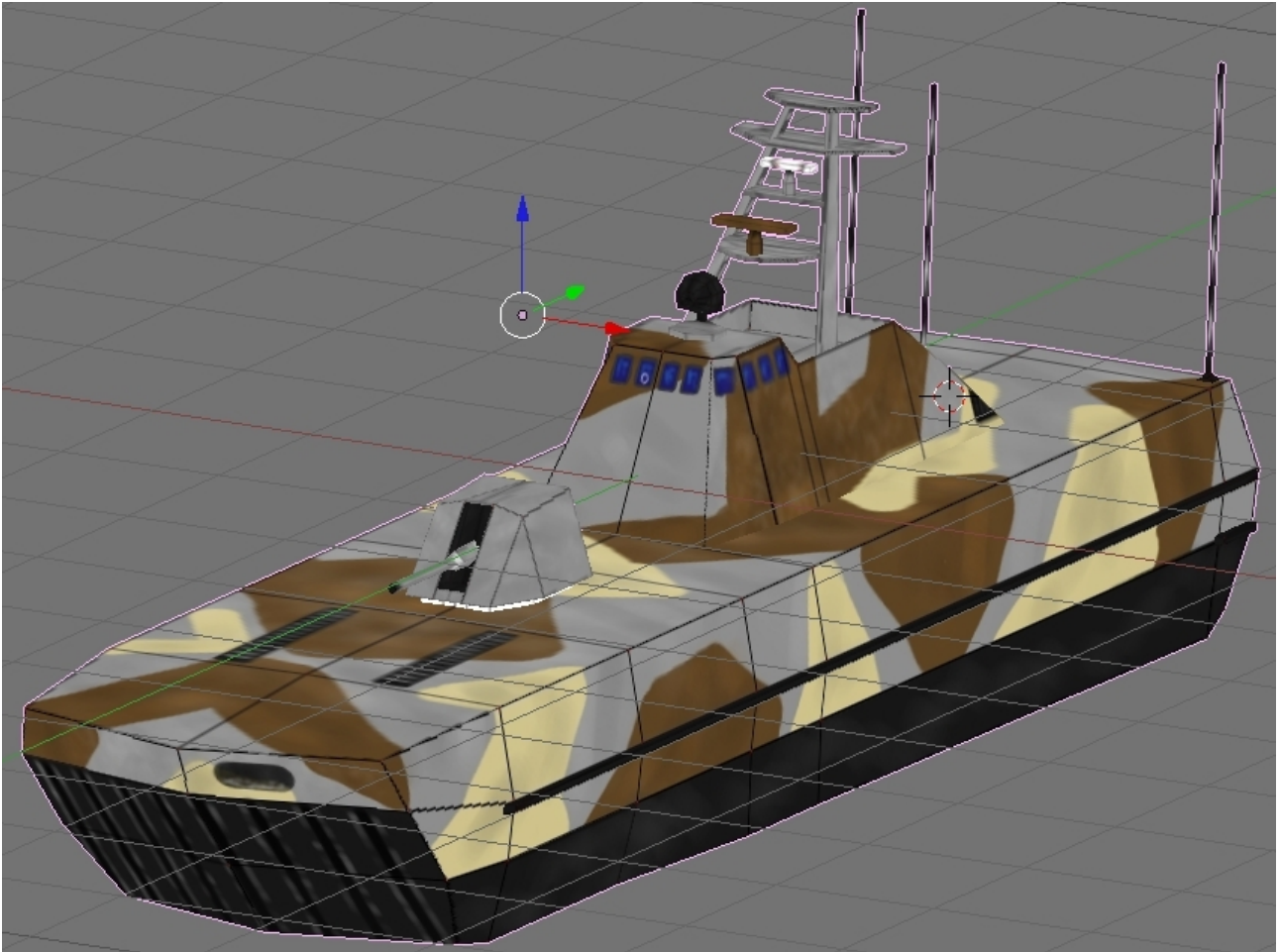
<sup>17</sup> Layer – transparency – colour to transparency – select white as colour



you have to open the layer dialog. Now lets start do add colours to our texture.



More or less the texture is finished, you can see, first i draw the basic colours, than start with the bigger details, than recolour the basic areas and finally i add small details. The result in Blender looks like this



As next step we want to save our texture as .dds. For this purpose delete the UV map layer<sup>18</sup>, after this merge layers to one, can be stepwise done in the layer menu, and resize the texture to 256\*256<sup>19</sup>. After all this is done save the final product as .dds.



<sup>18</sup> The layer where the unwrap is shown, it's no longer necessary

<sup>19</sup> Or the resolution you desire

Now we are ready, the next step is to export the object

## Export the model

There is not much to say because how to do can be found excellent described here:

<http://forums.civfanatics.com/showthread.php?t=167335>

I'm not willing to copy this part, But nevertheless some other basics.

## Basics

When you export your model the result will be a nif. If you want to add a more advantage shader, using straight the method from above does not work. For shader models the mesh (model) must get a skin partition, this can be later done in nifscope, but it is necessary to rig vertices to the correct bones. Here is explained how to do this:

<http://forums.civfanatics.com/showthread.php?t=252568>

<http://forums.civfanatics.com/showthread.php?t=267233>

I personal used this method without problems for planes and ships, but never used it by a complete human model. For more complex units, especially ones likes human it's necessary to get them rigged to an existing armature, without it would be static. To avoid this, theoretical, load the armature of the model you want as base, model your unit and rig the vertices of your model to the armature. After this export the model, the rigging is also exported.

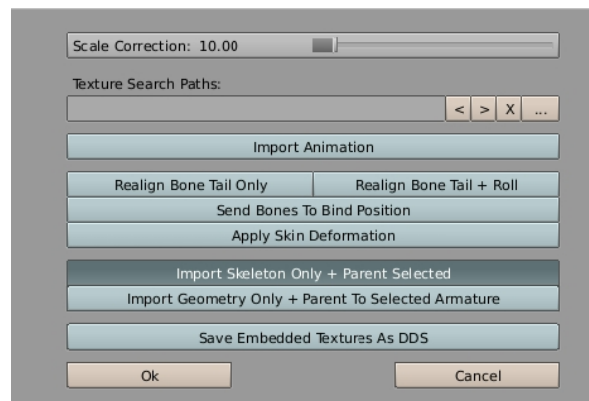
On additional side note, when you change something on your model while exporting, the changes are first exported when you go back to the object mode. As long you stay in the edit mode the changes wont be exported.

## Example

This time there is nothing more to say to the export way in the tutorial before, so nothing new to write. I will only show linking vertices of the model to an armature. As master i decided the stealth destroyer could fit best, so i imported the armature of this ship. This can be done when while importing the nif the following setting are chosen.

After the import is finished there will be the armature visible. The next important step is to make the skeleton the parent of the model. To reach this target change to object mode select first the model, than the also select the armature. Under object there is an option „Parent“, select make parent to armature and name groups, now select only the model again.

First center, if necessary, our model to his center, it's a purple dot. Select all vertices and move them, so that the dot is where the center of your model should be. Change to object mode and center the object in the view again. After this is finished change again to the edit mode. Now assign the



vertices of the ship, without the gun, to the point\_ship\_hull and the gun to the point\_fore\_gun node.<sup>20</sup> After this is done export the model exact the same way as described before. Changing the positions of the armature node already in blender will not work because we will later import the model in the original nif. Control as last step if your exported nif is shown correct in the nifviewer<sup>21</sup>, if yes we are done here. The next step is to link the ship to an animation.

## **Linking to an animation**

### **Basics**

The best basics for this chapter is to understand how nifscope and the nifviewer works, looks out for the tutorials for this programs.

Nifviewer:

<http://forums.civfanatics.com/showthread.php?t=163585>

<http://forums.civfanatics.com/showthread.php?t=165689>

<http://forums.civfanatics.com/showthread.php?t=176106>

<http://forums.civfanatics.com/showthread.php?t=245363>

Nifscope:

<http://forums.civfanatics.com/showthread.php?t=183742>

<http://forums.civfanatics.com/showthread.php?t=271331>

So after you read a little we go on. The most work can be good done in nifscope, most changes i do there, only when i want to change textures and shaders i prefer nifviewer. In nifscope most objects can be linked to make them a child<sup>22</sup> of the node. If there is no empty child position left you can raise the number of children by 1 and after using refresh array on the children array you can add your object.

Most standard models are rigged to an armature, when it's done this way, the model will be outside of the armature but still affected by the movements of the armature nodes, models linked direct as child to an armature node will also moved with the node. The last method is often done when parts of humans models are exchanged.

In nifscope most option can be reached when clicking with the right mouse button on a node.

### **Unrigged models**

This methods works good with planes and submarines. When working with surface ships there is already a small cheat necessary. The exported model, but only the NiTriShape, is copied in the master nif<sup>23</sup> and made a child of the dummy node controlling the body of the original unit (also footnote 20). After deleting the original mesh, change the positions of the effects to fit the new model, after this save your model nif and try it in game.

When the model is a little bit more complex, for example you want to add moving turrets to your brand new ship – yes the way described before the turret will not move, you must export the turrets

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20 The names will differ from unit to unit, but they should be clear enough to know which part is affected, and when not open the original nif in nifscope and scale the questioning node to zero and look what disappears

21 Nifviewer is in this case better, because nifscope will display objects without error which can crash the game, nifviewer will crash earlier

22 Sometimes called different

23 The nif file of the used animation

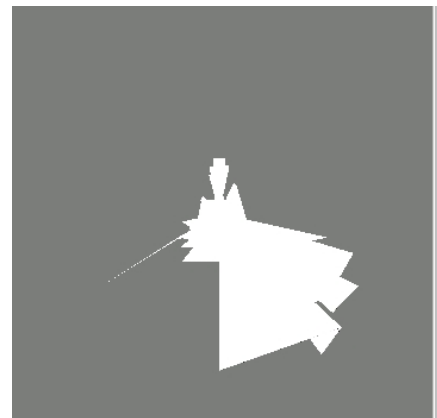
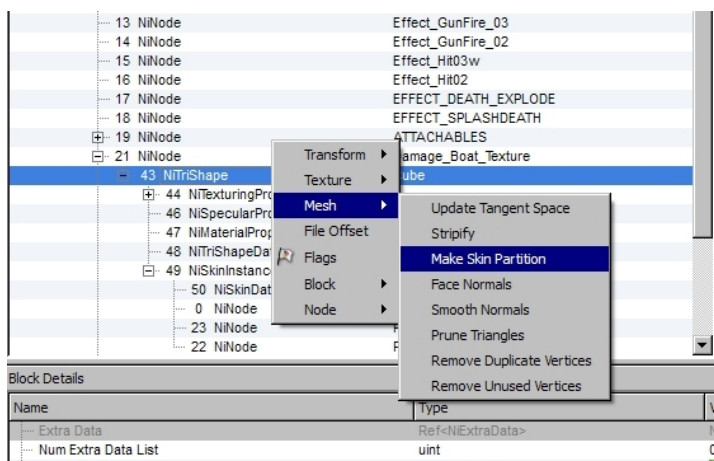


as indepent object. So you must add two objects, the ship without turrets and the turret(s). The ship is again added to the same node, but the turrets are added to the turrets nodes. If you use this you will run very quick into some problems, if you must change the positions of the turret node<sup>24</sup> to fit your ship, you will be, when trying it in game, surprised. The turrets will be again on his old postions. The reason is, the position is set to the old number in the animations files, what can be done to solve this problem, model your ship to fit the proportions of the armature, but if this is not possible another solution will come later.

## Rigged models

If the model is rigged the story is different, you can exchange the old model with you new one and after fitting the effects to the new models your are almost done. But in this case it makes sense to change the position of the armature nodes already in Blender<sup>25</sup>, simply because after linking this model to the old armature the postions are reseted to the old figures but the correct new figures are saved in the exported nif. Of course there is the same turret node problem as before.

But the more interesting option is to make a shader models, right click on NiTriShape and select the following.



*result in nifviewer*

The screen should be selve explaining, after completing this save the nif as „\_fx“ and open it again in nifviewer. Now the result should look strange, but this is ok. After changing to a shader the model will look ok again. Where to link the textures now, look again at this tutorial:

<http://forums.civfanatics.com/showthread.php?t=245363>

After this you completed this steps you have a shader model.

## Changing animation

Like i said before there is a solution to solve the turret problem beside modeling after the armature. nifscope can open and change the animation files, the kfs. Look here for the first details:

<http://forums.civfanatics.com/showthread.php?t=271331>

<sup>24</sup> By this example the turrets node rotates and all linked objects also, when a object is not centered to the rotation axis of the node it will rotate on a circle

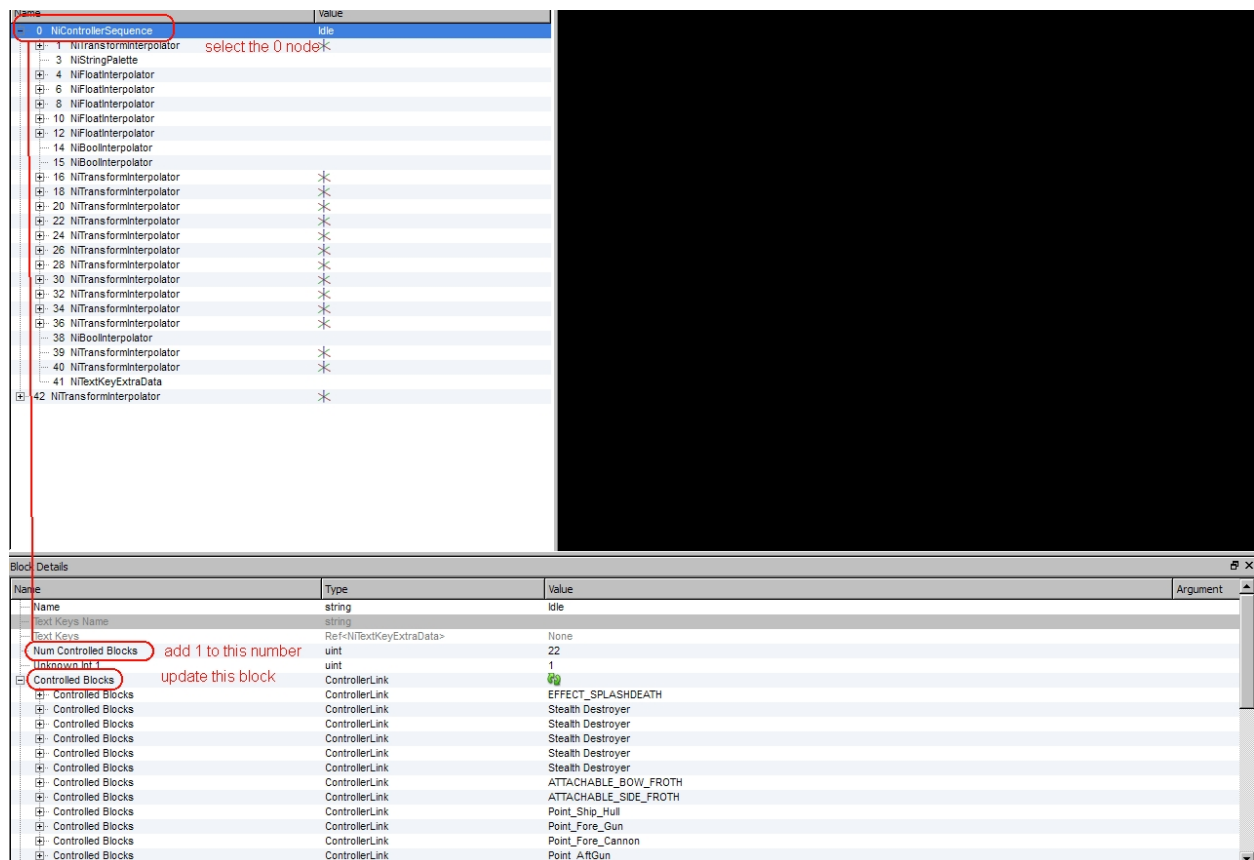
<sup>25</sup> Yes perhaps a little late this info, but you have saved your result, or?

The turret fix should solve the wrong turret position, so start with this and check the result in game. But if you try to move the ship dummy and change the number like you did by the gun, the ship will not be there where it should be, it's still on his old position. The reason is that in the child, where the actual animation is controlled by most modifiers the ship is also set to the old position. In the child node is the moving with the waves effects done.

changing this number will not move the ship ingame, the position is also set in the child node 17 ("NiTransformData")

here is the reason, as you see the keys under translation also set figure for the y - position to 12.27. If you want to change it you must change it in all translations keys in all kf files of the animation affecting the controlled node

Now some additional info was is also possible in nifscope considering animation, it is possible to add new nodes and add them to the „NiTransformController“ in the nif. It's is possible to add animations to this new node using an existing one, easy ones<sup>26</sup> should also be able from scratch, How to do this, first add a new node in the nif you want to use base, add this node also as child to the „NiTransformController“. Now rig the objects you want to this node.<sup>27</sup>



As next step it's necessary to add it in the kf files and to decide what shall happen with this new node In most cases it will be a copy of an existing movement<sup>28</sup>. So copy the wanted movement in the kf file. In the shown example it is the turret animation. Than we must create a new controlled block entry, how to add a new is described above. After adding the block go to the new block and open the block. Because it's a new block there are no informations. The easiest way now is to open a similar block and copy all entries of this one. After performing all changes, change the values of the imported NiTransform modifier to the one you like, eg change the position of the node.

Now you only must perform this changes in all necessary kf files. I tried this method one time so far, so i would not say it's „completely researched“, but i used it to add 2 additional propeller to the bomber idle animation, and it worked in game like it should.

<sup>26</sup> Like moving only up or down

<sup>27</sup> No pics for this but as additional information: If the nif is renamed, the link in the kfm files must also be changed, for example using the KFMEEditor, but be aware of the possible problems (especially with modular loading)

<sup>28</sup> The transform modulator of the node which animation you want to add / copy

| Block Details          |                      |                             |  | Argument   |
|------------------------|----------------------|-----------------------------|--|--|
| Name                   | Type                 | Value                       |  |  |
| Num Controlled Blocks  | uint                 | 23                          |  |  |
| Unknown Int 1          | uint                 | 1                           |  |  |
| Controlled Blocks      | ControllerLink       |                             |  |  |
| Controlled Blocks      | ControllerLink       | EFFECT_SPLASHDEATH          |  |  |
| Controlled Blocks      | ControllerLink       | Stealth Destroyer           |  |  |
| Controlled Blocks      | ControllerLink       | Stealth Destroyer           |  |  |
| Controlled Blocks      | ControllerLink       | Stealth Destroyer           |  |  |
| Controlled Blocks      | ControllerLink       | Stealth Destroyer           |  |  |
| Controlled Blocks      | ControllerLink       | ATTACHABLE_BOW_FROTH        |  |  |
| Controlled Blocks      | ControllerLink       | ATTACHABLE_SIDE_FROTH       |  |  |
| Controlled Blocks      | ControllerLink       | Point_Ship_Hull             |  |  |
| Controlled Blocks      | ControllerLink       | Point_Fore_Gun              |  |  |
| Controlled Blocks      | ControllerLink       | Point_Aft_Gun               |  |  |
| Controlled Blocks      | ControllerLink       | Point_Aft_Cannon            |  |  |
| Controlled Blocks      | ControllerLink       | Dam_BackPipe                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_TowerDamage             |  |  |
| Controlled Blocks      | ControllerLink       | Dam_Fore_Gun                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_BodyRear                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_Back_Gun                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_OverallTweak            |  |  |
| Controlled Blocks      | ControllerLink       | ATTACHABLE_DAMAGE_SMOKE     |  |  |
| Controlled Blocks      | ControllerLink       | MD                          |  |  |
| Controlled Blocks      | ControllerLink       | MD NonAccum                 |  |  |
| Controlled Blocks      | ControllerLink       | <empty>                     |  | open the new block in the array  |
| Controller             | Ref<NTimeController> | None                        |  |  |
| Interpolator           | Ref<NInterpolator>   | None                        |  |  |
| Controller             | Ref<NTimeController> | None                        |  |  |
| Unknown Link 2         | Ref<NObject>         | None                        |  |  |
| Unknown Short 0        | ushort               | 0                           |  |  |
| Priority?              | byte                 | 0                           |  |  |
| String Palette         | Ref<NStringPalette>  | None                        |  |  |
| Node Name              | string               |                             |  |  |
| Node Name Offset       | StringOffset         | txt <empty>                 |  |  |
| Property Type          | string               |                             |  |  |
| Property Type          | string               |                             |  |  |
| Property Type Offset   | StringOffset         | txt <empty>                 |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type Offset | StringOffset         | txt <empty>                 |  |  |
| Variable 1             | string               |                             |  |  |
| Variable Offset 1      | StringOffset         | txt <empty>                 |  |  |
| Variable 2             | string               |                             |  |  |
| Variable 2             | string               |                             |  |  |
| Variable Offset 2      | StringOffset         | txt <empty>                 |  |  |
| String Palette         | Ref<NStringPalette>  | 3 [NStringPalette]          |  |  |
| Node Name              | string               |                             |  |  |
| Node Name              | string               |                             |  |  |
| Node Name Offset       | StringOffset         | txt Point_Fore_Gun          |  | existing gun   |
| Property Type          | string               |                             |  |  |
| Property Type          | string               |                             |  |  |
| Property Type Offset   | StringOffset         | txt <empty>                 |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type Offset | StringOffset         | txt NTransformController    |  |  |
| Variable 1             | string               |                             |  |  |
| Variable 1             | string               |                             |  |  |
| Variable Offset 1      | StringOffset         | txt <empty>                 |  |  |
| Variable 2             | string               |                             |  |  |
| Variable 2             | string               |                             |  |  |
| Variable Offset 2      | StringOffset         | txt <empty>                 |  |  |
| Controlled Blocks      | ControllerLink       | Point_Fore_Cannon           |  |  |
| Controlled Blocks      | ControllerLink       | Point_AftGun                |  |  |
| Controlled Blocks      | ControllerLink       | Point_Aft_Cannon            |  |  |
| Controlled Blocks      | ControllerLink       | Dam_BackPipe                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_TowerDamage             |  |  |
| Controlled Blocks      | ControllerLink       | Dam_Fore_Gun                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_BodyRear                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_Back_Gun                |  |  |
| Controlled Blocks      | ControllerLink       | Dam_OverallTweak            |  |  |
| Controlled Blocks      | ControllerLink       | ATTACHABLE_DAMAGE_SMOKE     |  |  |
| Controlled Blocks      | ControllerLink       | MD                          |  |  |
| Controlled Blocks      | ControllerLink       | MD NonAccum                 |  |  |
| Controlled Blocks      | ControllerLink       | new_gun_node                |  |  |
| Controller             | Ref<NTimeController> | None                        |  |  |
| Interpolator           | Ref<NInterpolator>   | 42 [NTransformInterpolator] |  | link to new pasted movement  |
| Controller             | Ref<NTimeController> | None                        |  |  |
| Unknown Link 2         | Ref<NObject>         | None                        |  |  |
| Unknown Short 0        | ushort               | 0                           |  |  |
| Priority?              | byte                 | 0                           |  |  |
| String Palette         | Ref<NStringPalette>  | 3 [NStringPalette]          |  | the number of the NStringPalette node in this kf file  |
| Node Name              | string               |                             |  |  |
| Node Name              | string               |                             |  |  |
| Node Name Offset       | StringOffset         | txt new_gun_node            |  | the exact name of the affected node in the kf file, can be changed after open the menu with the right mouse button and select edit string offset, enter the name and confirm with ok |
| Property Type          | string               |                             |  |  |
| Property Type          | string               |                             |  |  |
| Property Type Offset   | StringOffset         | txt <empty>                 |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type        | string               |                             |  |  |
| Controller Type Offset | StringOffset         | txt NTransformController    |  | same as before, but in most cases you can select it from the list  |
| Variable 1             | string               |                             |  |  |
| Variable 1             | string               |                             |  |  |
| Variable Offset 1      | StringOffset         | txt <empty>                 |  |  |
| Variable 2             | string               |                             |  |  |



## Links (not complete)

### Software:

Blender: <http://www.blender.org/>  
Gimp: <http://www.gimp.org/>  
Paint.net: <http://www.getpaint.net/index.html>  
NifScripts: [http://sourceforge.net/project/showfiles.php?group\\_id=149157&package\\_id=166219](http://sourceforge.net/project/showfiles.php?group_id=149157&package_id=166219)<sup>29</sup>  
NifScope: [http://sourceforge.net/project/showfiles.php?group\\_id=149157&package\\_id=170735](http://sourceforge.net/project/showfiles.php?group_id=149157&package_id=170735)  
Niflib: [http://sourceforge.net/project/showfiles.php?group\\_id=149157&package\\_id=166113](http://sourceforge.net/project/showfiles.php?group_id=149157&package_id=166113)  
PyFFI: [http://sourceforge.net/project/platformdownload.php?group\\_id=199269](http://sourceforge.net/project/platformdownload.php?group_id=199269)  
Python: <http://www.python.org/>

### Tutorials:

Export from Blender: <http://forums.civfanatics.com/showthread.php?t=167335>  
Texturing: [http://www.colacola.se/howto\\_texttut.htm](http://www.colacola.se/howto_texttut.htm)  
Assign vertices to bones: <http://forums.civfanatics.com/showthread.php?t=252568>  
some basics and assign vertices: <http://forums.civfanatics.com/showthread.php?t=267233>  
Nifviewer, Nifscope: <http://forums.civfanatics.com/showthread.php?t=263814>  
UV edit in nifscope: <http://forums.civfanatics.com/showthread.php?t=258966>  
Nifscope: <http://forums.civfanatics.com/showthread.php?t=183742>  
Nifviewer, Part I: <http://forums.civfanatics.com/showthread.php?t=163585>  
Nifviewer, Part II: <http://forums.civfanatics.com/showthread.php?t=165689>  
Nifviewer, Part III: <http://forums.civfanatics.com/showthread.php?t=176106>  
Nifviewer, shader, teamcolour: <http://forums.civfanatics.com/showthread.php?t=245363>  
Animations: <http://forums.civfanatics.com/showthread.php?t=271331>

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<sup>29</sup> I still use an older version, version 2.2.11