PROCEDURE TO ADD NEW VESSELS TO SHIP SIMULATOR 2008

Version 1.4a, released 8 August 2008

Ship Simulator 2008 contains a number of different ships, each with its specific sailing characteristics. We intend to add new vessels to the game on a regular basis, on the Webshop "The Shipyard". A number of users and external parties have shown interest in creating their own ship models, to be added to the game.

A large number of manual steps need to be taken before any new ship model can be added. Some of these can only be done by different people at VSTEP. They are so specialist in nature, that it is impossible, or at least very difficult, to develop tools to automate this process 100%. There are however a number of separate tools for different steps of the process, which can be given out to selected vessel creators: the Ship Dynamics Editor, the Rope Connection Editor, the Lights Editor and the Bridge Object Placement Editor. These will be explained in separate documents and video tutorials.

New vessels in the game

In July 2008, we launched a Webshop called The Shipyard, where new vessels are offered to players of the game. We aim to offer at least one new vessel per month, and a set of missions in which that vessel plays an important part. The 3D models of these vessels can be supplied by external modellers, who will get paid for their efforts. In addition, they can offer their 3D model for sale at 3rd party model sites like TurboSquid. This way we can support external modellers with their efforts, even without the need to develop a complete 3rd-party toolset for this purpose. If you have interest in creating a new player ship for the game, contact us first at info@shipsim.com .

Given the large time investment that our developers have to make for each ship, we want to carefully consider your proposal before committing to it. Our decision will be based on a number of factors:

1. Do you have the 3D modelling and texturing skills to make a ship of sufficient quality, and in line with our guidelines? This will be assessed based on other ship models you made in the past.
2. Can you cover some of the other points of the procedure below, like low-detail model, walkthrough collision model etc.? The more you can cover, the less work we have to do here, and the more likely it is we want to work with you.
3. Does the 3D model you have in mind add sufficient variety to the list of vessels we already have in the game? Do people on the forum ask for that ship type? Can we make nice missions with it?

Selected model creators will get a library of objects from us of small parts of a ship, that they may use for the new vessel, like anchors, winches, fenders, lifeboats etc. If you want to sell your 3D model also on TurboSquid or another commercial 3D modelbank, you cannot use the items of our library, or only after explicit permission from us.

Static objects

Adding scenery objects and static ships is much easier. We encourage users with an interest in 3D modelling to create objects like ramps, jetties, static ships (to be moored or anchored), wrecks, icebergs etc. Initially, you can send these to info@shipsim.com in the 3DS or .X file format, with accompanying texture in DDS format. Later, we may extend the mission editor to automate the process for adding static objects.

New scenery

The effort and workflow for creating new scenery for the game is time consuming and complex. We are still working on improving the internal toolset and procedure, so it is not possible to involve 3rd party developers in this process, until we have progressed this further internally.

Procedure for player ships

In this section, the steps are described that are needed to add a new vessel to the game. The steps that can only be done by VSTEP are indicated in dark blue.

1. **Permission** - We need to have permission from the ship's owner and/or designer, to use it in the game. We have a standard letter for that purpose.
2. We need to know the **physical properties** (dimensions, weight), engine characteristics (type, position, power), and manoeuvring characteristics (top speed, turning angles, acceleration/deceleration).
3. A **description** of the vessel needs to be written, which will be shown in the game when people select the vessel, and in the Webshop. Just a few lines of text, sent to us in plain text format.
4. We need to get **reference material** of the real vessel: pictures, drawings, videos. The owner of the vessel can provide some of this, but also pictures and videos found on the Internet.
5. We need the "**Sea trials report**" and the
6. "**Pilot Card/Bridge Poster**" (sometimes also referred to as "Wheelhouse Poster"). A copy of those two documents must be delivered by the operator. Preferably we need these documents in electronic format e.g. PDF. But a high-resolution digital picture may also be sufficient, provided that the text is readable on the picture when zooming in.
7. **Detail level** - The ship model complexity needs to be brought down to about 25-100,000 triangles. Overlapping surfaces need to be cleaned up, as they cause flickering in the game.
8. **Hull grid** - The hull needs to get the right polygon grid for collisions. Some areas may need more triangles, to make it possible to get small dents and holes. The minimal Space between vertices is 2 meter. Long stretched triangles should be subdivided into more square shapes because they subdive strange by the damage collision algorithm.
9. **Windows** - Reflective and transparent areas like windows will need some special treatment with materials. They should be separate surfaces, placed slightly off the wall, to avoid flickering.
10. Also things like **decals** (writing on the hull etc) can be optionally added as a separate surface .It makes the hull easier to map if you choose that option .Just detach as a clone the polygons from the area of the deck/bridge/hull and map these with an alpha texture. Do not move the vertices of the detached piece. This will have a z-bias modification in Quest so that the surface will always draw in front of the surface that it has been taken from. Keep all the decals (images like logos on top of 3D models) in one texture page.
11. Many ships have some **special items**, like doors that turn or slide open and close when you get close to them in walkthrough mode. We may add window wipers to some ships for bad weather conditions. For doors, the easiest solution is to leave them open so people can walk through them. Animated opening doors are harder to program. But if the doors are meant to open and close then follow this procedure.:-
    Detach the door from the mesh if attached .Move the pivot point to where the hinge should be and then move the door to 0,0,0 in world space. Also it is good practice to reset the xform (3DS max command).
12. **Extra LOD** - Two extra low-complexity LOD (Level Of Detail) models need to be made, one of roughly 3% (with a minimum of 2,000) of the original triangles and one of 10% (with a minimum of 5,000) triangles, for distant viewing
13. **Interior** - The bridge interior and staircases need to be made. Some ships need some extra interiors to walk from the bridge to the deck level. No need to create consoles models on the bridge, please use the objects from our library. Do not attach the bridge interior to the exterior of the Ship. Also other interior parts of a ship should be detached from the exterior. Walking areas of other parts of the

vessel like the decks need to be detached as walking area object (see also point 13 on walkthrough model).

14. **Texturing** - The 3D model needs to be textured with as few textures as possible. Multiple small textures need to combined to one larger texture. All the texture space of a texture should be used, or else the texture needs to be cropped. Textures need to be in DDS format, with resolutions that have a power of 2 size. For example 64x64, 128x64, 512x256 are allowed. The fewer the number of surfaces, the better the performance in the game. Max size for a texture is 1024x1024 pixels. DXT1 for normal textures DXT5 for alpha textures.

15. **Lightmapping** - 2 lightmaps need to be made for the ship, 1 for the exterior and one for the interior of the ship (bridge).
    For the ship exterior, only lightmap the bigger areas like walkways and walls (but not the hull). This should go on all surfaces apart from railings and other really small triangles. Try to lightmap the whole interior unless there are a lot of very small pieces
    Use a SkyLight in the Scene to Create The Light map.
    Do not use mental ray for the texture baking as it has been found that the resulting lightmap is very blotchy and dark and not as good quality as the scanline version.

    Try to map the UV's for the bigger surfaces by hand and let automatic unwrap sort out the rest of the UV's. This no doubt will take a little longer but you will be able to use more texture space of the map making it more efficient and better overall quality. Also the automatically generated UV's will need to be scaled up in most cases to use more texture area especially UV's that are long thin strips of 1 pixel.

    Using the flatten mapping in the unwrap UV modifier option the settings which have proved best are: Face angle threshold = 50 and spacing = 0.005

16. **Damage** - A damage texture needs to be added to the hull. This will be an extra texture stage for the hull only. The hull should be ever thing that should get damage and can have no LightMap. The 2nd UV channel is used for a tiling damage texture. The model should be completely flatten-mapped.

17. **Hull coloring** - The hull needs to be vertex-colored according to the areas that can have dents and holes.
    Vertex Colour Black: Make Holes, Dents and Draw damage.
    Vertex Colour Red: No Holes But Dents and Texture Damage
    Vertex Colour Blue: No Dents But Holes and Texture Damage
    Vertex Colour Violet: No Holes and Dents but only Texture Damage

18. An **inner hull** is needed, black, to avoid that you can see the ocean through a hole after collision

19. **Inverted outer hull** - For small ships like powerboats, the outer hull needs to be inverted and slightly reduced in size, to function as the inner side of the hull. This is to avoid seeing through the hull in case of a hole.

20. A **collision model** needs to be made for the ship dynamics. This should be made of the High Polygon Mesh and should be REALY low like maximum a few 100 triangles, but should fit like a cage around the model. Small objects can be left out of the Collision Model.

21. A **walkthrough** collision model needs to be made, with all the walkable areas of the ship and vertical areas to prevent people from falling off or walking through walls. The vertical areas need to have rounded edges (angles less than 90 degrees) to avoid getting stuck in tight places. Chafer the Edges of the walkable areas. Stairs should be slopes in the walkthrough model and can't have steps. Also offset the Collision wall at least 0.2 Meters of the visible wall. Ladders etc should be steep slopes but not perpendicular to the ground.

22. A **roof** collision model is needed to avoid the appearance of rain in interior areas like the bridge/cockpit (rain collision model). This can also be used to switch on/off specific sounds based on

where you are. The normal Should Face down to the walking Area. This should go a little bit above the Roof and be a little bit large that the Surface its Covering. And be a little bit above the Roof because otherwise you would still see the rain entering the roof.

23. **Propellers and rudders** should be exported separately from the object with the X,Y,Z, at 0, placed at the pivot point. This is because the propellers and rudder blades will be animated according to the engine and rudder setting of the player. The original objects should still be left also at their original position, as a separate surface, so we know where to place the dynamic equivalent of the item. After adding the dynamic version, we need to simply take off or hide the original static element.
24. **Interactive bridge objects** need to be placed on the bridge (navigation and steering equipment). These need to be connected to the corresponding values in the game. Consoles objects are ready made and can be given to external modelers. Interactive elements need to be added, using our *Bridge Object Placement Editor*. If special controls are made, they should be a bit oversized to make them easier to use. Also text that people should be able to read should be made white triangles instead of a texture because then you can see them better, If you still choose to use a texture for text, no Mipmaps are used in that case.
25. **Chart icon** - Each ship needs to get an extra horizontal flat surface with just its outline, to show the ship on the electronic chart in the correct dimensions.
26. **Rope attachment points** - Each ship will get special areas where ropes can be attached to, like mooring ropes and towing ropes. Of course there should also be objects on the ship on the correct spots for mooring and towing. We have a library of re-usable elements for this. We have a *rope connection editor* which can be used for this (separate manual).
27. **Navigation lights** need to be added, in accordance with the IMO Regulations. This is done with our *Lights Editor* (separate manual).
28. **Engine and horn sounds** - We need to have sound files for the ship, of the engine in different speeds. Both recorded outside and on the bridge. Also the horn sound needs to be recorded and sent to us in mp3 or WAV format.
29. **Icons** and **renderings** need to be made, for in-game display and for display on the Website. Examples can be provided.
30. The ship needs to get its **hydrodynamic properties**, for steering/manoeuvring/handling, for collisions, and for its behaviour in waves. These can be set using our *Ship Dynamics Editor*. It has a separate manual. We have two volunteers who an assist with the process of setting and tweaking hydrodynamic properties.
31. The ship needs to get a **bow wave** (dependent on its motion on waves) (VSTEP staff)
32. The ship needs to get **stern wake** water (VSTEP staff)
33. The ship needs to get **foam** on its sides (VSTEP staff)
34. The ship needs to get **fume** from the exhaust. All of this dependent on its speed and the wind speed. This can only be done by VSTEP staff (VSTEP staff)
35. A **loading mechanism** needs to be made to make the ship usable with the mission editor and in gameplay mode. All the separate parts of the previous points are put together here (VSTEP staff)
36. **Translations** - All text including the ship's description and the missions can be translated in German, French, Spanish, Italian and Dutch using our Web based *translation system*. This is not a must, but it may stimulate sales in those countries.
37. **License key** - If the vessel will be sold as a single-vessel add-on product on our Shipyard, we need to create a license key check (VSTEP staff)
38. We need to make an **installer** with the vessel and its missions (VSTEP staff)

39. **Testing** - The installer needs to be tested on several PCs, with different versions of Windows and different versions of the game.
40. **Missions** need to be made where the ship plays the main role. This can also be done by our volunteers.
41. **Multiplayer sessions** need to be made where the new vessel can be selected.
42. We will need to make a **Product page** on The Ship Yard Webshop. Here we can add a logo and picture of the creator, and a link to his Website and/or the vessel at TurboSquid (VSTEP staff)
43. The vessel creator will get his own **Management page**, to follow the sales of his vessel. The earnings split between the creator and VSTEP will be set here, so the revenues can be followed. The easiest way to get these revenues is to get a PayPal Merchant account (VSTEP staff)
44. **Promotional material** like screenshots, renderings and videos need to be made and posted on the site and on YouTube, to stimulate the demand for the vessel.
45. A set of **2D renderings** needs to be made for te vessel, with top view, side view, front view, and bridge floorplan.
46. We need to carry out simulated **sea trials**, whereby the response of the vessel is measured to different settings of the engines and rudder. The results need to be described in a set of graphs and a Sea Trials document.
47. **Press release** - We will need to send out a message to all known users about the new vessel, plus a press release (VSTEP staff)