3DSimED3 Introduction

3DSimED3 is an DirectX application designed to help the authors of tracks and cars for racing simulator games.

- 3DSimED3 has comprehensive support for many sim formats with the ability to import models and scenes.
- Fast rendering of even the largest models.
- Support for DX9 Shaders, shadows, night lights, live frame buffers etc.
- 'Live' editing so you can see the results instantly.
- Export to many sim formats or design formats to allow exchange of models with other 3D editor applications.

New to Version 3

3DSimED 3 adds a large number of enhancements, some of which are documented below.

- DirectX has replaced OpenGL as the 3D API. This should improve compatibility, has seen a performance gain and it is easier to port game shaders as nearly all games are now written using DirectX. Version 9 of the API has been adopted for maximum coverage of modern cards/and Windows OS.
- Non-modal editing allowing View/Display functions to be used while editing a vertex, face, object or material, so that the model can be freely zoomed in, rotated etc without exiting the edit.
- A second consequence of non-modal editing is 'live' preview of the modifications, no apply button to confirm the edits.
- Full undo/redo stack, all edits can be undone and then redone.
- Support for night lighting allowing the user to visualize night scenes.
- Shadow rendering including support for DirectX hardware assisted shadows.
- Improved selection: after right-clicking the user will be presented with sub-menus of any objects or materials beneath the cursor, these menus can be navigated to highlight individual objects and materials greatly simplifying the editing of complex models.
- Import and Export of rF2 .scn and .gmt.
- Improved custom shader support; it should be much easier to add custom shaders.

Quick UI Guide

- Right click to edit faces, objects, or points, beneath the cursor (more details).
- Hold down the left mouse button to rotate a drawing.
- Hold down the shift key with the left button to move the light around the drawing.
- To zoom use the mouse wheel, or the +/- keys on the numeric pad.
- Double-click left mouse button to set the view center to the nearest point.
- The arrow keys will move the camera left, right, forward and backward. The 'A' and 'Z' keys will move the camera up and down.
- Ctrl key and left mouse gives a rectangular selection box. The faces and objects within the selection can be edit (more details).
- The F1 key will give you context help.

3DSimED3 features a Office Fluent Interface, otherwise known as a Ribbon Interface Click here for help with the Ribbon Interface,

3DSimED3 Office Fluent Interface

3DSimED3 includes a fully-featured ribbon interface with user customization.

- You can define your own keyboard shortcuts to any command.
- A Quick Access Toolbar allows any commands of the user's choice to be constantly available
- The Style command allows the theme of the ribbon interface to be changed.
- Scenes are tabbed. The tabs include a close button for the presently selected scene.
- A Home panel contains some of the commonly used commands particularly after start-up.
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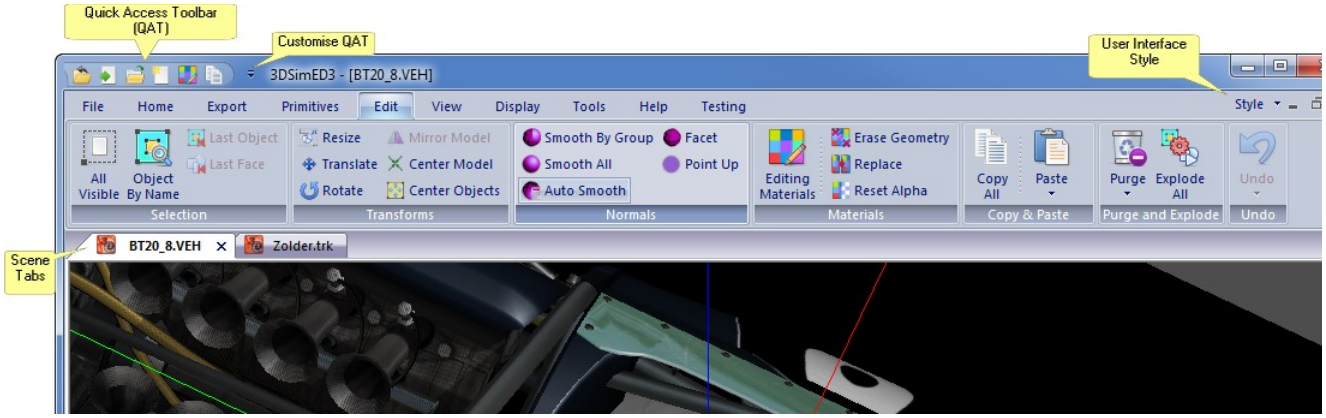
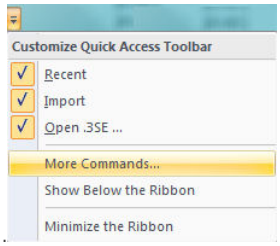


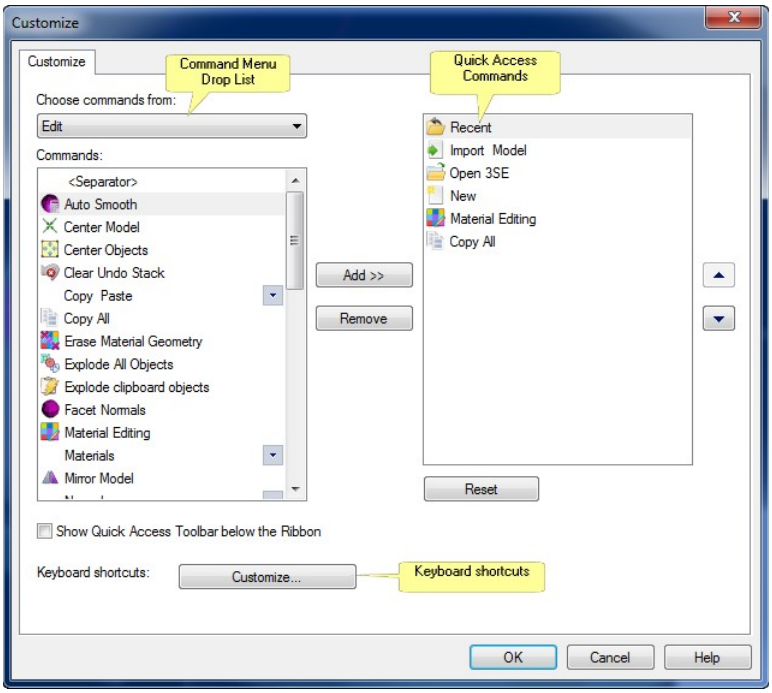
The **Quick Access Toolbar** (QAT) is always displayed and you can add any commands you wish from the menus to this toolbar 

The Customize QAT (Quick Access Toolbar) menu has a number of useful commands.



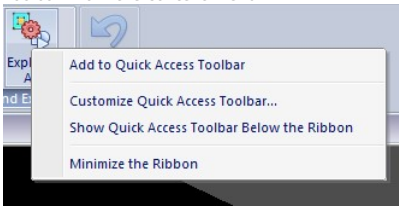
Default QAT entries which can be unchecked if you do not want them on the QAT.
More Commands allows customisation of the QAT and keyboard shortcuts.
Show Below Ribbon which just moves the QAT below the ribbon.
Minimize the Ribbon which will remove the ribbon whenever it is not in use, giving you a greater screen area for rendering.

When the More Commands functions is selected from the QAT menu, the Customize Options dialog is displayed.
To add functions to the QAT, first selected the command menu and then the command itself from the list on the left. With a command selected used the Add button to add to the QAT.
With the Remove button commands can be deleted from the QAT.

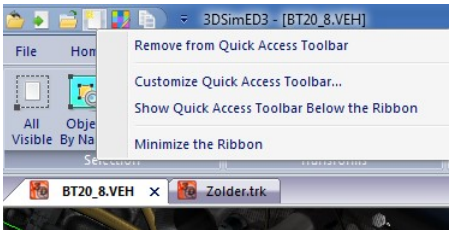


To change keyboard shortcuts, click the Customize button at the bottom left of the dialog and you will be able to assign your own shortcuts.

Note:- Commands can also be added to the QAT at any time by right-clicking on a command and selecting 'Add to Quick Access Toolbar' from the context menu.

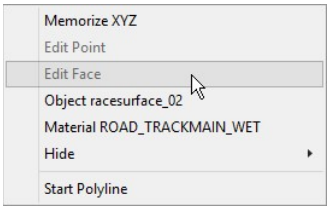


Right-clicking on a button in the QAT gives the option 'Remove From Quick Access Toolbar'.



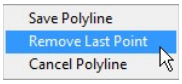
Context Selection

Clicking the Right button on part of the drawing you will be presented with a context menu.



Context Menu

Memorize XYZ	will record the location which you have clicked on. This can be recalled when editing points, objects, or creating primitives. A copy of the position is also placed on the clipboard to allow pasting into text editors
Edit Point	The menu will be grayed out if you are not over a vertex of the model data. If you are over a vertex then clicking on Edit Point will be present the Vertex Edit Panel. • You cannot select a vertex of an object. To edit an object vertex requires isolating the object see Object Instance Edit Pane.
Edit Face	Will be grayed out if no face is available for editing, otherwise clicking on Edit Face will give the Edit Face Pane.

Object <object name>	Clicking on the will present the Object Instance Edit Pane, or if more than one object is available for selection, a sub-menu will be displayed and moving over the menu will highlight the object that will be edited.
Material <material name>	If more than one material is under the cursor select the material to edit from the sub-menu, otherwise click on the Material entry for the Material Edit Pane.
Hide	The hide command will present a sub-menu allowing either the Object or Material beneath the cursor to be hidden
Start Polyline	Starts the creation of a Polyline using the current XYZ, When the Polyline is completed it is saved to a .CSV file. To add points to the Polyline use the left mouse button. To save, cancel, or remove the last point, use the right button menu and use the Polyline menu. Note that their are also the keyboard short-cuts of Esc for cancel and Backspace for remove last point. 

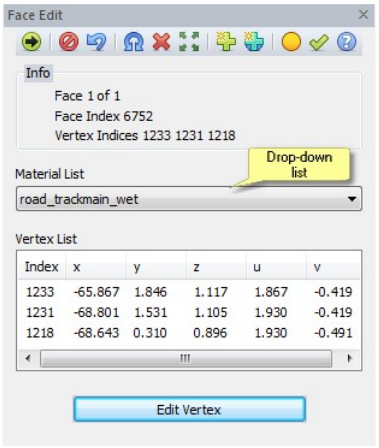
Face Edit Pane

The Edit Face Pane allows individual faces to be modified

- Editing is 'live', you will see the drawing updated instantly (there is no apply button).
- When editing is complete, close the pane using the confirmation tick button or exit button at the top right., in both cases changes will be kept.
- Most the View Menu and Display Menu functions are available; commands such as zoom, change view center, display model in wire-frame etc. can be used while editing .
- The Toolbar includes an Undo button to allow you to cancel editing since the pane was activated. If only some of the editing needs an undo use the Edit Undo function.

Toolbar

The Edit Face Pane toolbar has a number of simple functions to apply to the face.



Next:	Edit the next selected face. • If more that one face was selected, the sort order is from nearest face to furthest face.
Cancel	Clears all editing and closes Edit Face Pane.
Undo:	Clears all editing on the selected faces. This returns the Editable Face Data back to it's state when the Edit Face Pane was open.
Reverse:	Reverses the order of the vertices. In 3DSimED3 a front-facing face has counter-clockwise vertex order. • Reverse does not change the vertex normals.
Delete:	Removes the face from the Editable Face Data
Detach:	Detach creates new vertices so that the face no longer shares vertices with other faces.
Duplicate:	Creates a copy of the present face.
Duplicate Reversed Face:	Creates a copy of the present face but with a reversed vertex order.
Highlight Face:	Highlights the currently selected face
Close	Closes the Edit Face Pane keeping all edits (this is the same result as using the close window button at the top-right of the pane)

Material Selection:

This drop down list allows the material assigned to the face to be changed.

Vertex List

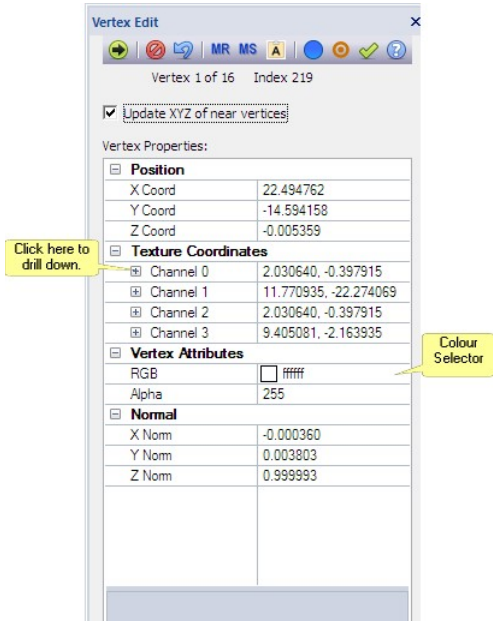
A list of the vertices used by the selected face. If you select one of the vertices then the Edit Vertex button will take you to the Vertex Edit Pane with the selected vertex as the first vertex to edit.

Vertex Edit Pane

The Vertex Edit Pane modifies selected vertices.

- Editing is 'live', you will see the drawing updated instantly (there is no apply button).
- When editing is complete, close the pane using the confirmation tick button or exit button at the top right., in both cases changes will be kept.
- Most the View Menu and Display Menu functions are available; commands such as zoom, change view center, display model in wire-frame etc. can be used while editing .

- The Toolbar includes an Undo button to allow you to cancel editing since the pane was activated. If only some of the editing needs an undo use the Edit Undo function.



Update of near vertices

- With this option on any vertices very close to the selected vertex will have their XYZ values updated to the same XYZ values as the selected vertex.
- Texture coordinates, colour, alpha and normals are not changed for near vertices,

Vertex Properties

- The XYZ Coord windows can be configured for different axis layouts, see Axis Layout.
- Vertex properties can be changed directly in the grid. Click on a property to change it, and, optionally drill down some of the properties to easily change one part
- When editing the coordinate values a spin control is presented. The spin control will take up/down keyboard arrows and mouse wheel input.
- The Vertex RGB can be typed in directly or clicking will give you a button which allows colour selection.

Toolbar

The Edit Vertex Pane toolbar has a number of simple functions to apply to the vertex.

Next Vertex:	Edits the next selected vertex keeping the changes so far.
Clear Vertex Edit:	Clears all changes made and exits the Vertex Edit Pane.
Undo Edit:	Undoes edits so far but leaves pane displayed.
MR:	If a vertex is has been copied to the internal clipboard it replaces the current vertex.
MS:	Copies a vertex to the internal clipboard.
Paste Text:	Use the text on on the system clipboard to update the XYZ of the vertex. The text must be either of the form 3 floating point numbers separated by spaces or the text XYZ followed by 3 floating point numbers.
Highlight Vertex:	Highlights the edited vertex.
Vertex centre view:	Centres the current drawing view on the currently edited vertex.
Close:	Closes the Vertex Edit Pane keeping all edits.

Material Edit Pane

The Material Edit Pane modifies the selected material.

- Editing is 'live', you will see the drawing updated instantly (there is no apply button).
- When editing is complete, close the pane using the confirmation tick button or exit button at the top right., in both cases changes will be kept.
- Most the View Menu and Display Menu functions are available; commands such as zoom, change view center, display model in wire-frame etc. can be used while editing .
- The Toolbar includes an Undo button to allow you to cancel editing since the pane was activated. If only some of the editing needs an undo use the Edit Undo function.

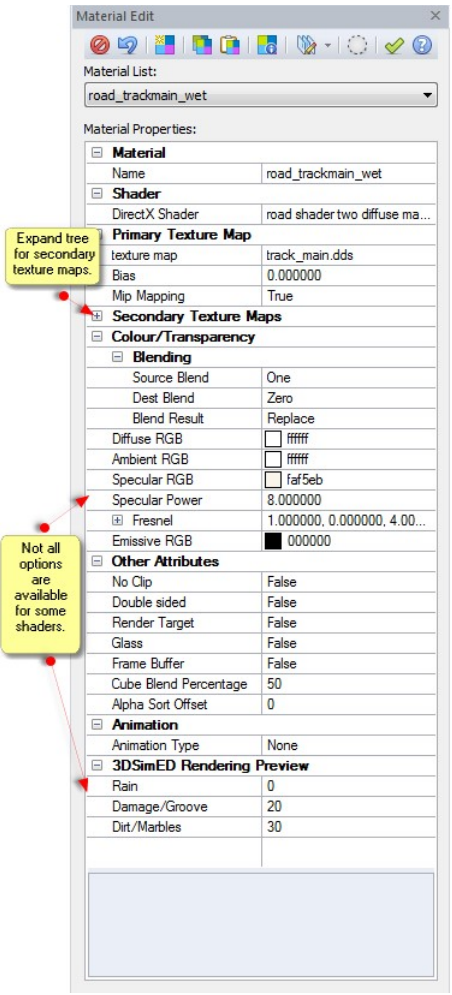
Material List

Allows a different material to be edited, select from the drop-down list of materials

Toolbar

Cancel:	Cancels editing, discarding any modifications to any materials and closes the pane.
Undo:	Undo all changes to materials since the Pane was started.
New Material:	Creates a new material using the properties of the presently edited material.
Copy Material:	Copies the material properties to the internal clipboard of 3DSimED3
Paste Material:	Paste the material properties from the internal clipboard to the present material. The material name, and texture maps assigned to the material are *NOT* overwritten.
Material Catalog:	An alternative to selecting from the Material List is to use the Material Catalog which gives more detail about each material.
Texture Channel Coordinates	Allows texture coordinates of each channel for the material to be scaled, copied and swapped with other channel.
Show Material:	Highlights the selected material.

Close: Closes the Edit Face Pane keeping all edits (this is the same result as using the close window button at the top-right of the pane).



Material Properties

Direct Shader Click on the value to show a button that will prompt with the SelectDirectXShader. Shaders control the rendering of a material and most of the properties below are inputs to the Shader.

Texture Map: Takes you to the Texture Browser allowing you to preview/change the primary texture map for the material, for most shaders this is the diffuse texture map.

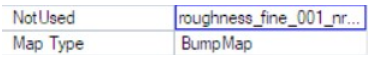
Bias Controls the level of mipmap when rendering. Mipmaps are the levels of detail usually included in a texture map. A positive number will force the material to be rendered with lower level of detail. Negative values will cause the the material to be rendered with higher level of detail

Mip Mapping Switches on/off Mip-mapping. Switch to off if only the top level of the texture is to be displayed

Secondary Texture Maps Expands to allow other texture maps to be assigned.

If a Texture Map is blank with a magenta box then it is a map required by the shader for the material.

If the Texture Map is bordered with a blue box then it is not needed by the shader for rendering but is available for exporting to such formats as FBX and the Map Type can be set.



Diffuse/Ambient RGB: Rarely set to anything other than white (ffffff). Clicking on the value will display a button allowing color selection by a color picker dialog box

Specular RGB: Used only in materials with a shader including specular lighting, nearly always white or near to white.

Specular Power: Only for a specular shader, the shininess of a material from 1 to 100. Higher values cause the material to reflect more of the light while small values will concentrate the reflection to a small spotlight.

Fresnel Values Only used with specular lighting and used by very few shaders.

Emissive RGB The glowing color of a material, if not black the material will be a light of some form.

No Clip Faces in this material are not clipped and everything is drawn over them They are background materials and only have a meaning for ISI format sims.

Double Sided . Faces, using this material, are to be seen from both sides

Render Target Render Target materials are special materials which can have other texture maps drawn over them.

Glass Glass materials are drawn last after the shadows cast by faces of other materials. Note that this attribute is not correctly rendered in 3DSimED3

Frame Buffer: Used for TV screens, the diffuse map is replaced by a camera view. In 3DSimED3 the present view is used

Cube Blend: Only used when a cube map or reflection map is used by the shader. This controls the blending of the cube or reflection map.

Alpha Sort Map: Used by rF2materials, to control Z-buffering of materials. See ISI's documentation for an explanation.

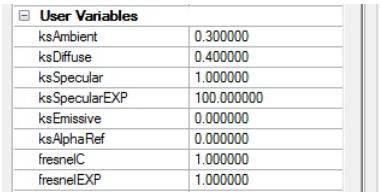
Animation: Animation is only for ISI format sims. Movie animation is for .BIK movies, 3DSimED3 cannot play .BIK animations. Cycle animations are continuous, Cycle Skip 0 skips the first frame until the animation stops - then it holds, One shot plays the sequence once, Pendulum also goes back through the sequence, Transient plays once and then the material is not displayed, Event animations have special names to trigger the animation, and Lerp animations are special animations that can be used to control sky transitions.

Setting the Animation to anything but 'None' will present two more properties: Frames and Frequency.

Frames is the sequence of texture maps that will be used, and the number is used in the texture map naming. A frame sequence 0,1,2,0 with primary map sky.dds will use maps sky00.dds, sky01.dds, sky02.dds, sky00.dds.

Frequency is the delay in seconds between the frames.

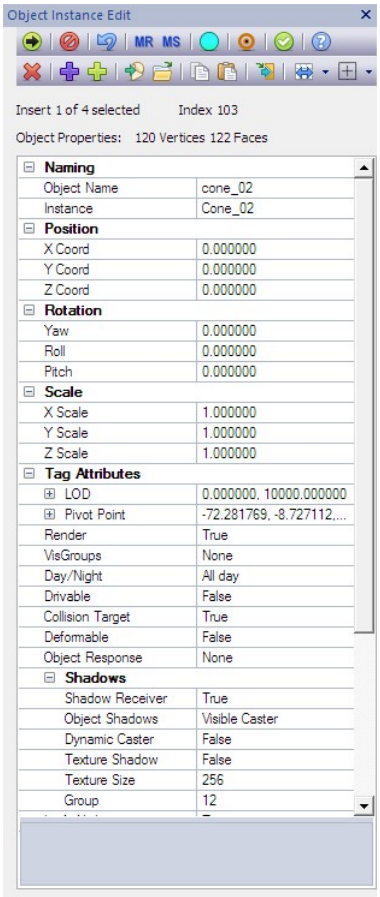
3DSimED3Rendering Preview	This property is available with only a few shaders and helps with previewing a shader as it allows emulating inputs from a game engine which otherwise cannot be modeled in 3DSimED3.
User Variables	Some plugins support shaders which have extra input variables which depend on the individual shader, when this occurs these user variables will be displayed at the bottom of the Material Edit Pane.



Object Instance Edit Pane

The Object Instance Edit Pane modifies selected object instances.

- Editing is 'live', you will see the drawing updated instantly (there is no apply button).
- When editing is complete, close the pane using the confirmation tick button or exit button at the top right., in both cases changes will be kept.
- Most the View Menu and Display Menu functions are available; commands such as zoom, change view center, display model in wire-frame etc. can be used while editing .
- The Toolbar includes an Undo button to allow you to cancel editing since the pane was activated. If only some of the editing needs an undo use the Edit Undo function.



Toolbar

The Object Instance Edit Pane toolbar has a number of simple functions to apply to the object instance

Next:	Selects the next object Instance of the selected group of objects.
Cancel:	Cancels editing, discarding any modifications to the selected objects and closes the Pane.
Undo:	Undo editing on the selected objects.
MR:	Overwrites the current XYZ coordinate with data from the memorized point. • A point can be remembered with the MS button or right clicking on the drawing and choosing Memorize XYZ
MS:	Remembers a point.
Show edit:	Highlights the current object.
Center view:	Centers the view on the current object.
Close:	Closes the Object Instance Edit Pane keeping all edits (this is the same result as using the close window button at the top-right of the pane).
Delete	Delete the current object Instance.
Duplicate:	Duplicates the object Instance and jumps to editing this new Instance.
Isolate:	Creates a new drawing from the object data.
Open Object:	If the object is on disk opens the disk file as a new drawing, otherwise Isolates the object.
Copy Instance:	Copies the object Instance to the clipboard, useful when used with Edit Paste Objects for copying Instances between drawings.
Paste Face Data:	Pastes Editable Face Data from the clipboard overwriting the object's geometry.
Replace Object:	Replaces the object geometry with geometry from a disk object
Reversed/Double Sided.	The faces in the object can be reversed or the object can be changed to have double-sided faces (please note that 3DSimED3 does not check as to whether the faces are already double-sided). Please see the notes on front and back faces in the Display Culling.
Calculate Pivot Point.	Moves the Pivot Point of the object to either the geometric center or the bottom center of the Object.

Object Properties

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- The XYZ Coord windows display output for different axis layouts, see Axis Layout.
- Object properties can be changed directly in the grid. Click on a property to change it, and, optionally drill down some of the properties to easily change one part.
- When editing the coordinate, rotation, scales and other properties of often a spin control is presented. The spin control will take up/down keyboard arrows and mouse wheel input.

Tag Attributes

LOD	Controls the near and far viewing distance of the object.
Pivot Point:	The pivot point for the object, important for objects that rotate - for example, steering wheels.
Render	usually ticked but when un-ticked can be used to hide objects such as shadow generators or timing objects
VisGroups	Sets the detail level for the object.
Day/Night	Controls when the object should be displayed.
Driveable	Also known as HAT objects - only normally set for track objects
Collision Target	Object can be collided with. Normally restricted to track object but could apply to other objects such as cones
Response	Timing for objects used in timing a lap such as the sector objects. Pit is for the pitting objects at the start and finish of the pit lane. Corner responses are used in GTL and GTR2.
Shadow Receiver	Receiver object has shadows cast on to it.
Object Shadows:	None for no casting of shadows by this object. Visible Caster for a normal object that casts shadows, Hidden Caster for 'Shadow Objects' which are objects only used to cast shadows, these are normally simplified versions of other objects to help lower the computation required for shadows. If set to a caster two other properties are displayed: **Dynamic Caster:** This object is cast onto moving objects (cars). **Texture Shadow:** The primary texture map is used to cast the shadow. Note this is hardly any slower than just using the object shape but problems with aliasing tends to cause the shadows to have low quality. **Texture Size:** This texture size is the size to be used in generating a shadow, so higher numbers will give better quality shadows but at the cost of speed and memory use. **Group:** A mask to indicate the detail level at which to display this shadow. The max detail mask is 8 and the lowest detail mask is 1, hence, to cast a shadow at the two highest detail levels the mask would be 12.
Lit at night	Object will reflect light from night lighting
Moveable:	The object will move when there is a collision, used for objects such as cones
Billboard:	Very simple objects which in rF1 and rF2 always face the viewer (3DSimED3 does not billboard these objects when rendering).
Decal	Object which is applied on top of another surface.
Race Weekend Visibility	Controls which parts of a race week the object is displayed in. Objects can be restricted to race only, qualifying only, practice only, race weekend (qual & race) or can be displayed all week (which is all the time).
Visible in rear mirror.	An object that can be seen in a rear-view mirror.
Reflected:	Objects which will be reflected onto cars. This is only used in rF2
Reflection Plane:	All zeroes there is no reflection plane, when set defines the plane the object will be reflected in for water reflection. The most common value would be 0.000, 1.000, 0.000, 0.000. This property is only used in rF2
Transparency	This tag is only used in Assetto Corsa allowing a mesh to be marked as having a different transparency to the material.
Render Animation	If a an object has multiple animations the rendered one can be selected from a drop-down list. Note: this does not change in anyway the data saved, it's only used to selected the rendered animation.
New Animation	Allows an animation file to be attached to an object, this will not animate an object unless it has bones.

Converting Between Sim Formats

In all the cases below you will probably need to convert the textures. Don't forgot to use Tools Texture Browser which includes a batch converter.

Single Object Conversion

For a single object this is very simple. Simply open with Import Model. To save use the relevant Savel command.

Multiple Object Conversion

Conversion of multiple objects is a little more complicated.

- Papyrus N2003 to Imagespace .MTS, rFactor .GMT or GTR .GMT. Open the track .PTF file with Open Model. Then for each of the formats use the relevant Save Objects command. You will be prompted for a save folder as multiple objects are going to be written to disk. A .PTF can contain many references to the same Object which is not the case for the other formats listed above so you may get a number of objects with a number appended.
- Papyrus ICR2, N2, N3, NL, GPL to Imagespace .MTS, rFactor .GMT or GTR .GMT. The same as for .PTF above but open the main track .3DO with the Import Model command.
- Creating Objects for Papyrus N2003 from previous Papyrus Sims. Open the .PTF of the N2003 version with Import Model. From the older version open the main track .3DO with the Import Model command. Use Edit Copy All and Paste Objects to transfer the objects. Save all the objects with the Save as N2003 Objects command. Finally use the Update .PTF command to ensure your objects are referenced in the .PTF.
- Creating Objects for Papyrus N2003 from other sims. Open the N2003 .PTF file with Open Model. Open the objects you need using the Open Objects command. Copy and Paste these objects to the .PTF. Before saving the N2003 Objects with Save N2003 Objects, use the Edit Center Objects. Finally use the Update .PTF command to ensure your objects are referenced in the .PTF.