

Translators

Version 6.5



Maya®, Version 6.5

© Copyright 2005 Alias Systems Corp. ("Alias"). All rights reserved.

Graph Layout Toolkit

© Copyright 1992-1997 Tom Sawyer Software, Berkeley, California. All rights reserved.

All documentation ("Documentation") is copyrighted ©2005 Alias and contains proprietary and confidential information of Alias. The Documentation is protected by national and international intellectual property laws and treaties. All rights reserved. Use of the Documentation is subject to the terms of the license agreement that governs the use of the software product to which the documentation pertains (the "Software"). The authorized licensee of the Software is hereby authorized to print no more than one (1) hardcopy of any Documentation provided in digital format per valid license of the Software held by such licensee. Except for the foregoing, the Documentation may not be translated, copied or duplicated in any form (physically or electronically), in whole or in part, without the prior written consent of Alias.

Alias, the swirl logo and Maya are registered trademarks and the Maya logo, Conductors, Trax, IPR, Maya Shockwave 3D Exporter and MEL are trademarks of Alias in the United States and/or other countries worldwide. FBX is a registered trademark of Systèmes Alias Québec Inc. SGI, IRIX, Open GL and Silicon Graphics are registered trademarks of Silicon Graphics, Inc. in the United States and/or other countries worldwide. mental ray and mental images are registered trademarks of mental images GmbH & CO. KG. in the United States and/or other countries. Lingo, Macromedia, Director, Shockwave and Macromedia Flash are trademarks or registered trademarks of Macromedia, Inc. Wacom is a trademark of Wacom Co., Ltd. NVidia is a registered trademark and Gforce is a trademark of NVidia Corporation. Linux is a registered trademark of Linus Torvalds. Intel and Pentium are registered trademarks of Intel Corporation. Red Hat is a registered trademark of Red Hat, Inc. ActiveX, Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Mac, Macintosh and QuickTime are trademarks of Apple Computer, Inc., registered in the United States and other countries. Adobe, Adobe Illustrator, Photoshop and Acrobat are either registered trademarks or trademarks of Adobe Systems Incorporated. UNIX is a registered trademark, licensed exclusively through X/Open Company, Ltd. AutoCAD, Discreet Logic, Inferno and Flame are either registered trademarks or trademarks of Autodesk, Inc. in the USA and/or other countries. OpenFlight is a registered trademark of MultiGen Inc. Java is a registered trademark of Sun Microsystems, Inc. RenderMan is a registered trademark of Pixar Corporation. Softimage is either a registered trademark or trademark of Avid Technology, Inc. in the United States and/or other countries. Unigraphics is a registered trademark of UGS PLM Solutions Inc.

CATIA is a registered trademark of Dassault Systèmes SA.

All other trademarks mentioned herein are the property of their respective owners.

All images © Copyright Alias unless otherwise noted. All rights reserved.



Table of Contents

1	DWG/DXF file translator	5
About	Translator Utilities	5
	DWG/DXF file translator	5
	Overview of DWG/DXF file translator	5
	Install DWG/DXF translator	5
	Import/Export DWG/DXF files	5
	Version compatibility	5
	DWG/DXF Import Options	5
	DWG/DXF Export Options	6
	Known Issues	7
	DXF entity support	8
2	IGES Translator plug-in	9
About	Translator Utilities	9
	IGES Translator plug-in	9
	Overview of IGES Translator plug-in	9
	Install IGES translator	9
	Import/Export IGES files	9
	IGES import options	9
	IGES export options	10
	Known Issues	10
	IGES entity support	10
3	StudiolImport Plug-in and Translator	13
About	Translator Utilities	13
	StudiolImport	13
	StudiolImport conversion issues	13
4	Export plug-ins	15
About	Translator Utilities	15
	MayaToAlias export plug-in	15
	Troubleshooting	16
	Wavefront (OBJ) export plug-in	16

Table of Contents

	RenderMan (RIB) export plug-in	17
	RIBexport Options	18
5	Maya OpenFlight Importer/Exporter.	19
About	Translator Utilities	19
	OpenFlight	19
	Overview of OpenFlight	19
	Import/export OpenFlight files.	19
	Version compatibility.	20
	User Interface	20
	OpenFlight Menu	20
	Workflow Considerations.	22
	When importing files.	22
	When exporting files.	22
	Shading Models	23
	When using Switch Nodes	23
	Example	24
	When using Light Points.	25
	Example	29
	Example	29
	Degree Of Freedom (DOF) Nodes.	30
	Level Of Detail (LOD) Nodes	30
	Supported OpenFlight Beads.	30
	Known Issues	34

1

DWG/DXF file translator

About

Translator Utilities

DWG/DXF file translator

Overview of DWG/DXF file translator

The DWG/DXF file translator plug-in extends Maya to help address the needs of those customers familiar with files in Autodesk's DWG or DXF format. This data translator is capable of both reading existing DWG/DXF files into Maya and exporting files from Maya to the DWG or DXF format. The translator supports the import and export of AutoCAD files as recent as AutoCAD 2004.

Install DWG/DXF translator

This translator is installed with Maya.

Import/Export DWG/DXF files

To load the DWG/DXF file translator

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the loaded button for the DWG/DXF plug-in, dwgTranslator.

To import a DWG/DXF file

- Select File > Import and select the DWG/DXF file you want to open from the file browser selection.

To export a DWG/DXF file

- Select File > Export All or File > Export Selection, and choose DWGExport or DXFExport from the File of type drop-down list.

Version compatibility

You can read (import) and write (export) versions as recent as AutoCAD 2004.

DWG/DXF Import Options

To access these options, the DWG/DXF translator plug-in must be loaded, and you must change the File Type drop-down box to DWG_DXF.

1 | DWG/DXF file translator

About > DWG/DXF file translator

Override file units with

Interpret the values specified by the DWG/DXF file as values with units as specified by the user in the adjacent drop-down box.

Scale Factor

Scale all imported geometry by a common factor. This allows very large scenes to be viewed more easily.

Note

DWG/DXF files often contain geometry that is very large. In order to view this geometry properly, Scale Factor can be used to scale it down. Otherwise, in the viewing window, select View > Frame All to frame your selection, and if the geometry does not appear, it is beyond the camera's rear clipping plane. Select View > Camera Attribute Editor and set the Far Clip Plane to a value sufficiently large such that the geometry is visible.

DWG/DXF Export Options

To access these options, the DWG/DXF translator plug-in must be loaded, and you must change the File Type drop-down box to DWG_DXF.

General Options

Output File Format

The version of AutoCAD that dictates the DWG or DXF format. (default: ACAD2004).

Units

The units that are used as the export units (default: centimeters).

Scale Factor

The factor by which the resulting geometry in the DWG/DXF file is scaled upon export (default: 1.0000).

Precision

(DXF only.) The precision of the values used in the scene. Single precision supports 8 digits after the decimal, and double precision supports 17 digits after the decimal. Selecting Custom allows you to specify the number of supported digits following the decimal in the adjacent text box (default: Double(17)).

Include Comments

(DXF only) appends comments to the generated DXF file. These include comments such as the Maya version, the date and time the file was generated, and the units of the file (default: false).

Polygon Mesh Options

Tessellation

Tessellates polymesh geometry on export. The Maya scene remains unaltered while the resulting DWG/DXF scene is either Triangulated or Quadrangulated, depending on the option selected. (default: No tessellation)

Export As

Allows polymesh geometry to be exported either as a single polyface mesh, separate polyfaces, or as 3D faces. (default: Polyface Mesh)

NURBS Surface Tessellation Options

NURBS surfaces are currently exported as polyface meshes.

Type

Determines whether the surface is triangulated or quadrangulated on export. (default: Quadrangulate)

Method

Determines the method of tessellation

General	Requires that the user specify which subdivisions types are to be used in the tessellation. For each subdivision type the corresponding parameters must be set. "U Type", "Number U", "V Type" and "Number V" are all options that specify how the general tessellation is carried out.
Standard Fit	Tessellates the surfaces with standard fit ratios. The parameters for this type of refinement are "Chord Height Ratio", "Fractional Tolerance", "Minimal Edge Length", and "3D Delta".
Count	Uses the specified triangle "Count" as a rough estimate of the triangles produced in the tessellation.

Known Issues

- 3D Solids (import): 3D solids are currently imported as blocks references containing SOLID entities. Workaround: Convert to polygons prior to export. (Modify > Convert > Subdiv to Polygon)

1 | DWG/DXF file translator

About > DWG/DXF file translator

- NURBS surfaces (export): NURBS surfaces are exported as tessellated polyface meshes.

DXF entity support

DXF entities supported in Maya

DXF Entity
ARC no thickness
ARC with thickness
CIRCLE no thickness
CIRCLE with thickness
POINT, with thickness
LINE/3DLINE no thickness
LINE/3DLINE with thickness
3DFACE/SOLID/TRACE
POLYLINE/3D open
POLYLINE/3D closed
POLYLINE/3D with thickness
POLYLINE/3D Mesh
POLYLINE/Polyface Mesh
BLOCK
INSERT
LAYER

2

IGES Translator plug-in

About

Translator Utilities

IGES Translator plug-in

Overview of IGES Translator plug-in

The IGES file translator plug-in extends Maya to help address the needs of those customers familiar with files in the IGES format. This data translator is capable of both reading existing IGES files into Maya and exporting files from Maya to the IGES format.

Install IGES translator

This translator is installed with Maya.

Import/Export IGES files

To load the DWG/DXF file translator

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the loaded button for the DWG/DXF plug-in, IGES.

To import a IGES file

- Select File > Import and select the IGES file you want to open from the file browser selection.

To export an IGES file

- Select File > Export All (or File > Export Selection), and choose IGES from the File of type drop-down list.

IGES import options

To access these options, the IGES translator plug-in must be loaded, and you must change the File Type drop-down box to IGES.

Default Trim Curves

Select Parameter Space trimming (curves defined in the parameter space of the surface) or World Space trimming (curves defined in world space of the model). The default is to use parameter space trimming.

2 | IGES Translator plug-in

About > IGES Translator plug-in

IGES Trim Flag. In IGES a trimmed surface can specify its preferred trimming method, either world space or parameter space. Choosing this option tells Maya to use whatever method is preferred in the file.

Scale Factor

Scales all imported geometry by a common factor. This allows very large scenes to be viewed more easily.

Note

IGES files often contain geometry that is very large. In order to view this geometry properly, the Scale Factor can be used to scale it down. Otherwise, in the viewing window, select View > Frame All to frame your selection, and if the geometry does not appear, it is beyond the camera's rear clipping plane. Select View > Camera Attribute Editor and set the "Far Clip Plane" to a value sufficiently large such that the geometry is visible.

Level Mapping

Controls whether layers from a IGES file are imported. The default is to always import layers.

IGES export options

To access these options, the IGES translator plug-in must be loaded, and you must change the File Type drop-down box to IGES.

Scale Factor

Determines the factor by which the resulting geometry in the IGES file is scaled upon export (default: 1.0000).

Known Issues

- If there is IGES created geometry in the scene then the plugin cannot be unloaded. Delete all data and unload plugin.
- The 500 Series (BREP) entities are unsupported.

IGES entity support

IGES entities supported in Maya

Type	Form	IGES Entity
100	0	circular arc

2 | IGES Translator plug-in
About > IGES Translator plug-in

102	0	composite curve
104	0-3	conic arc
106	1	copious data
106	2	copious data
106	11	copious data
106	12	copious data
106	63	closed area
108*	0*	plane
108	1	plane
110	0	line
112	0	parametric curve
114	0	parametric surface
118	0-1	ruled surface
120	0	surface of revolution
122	0	tabulated cylinder
124	0	transformation matrix
126	0-5	rational b-spline curve
128	0-9	rational b-spline surface
130	0	offset curve
140	0	offset surface
141	0	boundary entity
142	0	curve on surface
143	0	bounded surface
144	0	trimmed surface
308	0	subfigure definition

2 | IGES Translator plug-in

About > IGES Translator plug-in

402	7,9	associativity instance
406	1	property - definition levels
408	0	singular subfigure instance
406	15	name

3

StudioImport Plug-in and Translator

About

Translator Utilities

StudioImport

StudioImport is a translator for Studio wire files (previously known as Alias wire files).

Note

StudioTools v10 now uses a different file format for its wire files. This new file format should cause no change in your everyday use of StudioTools because the file provides all of the same capabilities as the old wire file. This new file format is compatible with new releases of StudioTools, so you won't need a translator to use Version 10 files in future releases.

To load the StudioImport file Translator

- 1 Start Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the **loaded** check box for the StudioImport plug-in.

To open a Studio wire file

- Select File > Open Scene and select the Studio wire file you want to open from the file browser selection.

StudioImport conversion issues

The following are known issues for StudioImport conversion as of Maya 5.0.

- Studio SID data is not supported in the StudioImport plug-in.
- Any paint data is not translated into Maya. SID shapes translate as Maya surfaces.
- Poly sets lose texture coordinates on translation to Maya.
- Area and Linear lights are not transferred correctly.

3 | StudiolImport Plug-in and Translator

About > StudiolImport

4 Export plug-ins

About

Translator Utilities

MayaToAlias export plug-in

Note The MayaToAlias plug-in is not available for Mac OS X systems.

MayaToAlias is a Maya plug-in for IRIX, Linux and Windows that uses OpenMaya API to get the scene information from Maya, and then exports it using OpenModel to one of the following, depending on which export file format is chosen:

- a wire file (version 9.7.3)
- IGES file
- DXF file

MayaToAlias exports the following from Maya to wire files:

- transform nodes
- hierarchy
- instanced objects
- NURBS curves
- NURBS surfaces
- trimmed surfaces
- meshes
- cameras

MayaToAlias exports the following from Maya to IGES format:

- transform nodes
- instanced objects (become copied objects in IGES)
- NURBS curves
- NURBS surfaces
- trimmed surfaces
- meshes

MayaToAlias exports the following from Maya to DXF format:

- transform nodes

4 | Export plug-ins

About > Wavefront (OBJ) export plug-in

- instanced objects (become copied objects in DXF)
- NURBS curves
- NURBS surfaces
- trimmed surfaces (become surfaces and curves in DXF)
- meshes

To load the MayaToAlias plug-in

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the **loaded** check box for the MayaToAlias plug-in.
Now you can export Maya content to wire, IGES, or DXF format through the usual export mechanism.

To export a Maya file to wire, IGES, or DXF

- 1 Select File > Export All or File > Export Selection.
- 2 Select a file name and file type, and then click Export.
aliasWireExport, IGESexport, and DXFexport are three of the options in the File Type pull-down menu.

Troubleshooting

- If you get an error message when using MayatoAlias of the form “Creating surface fails - node [nodename], it is because Studio Tools and Maya have different requirements for a valid NURBS surface. Valid NURBS surfaces in Maya may not be valid in Studio Tools, hence they are not created. Usually the problem can be fixed by changing Open to Periodic in either U or V direction (this can be done by using the Edit Surfaces > Open/Close Surfaces tool. Ensure that the Surface direction is set correctly by opening the option box).

Wavefront (OBJ) export plug-in

The objExport plug-in lets you export Maya polygon data to the Wavefront OBJ ASCII file format. It successfully converts:

- Maya texture coordinate and vertex normal information.
- Maya renderable set information into material names.
- Maya component set information into groups.

For details on exporting to OBJ format, see *Basic Tools*.

Note **objExport** does not export OBJ formatted curves, surfaces, smoothing groups, or point group materials. It also does not support NURBS. Use the MayaToAlias plug-in for scenes that contain NURBS surfaces.

Note Alias provides the source code for the objExport plug-in as part of the Maya Developer's Toolkit. Ensure that you have installed the Toolkit, and you can find the source code in `.../devkit/plugin/objExport.cpp`.

To load the objExport plug-in

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the **loaded** check box for the objExport plug-in.

To export a file in OBJ format

- 1 Select File > Export All or File > Export Selection.
- 2 Choose OBJexport as the file type and then click Export.

RenderMan (RIB) export plug-in

The ribExport plug-in adds the new file format RIBexport to the File > Export All options menu. This lets you export scenes created in Maya in the RIB (RenderMan) format.

Note This plug-in only supports the Export All file access mode. RIB file import is not supported.

The ribExport plug-in supports ambient, directional, point, and spot lights. Simple non-textured shaders are supported, although only the shader color is exported. All other shading attributes are ignored. Phong and Blinn shaders are exported as "plastic"; Lambert shaders are exported as "matte." Per-face shading groups are not supported; only shading groups that are assigned to objects or object instances are exported.

When exporting Maya scenes into RIB, note that the # character is a special formatting character in RenderMan image names. To include a real # character in a RenderMan image name, you must use "##". (See section 4.1.10 of the RenderMan user manual for information on formatting.)

4 | Export plug-ins

About > RenderMan (RIB) export plug-in

The image name constructed by the ribExport plug-in includes the contents of the “imageName” attribute of the renderable cameras. If you want to include the special RenderMan formatting characters in an image, the imageName attribute is the place those characters should be placed.

Note Alias provides source code for the ribExport plug-in as part of the Maya Developer’s Toolkit. If you install the Toolkit, you can find the source code in .../devkit/plug-ins/ribExport.cpp.

To load the ribExport plug-in

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the **loaded** check box for the ribExport plug-in.

To export a file in RIB format

- 1 Select File > Export All.
- 2 Select RIBexport as the file type and then click Export.

RIBexport Options

Default File Extensions

Specifies whether the .rib extension is appended to the specified file name. The .rib extension is not added if the specified filename already contains that extension.

Single File Output

If Yes, all frames is written to a single .rib file. If No, all frames are written to separate .rib files.

Extension Padding

If the *Single File Output* option is off, this option specifies whether the RIB file extensions is padded with 0’s.

Geometry Motion Blur

Specifies if geometry motion blur information is written to the RIB file.

Pixel Samples

Specifies the number of samples taken for each pixel. This value is used for both the X and Y directions.

5

Maya OpenFlight Importer/Exporter

About

Translator Utilities

OpenFlight

Overview of OpenFlight

The OpenFlight file translator plug-in provides extended functionality to Maya to help address the needs of the Visual Simulation customer. This is done by providing a data translator to read the currently existing OpenFlight databases into Maya. Accompanying the OpenFlight database importer is an OpenFlight Exporter. Functionality that was found to be missing from Maya was added in the form of new node types that can be created and edited from within the Maya modeling environment.

OpenFlight is installed with Maya.

Import/export OpenFlight files

To load the OpenFlight file Translator

- 1 Open Maya and select Window > Settings/Preferences > Plug-in Manager.
- 2 Click the **loaded** check box for the Open/Flight plug-in, **fltTranslator**.

OpenFlight is a 3D file format. The file importer/exporter is an OpenMaya plug-in. Any of the Beads that can be imported into Maya can also be exported (see "Supported OpenFlight Beads" on page 30).

The exported file contains a subset of the imported data. External file or texture references point to the referenced files in their current directories. Should it be necessary to move an exported file to a location that does not allow access to the original file references, these referenced files can be copied into the same directory as the target OpenFlight file and the references read correctly.

To open an OpenFlight file

- Select File > Open Scene and select the OpenFlight file you want to open from the file browser selection.

To export an OpenFlight file

- Select File > Export All (or File > Export Selection), and choose OpenFlight from the File of type drop-down list.

5 | Maya OpenFlight Importer/Exporter

About > User Interface

Version compatibility

You can read (import) versions from 14.2 up to 15.7, but only export 15.7 files.

User Interface

OpenFlight Menu

An OpenFlight menu is added to the main window when the OpenFlight plug-in is installed. The menu contains the following menu items:

OpenFlight > Create Light Points

Invokes the `fltLightPoints` command to create a new set of light points in the scene.

OpenFlight > Create Light Points > ☐

Number of Light Points

Sets the number of light points.

Distance Between Light Points

Set the distance between light points.

Light type

Choose one of Omnidirectional, Unidirectional, or Bidirectional.

Light Normal

Only active when the light type is unidirectional or bidirectional. Set the light normal.

Light Color

Set the light color.

Note

The light colors only appear in shaded mode. Turn on Smooth Shading to see the colors.

OpenFlight > Create Lights on Curve

Invokes the `fltLightsOnCurve` script to create light points along a selected curve.

OpenFlight > Create Lights on Curve > ☐

Number of Light Points

Sets the number of light points.

Light type

Choose one of Omnidirectional, Unidirectional, or Bidirectional.

Light Color

Set the light color.

Note

The light colors only appear in shaded mode. Turn on Smooth Shading to see the colors.

OpenFlight > Edit Light Points Color

Used to change the color of selected light points.

To change the color of selected light points

- 1 Select the light points to modify.
- 2 From the OpenFlight menu, select Edit Light Points Color.
The Light Points Color Editor appears.
- 3 Select the color to apply to these light points in the color slider.
- 4 Press the Apply (or Apply and Close) buttons to apply the color to the selected light points.

This dialog box works with light points selected in object mode and with light points selected in component mode.

OpenFlight > Edit Light Points Normal

Allows you to change the normal of any selected light points.

To change the normal of any selected light points

- 1 Select the light points to modify.
- 2 From the OpenFlight menu, select Edit Light Points Normal.
The Light Point Normal Editor appears.
- 3 Enter the value of the new normal to apply to these light points.
- 4 Press the Apply (or Apply and Close) to apply set the normal of the selected light points.

5 | Maya OpenFlight Importer/Exporter

About > Workflow Considerations

This dialog box works with light points selected in object mode and with light points selected in component mode.

Workflow Considerations

The following are workflow issues you should consider when working with OpenFlight files in Maya.

When importing files

OpenFlight models are built with a Z-up axis up orientation. When a model is read into Maya using File > Open, the default orientation in Maya is repositioned so that Z is the up vector (normally Maya's Y axis is oriented as the up vector).

When files are read into Maya using File > Import, the orientation is not affected by the import. You must correctly orient the imported data yourself.

When exporting files

Here are some of the limitations to consider when exporting an OpenFlight file from Maya:

- Models are always exported in color RGB mode.
- The units are always meters.
- No animation can be exported.
- No cameras can be exported.
- The exporter only supports a single texture map per face. Layered textures results in only the first texture being exported.
- 2D and 3D procedural textures are not exported.
- Many Maya rendering parameters have no direct equivalent in OpenFlight.
- Degree of Freedom Beads are only created when Limits are set on a Maya group/transformation node.
- No transformations on externally referenced nodes are saved out to OpenFlight format. To transform a referenced file from within the current scene, the DAG root objects in the referenced file should be grouped, and any transformations should be applied to the group node.

Shading Models

Flat Shading

OpenFlight objects have a flat shading flag, which specifies whether the object is to be drawn with flat shading or Gouraud (smooth) shading. This flag is now connected with the "Smooth Shading" attribute of polygons in Maya (as found in the Render Stats tab of the Attribute Editor for the shape).

While OpenFlight supports the flat shading flag at the object level as well as at the face level, Maya only supports the flag at the object level. Thus, the flat shading flag of any object imported into Maya must be set identically for the object and all its faces.

Illumination

The illumination flag of OpenFlight objects specifies whether the object is to be illuminated by nearby lights or whether it is exclusively self-illuminating.

When importing a self-illuminating object, the following attributes of the corresponding Maya object are turned off: "Casts Shadows", "Receive Shadows", "Visible in Reflections" and "Visible in Refractions". When the imported object is not self-illuminating, all these attributes are turned on.

When exporting a Maya object to OpenFlight, the self-illumination flag is set if and only if the "Receive Shadows" attribute of the Maya object is turned off.

When using Switch Nodes

Support has been added to Maya for OpenFlight Switch nodes. Switch nodes allow for an array of visibility masks to be applied to a group transform node. Each child node's visibility is represented by one bit in the visibility mask. (Current implementation only supports up to 32 children.)

The switch node is implemented as a helper node that is applied to a group transform node and can be viewed and selected through the Hypergraph. The currently selected mask can be modified through the Attribute Editor associated with the switch node.

Switch Nodes are created automatically when an OpenFlight database with Switch Nodes is read into Maya. They may also be created using the `fltSwitch` command from within the Maya modeling environment.

Switch node attributes

Name Long (Short)	Type	Default	Flags
-------------------	------	---------	-------

5 | Maya OpenFlight Importer/Exporter

About > Workflow Considerations

outputVis (out)	Tint32	0	R
curMask (in)	Tint32	0	RWSK
maskWidth (mkw)	Tint32	0	RWS
numMasks (nmk)	Tint32	0	RWS
masks (mks)	Tint32	0	ARWS

fltSwitch Command

Synopsis

`FltSwitch [flags]`

Return Value

[string[]] (object name or node name on create)

Description

This command is used to create, edit or query Switch Nodes from within Maya.

Flags

- p (c) The parent group transform node.
- cm (eq) Set or query the current switch node mask.
- n (ceq) The name of the node to be operated on.
- am (e) Append a mask based on the current object selection.
- em (e) Edit the currently active mask based on the current object selection.
- dm (e) Delete the current mask.

Example

```
// Create a Switch node
fltSwitch -n sw1;
// After some geometry has been added under sw1, masks maybe
created by selecting the geometry to be visible under the
switch for the mask and then using the fltSwitch command
as follows.
fltSwitch -e -am -n sw1;
// Setting the current mask to the desired switch will
enable that mask.
fltSwitch -e -cm 0 -n sw1;
```


When using Light Points

Support has been added to Maya for OpenFlight Light Points. Light Points allow for an array of lights to be created that have no render properties.

They can be imported & exported into OpenFlight files, with the following restrictions

Import

- Modeling lights are not supported
- OpenFlight Infinite lights are imported into Maya as directional lights
- OpenFlight Local lights are imported into Maya as ambient lights
- OpenFlight Spot lights are imported into Maya as spot lights

Export

- Directional lights are exported as infinite lights
- Ambient lights are exported as local lights
- Spot lights are exported as spot lights
- Light types not supported by OpenFlight (area lights, point lights) are exported as infinite lights
- Modeling lights are not supported

Notes

- One light palette is created for each light source
- The orientation of the light palette is always Yaw = 0, Pitch = 0

Light Points are implemented as a shape in Maya. They are created automatically when an OpenFlight database with Light Points is read into Maya. Additionally, Light Points can be created from within Maya using the OpenFlight menu commands or the MEL command, *fltLightPoints*.

Each Light Point Shape can contain any number of Light Points. By selecting a Light Point Shape and opening its Attribute Editor, all Light Points attributes are available. Many of these attributes have no visible effect within Maya but can still be edited, saved, and exported.

Light Point attributes

Name Long (Short)	Type	Default	Flags
LightPointsMin (lpmn)	double3	0	RWS
LightPointsMax (lpmx)	double3	0	RWS

5 | Maya OpenFlight Importer/Exporter

About > Workflow Considerations

SurfaceMaterialCode (smc)	Tint16	0	RWS
FeatureId (fid)	Tint16	0	RWS
BackColor (bc)	Tint32	0	RWS
DisplayMode (dm)	Enum	0	RWS
Intensity (ity)	Float	0	RWS
BackIntensity (bit)	Float	0	RWS
MinimumDefocus (mndf)	Float	0	RWS
MaximumDefocus (mxdf)	Float	0	RWS
FadingMode (fm)	Tint32	0	RWS
FogPunchMode (fpm)	Tint32	0	RWS
DirectionalMode (drm)	Tint32	0	RWS
RangeMode (rm)	Tint32	0	RWS
MinimumPixelSize (mnps)	Float	0	RWS
MaximumPixelSize (mxps)	Float	0	RWS
ActualSize (aps)	Float	0	RWS
TransparentFalloffPixelSize (tfps)	Float	0	RWS
TransparentFalloffExponent (tfe)	Float	0	RWS
TransparentFalloffScalar (tfs)	Float	0	RWS
TransparentFalloffClamp (tfc)	Float	0	RWS
FogScalar (fs)	Float	0	RWS
SizeDifferenceThreshold (sdt)	Float	0	RWS
DirectionalType (drt)	Enum	0	RWS
HorizontalLobeAngle (hla)	Float	0	RWS
VerticalLobeAngle (vla)	Float	0	RWS
DirectionalFallofExponent (dfe)	Float	0	RWS

5 | Maya OpenFlight Importer/Exporter

About > Workflow Considerations

DirectionalAmbientIntensity (dai)	Float	0	RWS
AnimationPeriod (ap)	Float	0	RWS
AnimationPhaseDelay (apd)	Float	0	RWS
AnimationEnabledPeriod (aep)	Float	0	RWS
Significance (sig)	Float	0	RWS
Calligraphic (call)	Tint32	0	RWS
Flags (flgs)	Tint32	0	RWS
XanimRotateAxis (xra)	Float	0	RWS
YanimRotateAxis (yra)	Float	0	RWS
ZanimRotateAxis (zra)	Float	0	RWS
LightColors (lc)	Double3	0	ARWS
LightNormals (ln)	Double3	0	ARWS
InputLightPoints (ilp)	0x58000014	0	RW
OutputLightPoints (olp)	0x58000014	0	RS
WorldLightPoints (wlp)	0x58000014	0	ARS
CachedLightPoints (clp)	0x58000014	0	RWS
<i>DisplayNormals (dn)</i>	Boolean	false	RWSK
<i>DisplayLobe (dl)</i>	Boolean	false	RWSK

Light point functionality has been extended to display the affects of several more attributes of light point shapes:

- Directional Type
- Intensity
- Directional Ambient Intensity
- Back Intensity
- Horizontal Lobe Angle
- Vertical Lobe Angle
- Roll Lobe Angle

5 | Maya OpenFlight Importer/Exporter

About > Workflow Considerations

- Normals Display
- Lobe Display

Both Normals Display and Lobe Display have no Creator equivalent. They are used to control the visibility of the normal and lobe of light points as you develop your scene inside of Maya. Note that you cannot display lobes of omni-directional lights.

Currently the back color only displays as red regardless of the actual value set. This default color does respond to the back and ambient intensities to enable more sophisticated simulation.

fltLightPoints Command

Synopsis

`fltLightPoints [flags]`

Return Value

[string[]] (object name or node name)

Description

This command is used to create Light Points from within Maya.

Flags

- d (c) The distance between light points.
- c (c) The number of light points to be created.
- n (c) The node name to be created.
- p (c) The parent group transform node.
- nt (c) If specified, then no parent transform is created. In this case a parent must also be specified with the `-p` flag.
- clr (ce) The RGB color value to be applied to all created light points. Each value should be in the range from 0.0 - 1.0. In edit mode if no light points are selected then the light point shape name must be specified using `-n`.
- nml (ce) The Normal to be applied to all created light points. In edit mode if no light points are selected then the light point shape name must be specified using `-n`.
- dt (ce) Type must be one of: "OMNIDIRECTIONAL", "UNIDIRECTIONAL", or "BIDIRECTIONAL". By default, light points are omnidirectional.
- dnml (ce) Enable or Disable the display of normals (true/false)

Example

```
// Create 3 light points spaced 0.5 UI units apart
fltLightPoints -c 3 -d 0.5/

/ this creates a light point string with 5 light points and
visible normals
fltLightPoints -c 5 -dnml true;

// this makes the normals of the selected light points
string invisible and
// changes the light type to be Unidirectional.
fltLightPoints -e -dnml false -dt UNIDIRECTIONAL;
```

fltLightsOnCurve Script

Synopsis

`fltLightsOnCurve [arguments]`

Return Value

None

Description

This script uses an existing curve and creates a given number of Light Points using the currently selected curve as a placement guide. The Light Points are evenly spaced along the curve.

Note—The curve is used for construction purposes only and *is* modified by this script.

To use this script

- 1 Create a curve to use as a placement guide for the Light Points.
- 2 Select the curve and then execute the script.

Example

```
// Create 3 Red Light Points equally spaced along the
selected curve
fltLightsOnCurve 3 1.0 0.0 0.0;
```

Arguments

Arg1 An integer that specifies the number of Light points to be created.

Arg2 A float that specifies the Red component of the assigned color for the Light Points (0.0 – 1.0)

Arg3 A float that specifies the Green component of the assigned color for the Light Points (0.0 – 1.0)

5 | Maya OpenFlight Importer/Exporter

About > Supported OpenFlight Beads

Arg4A float that specifies the Blue component of the assigned color for the Light Points (0.0 – 1.0)

Degree Of Freedom (DOF) Nodes

All transform nodes in Maya can represent DOF nodes. They each have limit information available and by default work within their own co-ordinate space.

To create a DOF from a Maya transform node

- Set a limit on a group transform node from the Attribute Editor.

Level Of Detail (LOD) Nodes

Maya's LOD nodes work slightly differently from the OpenFlight LOD nodes. To simulate the behavior of OpenFlight LOD nodes, all children of an OpenFlight LOD node are grouped together under a single group transform node that is controlled by the LOD node. A null transform node can also be inserted before and/or after the controlled LOD node to satisfy Maya's switch in/switch out requirements.

Note Deleting these nodes cause the LOD to behave incorrectly.

Maya's LODs are also tied to a particular camera. When importing an OpenFlight file, a camera named *fltLOD* is created. To activate the LOD behavior, you must use this camera. If new LOD nodes are created from within Maya, they should likewise be associated with the LOD camera.

Supported OpenFlight Beads

The following table provides comparisons between OpenFlight and Maya.

OpenFlight Beads	Maya equivalent/comment
Control Records	
Instance Definition	Instanced geometry
Instance Reference	Instance group node
POP	Changes move up to the previous parent in the DAG

5 | Maya OpenFlight Importer/Exporter

About > Supported OpenFlight Beads

PUSH	Creates a child under the current parent
Unsupported Control Records	
Extension	
POP Subface	See PUSH Subface
PUSH Subface	Maya cannot support hierarchy on co-planer surfaces. Instead the next face to be created is offset by 1 mm in the direction of the normal.
Pop Attribute	Reserved for MultiGen
Push Attribute	Reserved for MultiGen
Primary Records	
Degree-of-Freedom Record	Maya transforms are used to represent DOF's. See "Workflow Considerations" on page 22 for more information.
EXTERNAL REFERENCE	File reference to another OpenFlight database.
FACE	Shape node for a face. Faces are part of a polymesh within Maya.
GROUP	Group transform node.
HEADER	Header record for an OpenFlight file. Sets orientation, field of view, etc. Sets the appropriate orientation and UI units.
Level-of-Detail	Level of detail group node.
Light Source	A Light.
Light Point	A special node type associated with the OpenFlight translator. See "When using Light Points" on page 25" for more details.
OBJECT	Transform node.
SWITCH	A special node type associated with the OpenFlight translator. See "Switch Nodes" under "Work Flow Considerations" for more details.
Unsupported Primary Records	
Binary Separating Plane	Allows for the modeling of databases without Z information
Curve	B-spline, Cardinal, also known as Catmull-Rom, and Bezier.

5 | Maya OpenFlight Importer/Exporter

About > Supported OpenFlight Beads

CAT	Continuously Adaptive Terrain Skin. A triangle mesh for high fidelity, real-time viewing.
Clip Region	
Extension Node	User defined node information.
MESH	Poly mesh. (This is not widely supported and may not be available in the first release)
Morph Vertex List	Works in conjunction with LOD node to morph geometry depending on the distance from the camera.
Road Segment	
Road Construction	
Road Path	
Sound	Sound emitter position
Text	
Ancillary Records	
Continuation	Not a node but simply a continuation of a vertex list. Records are limited to 64K in size.
LONG ID	A node name greater than 7 characters to be applied to the previously read node. Maya node names do not have this restriction so the name is applied directly to the node.
REPLICATE	Multiple instances of the current transform node.
TRANSFORMATION MATRIX	Transform matrix to be applied to the current transform node.
Unsupported Ancillary Records	
Bounding Volume	
CAT Data Header	
CAT Data Key	
CAT Data Face	
Extension Attribute	3rd party support.

5 | Maya OpenFlight Importer/Exporter

About > Supported OpenFlight Beads

Local Vertex Pool	
MESH PRIMITIVE	
MultiTexture	Allows support for up to 8 textures per vertex (May not be in first release).
Road Zone	(Pointer to a file that contains grid elevation data)
UV List	Follows Vertex List and contains texture layer information.
Vector	(Only used for light point faces).
Palette Records	
Color Palette	A collection of color entries. Maya does not use a color palette. Each vertex holds the corresponding RGB color.
LIGHT PALETTE	Lights are DAG node entries in Maya.
MATERIAL PALETTE	Material become Shaders within Maya. See Texture Palette
TEXTURE PALETTE	Textures are applied to shaders within Maya. Shaders have an associated shading group that all nodes using this texture are connected to.
Eyepoint and Trackplane Palette	Implemented as Cameras in Maya. (See "Known Issues" on page 34.)
Light Source Palette	
VERTEX PALETTE	Vertices are part of a polymesh in Maya.
VERTEX LIST	See Vertex Palette.
Vertex Palette Header	Followed by vertex data.
Vertex with Color	Polymesh vertex data.
Vertex with Color and Normal	Polymesh vertex data.
Vertex with Color, Normal and UV	Polymesh vertex data.
Vertex with Normal and UV	Polymesh vertex data.

Unsupported Palette Records

5 | Maya OpenFlight Importer/Exporter

About > Known Issues

Key Table	
Linkage Palette	
Line Style Palette	Maya has only 1 line style.
Name Table	
Sound Palette	
Texture Mapping	

Known Issues

The following outlines the known issues in OpenFlight Version 1.1.

- It is not possible to change the Maya display color of a unidirectional or bi-directional light. This color always defaults to red. It is expected that future releases will have the ability to map back colors to RGB display.
- An attempt is made to map Eye Points to Cameras in Maya; however, the mapping appears incorrect in some cases. Eye points are not exported from Maya.
- Track Planes are not supported.
- The only way to freeze a DOFs co-ordinates from within Maya is to export the scene as an OpenFlight file and then read it back in.
- Articulations on group nodes are not supported.
- Maya's LODs need to be extended to better handle the flexibility of the OpenFlight LODs.
- UI-based tools are missing to support Switch nodes, and LODs.
- If you perform a Freeze Transformations on a translated Light Point, Maya versions older than 4.0.3 will crash. This can be fixed by updating to Maya 4.0.3.
- File textures may only be applied to the color attribute of a Maya shader. Textures applied to other attributes are ignored.
- The only export type supported is OpenFlight 15.7.

Index

A

- Alias wire files
 - importing 13
- Alias wire format
 - converting Maya files to 15

B

- beads, import into Maya 19

C

- cameras conversion
 - in MayaToAlias 15
- Continuation
 - of vertex list 32
- converting
 - Maya files to Alias wire format 15

D

- Degree-of-Freedom Record 31

E

- exporting
 - Maya files to Alias format 16
 - OBJ files 17
 - RIB files 18
- external reference 31
- Eyepoint and Trackplane Palette 33

F

- face shape node 31
- fltLightPoints command 28
- fltLightsOnCurve script 29
- fltSwitch command 24

G

- groups
 - conversion in objExport 16
 - transform node 31

H

- HEADER 31
- hierarchy conversion
 - in MayaToAlias 15

I

- Instance Definition
 - instanced geometry 30
- Instance Reference
 - instance group node 30
- instanced objects conversion
 - in MayaToAlias 15
 - to DXF 16
 - to IGES 15

K

- known issues 34

L

- Level-of-Detail, LOD 31
- light palette 33
- Light Point 31
- Light Source 31
- Light Source Palette 33
- long ID 32

M

- material names
 - in objExport 16
- material palette 33

Index

MayaToAlias conversion

cameras	15
export plug-in	15
hierarchy	15
instanced objects	15
meshes	15
NURBS curves	15
NURBS surfaces	15
to DXF	15
to IGES	15
transform nodes	15
trimmed surfaces	15

meshes conversion

in MayaToAlias	15
primary record	32
to DXF	16
to IGES	15

N

NURBS curves conversion

in MayaToAlias	15
to DXF	16
to IGES	15

NURBS surfaces conversion

in MayaToAlias	15
to DXF	16
to IGES	15

O

OBJ format, exporting to from Maya 17

OBJECT

transform node	31
--------------------------	----

objExport conversion

Maya component set information	16
Maya renderable set information	16
Maya texture coordinates	16
Maya vertex normals	16
plug-in	16

OpenFlight

description	19
export	19

Translators

P

palette

eyepoint, trackplane	33
light source	33

plug-ins

objExport	16
---------------------	----

POP 30

PUSH 31

R

replicating multiple instances 32

RIB format, exporting to from Maya 18

ribExport plug-in 17

S

Studio wire files

importing	13
---------------------	----

StudioImport plug-in 13

T

texture conversion

in objExport	16
------------------------	----

texture palette 33

transform nodes conversion

in MayaToAlias	15
to DXF	15
to IGES	15

transformation matrix 32

trimmed surfaces conversion

in MayaToAlias	15
to DXF	16
to IGES	15

U

UV List 33

V

vertex	
list.....	33
palette	33
palette header.....	33
with color	33
with color and normal	33
with Color, Normal and UV	33
with Normal and UV	33

W

Wavefront	
exporting in OBJ format	17
exporting in RIB format	18

Index