

Lightwave Geometry Import Converter

This geometry import converter reads in Lightwave binary object files (.lw) and ASCII scene files (.scn). It is a very complex converter that will allow you to read in Lightwave files and render them right away in the NuGraf Rendering System software with only minor changes necessary to the imported scene.

NOTE: If the import converter reports that it cannot find a particular Lightwave object file (.lwo) or a bitmap texture (.iff) then add a new path to the directory where these files reside via the **Preferences/Configure File Search Paths** menu option of the main program.

Some of the features of the converter include:

- Reading of all Lightwave supported polygon geometry,
- Reading of animation and envelope keyframe animation data. The degree of this keyframe data converted to other export file formats is dependent upon the export converter in question. This capability is only available when running this converter with Okinos PolyTrans or NuGraf Rendering System software.
- Reading of surfaces (materials) with multiple layers of textures enabled. Okinos NuGraf and PolyTrans programs have complete support for multiple layers of texture maps per material so this capability is put to good use when importing Lightwave files. All texture mapping methods are supported for multiple layers of texture maps including diffuse surface color, luminous surface color, diffuse shading coefficient, specular shading coefficient and bump mapping.
- Ability to break apart each Lightwave object according to the materials assigned to each polygon,
- Objects which are instanced one or more times within Lightwave (cloned) are likewise instanced within NuGraf (they instanced geometry will appear below a red folder within the Selector Window). Thus, much memory is saved since only one true copy of the raw geometry is stored in memory for each of the instances.
- The object hierarchy within the original Lightwave file is recreated exactly within NuGraf & PolyTrans.
- All cameras and lights types are supported.
- Every surface (material) attribute is mapped to equivalent NuGraf surface attributes.
- All texture mapping types are supported (diffuse, specular, spherical environment mapping, etc).
- All of the Lightwave texture projection methods are supported, including planar, spherical, cylindrical and cubical. These projection methods are converted directly to equivalent NuGraf projection methods. The conversion is exact, so the textures should appear faithfully when rendered within NuGraf or when the data is exported to another file format (such as 3D Studio, VRML or Wavefront).
- An IFF image format reader has been added to the NuGraf & PolyTrans software so that it can directly read in the Lightwave IFF-formatted texture maps.

As some background information, Lightwave uses two types of files to describe a scene:

1. The raw geometry for each object is stored in a separate file called a **Lightwave Object File**. Normally it has a file extension of **.lw**, **.lwb**, **.lwobj** or sometimes no extension at all. These files are binary and cannot be read directly.
2. The scene setup description file is stored in a single file called a **Lightwave Scene File**. Normally it has a file extension of **.scene**, **.scn** or it must use a descriptive filename such as **Load Up The Entire Scene**. This file is human readable and can be edited with a normal text editor.

Due to the fact that many Lightwave scene files originated on the Amiga you may have to perform some hand editing of the files before they can be loaded (but not in general). In particular you should perform the following changes to the files:

1. **Rename** all of the bitmap files which have the extensions **BRS**, **.BRUSH**, **.MAP**, **.HAM**, **.ILBM**, **.ILB** or **.COL** to the file extension **.IFF**. NuGraf & PolyTrans directly supports the reading of

Amiga IFF texture files, but only as long as the file extension is IFF.

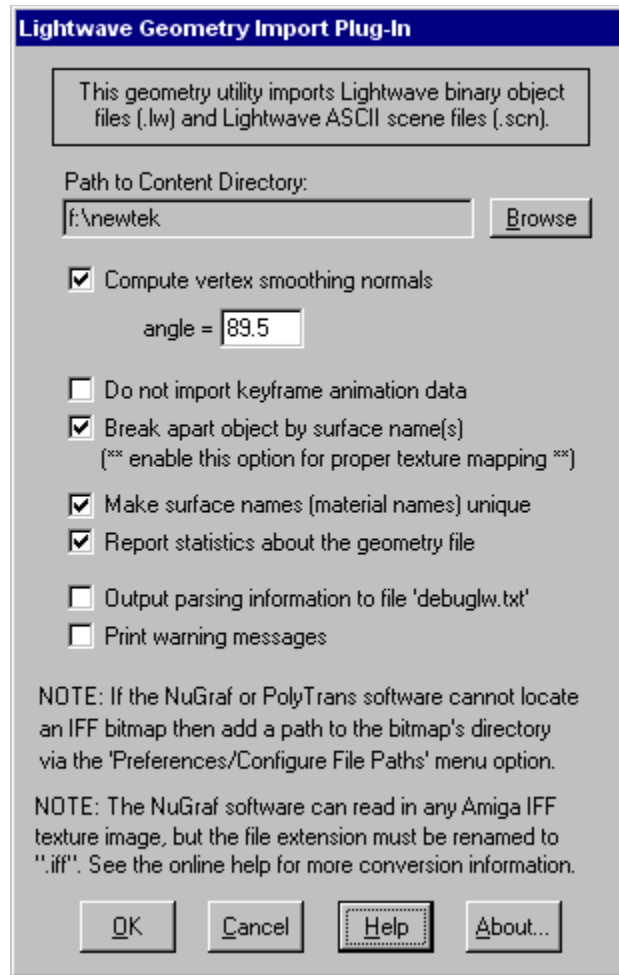
2. If not using Windows NT or Windows 95 then change the filenames of all Lightwave files to have a maximum length of 8 characters.
3. Change the file extension of the Lightwave scene file to **.lws**.
4. Change the file extension of the Lightwave object files to **.lwo**
5. This step is optional and is only required in **extreme** cases: edit the main Lightwave scene file with a text editor and modify the filepath and filename after each occurrence of the **LoadObject** keyword. For example, the original filepath may look something like **LoadObject HD1:Bottle/ExampleBottle**. This should be changed, for example, to **bottle.lw**. This step in general is no longer required because the import converter uses half-a-dozen methods to locate a object (.lwo) file given its base filename (ie: it looks in the current directory, in all the default file search paths, in the Newtek directory (see below) and in each of the directories listed in the LoadObjects filepath).

Once these changes have been made invoke the **Import Geometry/Lightwave** command and choose the Lightwave scene file (.lws) using the file selector. If no scene file exists for the scene then directly import each Lightwave object file (.lwo) one-by-one.

Notes:

1. This converter can handle the Amiga IFF image file format directly so you do not have to convert these image files to any other format.
2. If an object has more than one surface applied to it then the converter will explode the object into separate pieces, each with a single surface assigned to it.
3. A valiant attempt is made to map Lightwave surface attributes to equivalent internal surface attributes but it will probably not be perfect due to the small differences between the two programs. Even so, all the texture map types (luminous, diffuse, specular, ambient, etc). are imported as well as all of the texture modulation parameters.
4. Lightwave allows a different texture projection type to be assigned to each texture applied to a surface (ie: spherical for the color texture, cylindrical for the bump texture). NuGraf only allows one, so it chooses the first texture projection type assigned to the surface.
5. The smoothing angle specified on the Lightwave converters dialog box will be overridden on an object-by-object basis if a surface definition has a smoothing angle associated with it.
6. Detail polygons are created as separate polygons. This might cause problems when rendered with NuGraf.

CONVERTER OPTIONS:



The following information explains the various options on the dialog box:

Path to Content Directory

Most often, Lightwave scene, object and image files are stored in a hierarchical directory structure in which all the scene files (.scn files) are located in a scenes directory, the objects (.lwo files) are stored in a objects directory and the images (.iff) are stored in a images directory. For example, the scene files on the Lightwave distribution CDROM are stored in this manner. In order for this import converter to locate the files, the **Path to Content Directory** option must be set so that it points to the single directory which holds the scenes, objects and images directory. To read in the Lightwave scene files from the Lightwave distribution CDROM, for example, set this directory path to point to **c:\newtek** (if indeed you installed Lightwave in c:\newtek). To change the directory path press the **Browse** button and choose the new root content directory.

Do not import keyframe animation data

If this checkbox is enabled (the default) then no keyframe animation data will be imported. This will make the resulting imported scene file smaller, less complicated and will prevent any animation data from being output to the export file formats.

If this checkbox is disabled then all the animation keyframe data from the Lightwave scene file (.lws) will be imported into NuGraf or PolyTrans. This animation data can then be exported to the export file formats which output animation data. This capability is only available when running this converter with Okinos PolyTrans or NuGraf Rendering

System software.

Make Surface Names (Material Names) Unique

If this checkbox is enabled (check-marked) then the import converter will append each imported surface name (material name) with a number to make it unique should it find that the name is already defined in the internal 3d scene database. For example, if the same Lightwave object file is imported twice in succession (which includes a surface called car_red) then the import converter will rename the second surface to car_red # 2 so that it will not conflict with the first imported surface called car_red (even though they are identical surface definitions). The checkbox is enabled by default.

If the checkbox is disabled (un-checkmarked) then the import converter will not make the surface names unique even if an identical surface name exists within the 3d scene database. You may want to disable this option so that multiple geometry meshes share the same surface definition.

Compute vertex smoothing normals

If this checkbox is enabled then new vertex normals will be computed for the raw imported geometry. These vertex normals are required if the geometry is to appear smooth when rendered.

The smoothing criterion is based on the angle between abutting polygons; common smoothed vertex normals will be computed if the angle between their geometric surfaces normals is less than the angle specified on the dialog box (which defaults to 89 degrees). This value will be overridden if a Lightwave surface definition has a smoothing angle specified for it.

Break apart object by surface name(s)

If this checkbox is enabled (check-marked) then each imported Lightwave object will be exploded into separate sub-objects based on the surface (material) names assigned to the polygons in the objects. This is a useful option because it will allow you to modify the various sub-pieces of each object much easier than if you do not explode the object.

Take for example an object which is a human head. All of the polygons are stored in a single Lightwave object. The head has multiple surfaces assigned to it, including a surface for the mouth, eyes, hair, face and eye brows. By enabling this option the human head will be exploded into separate sub-objects.

NOTE: If this option is disabled then it is possible to have improperly texture mapped objects. This can occur if two or more materials (surfaces) are used by a single Lightwave object, and each material (surface) uses a different texture projection type (ie: planar, cylindrical, spherical, cubical). To correct this texture mapping problem, enable this option.

Report statistics about the geometry file

If this checkbox is enabled then the Lightwave geometry import filter will report the number of polygons and vertices read from the file.

Output parsing information to file debuglw.txt

If this checkbox is enabled (check-marked) then verbose information about each Lightwave object and scene file parsed will be output to the text file **debuglw.txt** in the current working directory. This file will describe each files contents in detail (polygon counts, material names and detailed material descriptions).

Print warning messages

If this checkbox is enabled then any warnings reported by the Lightwave geometry import filter will be printed to the messages window.

