

# TWL-System g3dcvtr Manual

## Using the G3D Binary Converter

2009/03/04

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and should be handled accordingly.**

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## Revision History

Revision Date	Description
2009/03/04	Added information on the <code>-we</code> option.
2008/05/30	Made revisions in line with the NITRO-System name change (from NITRO-System to TWL-System)
2008/04/08	Changed the format of the Revision History and the license notification for Xerces-C++.
2007/11/26	Added more information regarding the number of files that can be converted to a single binary.
2006/05/29	Added a description of the <code>-tex-nomerge</code> option.
2005/05/11	Added note on packing restrictions.
2004/10/12	Added a description of the <code>-texsrt</code> option.
2004/09/02	Added description regarding the file indexing specification.
2004/08/02	Initial version.

# 1 Introduction

G3D Library uses binary format for drawing data. TWL-System includes the `g3dcvtr` converter, which converts XML-formatted NITRO intermediate files to binary files for use with the G3D Library.

## 2 How to Use g3dcvtr

`g3dcvtr` is a command line application that operates on Windows and is used for converting the NITRO intermediate file in TWL-System to the binary file format used by the G3D Library. With `g3dcvtr` it is possible to convert the six types of intermediate files shown in Table 2-1. The content to be converted is automatically determined from the extension of the intermediate filename specified by the `g3dcvtr` argument.

**Table 2-1 Intermediate Files That g3dcvtr Can Convert**

Extension	Type of Intermediate File	File Description
imd	Model data	Model information including polygons, parent/child structure, materials, and textures.
ica	Character animation data	Animation data that operates the node matrix.
iva	Visibility animation data	Animation data that operates the node visibility.
ima	Material color animation data	Animation data that operates the material colors.
itp	Texture pattern animation data	Animation data that cycles through multiple textures.
ita	Texture SRT animation data	Animation data that operates the texture matrix.

### 2.1 Command-Line Description

Use `g3dcvtr` in the following format.

```
g3dcvtr Intermediate_file_name ... [option] ...
```

#### 2.1.1 Specifying Filenames of Multiple Intermediate Files

Multiple intermediate files can be specified at one time with `g3dcvtr`. If multiple intermediate filenames are specified in the command line, `g3dcvtr` converts these intermediate files and outputs them by packing them into a single binary file. If the intermediate files are not all the same type, an error is generated.

The output binary data can be accessed by using the index that starts at 0, in the order that was specified by the argument. It can also be accessed by using a filename (by eliminating the file extension to limit the length of the filename to 16 characters or fewer). Additionally, to specify multiple intermediate filenames, you must specify the `-o` option at the same time to specify the output filename.

A maximum of 255 intermediate files can be converted to a single binary file.

#### 2.1.2 Options

The `g3dcvtr` options are characters or strings that begin with a hyphen (-). The option is described after the intermediate filename. The following options can be specified regardless of the content being converted.

**Table 2-2 g3dcvtr Option Descriptions**

Option	Description
-h / --help	Display help message and exit.
-o <output>	Specify output file name. If the file extension was omitted, the proper one is automatically added.
-we	Handle warnings as errors.
--version	Display the g3dcvtr version information and exit.

Besides these common options, unique options for each conversion type exist for g3dcvtr. These unique options are introduced with their respective chapters.

### 2.1.3 Expansion of Command-Line Arguments Stored in Files

For command-line arguments that begin with the @ symbol, the second and subsequent characters are recognized as the filename, and the contents of the file with that name are expanded to become the argument. There can be multiple files and multi-step expansion of file content. A self-referencing file reference results in an error.

## 3 Converting the Intermediate File

### 3.1 Converting Model Data

If the model data file (file extension: `.imd`) is specified in the `g3dcvtr` intermediate filename, it is converted to the model binary file (file extension: `.nsbmd`) used with the G3D library.

#### 3.1.1 Selecting the Output of the Model Binary Data

The output content can be selected by specifying any of the options below when converting the model data. If these options are omitted, they are converted as if `-eboth` was specified.

**Table 3-1 Output Option Descriptions**

Option	Description
<code>-etex</code>	Outputs only the texture data. The extension of the output file is <code>.nsbtx</code> .
<code>-emdl</code>	Outputs only the model structure to the file. The extension of the output file is <code>.nsbmd</code> .
<code>-eboth</code>	Outputs a file that includes both the model structure and texture data. The extension of the output file is <code>.nsbmd</code> (default conversion operation).

#### 3.1.2 Storing in the Matrix Stack

Options for the G3D library drawing can be specified when converting the model.

**Table 3-2 Matrix Option Description**

Option	Description
<code>-s</code>	Stores all of the joint matrices in the matrix stack.

If the `-s` option is specified, `g3dcvtr` converts all of the joint matrices used in the model drawing to be stored in the matrix stack. The presence of 32 or more joint matrices in the model results in an error. Storing the joint matrices in the matrix stack simplifies obtaining the calculation result of the joint matrix from the application.

#### 3.1.3 Sharing of Textures among Models

If multiple model intermediate files are specified in the command line and multiple model data is stored in one binary file, and if the same texture is used for all that model data, the texture is converted in a way that allows it to be shared.

By comparing the texture name and content, it is determined whether the same texture is used. If the texture name is the same but the content is different, an error occurs.



### 3.1.4 Outputting the Material Texture Matrix Field

When converting model data, you can specify an option that controls the output of the material's texture matrix field.

**Table 3-3 Material Texture Option Description**

Option	Description
-texsrt	Always outputs the material's texture matrix field to the .nsbmd file.

Normally, `g3dcvtr` does not output the material's texture matrix field to the .nsbmd file when the texture has the Scale of 1 and there are no rotations or translations. When the `-texsrt` option is specified, `g3dcvtr` suppresses this process so that the material's texture matrix field is always output to the NSBMD file.

Use this option to ensure that the material's texture matrix field is included in the NSBMD file, so an application program can modify the material's texture matrix.

### 3.1.5 Suppressing Merges of Texture and Palette Data

In the default state, if the data in the texture and palette are the same, they will be converted to share the same region, even if the texture and palette have different names. If this conversion is desired, specify the following option.

**Table 3-4 Texture and Palette Data Merge Option Description**

Option	Description
-tex-nomerge	If the texture and palette do not have the same name they are not merged.

## 3.2 Converting Character Animation Data

If the character animation data file (file extension: .ica) is specified in the `g3dcvtr` intermediate filename, it is converted to the character animation binary file (file extension: .nsbca) used with the G3D Library. The number of unique rotation matrices in the character animation data that is converted must be 32,767 or less.

### 3.2.1 Suppressing the Output Content of the Character Animation Data

The content output when converting model data can be suppressed by specifying the following options. As for the omitted data, information from the model data is used during playback. If these options are not used, all of the data is output without any omissions.

**Table 3-5 Character Animation Data Output Option Description**

Option	Option Name	Description
-OT	--OmitTranslation	Omits translation data. The translation data of the root node is never omitted.
-OS	--OmitScale	Omits scaling data.
-OR	--OmitRotation	Omits rotation data.

### 3.3 Converting Material Animation Data

TWL-System has four types of material animation.

#### 3.3.1 Converting Material Color Animation Data

If material color animation data (file extension: `.ima`) is specified in the `g3dcvtr` intermediate file name, it is converted to the material color animation binary file (file extension: `.nsbma`) used with the G3D library.

#### 3.3.2 Converting Texture SRT Animation Data

If texture SRT animation data (file extension: `.ita`) is specified in the `g3dcvtr` intermediate filename, it is converted to the texture SRT animation binary file (file extension: `.nsbta`) used with the G3D library.

#### 3.3.3 Converting Texture Pattern Animation Data

If texture pattern animation data (file extension: `.itp`) is specified in the `g3dcvtr` intermediate filename, it is converted to the texture pattern animation binary file (file extension: `.nsbtp`) used with the G3D library.

#### 3.3.4 Converting Visibility Animation Data

If visibility animation data (file extension: `.iva`) is specified in the `g3dcvtr` intermediate filename, it is converted to the visibility animation binary file (file extension: `.nsbva`) used with the G3D library.

### 3.4 Limitation on the Name Length

To speed up processes with the G3D library, the length of the joint name, material name, texture name, palette name, and polygon name are limited to 16 characters.

If the name length of each type used with `g3dcvtr` in the intermediate file exceeds 16, everything past the sixteenth character is truncated. A warning occurs whenever such truncation happens. If this truncation of the filename results in a duplication of names an error results.

### **3.5 Restrictions on the Number of Files That Can Be Packed**

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The maximum number of files that can be packed into a single binary file is 255.

## 4 Utilities Feature

By specifying the binary file used with the G3D Library in the `g3dcvtr` command line, you can display (output to `stdout`) information about the content of the corresponding binary file.

## 5 About Xerces-C++

`g3dcvtr` uses Xerces-C++, developed by the Apache Software Foundation (<http://www.apache.org/>). Copies of the Xerces-C++ NOTICE file and license file are in the following directory.

- `TwlSystem/docs/Xerces-C++/NOTICE`
- `TwlSystem/docs/Xerces-C++/LICENSE`

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