

## **WCVT2POV Contents**

WCVT2POV is a freely distributable program that allows 3D files to be converted from one format to another. It was originally intended to be used primarily by POV-Ray users, but has been expanded over time to be useful by a large variety of users.

Because of that, I expect this to be the last version of WCVT2POV. Expect this program to reappear with a new name (and hopefully a new look) in a few months. If you have any questions or comments feel free to contact me by email. My email address is *keithr@europa.com*.

[Licensing Agreement](#)

[Acknowledgements](#)

[About The Author](#)

[3D File Formats Supported](#)

[New Features](#)

## **Commands**

[Menus & Toolbar Commands](#)

## **Troubleshooting**

[Troubleshooting](#)

## Troubleshooting

There are several common things that can go wrong when converting a 3d model.

- Q** The model reads okay but nothing is visible, what's going on?  
**A** Look to see if the model is the *same* color as the screen background.
- Q** The model seems to be just a ball or just a flat plane, is this the model?  
**A** You probably read in a scene rather than a model. All you need to do is bring up the color and texture dialog and check "ignore group" for each group that sounds like it might be the sky or the floor. This should fix this problem.
- Q** The normals in the model are pointing in the wrong direction, can I change the direction?  
**A** Yes, select the File|Preferences|View item. You will see a dialog that will give you the option of reversing the direction of the normals.
- Q** PovSB imports the model but the camera is in some funny position, what's up?  
**A** PovSB doesn't seem to like cameras with the Y axis being up. Hopefully this will be fixed in the near future.
- Q** I saved my model in RAW (obj, or tpoly) when I read back my file all the color info is gone, why?  
**A** These file formats don't support color or texture info, so your color info will be lost when it is saved into these formats.
- Q** I saved my model in NFF and when I read the file back all my groups had different names, and some of the groups were completely missing, why?  
**A** The NFF file format doesn't support groups. When you saved your file as an NFF file all that was saved was the polygons and their associated color info. The polygons were placed in groups by colors when the NFF file was read.

## **About The Author**

Keith is a software engineer at Tektronix, Inc. in Beaverton OR. He works in the VXPL division which produces VXIbus test and measurement devices.

3D stuff has been Keith's hobby for about two years. He enjoys taking photos with his Kodak Stereo camera, ViewMaster Personal camera, and Nimslo. He also enjoys playing with the Povray raytracer and has been trying to figure out how to combine these two hobbies.

## **New Features**

Jeff Hauswirth provided me with the his new file format to PoVSB, a windows POVRay modeller. Todd A. Prater has allowed me to use portions of his Font3d program. This allows WCVT2POV to read TrueType fonts and create an extruded object. Ive also added a VRML emitter. The VRML format is a new format for me (and just about everyone else), so Im expecting to have to remove some rough edges on this format over time.

To summarize, the new formats are truetype fonts (\*.tff - input only), PoVSB (\*.psb - output only), and VMRL (\*.wrl - output only).

## Menus & ToolBars



[New File](#)



[Open File](#)



[Save File](#)



[Zoom In](#)



[Zoom Out](#)



[Rotate 3d Object](#)



[Mirror 3d Object on the X Axis](#)



[Mirror 3d Object on the Y Axis](#)



[Mirror 3d Object on the Z Axis](#)



[Color & Texture Dialog](#)



[Floor](#)



[Sky](#)



[Print](#)



[Help](#)

## **File|New Menu Item**

The File|New command clears the current document.

## **File|Open... Menu Item**

Opens an existing 3d model in one of several formats into the document window. Several 3d file formats are supported. These include :

[Wavefront \(\\*.obj\) File](#)

[Neutral File Format \(\\*.nff\)](#)

[RAW \(\\*.raw\) File Format](#)

[TPoly \(\\*.tpo\) File Format](#)

[AutoCad \(\\*.dxf\) Files](#)

[AOFF \(\\*.geo\) File Format](#)

[TrueType Font \(.ttf\)](#)

[3D Studio \(\\*.3ds\) File Format](#)

## **TrueType Font**

This file reader will read TrueType fonts (which are usually found in the C:\WINDOWS\SYSTEM subdirectory). It will read most TrueType fonts, allow a string to be entered, and then extrude the string as a 3D model. Thanks to Todd A. Prater for making this code available.



## **File|Save Menu Item**

Saves the currently selected file, in its original format. If the current file can't be save in its original format a open file dialog will appear, otherwise the file will be saved directly.

## **File|Save As... Menu Item**

Saves the currently selected files in the specified file format selected. You may select one of the following file format:

- [AutoCad \(\\*.dxf\) Files](#)
- [3D Studio \(\\*.3ds, \\*.asc\) File Format](#)
- [Neutral File Format \(\\*.nff\)](#)
- [RAW \(\\*.raw\) File Format](#)
- [TPoly \(\\*.tpo\) File Format](#)
- [Pov SB \(\\*.psb\) File Format](#)
- [Povray \(\\*.pov, \\*.inc\) Files](#)
- [Virtual Reality Markup Language \(\\*.wrl\)\)](#)
- [Wavefront \(\\*.obj\) File](#)

## **Virtual Reality Markup Language (\*.wrl)**

The Virtual Reality Markup Language is a new standard language for representing 3D objects and scenes on the World Wide Web. This emitter will create a VRML file. Colors will be converted, however this version does not fully convert textures (hopefully future versions will fix this limitation).

Normals will be emitted when the smoothing operator is selected in the Color&Texture dialog. This will allow a smoother 3d image (however the resultant file will be much larger). Normal direction can be inverted by using the File|Preference|View dialog.

## **Object|Zoom|In Menu Item**

Redisplays the current 3d object 25% larger. This command does not scale the data in the underlying object. It only effects the current display zoom factor.

## **Object|Zoom|Out Menu Item**

Redisplays the current 3d object 25% smaller. This command does not scale the data in the underlying object. It only effects the current display zoom factor.

## **Object|Rotate... Menu Item**

This menu item brings up the rotate dialog box. This allows the selection of rotation values (in degrees) to be used in rotating the current 3d object.

The Rotate X entry, rotates the object around the X axis. The x axis runs horizontally across the screen with + to the right and - to the left of the center of the display.

The Rotate Y entry, rotates the object around the Y axis. The Y axis runs vertically up and down the screen with + to the top and - to the bottom of the center of the display.

The Rotate Z entry, rotates the object around the Z axis. The Z axis runs into and out of the display and is centered slightly behind the screen. The + values are behind the screen (or away from you) and the -values are in front of the screen (or toward you).

## **Object|Mirror|X Axis Menu Item**

The Mirror X command flips the data in the object along the X axis.

## **Object|Mirror|Y Axis Menu Item**

The Mirror Y command flips the data in the object along the Y axis.



## **Object|Mirror|Z Axis Menu Item**

The Mirror Z command flips the data in the object along the Z axis.

## **Save A POVRay Scene**

WCVT2POV allows POVRay files to be saved just like any other exportable file type. You simply select the "File|Save As..." menu selection. The Save As dialog box will appear. The default output type is the POVRay V2.2 file format. Simply type in the name you'd like the POVRay file to have and then save it.

## **Define a Floor and a Sky for POVRay Files.**

WCVT2POV is intended to allow a 3d model to be quickly and simply converted into a POVRay V2.2 file. Most models, to be viewed correctly, need to have a floor and a sky. WCVT2POV allows several types of floors and skies to be selected. Simply use the floor or sky button on the tool bar. You have the choice of "No Sky", "Blue Sky", "Lightning Sky", and "Star Field".

When you select Floor texture you have the choice of: "No Floor", "BW Checker", "Jade", "White Marble", "Oak Wood", and "Water". The offset is intended to allow you to select the position of the floor. By default the offset is at the base of the current 3d object. Since objects are unitized when they are read in, the offset values are always between -1 and 0.

## **Acknowledgments**

I'd like to thank Richard Dorman (richard@concave.cs.wits.ac.za) for his DXF-POV translator. This is the basis for my DXF reader. His reader is one of the easier freely available version of a DXF reader to understand and modify.

I'd also like to thank Steve Anger for his great tools (raw23ds, 3ds2pov and others). I used his definition of the RAW format for my reader and writer. I've also used large portions of 3ds2pov, with his permission.

Todd A. Prater was kind enough to allow me to freely use a portion of his Font3d shareware code in this program. Please check out his shareware program Font3D which does a much more complete job of converting truetype fonts to 3D objects. His program includes the ability to bevel edges and is portable to a large variety of environments. You will find his program on <ftp://ftp.povray.org/pub/povray/utilities>.

I wrote all other code, with help from a textbook or two. I also peeked at the source to a few other freely available file translators, but decided to "roll my own" rather than reuse the code. I'd like to thanks those folks too, unfortunately I don't remember which translators I peeked at. So I'd like to give a blanket thanks to all those folks who have freely donated 3d file translators, your effort is much appreciated.

## **Licensing Agreement**

### **Legalize**

Permission to use, copy, and distribute, this software and its documentation for any purpose is hereby granted without fee, provided that no portion of the code, dialogs, or other resource components are modified. I make no representation about the suitability of this software for any purpose.

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### **Human Comprehensible Description**

It is my intention to produce high quality, easy to use software. The reality is that all software has bugs. I have tried my best, given my limited resources as a 3d hobbyist, to ensure that all serious problems have been removed. However, all freeware should be used carefully, especially when converting important files. Please make sure to backup all important file before they are converted using the program.

## 3D File Formats Supported

WCVT2POV support several different types of 3d model files. This version supports the following formats:

[Wavefront \(\\*.obj\) File](#)

[Neutral File Format \(\\*.nff\)](#)

[RAW \(\\*.raw\) File Format](#)

[TPoly \(\\*.tpo\) File Format](#)

[AutoCad \(\\*.dxf\) Files](#)

[AOFF \(\\*.geo\) File Format](#)

[3D Studio \(\\*.3ds, \\*.asc\) File Format](#)

[Pov SB \(\\*.psb\) File Format](#)

[Povray \(\\*.pov, \\*.inc\) Files](#)

[TrueType Font \(\\*.ttf\)](#)

[Virtual Reality Markup Language \(\\*.wrl\)](#)

## Povray (\*.pov, \*.inc) Files

[Introduction from the POV-Ray user documentation. Look on the anonymous ftp site <ftp.povray.org> for the current Povray distribution.]

The Persistence of Vision Ray Tracer (POV-Ray) is a copyrighted freeware program that allows a user to easily create fantastic, three dimensional, photo-realistic images on just about any computer. POV-Ray reads standard ASCII text files that describe the shapes, colors, textures and lighting in a scene and mathematically simulates the rays of light moving through the scene to produce a photo-realistic image!

The standard POV-Ray package also includes a collection of sample scene files that illustrate the program's features. Additionally the POV-Ray Team distributes several volumes of scenes that have been created by other artists using the program. These scenes can be rendered and enjoyed even before learning the scene description language. They can also be modified to create new scenes.

Here are some highlights of POV-Ray's features:

- \* Easy to use scene description language
- \* Large library of stunning example scene files
- \* Standard include files that pre-define many shapes, colors and textures
- \* Very high quality output image files (24-bit color.)
- \* 15 and 24 bit color display on IBM-PC's using appropriate hardware
- \* Create landscapes using smoothed height fields
- \* Spotlights for sophisticated lighting
- \* Phong and specular highlighting for more realistic-looking surfaces.
- \* Several image file output formats including Targa, dump and raw
- \* Wide range of shapes:
  - \* Basic Shape Primitives such as... Sphere, Box, Quadric, Cylinder, Cone, Triangle and Plane
  - \* Advanced Shape Primitives such as... Torus (Donut), Hyperboloid, Paraboloid, Bezier Patch, Height Fields (Mountains), Blobs, Quartics, Smooth Triangles (Phong shaded)
- \* Shapes can easily be combined to create new complex shapes. This feature is called Constructive Solid Geometry (CSG). POV-Ray supports unions, merges, intersections and differences in CSG.
- \* Objects are assigned materials called textures. (A texture describes the coloring and surface properties of a shape.)
- \* Built-in color patterns: Agate, Bozo, Checker, Granite, Gradient, Leopard, Mandel, Marble, Onion, Spotted, Radial, Wood and image file mapping.
- \* Built-in surface bump patterns: Bumps, Dents, Ripples, Waves, Wrinkles and mapping.
- \* Users can create their own textures or use pre-defined textures such as... Mirror, Metals like Chrome, Brass, Gold and Silver, Bright Blue Sky with Clouds, Sunset with Clouds, Sapphire Agate, Jade, Shiny, Brown Agate, Apocalypse, Blood Marble, Glass, Brown Onion, Pine Wood, Cherry Wood
- \* Combine textures using layering of semi-transparent textures or tile or material map files.
- \* Display preview of image while computing (not available on all computers)
- \* Halt rendering when part way through
- \* Continue rendering a halted partial scene later







## **Wavefront (\*.obj) Files**

Wavefront \*.obj files are ASCII files that represent a 3d model as a hierarchical set of groups. Each group is composed of polygons which are separated into vertices and faces.

WCVT2POV can both import and export this format.

There are a large number of freely available Wavefront \*.obj files. Look on the anonymous ftp site [avalon.chinalake.navy.mil](ftp://avalon.chinalake.navy.mil) under `pub/objects/obj` for a large variety of \*.obj files.

## **Neutral File Format (\*.nff)**

There are currently two (and probably more) dialects of Neutral File Format. This format was described in that late 80's by Eric Haines and is intended to be a minimal file format for raytracers. It includes light sources, cameras, polygons, and some primitive shapes. An extended version of \*.nff has been defined which is calls \*.enff or Extended Neutral File Format. WCVT2POV only support \*.nff files.

WCVT2POV can both import and export this format.



## **AutoCad (\*.dxf) Files**

DXF files are typically an ASCII format CAD file emitted from Autocad and several other CAD programs and tools. It is intended to be an interchange format for CAD program.

WCVT2POV can import a subset of this format and can export this format (as 3DFACES).

In reality, DXF is a kitchen sink containing both 2d and 3d elements. WCVT2POV only supports a subset of the 3d elements. This includes 3DFACES, and 3d poly-meshes.



## **RAW (\*.raw) File Format**

The RAW file format is imported and output from many interesting tools. The shareware modeller GUM can import RAW directly. RAW is a fairly primitive format that only supports the description of triangles. No color, or texture information is supported.

WCVT2POV can both import and export this format.



## **TPoly (\*.tpo) File Format**

This format is a slight variation of the RAW file format. There are several interesting TPOLY files on the anonymous ftp site [avalon.chinalake.navy.mil](ftp://avalon.chinalake.navy.mil).





## **AOFF (\*.geo) File Format**

This is another polygon file format that is found on the ftp site [avalon.chinalake.navy.mil](ftp://avalon.chinalake.navy.mil). There are several classic 3d models in this format including the Utah teapot, and VW bug available on the anonymous ftp site [avalon.chinalake.navy.mil](ftp://avalon.chinalake.navy.mil).

## **3D Studio (\*.3ds, \*.asc) File Format**

3D Studio is one of the most popular 3d modeling and rendering tool on the PC. There are literally hundreds (if not thousands) of freely available 3D studio models. Look on the anonymous ftp site [avalon.chinalake.navy.mil](ftp://avalon.chinalake.navy.mil) for tons of these files.

## **Pov SB (\*.psb) File Format**

PoVSB is a Windows based modeler for the Persistence of Vision Raytracer. The goal of PoVSB is to allow users of PoV to quickly and easily design scenes in the Windows environment with true camera preview of the scene so no guess work is involved. PoVSB is continually being enhanced and new features added.

## **Color & Textures Dialog**

The Color & Texture Dialog allows groups of polygons in the 3d object to have individual colors, textures, and smoothing properties to be assigned to them. The Group Name list contains the groups to available in the 3d object. By selecting a group in the list, you may change several properties of that group such as color, texture, and smoothing.

## **Smooth Group**

This check box selects that vertex normals will be emitted with the 3d polygons in this object. Currently only the Neutral File Format (\*.nff), and POVRay (\*.pov, \*.inc) file emitters can output vertex normals.

Vertex normals allow rendered images to be smoothed. This means that images rendered using this option will normally not show lines between polygons. This mode will significantly increase the size of the output file.

## **Floor**

Use this command to select the floor to be emitted in a POV-Ray V2.2 file, when the file is outputted. The possible selections are: No Floor, Black & White Checker, Jade, White Marble, Oak Wood, and Water. The offset is the depth with which the floor is placed. By default, the offset is the base of the current 3d object.

## **Sky**


Use this command to select the type of sky to be emitted in a POV-Ray V2.2 file, when the file is outputted. The possible selections are: No Sky, Blue Sky, Lightning Sky and Star Field. No Sky, is a black sky, Blue Sky is a blue sky with wispy clouds, Lightning Sky is a sky with what look like lightning bolts, and Star Field is a night sky with stars.



## **Print command**

Use this command to print a document. This command presents a Print Dialog Box, where you may specify the range of pages to be printed, the number of copies, the destination printer, and other printer setup options.

## **Shortcuts**

Toolbar:   
Keys: CTRL+P

**About command (Help menu)**

Use this command to display the copyright notice and version number of your copy of WCVT2POV.

