<< TOD plug-in document in English >>

Name
====
tod_i.kxp (3D Studio TOD plug-in)

VERSION
=======
version 4.0f (Dec 26, 1995)

- Sony Computer Entertainment makes no expressed or implied warranty of any kind with regard to these programs or to the supplemental documentation in this manual. In no even shall Sony Computer Entertainment be liable for incidental or consequential damages in connection with or arising out of this program or documentation. This disclaimer includes, but is not limited to, any loss of service, loss of business, or anticipatory profits, or consequential damages resulting from the use or operation of the enclosed software.

- 3D Studio is a trade mark of Autodesk Inc.

- PlayStation is a trade mark of Sony Computer Entertainment Inc.

FUNCTION
========
This program is a plug-in program for the Autodesk 3D Studio (3DS).

With this plug-in, you can save 3DS object or animation data in PlayStation format (RST ,TOD) while using 3DS. You can also preview animation while using 3DS by sending animation data to PlayStation board (DTL-H2000).

HISTORY
=======
Version 4.0f

[Bug fix]
1) Texture map UV value had been incorrect.

Version 4.0e

[Bug fix]
1) Dummy object's parent was not correctly saved into TOD file.

2) Texture UV was incorrect in some cases.

For instance, if a texture pixel size is w * h,
the correct UV range is, (0,0) to (h-1, w-1),
but, it the UV range had been (0,0) to (h,w).

3) TOD preview is now compiled with latest (version 3.*) library.

You have to re-install the previewer. Please read installation section.

Version 4.0d

[New features]
1) You can save hierarchy data into TOD file.

2) You can select RST (Rotation, Scale, Translation) packet type.

3) Load object from TOD plug-in dialog.

4) Save (and load) plug TOD plug-in parameters into TOD.INI file.

[Bug fix]
1) There was a bug in scaling objects.

Version 3.1
---
1) Object scale is converted to TOD data.

2) Some sample data (for instance, IK_*.3DS) could not be handled in version 2.1. This version can handle them.

3) You can preview or save animation without re-invoking the plug-in.

4) You can specify start and end frame of an animation to preview or save.

5) Objects with more than 10 textures could not be processed in version 2.1. This version can handle them.

6) In "Quick Preview" only TOD file is generated. TMD files are generated only once when you invoke "Preview".

7) You can save RSD file and TOD file independently.

Version 2.1
---
1) You can save camera animation data into TOD, and preview it.

2) You can save mesh objects in RSD files.

3) You can configure plug-in environment.

REQUIREMENT
==========
This plug-in runs only on 3DS R4.
In order to use previewer function, you also need DTL-H2000.

FILES
=====

This plug-in kit contains following files.

```
3dstod_e.txt  ... Document in English
3dstod_j.txt  ... Document in Japanese

tod_i.kxp     ... Plug-in module.
tod.ini       ... Configuration file sample.

psboard.ini   ... DTL-H2000 port address configuration file.
psbload.exe   ... Communication program between DTL-H2000 and PC
psreset.exe   ... Communication program between DTL-H2000 and PC
psrun.exe     ... Communication program between DTL-H2000 and PC

patchj.exe    ... DTL-H2000 patch program (Japanese version)
patchw.exe    ... DTL-H2000 patch program (non-Japanese version)

todvj.bat     ... TOD previewer batch file (Japanese version)
todvw.bat     ... TOD previewer batch file (non-Japanese version)
todview5.exe  ... TOD previewer
todview5.c    ... TOD previewer source code
```

If you use do not use the preview feature, you need only three files,
"tod_i.kxp", "tod.txt", and "tod.ini".

INSTALLATION
============

1) Copy plug-in module "tod_i.kxp" to the "process" directory in the 3DS home directory.

If you have installed your 3DS into "c:\3ds4", then you have to copy
"tod_i.kxp" to "c:\3ds4\process" directory.

2) Copy configuration file "tod.ini" into 3DS home directory.

If you do not use the TOD previewer, installation is complete.
If you do use TOD previewer, follow the installation steps below.

3) Copy "psboard.ini" to root directory "c:\".
This file specifies the port address of DTL-H2000.

If your DTL-H2000 card's port address is 0x1340, then the file must contain
a line as follows.

```
addr=0x1340
```

4) Copy all the following files to "c:\psxgraph\bin".

```
todvj.bat
todvw.bat
psbload.exe
psreset.exe
psrun.exe
```

patchj.exe
patchw.exe
todview5.exe

If you are using the Japanese version of DTL-H2000, you have to rename "todvj.bat" to "todv.bat".

If you are using the non-Japan-se version of DTL-H2000, you have to rename "todvw.bat" to "todv.bat".

You can change the location of these programs.
Please read the customization section.

5) Create working directory "c:\tmp" for the previewer.

You can change the working directory.
Please read the customization section.

Installation is complete.

Attention!!

The TOD previewer does not work properly if "DEXBIOS" is running on your PC. If you have one, you can delete them from PC memory as follows,

C:\> dexbios

If you see a message "Removing DEXBIOS" on the screen, then "DEXBIOS" is removed from memory.

Beware that, if you invoke the command when "DEXBIOS" is not running, this causes DEXBIOS to start.
In this case you have to invoke dexbios command again until you see the "Removing DEXBIOS" message on your screen.

How to start
==========
1) In the KeyFramer of 3DS, press "F12" key.

2) Select "TOD" from KXP plug-in list.

Previewer key bind
==========
The previewer's key bind is as follows.

L1, L2	• c Change BG color
SELECT	• c Pause
START	• c Reset Pause

You can proceed frame by frame, using SELECT key while you are in

the Pause mode.

FUNCTIONS
=========
scale:

Scales size of object size and translation of object/camera.

For instance, if you set scale value to 10.0, then the object size and translation of object and camera is expanded 10 times.

You can specify the scale value to control the object size. Also, you use this value to get rid of the near-clip, far-clip and z-sort problems, which will occur on PS.

Frames from:
to:

Specify regions of animation frames you want to preview or save.

You can use this function to extract some portion of animation, or to divide one animation to some peaces.

TOD type:

Specify TOD packet type.

Matrix ... MATRIX (Rotation Matrix + Translation)
RST ... RST (Rotation vector, Scale, Translation)

Animation will look same whether you chose Matrix or RST. RST data is converted to Matrix on PlayStation, therefore RST type TOD animation will consume much CPU power.

Hierarchy:

On ... Hierarchy relation of objects is saved.
Off ... Hierarchy relation of objects is not saved.

Animation will look same whether you chose On or Off. When you chose On, each object's animation data will be relative to its parent object. Whereas if you chose Off, the animation data will be relative to the WORLD.

You do not have to save hierarchy information as far as you play the TOD data. But, if you have to animate a body of a robot with you program, for example, hands and legs of the robot will be disconnected because they are not linked to the body. In such a case you should save hierarchy information in the TOD file.

In order to support hierarchy structure, dummy objects in 3DS will be saved

in TOD file. Dummy object will be represented as an object which has coordination data only (TMD is null).

Frames:

Thin down the frame data.

All ... saves all the frames
1/2 ... saved every 2 frames
1/3 ... saved every 3 frames
1/4 ... saved every 4 frames
1/5 ... saved every 5 frames

If you specify "1/4", then only frames "1,5,9,13,..." will be saved. This will make the TOD data size 1/4. You can interpolate between frames to reproduce the original animation sequence on PlayStation. You can use this method to reduce the size of TOD data.

The TOD previewer included in this tool, does not do interpolation. If the previewer finds some frames missing, then it will draw the previous frames again. For instance, if you had specified "1/3", then the frames will be like this.

TOD frames: 1, 4, 7, 10, ...
Drawn frames: 1,1,1,4,4,4,7,7,7,10, ...

Load obj:

Loads new 3DS file without exiting from TOD plug-in.

Preview:

Invokes animation previewer on DTL-H2000.

When you click this button, object data is saved as temporal RSD files. Then RSDLINK command converts the RSD files into one TMD file. Then, animation data is save as one TOD file. The TMD file and TOD file are transferred to DTL-H2000, where TOD previewer is invoked.

You can speed up the invocation of the previewer by placing the working directory (specified as TMP_DIR in TOD.INI file) in the RAMDRIVE of you PC.

Quick Preview:

Invokes animation previewer on DTL-H2000.

Only TOD file (animation data file) is generated. Instead of generating new TMD file (object data), previously generated TMD file found in (c:\tmp\tmp.tmd) is used for previewing.

Quick Preview is useful when you have finished editing objects and you are frequently changing animation data only. In such cases, you invoke "Previewer" only once, and you can invoke repeatedly "Quick Previewer" after that. This speeds up the previewing process, because "Quick Previewer" skips generating RSD files and TMD file.

In order to make object scale and animation scale reasonable, you have to set the scale value of "Preview" phase and the "Quick Preview" phase same. If you need to change the scale value, you have to invoke "Previewer" in order to save TMD file (object data) in the new scale.

Save RSD:

Object data is saved as RSD file.
Each object is saved as different RSD file.

System will ask "Generate File name automatically?".

If you choose "Yes", system asks you a base name which will be used to generate new file names. System adds hexadecimal 3 digit to the end of the base name. Therefore only first five letters are used as base name.

For instance, if you give "c:\psxgraph\data\rsd\mydata.rsd" as the base name, following RSD files will be generated automatically.

c:\psxgraph\data\rsd\mydat000.rsd
mydat001.rsd
mydat002.rsd
...
mydat00e.rsd
mydat00f.rsd
mydat010.rsd
...
mydatfff.rsd

The object names used in 3DS cannot be used as RSD files, because it can be longer than 8 letters.

TOD plug-in also generates PRJ file (in the case above,"mydata.prj"). Correspondence between object name and RSD file is specified in the project file.

If you choose "No", you have to give all the RSD file names.

You had better choose "Yes", except when you have to specify the file names by yourself.

[Material]
- 3DS material should be set as follows in order to generate Gouraud polygon in RSD file.

1) polygon is either, Gouraud, Phong, or meta.
2) at lease one of it edge is smooth.
which means that, it has at least same smoothing group with at lease one its adjacent polygons.

- "Diffuse color" in 3DS is converted into polygon color in RSD.

- "Non 0 transparency value" in 3DS is converted into semi-transparent polygon in RSD.

- Texture maps

1) Only the "texture 1" is converted to RSD.

2) Texture more than 256x256 can not correctly converted to RSD.

3) Tiling information is ignored.

4) Face map can be converted to RSD.

- Any other 3DS material information is ignored.

[!]
Each object is save as RSD format in local coordinate. The difference of each object from the origin of world coordinate is saved in TOD file. For instance, if you have created human body which consists of number of parts, and saved each parts as different RSD file, those RSD file objects does not represent the location of each part in the body. In order to take account in the location of each object, you can follow following method,

1) On PlayStation, specify each object's coordinate referring the TOD data.

2) On 3DS attach all the parts in one object.

TOD previewer is using the first method. Second method is valid only when each part of the body does not change the location each other.

Save TOD:

Keyframe animation data is save as TOD file.

When you have many animation data for one character, you only have to save object data (RSD file) only once, and save each animation as different TOD file.

LIMITATIONS
==========
1) Morphine data is not converted.

2) Information on lights is not converted.

3) Pivot:

3DS's pivot is interpreted as translation and transformation in TOD data. Therefor as far as you play the TOD data on PS, the animation on 3DS is correctly reproduced on PS. But, the data of "pivot" itself is not converted to TOD data. So you cannot animate an object according to its pivot from your program. For instance, if you place a pivot of a robot's arm to its shoulder point, and if you try to rotate the arm around the shoulder point, the arm will rotate around its local axis, not around the shoulder point.

You can use "dummy object" instead of pivot, to change the rotation axis.

4) Link information:

In 3DS, you can specify whether to propagate the rotation and scaling information from the parent object to the child object or not. On the other hand, PlayStation's library (libgs) always propagate those information from the parent to the child. Therefore, if you specify not to propagate any of those information on 3DS, the resultant TOD will not reproduce the same effect. To avoid those problems, you should not stop propagating the information from the parent to the child.

5) Scaling:

If the scale value exceed 8.0 on 3DS, it will not apply properly on PlayStation. It is because, PlayStation uses fix-point for the scale value. "8.0" is the maximum scaling value expressed in fix-point (4096 * 8). Notice that, in hierarchyly linked object, scale values are multiplied from all thorough it ancestors. So the scale value could exceed 8.0 even if its local scale is less than 8.0.

GENERATED FILES

TOD plug-in generates following files.

1) Preview
In temporally directory (c:\tmp),

RSD files
tmp.3ds
tmp.prj
tmp.tmd
tmp.tod

2) Quick Preview
In temporally directory (c:\tmp),

tmp.tod

3) Save RSD
In temporally directly (c:\tmp),

tmp.3ds

In user specified directory.

RSD files
PRJ file

4) Save TOD
In user specified directory.

TOD file

CUSTOMIZATION

The TOD plug-in invokes TOD previewer as follows.

```
c:\psxgraph\bin\todv  c:\tmp\__000__.tmd  c:\tmp\__000__.tod
```

The argument specifies an TOD file to preview. This file is created by
the TOD plug-in. You can substitute the previewer batch command "todv.bat"
with your own previewer.

INFORMATION

If you have any question on this program, please contact us (SCE).
It is useless to call Autodesk, because they do not take any charge of this
program.