



Release Notes

Version 3.7
for IRIX and Windows NT®

The *SOFTIMAGE 3D Release Notes* were written by Susan Duciaume and Suzanne Gerrior, edited by Edna Kruger, illustrated by Francois Giard, and layout done by Paul Verrall.

© Copyright 1988–1997 Microsoft Corporation. All rights reserved.

SOFTIMAGE® is a registered trademark of Softimage Inc., a wholly owned subsidiary of Microsoft Corporation, in the United States, Canada, and/or other countries.

Microsoft®, MS®, MS-DOS®, Windows®, and Windows NT® are registered trademarks of Microsoft Corporation in the United States and/or other countries.

All other trademarks belong to their respective owners and are hereby acknowledged.

This document is protected under copyright law. The contents of this document may not be copied or duplicated in any form, in whole or in part, without the express written permission of Microsoft Corporation. This document is supplied as a guide for SOFTIMAGE 3D products. Reasonable care has been taken in preparing the information it contains. However, this document may contain omissions, technical inaccuracies, or typographical errors. Microsoft Corporation does not accept responsibility of any kind for customers' losses due to the use of this document.

Document No. 98823-0597

Printed in Canada.

Table of Contents

What's New for Version 3.7	85
Introduction	87
Gifts and Tutorials	89
New Picture CD	89
New mental ray Shader Presets	89
New Custom Effects.	90
Additions to Example Databases.	90
HTML Documentation	90
Ray Rebels Has a New Name	90
CD Organization and Structure	91
The Interface	93
Information on Selected Objects in the Status Line	94
True Type Fonts	94
Shade View Mode	97
Camera Projection Planes (Asymmetrical Viewing Frustum).	103
Editing Lights Interactively	105
Editing Clipping Planes.	113
Swift Mouse Shortcuts	116
Displaying Swift Keys	118
Duplicating User Data from Custom Effects	118
Error Handling of SOFTIMAGE SDK Custom Effects	118
Blending NURBS Surfaces	120
How Does Blending Work?	120
Before You Begin.	121
Creating and Editing a Blend Surface	122
Surface Blending within Character Animation	127
Blending Surfaces Parameters.	129
Troubleshooting.	133
Animation	134
Midi Channel Driver	134
MidiOut Driver.	141
Function Curves for Persistent SOFTIMAGE SDK Custom Effects	142
Paint	144
Larger Viewing Area and Access to Paint	145

Interactive 3D	145
Paint Tool Supra Keys	146
Zoom, Select, and Colour Picking Supra Keys	146
Show Crop Option	147
Creating and Resizing Images	147
Selecting Textures by Raycasting	147
Selecting and Highlighting Multiple Polygons	148
UV Manipulation Options	149
Editing UV Coordinates and/or Vertex Colours	150
Painting with Textures or Vertex Colours.	153
Vertex Colours Preview Mode	154
Vertex Colour Painting and Tagging	155
Luma Option.	156
RGBA Channel Painting	156
Vertex Colours	157
Using Vertex Colours	157
Displaying Vertex Colours	158
Generating Vertex Colours	159
Texture Pre-lighting	162
Using Texture Pre-lighting.	163
How Texture Pre-lighting Is Calculated	164
Colour Reduction	166
Games Conversion and Viewer Tools.	167
Direct 3D X Converters	167
Exporting as VRML Files	171
Rendering	173
soft -R.	173
Lightning Volume Shader	174
Interactive Selection of Hosts (mental ray)	175
Special Case for Shader Developers Using IRIX 6.x.	176
mental ray Release Notes for Version 1.9	177
Conversion Tools/Standalones	179
Kodak Cineon Files	179
Improvements to imgconv.	180
Wavefront Export	181
Digital Disk Recorder Conversion Tools	182

C H A P T E R T H R E E

What's New for Version 3.7

Introduction

This chapter contains descriptions of all the new features of SOFTIMAGE 3D version 3.7 for the IRIX and Windows NT operating systems. They also contain an outline of bug fixes and some known problems and limitations for version 3.7 (see Chapter Four).

Here is a brief summary of what's new in version 3.7:

Gifts and Tutorials (see page 89)

- New Picture CD with copyright-free images to use.
- New SOFTIMAGE SDK custom effects.
- New mental ray shader presets.

Interface (see page 93)

- True Type fonts are now supported.
- The Shade view mode has been significantly enhanced.
- Two new light plug-ins called LightMaster and LightPalette for faster and interactive light editing.
- You can interactively change the clipping plane settings for the Front, Top, and Right windows.
- New Swift mouse shortcuts.
- The **Save → vrml** command is now the **Export → Objects → vrml** command in the Tools module.

Modelling (see page 120)

- The NURBS Blender plug-in lets you blend NURBS surfaces (unsupported gift).

Animation (see page 134)

- Improvements to the Midi channel driver.
- A new channel driver called MidiOut.
- Function curves available for SOFTIMAGE SDK custom effects

Materials and Textures (see page 144)

- Many improvements and additions to the Paint dialogue box.

- Vertex colours support: the new Generate Vertex Colours plug-in, three new options for it in the Paint dialogue box, and one new option in the Material dialogue box.
- A new texture pre-lighting plug-in that generates light information.
- Colour reduction can now generate a palette for a sequence.

Games Conversion and Viewer Tools (see page 167)

- Changes to the Direct 3D Export, Import, and Viewer tools.
- The **Save → vrml** command is now the **Export → Objects → vrml** command in the Tools module.

Rendering (see page 173)

- Improvements to the Lightning volume shader
- Two new command line options for the SOFTIMAGE rendering standalone (**soft -R**)
- New command called **Info → MentalHost** command in the Matter module for interactively selecting host rendering machines.
- Information for the mental ray shader developer using IRIX 6.x.

Conversion Tools/Standalones (see page 179)

- Support for Kodak Cineon files.
- **imgconv** now supports Kodak Cineon files, Targa 16-bit files, and has a new option.
- New command called **Export → Objects → WavefrontExport** in the Tools module.
- Three new standalones for converting to/from SOFTIMAGE 3D **.pic** files and frames on a Digital Disk Recorders.

Gifts and Tutorials

There is new material and a number of changes available on the CDs for SOFTIMAGE 3D version 3.7. These include:

- A new picture CD
- New mental ray shader presets
- New SOFTIMAGE SDK custom effects
- Additions to the examples databases
- Changes to the effects and examples HTML documents
- Ray Rebels name changed to 3D Extreme Custom Effects

Check the CD organization tables starting on page 91 to see what's on each CD for each platform (IRIX or Windows NT).

New Picture CD

There is a new, unnumbered picture CD that contains libraries of 420 new images in SOFTIMAGE 3D .pic format. These are furnished for your use without any copyright restriction.

Images with a “_t” file extension can be tiled to create simple texture maps. Some images have alpha channels for bump mapping, although this is not indicated by the file name.

On the picture CD, the PIC_LIB directory contains the following:

- SOFTIMAGE .pic files
- Corresponding JPEG files for HTML viewing
- A full set of icons that allow you to click and view the corresponding JPEG file.
- A **Welcome.htm** introductory document for the CD. Open this HTML file from your Web browser. Then follow the online instructions to select and access libraries and view pictures.

You can copy the appropriate .pic files to any location on your hard drive or access the CD directly from within SOFTIMAGE 3D.

New mental ray Shader Presets

There are 73 new shader presets for mental ray:

- 6 shaders for Material, Environment, and Atmosphere

- 25 shaders for 2D Texture (fabric)
- 15 shaders for 3D Texture (marble)
- 13 shaders for 3D Texture (rock)
- 13 shaders for 3D Texture (wood)
- 1 Particle Explosion effect

New Custom Effects

More than 30 new SOFTIMAGE SDK custom effects are included in SOFTIMAGE 3D version 3.7. They appear in directories under **3D/gifts/custom** on both platforms and are available as new menu commands in the Model, Motion, Matter, and Actor modules.

Additions to Example Databases

- The MR_Effects database includes three new scenes used to create the six new Material/Environment/Atmosphere shader presets. This database is found in **3D/gifts/mental ray** on both platforms.
- The Particle/PS_Effects_Library database includes one new particle system used to create the new Particle Explosion effect. This database is found in **3D/gifts** on both platforms.

HTML Documentation

The HTML online documentation for the effects has been updated:

- The existing *Effects_Overview* document has been updated to include the new mental ray shader presets previously mentioned.
- A new document called *SI_Example_Databases* describes the existing databases called SI_Animations, SI_DEMOS, and SI_Dynamics. Note that these databases have not changed, but they were not documented until this version.

Ray Rebels Has a New Name

The Ray Rebels custom effects from previous versions are now called *3D Extreme Effects* because they are available only with the SOFTIMAGE 3D Extreme package.

It is important to note this name when using tutorials in the existing documentation because these tutorials refer to scenes by the “Rebels” database name. Same scenes, same tutorials – just look under the **3D Extreme Effects** directory instead of **Rebels**.

CD Organization and Structure

The following tables show the overall structure and contents of CDs for SOFTIMAGE 3D version 3.7.

On IRIX

CD #	Contents
1	SOFTIMAGE 3D version 3.7 software FLEX/m version 5.0
2	FLEX/m version 5.0 3D/gifts/: Contains all gift databases including 3D Extreme Effects, formerly called Ray Rebels and 3D/gifts/HTML sub-directory with related documents <i>Effects_Overview</i> and <i>SI_Examples_Databases</i> in HTML format 3D/databases/: Contains <i>SI_Material</i>
3	Courseware components: - <i>3D_Learn</i> , a guided tour of SOFTIMAGE 3D v3.5 in HTML format - Quick Start and Workbook databases: Contain scenes used in tutorials in SOFTIMAGE 3D <i>Quick Start</i> and <i>Self-Training Workbook</i> Human_Project/: Contains the Human Express database and related HTML document SI_Effects/: Contains the SI_Effects and Ray Rebels databases also included in 3D/gifts/ on CD #2
4	Reference materials for SOFTIMAGE 3D v3.5 in HTML format: - <i>SOFTIMAGE 3D Reference Guide (3D_Reference)</i> - <i>Attributes (Attributes)</i> - <i>Channel Developer's Guide (Cdk)</i> - <i>Database Tools (dbtools)</i> - <i>DXF Reference Guide (Dxf)</i> - <i>IGES Reference Guide (Iges)</i> - <i>Standalones (Standalones)</i> Anim_Guide: Example scene for SI_Live (Ruby)
Picture CD (no number)	420 maps and images for use as texture maps Related HTML document: <i>Welcome.htm</i>

On Windows NT

CD #	Contents
1	SOFTIMAGE 3D version 3.7 software MR_Shaders, Video FLEXIm version 5.0 3D\gifts\: Contains all executables for custom effects provided as gifts 3D\databases\: Contains SI_Material Rainbow\: Contains dongle driver to install Microsoft Internet Explorer v1.5 and v3.0: in directories \ie15, \ie 30
2	Microsoft Internet Explorer, v1.5 and v3.0: in directories \ie15, \ie 30 3D\gifts\: Contains all databases related to gift custom effects including 3D Extreme Effects, formerly called Ray Rebels HTML\: Contains the following HTML documents <i>Effects_Overview</i> and <i>SI_Example_Databases</i> Courseware components: - <i>3D_Learn</i>, a guided tour of SOFTIMAGE in HTML format - Quick Start and Workbook databases: Contain scenes used in tutorials in SOFTIMAGE 3D <i>Quick Start</i> and <i>Self-Training Workbook</i> Human_Express: Contains databases on the Human Project, and related document in HTML format Reference materials for SOFTIMAGE 3D v3.51 in HTML format: - <i>SOFTIMAGE 3D Reference Guide (3D_Reference)</i> - <i>Attributes (Attributes)</i> - <i>Channel Developer's Guide (Cdk)</i> - <i>Database Tools (dbtools)</i> - <i>DXF Reference Guide (Dxf)</i> - <i>IGES Reference Guide (Iges)</i> - <i>Standalones (Standalones)</i> Anim_Guide: Example scene for SI_Live (Ruby)
Picture CD (no number)	420 images for use as texture maps Related HTML document: <i>Welcome.htm</i>

The Interface

The interface contains the following updates and new features:

- The status bar displays the name of the selected object (see *Information on Selected Objects in the Status Line* on page 94).
- True Type fonts are now supported (see *True Type Fonts* on page 94).
- The Shade view mode has been enhanced (see *Shade View Mode* on page 97).
- Additional information on setting camera projection planes to create an asymmetrical camera (see *Camera Projection Planes (Asymmetrical Viewing Frustum)* on page 103).
- Two new light plug-ins called LightMaster and LightPalette for faster and interactive light editing (see *Editing Lights Interactively* on page 105).
- Clipping planes can now be edited for each parallel projection window (see *Editing Clipping Planes* on page 113).
- New Swift mouse shortcuts (see *Swift Mouse Shortcuts* on page 116).
- Swift key shortcuts are now automatically displayed beside the menu commands (see *Displaying Swift Keys* on page 118).
- A small change in Duplicate Setup dialogue box (see *Duplicating User Data from Custom Effects* on page 118).
- A change in error handling for SOFTIMAGE SDK persistent custom effects, which allows easier error recovery in some situations (see *Error Handling of SOFTIMAGE SDK Custom Effects* on page 118).

Information on Selected Objects in the Status Line

When you use the space bar Supra key to select an object, the name of the selected object is now displayed in the status line. For example, in Single selection mode, the status line displays “Select Object: mycube1”

As long as the object is selected, pressing the space bar displays its name.

In Multi mode, the status line displays “Select Object Multi” plus the name of the last item selected. For example, if you use the space bar to select the object called “sphere2,” the status line displays “Select Object Multi: sphere2”

L: Toggle Node	M: Toggle Branch	R: Toggle Tree
User: francois Status : Select Object Multi: sphere2		

As you select more elements, the status line changes and displays the name of your last selection.

Note After you select multiple objects and release the space bar, the name of the (last) selection is lost. Thereafter, if you press the space bar, the status line reads only “Select Object Multi.”

If you select an entire tree or a branch, the name of the root is displayed, followed by [Br] for “Branch” selection:

Select Object Multi < *name_of_root_element* > [Br]

True Type Fonts

The Text dialogue box (Get → Text command) now displays a list of True Type fonts from which you can select. This means that Bitstream fonts are no longer supported. Furthermore, only True Type fonts for Windows are supported for both IRIX and Windows NT.

In addition to the default font set provided, you may also load any True Type fonts for Windows that you acquire. The associated character set is the ANSI character set shown in *Generate Character Set* on page 96.

Adding Your Own True Type Fonts

To add fonts in SOFTIMAGE 3D, place the .ttf or .TTF files in the directory indicated by the SI_FONTS environment variable, which is

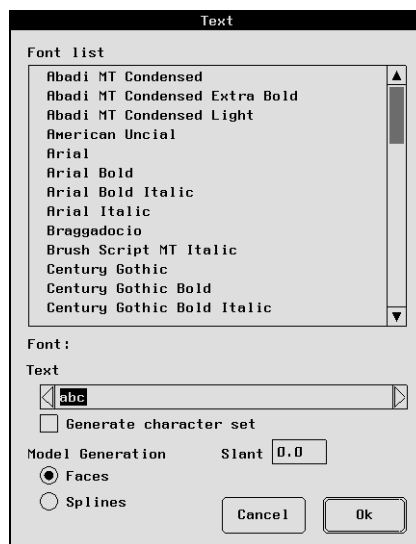
the location of the default set of .ttf/TTF files. Fonts in this directory are available only to SOFTIMAGE 3D.

When you add fonts on Windows NT, you can also make them available to all applications on the Windows NT machine by loading them into the **Control Panel → Fonts** list. In the SOFTIMAGE 3D Text dialogue box, Windows NT users can toggle between the SOFTIMAGE-specific font set and the Control Panel universal font set. For more information, see *Disk and Control Panel (on Windows NT Only)* on page 97.

For information on loading True Type fonts on Windows NT, please refer to the Windows NT manuals.

Creating and Editing Characters

1. Choose the **Get → Text** command to open the Text dialogue box.



2. Select the desired font in the **Font list**.

Windows NT users can toggle between the list of fonts available only within SOFTIMAGE 3D (**Disk option**), and those available within the **Control Panel → Fonts** list (**Control Panel option**).

3. To specify the exact text you want to generate, you can do any of the following:
 - Leave the default entry “abc” in the **Text** box.
 - Enter new text.

- Select the **Generate character set** option to generate the entire sample character set.
- 4. If you want to quickly preview the look of the text without generating faces, select the **Model Generation** ➔ **Splines** option.



If you select both **Splines** and **Generate character set**, you can quickly preview the entire character set for the specified font.

In **Spline** display mode, you can edit complex glyphs which may be excessively time-consuming or difficult to render. For example, you could edit the curves of a complex glyph to remove layers or shadows, or simply modify its shape generating a face from it.

To turn these custom glyphs into faces, use the **Draw** ➔ **Convert To Face** command in the Model module. Once you have generated faces from these edited curves, you can attach the holes as required using the **Draw** ➔ **Attach Hole** command.

- 5. After you click Ok to generate specified text or the entire character set, the mouse status line prompts you to use the middle-mouse button if you want to cancel this process. The last letter generated upon cancelling the process will be complete, but some “holes” may not be attached to the visible face.

New Text Parameters

The following new options are available in the Text dialogue box. All others are described in the existing SOFTIMAGE 3D documentation.

Generate Character Set

The **Generate character set** option lets you generate and view the entire default character set instead of viewing only the characters entered in the **Text** box. This can help you better judge the font's characteristics overall.

There are 94 characters, from ID 33 to 126 of the ANSI Character Codes chart:

!"#\$%&'()*+,-./0123456789;<=>

?@ABCDEFGHIJKLMNQRSTUvwxyz

[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

Model Generation

There are two **Model Generation** options:

- **Faces** generates the specified text or entire character set in Bezier faces. This is the default selection, and was the only method of generating text in previous versions of SOFTIMAGE 3D.
- **Splines** generates the specified text in Bezier splines (curves) instead of Bezier faces. This allows you to quickly preview fonts and more complex glyphs. If you are satisfied with the look of the fonts, you can then select the **Faces** option and regenerate the text or character set as faces.

Disk and Control Panel (on Windows NT Only)

The following two options allow you to toggle different lists of font files from which you can select:

- **Disk:** The list includes those fonts found in SOFTIMAGE 3D (in directory specified by the **SI_FONTS** environment variable). This option is selected by default.
- **Control Panel:** The list includes those fonts “loaded” on the system, as shown in **Control Panel ► Fonts** in the Windows NT interface. Fonts in the Control Panel font list are available to all applications on your Windows NT machine, not only those listed in the SOFTIMAGE 3D **SI_FONTS** directory.

Shade View Mode

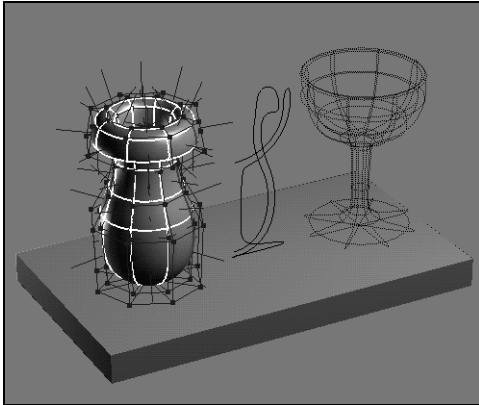
The Shade view mode has two new features: a new display mode which mixes wireframe and shade viewing, and a new option for optimizing editing points on shaded objects.

On IRIX only, there is also a new environment variable (**SI_SHADE_TEXTURE_NO_RELOAD**) you can optionally set to avoid unnecessary reloading of textures in certain circumstances using the Shade view. See *Optimization for Texture Loading (IRIX Only)* on page 102 for more information.

Mixing Wireframe and Shaded View Modes

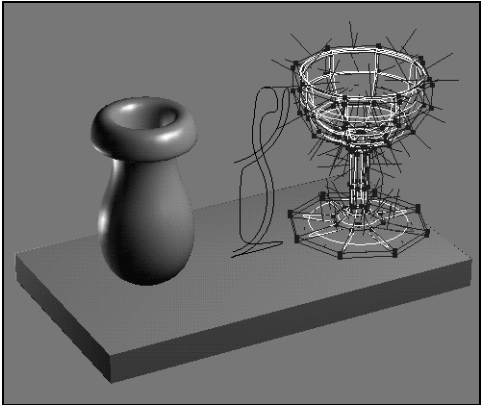
Most display options (show lines, points, tags, centres, etc.) which were previously available only in the Wireframe view mode are now available for objects in the Shade view mode.

In this display mode, you can show and manipulate points, lines, tagged points, and so on, on a selected shaded or ghosted object, as shown in the following illustration.



Selected shaded object has wireframe highlight

Unselected ghosted object



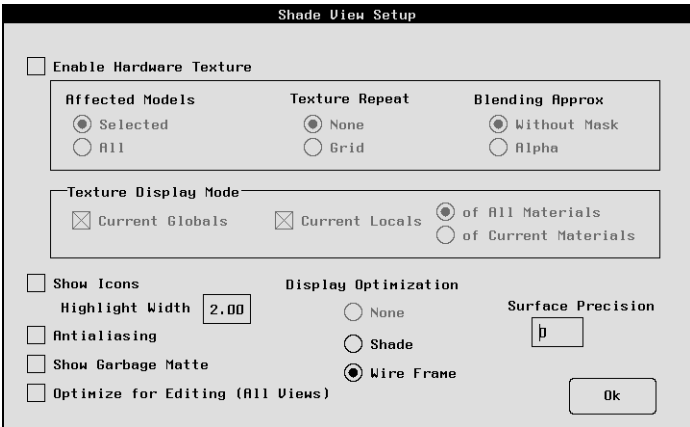
Unselected shaded object

Selected ghosted object is drawn in wireframe

The overall result of this display mode is that you can mix shaded and wireframe elements in the Shade view mode with the same direct manipulation of geometry for all objects.

To use the new display mode, follow these steps.

1. In any window, select Shade view and click **SETUP** in the window's title bar to display the Shade View Setup dialogue box.



2. Select the **Show Icons** option and click OK to exit the dialogue box.
3. In the **Show** menu, choose the commands that correspond to the elements you wish to display, such as **Points**, **Tags**, **Lines** (**Unselected**), and so on.

Note

This display mode does not include some elements in other menus such as **Skin → Envelope Assignment → Show Vertices**.

The elements that you selected to show in step 3 (lines, points, and so on) are displayed in wireframe over the currently selected object, whether the object is shaded or ghosted, and you can move and manipulate these elements directly. For a few limitations, see below.

Limitations

- Some operations cannot be previewed in this display mode. For example, when projecting NURBS curves onto NURBS surfaces, you cannot see the cyan blue line of projection, nor can you preview the projected curves on the surface.
- You can display all elements listed in the **Show** menu except links.

You can move points on shaded objects, but if you try to add new points to a polygon mesh object, be aware of the following problem. This problem occurs in all window views, shaded or not.

There is a problem with the **Edit → Add Point** command: when middle-clicking to add a point, you must click exactly on an edge or else the last modified point is displaced and is translated to the mouse cursor position instead of being added on the desired edge. (In the Perspective window, this displacement behaves as if you are in the Front window). To avoid this problem, use the **Polygon → Vertex** command to add points. This command works as advertised.

Setting the Highlight Width

The wireframe highlight and its behaviour are illustrated on page 98. The default width of this highlight is 2 pixels, but you can:

- Enter a different value in the **Show Icons → Highlight Width** text box (in the Shade View Setup dialogue box) to increase or decrease the width. To disable the highlight, enter 0.

- Change the default to something other than 2, as described next in *Changing the Default Highlight Width*.



For lines and ghosted objects, the highlight width is always one pixel. This is also true when **Display Optimization** → **Wire Frame** is selected. That is, while the mouse button is pressed down, the wireframe is one pixel wide; it returns to the width specified in **Highlight Width** when you release the mouse button.

The value in **Highlight Width** applies only to the current window and the value is saved with the scene.

There are some instances when it is useful to alter or disable the highlight:

- To better see the wireframe over the shaded object.
- When the geometry is heavy, drawing both the shaded and wireframe versions of the geometry takes too much time.
- When doing a channel run, you may not want to see the wireframe over a shaded object.

Changing the Default Highlight Width

To change the default width of the wireframe highlight to something other than 2, set the `SI_SHADE_HIGHLIGHT_WIDTH` environment variable with the desired value in the `.softimage` file (on IRIX) or the `setenv.bat` file (on Windows NT).

For more information on environment variables and how to edit them, refer to the *Installation Guide* for the appropriate platform.

Environment Variables for Drawing and Highlights

If you wish to use the new display mode but want additional control over the default drawing and highlight values, you can set the following environment variables to disable or adjust them. These variables do not affect other display modes.

To enable any of these environment variables, set them to any value, such as “1” or “on.” For example:

```
SI_SHADE_DISABLE_ OFFSET on
```

or

```
SI_SHADE_DISABLE_ OFFSET 1
```

On IRIX, all objects are shown with the wireframe highlight drawn slightly above the object to avoid a flicker problem. On Windows NT, the same offset is applied only to the wireframe highlight of polygon mesh objects.

- On IRIX only, if you are not satisfied with the display of the highlight, you can set the `SI_SHADE_DISABLE_OFFSET` variable to disable the default offset. Read about the `SI_SHADE_NOLIFT_POLYHIGHLIGHT` variable in the note below for more information.
- On Windows NT, to disable the offset from polygon mesh objects, you can set the `SI_SHADE_NOLIFT_POLYHIGHLIGHT` variable; in this case, you may experience the flicker problem.

Note

On IRIX, the highlight is still offset from polygon mesh objects even if the `SI_SHADE_DISABLE_OFFSET` variable is already set, so you can also set the `SI_SHADE_NOLIFT_POLYHIGHLIGHT` variable and get the same results as on Windows NT.

- `SI_SHADE_DISABLE_POLYSEL` disables the magenta highlight for selected polygons on shaded objects. This applies only to shaded objects, so selected polygons are still highlighted for ghosted or wireframe objects.
- `SI_SHADE_MONO_AXES` draws axes in black rather than in colour.
- `SI_SHADE_DISABLE_ANNOTATIONS` disables the drawing of points, tags, etc., but does not disable the wireframe highlight.

Optimization for Editing Points

Editing objects with heavy geometry in the Shade view mode can be slow. There is a new option in the Shade View Setup dialogue box called **Optimize for Editing (all views)** that provides better response time in this situation.

This option is deselected by default. Once selected, it is applied to all windows. This setting is saved with the scene.

To change the default so that it is selected, set the environment variable called `SI_SHADE_OPTIMIZE_EDITING` before starting SOFTIMAGE 3D. You can then select and deselect the option interactively in the Shade View Setup dialogue box.

Note

This option is really intended to optimize editing, not viewing. When activated, you will notice a slowdown in viewing operations (such as orbiting the camera). If you want to know why, read on.

Interaction with Speed of Viewing

By default, SOFTIMAGE 3D displays models by tessellating the geometry and displaying the triangles with their surface attributes, such as materials, textures, lights, and so on. A second operation constructs a tri-mesh version of the geometry as well as a hardware display list, which is used for high speed viewing.

When you edit the geometry, the object must be retessellated, but there is no need to generate the second, high-speed display list. This is why viewing slows down when you activate the **Optimize for Editing (all views)** option.

Optimization for Texture Loading (IRIX Only)

There are several instances in which textures are reloaded unnecessarily and slow down the performance time.

- If the scene includes objects with textures, and you switch from Shade to Wireframe view mode and back again, all textures are reloaded during the switch back to Shade view mode.
- If one of your window views is shaded and includes textures, and you maximize that view to a full screen display, all textures are reloaded. Furthermore, if you switch back to a normal display, textures are reloaded. In scenes with many textures, this slowed down performance significantly.
- If you have selected (in Shade View Setup) the **Enable Hardware Texture → Affected Models → Selected** option, textures are loaded for all objects instead of only for selected ones.

Version 3.7 introduces a workaround for the first two problems. These are currently available only on IRIX with the intention of generalizing the optimization later for Windows NT.

To solve the first two problems, you can set the environment variable **SI_SHADE_TEXTURE_NO_RELOAD** to any value, such as

SI_SHADE_TEXTURE_NO_RELOAD on

However, this variable does not solve the problem of textures being reloaded for all objects instead of only selected ones.

Camera Projection Planes (Asymmetrical Viewing Frustum)

To match real-world camera viewing with the camera in SOFTIMAGE 3D, the metaphor of a projection plane located some distance from the focal centre of the camera is used. By changing a camera's projection plane parameters, you can create an asymmetrical camera in SOFTIMAGE 3D. These projection plane parameters (such as distance, size, and offset) are available only in the Spreadsheet window.

Although being able to change the projection planes is *not* a new feature in version 3.7 (it was introduced in SOFTIMAGE 3D version 3.5 for IRIX and version 3.51 for Windows NT), the following information has been made available now and supplements the information found in the *Animating User's Guide* (page 270) and the *Reference Guide* (page 86).

A “normal” computer generated camera's viewing frustum is symmetrical; that is, if the field of view is n degrees, the top of the frustum is angled $n/2$ degrees up and the bottom is $n/2$ degrees down from the viewing direction. The horizontal angles of the frustum also share symmetry and can be determined based on the vertical field of view and the aspect ratio. An asymmetrical camera does not have these restrictions.

You can specify an asymmetrical camera in SOFTIMAGE 3D using a “projection plane” representation. That is, you can choose to specify the distance to an imaginary projection plane, as well as its size in X and Y and its offset from the viewing direction in X and Y. Note that even when you offset it, the imaginary view plane always remains *perpendicular* to your viewing direction.

Here are some ways in which you would use an asymmetrical camera.

Example 1

You are trying to model a real camera where the film (or the CCD, if it's a video camera) is not perfectly centred behind the lens. This is often the case when trying to match computer-generated images with real-world images.

Taking the example of a 35mm camera with a 50mm lens, the film (projection plane) size is 24 x 36mm (its aspect ratio is 1.5). However, suppose the film in your camera was offset by 1mm

horizontally and -0.5mm vertically from the true centre of projection of the lens. How would you model this accurately in SOFTIMAGE 3D? You first open the Spreadsheet window and do the appropriate query to get the Camera Projection Plane parameters (see page 86 in the *Reference Guide* for how to do this). Then set the following camera attributes:

- cmpdst (projection plane distance): 50
- cmpsxx (projection plane x size): 36
- cmpszy (projection plane y size): 24
- cmpofx (projection plane x offset): 1
- cmpofy (projection plane y offset): -0.5
- compact (proj. plane representation active): TRUE

Also be sure to set the aspect ratio (cmaspr) to 1.5 to match your projection plane's ratio.

Note that you can also do strange 2D squash and stretch effects by changing the projection plane's X and Y sizes relative to one another while keeping the viewport's aspect ratio fixed at some value. Offsetting the projection plane's position in this manner is *not* equivalent to slightly rotating the camera to compensate: the view direction does not change, only the frustum's shape does. If you choose the **Camera → Show Camera** and **Show → Cone (Unselected)** commands, you can see how the camera's viewing frustum changes when you change the values.

Another way to visualize an asymmetrical projection is to think of it as a subregion rendering of a larger image. Changing the X and Y offsets is equivalent to doing a 2D pan on the image (or moving the subregion around), and changing the X and Y size is equivalent to doing a 2D zoom on the image.

Example 2

Asymmetrical viewing frustums are also necessary to do correct stereo perspective projections. The typical "improvised" method of rotating the camera a bit to the right for the left eye and a bit to the left for the right eye provides an adequate approximation, but producing correct stereo projection images requires the use of asymmetrical frustums.

Editing Lights Interactively

Two new plug-ins – Light Master and Light Palette – have been created for faster, interactive editing of lights in a scene.

The ability to edit multiple lights and view the results interactively is a useful alternative to using the existing **Light → Edit** command, which allows you to edit only one light at a time and does not interactively show you the results.

Both new plug-ins are accessible from the **Light** menu in all modules except Tools. Their related dialogue boxes list all lights in the scene from which you can select one or more and edit their colour (all light types), fall off values (only Point and Spot lights), and cone and spread angle values (only Spot lights). The results are shown interactively in all window views in the Wireframe and Shade view modes.

To help you accurately assess the results of editing the lights, the Light Master and Light Palette plug-ins allow you to set the camera position and interest to that of the selected light. In the Perspective window view, you can then see the scene from the point of view of the selected light.

Light Master

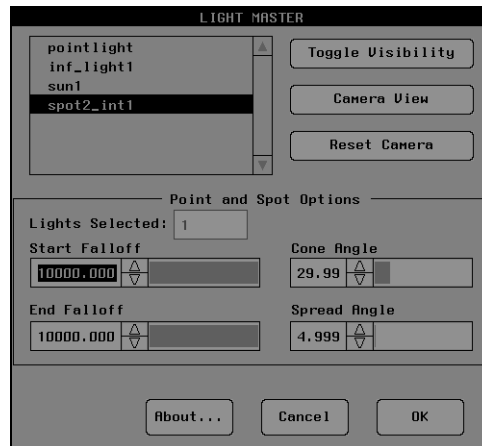
The Light Master plug-in is accessible from the **Light** menu in any module except Tools. In its dialogue box, all lights in the scene are listed and can be selected, but you can only edit the options that apply to Point and Spot lights:

- The **Start Falloff** and **End Falloff** options apply to Point and Spot lights.
- The **Cone Angle** and **Spread Angle** options apply only to Spot lights.



Before opening the Light Master plug-in, select the **Show Icons** option in the Shade View Setup dialogue box, and then choose the **Show → Cones** and **Show → Cones (Unselected)** menu commands to see the effects of your changes on Spot light cones interactively both in Wireframe view mode and in the enhanced Shade view mode (that is, with mixed shade and wireframe elements).

1. Choose the **Light → LightMaster** menu command. The Light Master dialogue box is displayed.

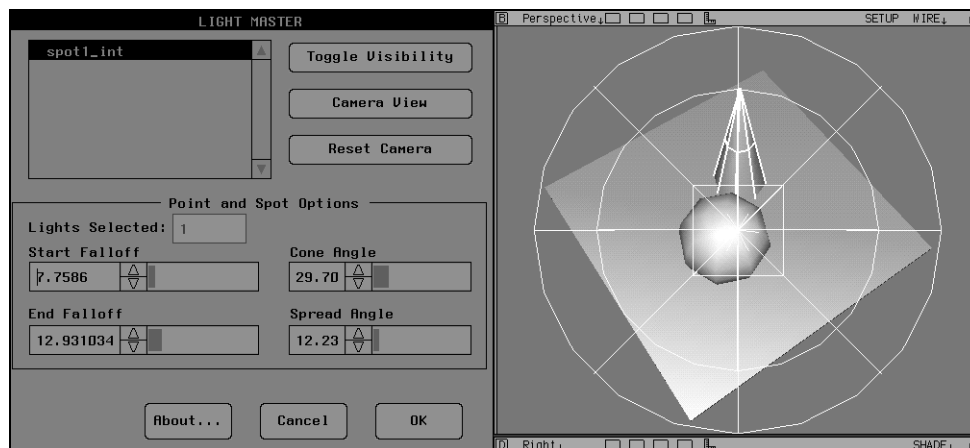


2. Click on a light in the list box to select it. To select more than one, press Shift while clicking.
 - The **Lights Selected** text box displays the number of lights currently selected.
 - If the selected light is a Point or a Spot, its **Start** and **End Falloff** values are displayed for the corresponding options.
 - If the selected light is a Spot, its **Cone** and **Spread Angle** values are also displayed for the appropriate options.
 - If more than one light is selected, the values displayed are those of the highest in the list order. If both Point and Spot lights are selected, the values displayed are those of the first Spot light in the list box.

In the Wireframe view mode, the cone(s) of the selected and unselected Spot lights are displayed, if you had chosen the **Show → Cones** and **Show → Cones (Unselected)** menu commands.

3. To hide or display selected lights, click **Toggle Visibility**.
4. To view the scene from the light's perspective, click **Camera View**.
 - If the selected light is not a Spot, the camera is simply repositioned to the light position.
 - If a Spot light is selected, the camera interest is moved to be the same as the selected light interest. In the Perspective window

view, the cone and spread angle are displayed; the camera focus includes both the cone and spread angles. The illustration below shows the **Camera View** setting, as seen in the enhanced Shade view mode described in the tip on page 105.

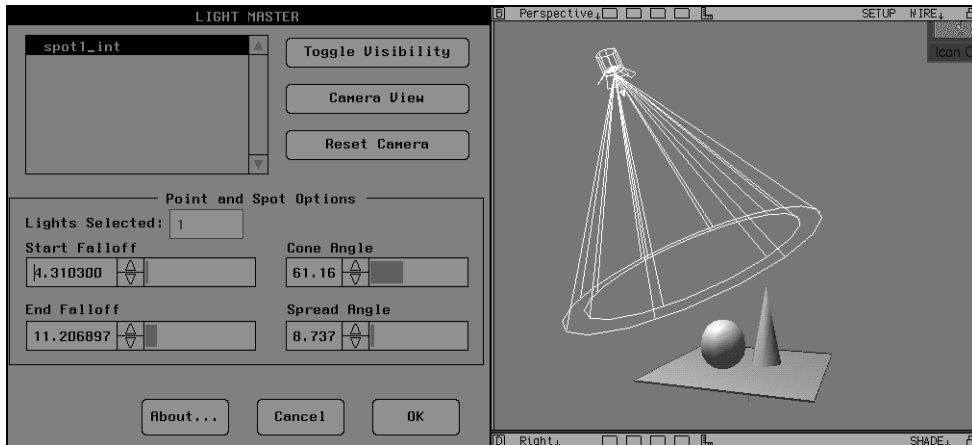


- If you select another light in the list, click **Camera View** again to update the camera view.
 - To reset the camera to its last position, click **Reset Camera**.
5. As you edit the values for each option, the values for all selected Spot and/or Point lights are updated and the results displayed in the window views.

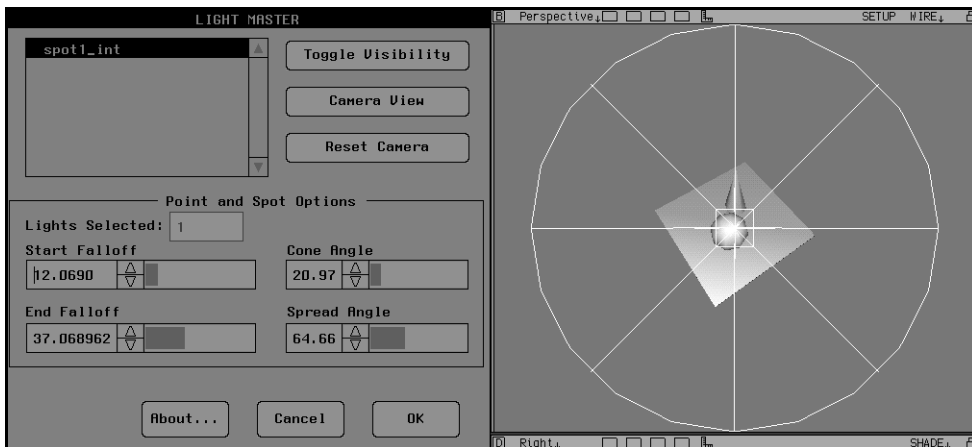
Note Verify your selection before editing because all selected lights are updated to the values you set.

If you selected a Sun or Infinite light and try to edit the Point and Spot Options options, a message is displayed warning you that at least one Spot or Point light must be selected.

6. If you modify the **Start Falloff** and **End Falloff** values, the cones of the selected lights are interactively updated in any window in the Wireframe view mode.

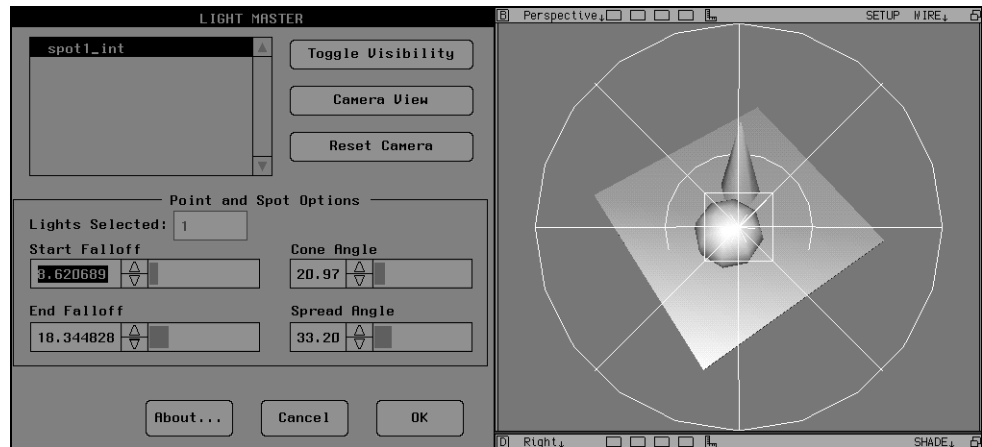


- If you modify the **Cone Angle** and **Spread Angle** values for a selected Spot light, the circles representing these are updated in the Perspective window view to show the effect of your modifications.
- If you are in **Camera View** mode, the camera focus is updated to include the cone angle plus the spread angle. As you edit these values, the camera zooms in or out as required.



Note

The visibility of the Cone and Spread Angle circles depends on the **End Falloff** value: if the falloff ends before the object, the circles are totally visible; if it ends behind a shaded object, all or part of the circles are obscured by the object.

**Parameters****List Box**

Lists all lights in the scene in the order in which they were created.

Toggle Visibility

Hides or unhides the selected lights. Lights remain in the toggled state when you exit the dialogue box.

Camera View

Allows you to view from the camera's perspective. When you select a spot light, the camera's position and interest is set to the spot light's position and interest. For all other lights, the camera position is moved to the light position, but the camera interest remains unchanged.

The camera focus is the cone angle plus the spread angle.

Reset Camera

Resets the camera to its last position.

Point and Spot Options

- **Lights Selected:** Displays the number of lights currently selected.

Useful for verifying your selection before applying the current slider values.

- **Start Falloff:** For point and spot lights only, specifies the point at which the light intensity start to decrease in all directions, measured in SOFTIMAGE units.
- **End Falloff:** For point and spot lights only, specifies the point at which the light intensity is no longer visible.
- **Cone Angle:** For spot lights only, sets the angle in degrees of the cone.
- **Spread Angle:** For spot lights only, sets the angle in degrees of the decreasing light around the spot light cone.

About

Displays a brief description of the Light Master effect.

Cancel

Closes the dialogue box without applying the settings.

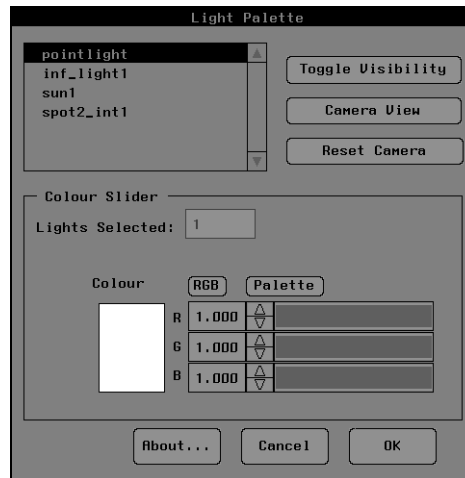
OK

Applies the settings and closes the dialogue box.

Light Palette

Using the Light Palette plug-in, you can edit the colour of selected lights of any type: Sun, Infinite, Point, and Spot.

When you choose the **Light → LightPalette** command in any module, the Light Palette dialogue box is displayed.



This dialogue box contains some of the same options as the Light Master dialogue box: a list box, **Toggle Visibility**, **Camera View**, **Reset Camera**, and **Lights Selected**. Their use is the same as described in the procedures for the Light Master plug-in on page 106.

1. Click on a light in the list box to select it. To select more than one, press the Shift key while clicking.

The **Lights Selected** text box displays the number of currently selected lights.

If more than one light is selected, the colour in the **Colour** box and its slider values are those of the selected light that appears highest in the list, whatever type of light it is.

2. Change the colour of your selection(s) using the sliders, or click the **Palette** button to select a new colour.
3. Click **Ok** to apply your changes or **Cancel** to exit the dialogue box without applying the changes.

Parameters

The **List Box**, **Toggle Visibility**, **Camera View**, and **Reset Camera** options are the same as described for the Light Master plug-in on page 109.

Colour Slider Options

- **Lights Selected** displays the number of lights currently selected. Useful for verifying your selection before applying the current slider values.
- **Colour Box and Sliders**: Three colour sliders (by default, these are R, G, and B) allow you set the colour for the selected lights using the sliders or by entering numerical values. The RGB button above the sliders toggles between the RGB, HLS, and HSV colour models. The **Colour** box displays the results.
- **Palette** displays the Palette dialogue box which allows you to use the system palettes for selecting and mixing colours.

About

Displays a brief description of the Light Palette effect.

Cancel

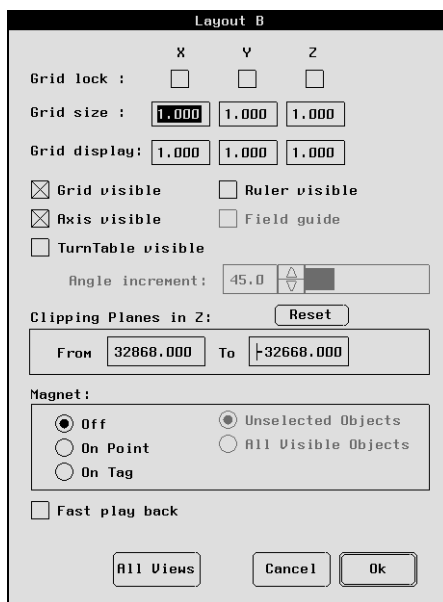
Closes the dialogue box without applying the settings.

OK

Applies the settings and closes the dialogue box.

Editing Clipping Planes

You can now interactively change the clipping plane settings for the Front, Top, and Right windows using a new option in the Layout dialogue box called **Clipping Planes**.



Editing the clipping planes allows you to model within a restricted area of a model or scene. For example, if you want to work only on the portion of the model or scene which lies between -1.0 and the 2.5 of the xy plane, open the Layout dialogue box in the Front window and specify these values in the **Clipping Planes in Z: From** and **To** text boxes.

Points outside the specified range for that area are not visible. Performing a draw or edit operation which moves the points outside the visible range makes them invisible.

Also, some drawing operations are normally performed at the origin (0, 0, 0) by default, such as when drawing curves and skeleton chains. If this default falls outside the visible area defined by the clipping plane settings, then the element is automatically drawn within the defined clipping plane area. For example, if the defined clipping plane in z is from 2 to 4, then a skeleton chain is drawn automatically at 2.1 in z.

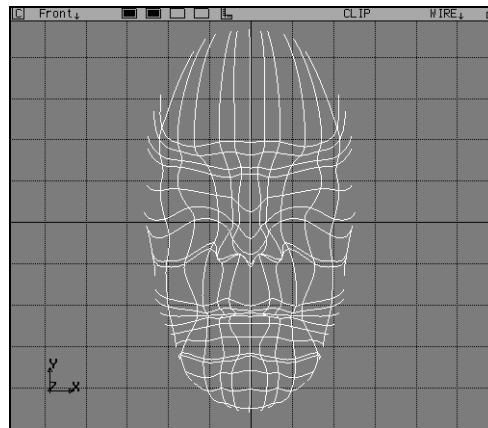
Setting Clipping Plane Values

1. Click on the Layout ruler in the Front, Top, or Right window title bar.
2. The Layout dialogue box is displayed and the **Clipping Planes** option is set to the axis appropriate for the current window. For example, in the Front window, you can set clipping values for z, whereas in the Top window, you can set clipping values in y.
3. In the Layout dialogue box, set the desired values for the **Clipping Planes** option by entering values in its **From** and **To** text boxes. For example, if you specify **From -4.0 To -2.0** or **From -2.0 To -4.0**, the result is the same.

Default values are **From 32868 To -32668**.

4. Click Ok to accept the changes for that window, or click **All Views** to apply them to all parallel projection windows.

Once you have defined clipping planes for a specific view, a **CLIP** option is displayed in the window's title bar indicating that clipping planes have been defined. You can also click on this option to quickly reset the clipping planes.



Clipping planes do not work well when the **TurnTable visible** option is selected. No warning is issued if you use them together.

Resetting the Values

There are three ways to reset the values to the default clipping plane values:

- In the Layout dialogue box, click the **Reset** button.
- Click on the **CLIP** option in the appropriate window title bar.
- Choose the **Camera → Reset** command. This resets clipping planes as well as the camera position.

Other Ways of Showing and Hiding Objects

Instead of setting a single global clipping plane for each window, you can also use expressions to show or hide objects depending on their position in space. You can:

- Define several smaller visible areas in the scene.
- Define slices in x in the Front window, for example, which would normally be defined only for z.

For more information, see the *Working with SOFTIMAGE 3D User's Guide* in the section called *Using Query Expressions to Define a Clipping Plane*. This is on page 91 for the IRIX version and page 88 for the Windows NT version.

Interaction with Other Window Settings

The **Clipping Plane** settings:

- Work with the **Fast play back** option. Note that when you change the **Clipping Planes** settings, you must reset using the Shift-r Supra key to see the difference reflected in your fast playback.
- Are valid for all combinations of windows and view modes: such as Top-Shade, Top-Matte, Top-Ghost, and so on.
- Are saved with the Setup file.
- Are remembered by the memo cameras; that is, you can define different **Clipping Plane** settings for each memo camera in each window.
- Are taken into account when using Depthcue, Hidden Line, Wireframe, Hardware, Ghost, or Rotoscope (Wire or Shade rendering in a parallel projection window. When you render using any of these techniques, you render what is between the specified clipping planes.

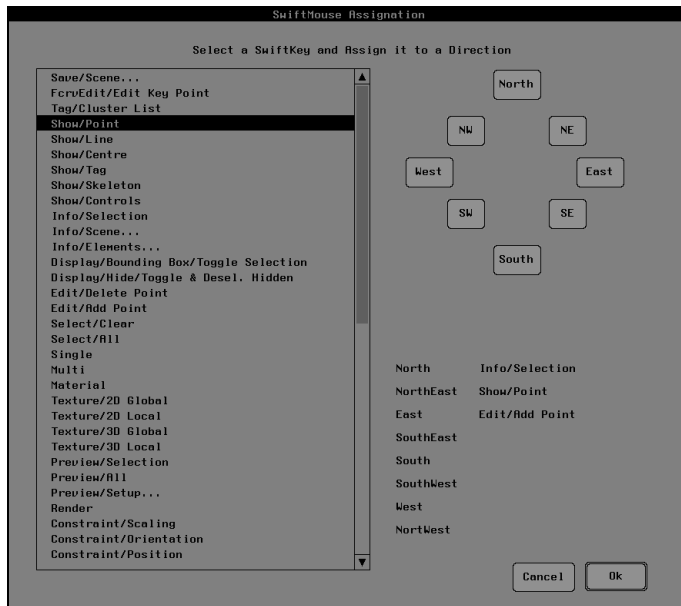
Swift Mouse Shortcuts

A Swift mouse shortcut is similar to a Swift key shortcut except that it is activated by moving the mouse (and the Alt key) rather than key combinations. You can map up to eight Swift mouse shortcuts to existing Swift keys.

For example, define the **North** mouse direction as a shortcut for the **Select All** command. Then while you work, pressing the Alt key and dragging the mouse in the northerly direction selects all objects in the scene.

Defining Swift Mouse Shortcuts

1. In any module except Tools, choose the **Info** ➔ **swiftmouse** command. The following dialogue box is displayed, listing currently active Swift keys on the left and eight buttons representing mouse directions in the upper right.



2. To define a Swift mouse shortcut, select a Swift key from the list on the left and click on the Swift mouse direction button you wish to associate with it (**North**, **South**, **NE**, etc.).



Leave at least one of the eight directions undefined. In this case, if you begin a Swift mouse action and change your mind before releasing the mouse button, you can cancel the

action by moving the mouse in any direction for which no shortcut is defined. For example, if NE is undefined, you can cancel an incomplete Swift mouse action by moving the mouse in the NE direction.

The Swift mouse shortcut is added to the list below the buttons. This shows all active Swift mouse settings.

Repeat this step for all Swift mouse definitions you want to make.

3. Click Ok to exit the dialogue box.
4. To use the Swift mouse shortcut, press the left or right Alt key and drag the mouse in the appropriate direction.

On IRIX, the status bar displays the action the Swift mouse will trigger upon release.

Saving the Settings

Swift mouse mappings are saved in the same `.sks` file where you save your Swift keys and Supra keys. This lets you load or save multiple settings.

Interaction with Other Settings

In the Supra Key dialogue box, the Alt key is mapped by default to be the Swiftmouse Trigger Key. If you want to map the Alt key as either a Supra key or Swift key shortcut, such as Alt = Exit or Alt = Select All, then you have to remap the Swift mouse Trigger Key to something else, such as Ctrl.

Limitations

- On Windows NT, while you are using the shortcut, the status bar does not display the action that the Swift mouse will trigger upon release.
- Swift mouse shortcuts are based on Swift keys and share the same conditions and limitations. For example, like Swift keys, some Swift mouse shortcuts can only be applied inside a specific module (Preview All can only be applied in the Matter module). There is one additional limitation with Swift mouse shortcuts: you can only map one key sequence to a Swift mouse shortcut, unlike Swift keys which can each have multiple keyboard shortcuts mapped.

Displaying Swift Keys

In previous versions, when you loaded a Swift key file at startup, Swift key shortcuts were still not displayed beside the menu commands until you chose the **Preferences → Keyboard Setup → Load** command. This limitation has been removed.

Duplicating User Data from Custom Effects

In previous versions, when you duplicated a model to which a DKit custom effect had been applied, the user data from the effect was copied onto the duplicate model. User data from other types of custom effects was not duplicated.

In this version, user data from any type of custom effect applied to a model can be copied to the duplicate. As a result, in the Duplicate Setup dialogue box (**Duplicate → Setup** command) the DKit **user data** button has been changed to **User data**.

Error Handling of SOFTIMAGE SDK Custom Effects

In previous versions, when a SOFTIMAGE SDK persistent custom effect used in a SOFTIMAGE 3D scene reported an error, the effect was usually deleted from the scene, whatever the cause of the error.

In version 3.7, such errors are handled differently. Once you have successfully invoked a persistent custom effect (meaning that you have accepted and closed any related dialogue box and picked any objects as prompted by the effect), SOFTIMAGE 3D reports any related error either in the status line or in the Status dialogue box, and the effect is disabled, but not deleted.

Depending on the cause of the error, you can choose whether to

- Delete the effect from the scene

or

- Attempt to fix the problem and reload the scene. This is useful when the error is not specifically related to the effect, such as when there are problems with a remote file system which the effect is trying to access.

For example, if the custom effect reports an error such as “Cannot access <file name>,” you can save the scene and fix the problem. When you reload the scene, the effect is automatically re-enabled and the scene includes all modifications up to the time of the error and the subsequent save.

Note

This behaviour applies only for persistent custom effects developed using SOFTIMAGE SDK. The effect is always re-enabled upon reloading the scene. Of course, if the problem has not been successfully fixed, the effect may become disabled again shortly.

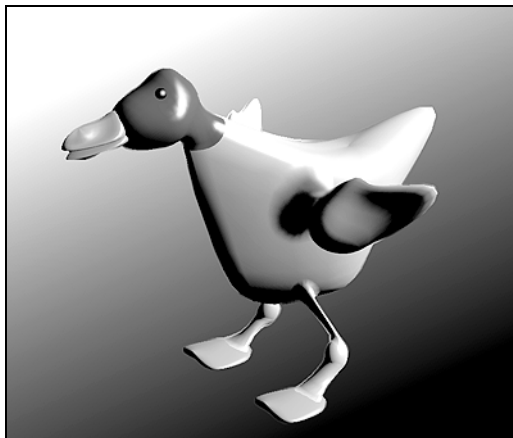
Blending NURBS Surfaces

The Blending custom effect allows you to create a new seamless blend between NURBS surfaces.

Note

This effect can be found in the 3D/gifts directory. This gift is provided freely “as is” and without any warranty or support. Softimage assumes no liability whatsoever and makes no representations in regard thereto.

Surface blending is an important tool for building seamless characters, such as when blending shoulders, fingers, and toes seamlessly to a body, or facial features to a head – or as in this example, blending wings and other duck extremities to its body!



Blending is also useful for building more realistic “architecture”, such as blending between cylindrical and planar surfaces to create the flange around the base of a water tower, or simply to create better rounding of intersections between models.

How Does Blending Work?

Blending is performed between selected NURBS curves on each NURBS surface using an interactive dialogue box for quick feedback. You can create further blends between the resulting blend surface and other NURBS surfaces.

The blend surface created by this operation is a separate object which can be independently transformed or deleted. After creating the blend, you can edit or animate the blend parameters using the Blending Surfaces dialogue box. Some changes in the blend surface can be applied only using relational modelling.

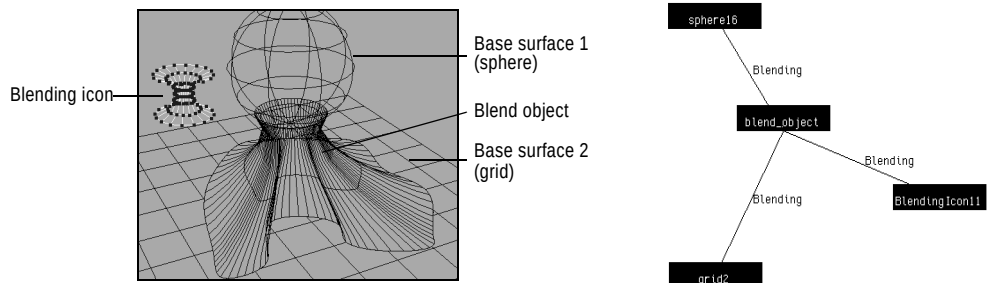
Before You Begin

Before you begin using the Blending custom effect, take note of the following information.

Default Relation between Base and Blend Surfaces

You can scale, rotate, or translate the blend surface independently without affecting the base surfaces.

As with any persistent custom effect, there is an inherent relation between the base surfaces and the resulting blend. If you look in the Schematic window (Model mode) after creating a blend, you will see the “Blending” relation between the base surfaces and the blend surface.



This means that any time you scale, rotate, or translate either of the base surfaces, the blend is updated and follows accordingly.

Typical of such relations, however, it will override your modifications in some cases. For example, if you have two spheres with trim or projected curves, create a blend between them, and then try to create a “blend off the blend,” you will lose the changes you made to the blend surface when you transform either of the original two spheres.



To avoid this problem, activate relational modelling at the appropriate time. For more information, read on!

Using Relational Modelling

It is often necessary to choose the **Preferences → Create Modelling Relation** command before creating a blend. Here are some examples:

- You may wish to use projected or trim curves as the base curves of the blend. You cannot directly edit projected or trim curves on surfaces, so if you think you may need to fine-tune the position or shape of such base curves, choose the **Preferences → Create**

Modelling Relation command *before* projecting the curves onto the base surface. After creating a blend between the curves, you will still be able to edit the original source curve, and in turn the projected (base) curve, and in turn the blend.

- The same applies when you are “blending off a blend.” Choose the **Preferences** ➔ **Create Modelling Relation** command *before* projecting the curve onto the blend surface. Otherwise, the projected curve on the blend will disappear when you transform any of the base surfaces.



Performance is slower when relational modelling is in effect. Some techniques for reducing this are included in *Surface Blending within Character Animation* on page 127.

For details on these modelling techniques, see *Relational Modelling* and *Modelling NURBS Surfaces with Projected Curves* in the *SOFTIMAGE 3D Modelling User's Guide*.

Creating and Editing a Blend Surface

The process of creating and editing a blend is described in detail in this section. As an overview, blending involves:

- Preparing the base NURBS curves surfaces (see page 122).
- Accessing the Blending effect icon (see page 123).
- Setting parameters in the interactive Blending Surfaces dialogue box and applying the result (see page 124).
- Editing the blend, if necessary (see page 126).

Preparing the Base Curves and Surfaces

1. Create two NURBS surfaces. These are referred to as the *base surfaces* (they need not be of the same degree).

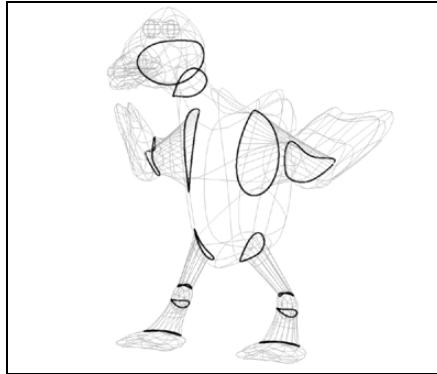
Blending is performed between curves on each surface, referred to as the *base curves*. These curves may be any combination of:

- Surface curves (any of the curves in the U or V surface direction)
- Projected curve
- Trim curves

Note

The base NURBS curves and surfaces may be linear, quadratic, cubic or any degree up to 24. The resulting blend surface is always of cubic degree in the V direction; the U direction may be linear or cubic, depending on whether you apply Curve fitting (see *Curve Fitting* on page 131).

This example highlights all base curves used for blending on the model. The base curves on each surface are projected curves.



2. Decide the type of base curves you wish to use: projected, trim, or surface curves.
3. Position the two base surfaces.

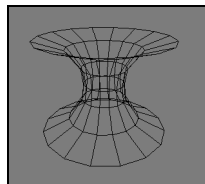
Tip

Remember to choose the **Preferences** → **Create Modelling Relation** command if you wish to be able to fine-tune the shape and position of the base (projected) curves later. For information, see *Using Relational Modelling* on page 121.

Accessing the Effect

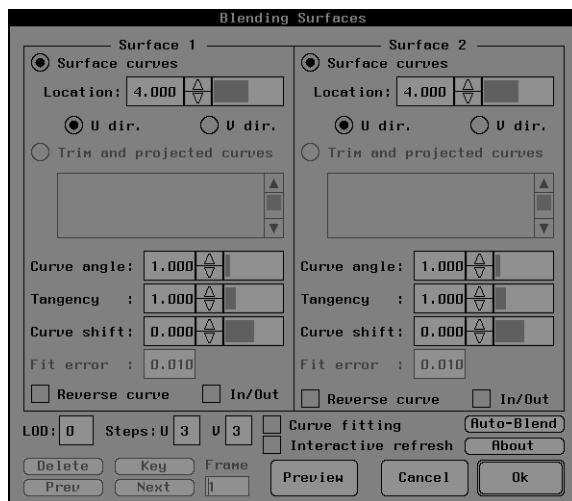
After preparing and positioning the base curves and surfaces, apply the blend as follows.

4. Choose the **Surface** → **Blending** command in the Model module. The Blending icon is displayed.



5. Pick each of the base surfaces by left-clicking them (follow the prompts in the status bar).

The Blending Surfaces dialogue box is displayed when the surfaces are picked.



This dialogue box contains identical blend parameters for each of the base surfaces which, in turn, affect the overall shape of the blend.

Perform the following steps to set parameters for blending. For detailed definitions of each parameter, see *Blending Surfaces Parameters* on page 129.

Choosing the Base Curves

6. For both **Surface 1** and **Surface 2**, choose the type and location of each base curve used for the blend. The selected curve is highlighted in magenta on the object.
 - **Surface curves:** Use the sliders or arrows to interactively choose the U or V location of the surface curve on the object.
 - **Trim and projected curves:** Choose the appropriate curve from the list box.

Setting Blend Parameters and Viewing the Results

The overall look of the blend surface is controlled by the settings (on each base surface) for the following parameters: **Curve angle**, **Tangency**, **Curve shift**, **In/Out**, and **Reverse curve**. These are controlled independently for each base surface.

7. To create the blend surface, you can do any of the following:
 - Use the default values for these parameters.
 - Click **Auto-Blend** to let the Blending effect calculate the “best guess” values. This is a good starting approach.
 - Adjust the parameter values manually, previewing and experimenting with combinations. While manual adjustments are often necessary for fine-tuning, it is not always a good idea until you are sure of the results. Try using **Auto-Blend** first.
8. To view the result, you can either:
 - Click **Preview** after each adjustment.or
 - Select the **Interactive refresh** option to see the result of all adjustments interactively. The refresh is slower with this option selected.
9. Based on the results, experiment with the other parameters to achieve the desired blend surface.

Tip

Here are some tips:

- If the result of the blend is a heavy blend surface, select **Curve fitting** to lighten the geometry, and use the default value for **Fit error** or enter a new one. For an example, see *Troubleshooting* on page 133.
- If interaction is slow, try entering a value other than 0 for the **LOD (Level of Detail)** option. See *LOD (Level of Detail)* on page 131 for more information.
- To resolve twisted or inverted blend surfaces, try reversing curve directions (select **Reverse curve**) or offsetting the beginning of a curve (select **Curve shift**). See *Troubleshooting* on page 133 for more information.
- To change the shape of the blend as it leaves the base surface, experiment with the **In/Out** option. Try experimenting also with **Tangency** and **Curve angle** settings, which specify respectively how far the blend follows the base surface and the angle of curvature as it leaves the base surface.
- To change the resolution of the blend surface, enter new values in **Steps: U** and **V** text boxes.

10. To exit the dialogue box before applying the blend, press Esc or click Cancel.
11. When satisfied with the result, click OK to exit the dialogue box.

Animating the Blend Parameters

After you click Ok, the animation commands (**Next**, **Previous**, **Delete**, **Key**, and **Frame**) become available the next time you open the dialogue box. You can animate the blend parameters interactively with the time line; you don't need to close the dialogue box. See *Next*, *Previous*, *Delete*, *Key*, and *Frame* on page 132 for more information.

Editing the Blend

The blend surface is a separate geometry from the base surfaces which you can scale, rotate, or translate independently.

To edit the parameters in the Blending Surfaces dialogue box:

1. Select the blending icon and choose **Effect → Custom → Edit Parameters** in the Model module to display the Blending Surfaces dialogue box.
2. Modify the parameters and click Ok to exit the dialogue box.

Using Relational Modelling

If you chose the **Preferences → Create Modelling Relation** command before applying the effect, you can modify the blend shape and/or position by modifying the original curve projected onto the base surfaces.

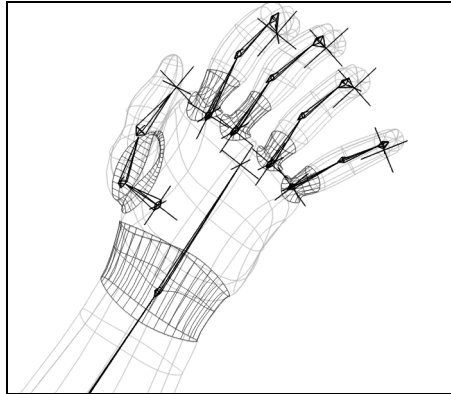
You can freeze the relational modelling at any time by selecting an object with a modelling relation, then choosing the **Effect → Freeze → Modelling Relation** command in the Model module. This removes the modelling relation between the object and its generator.

Freezing the Effect

To freeze the Blending custom effect, select the custom effect icon, and choose the **Effect → Custom → Freeze Effect** command in the Model module. Thereafter, the blend surface is unaffected by changes to the original surfaces. At the point when you freeze it, everything might look good; however, if you continue to animate or modify the shape of the model, it is usually difficult to retain a seamless blend because nothing is updated by the inherent relation any more.

Surface Blending within Character Animation

Blended models are very useful as skins for skeletons, as shown in the following illustration of the hand. The blending areas are shown where the thumb, fingers, and wrist are attached to the hand.



This section provides a few tips you may find useful when building and animating a character with a blended model.

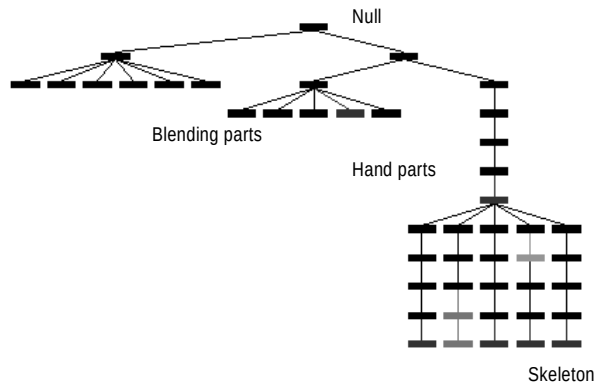
Tips on Building Hierarchies

Blend surfaces are animated and transformed automatically with their bases surfaces according to the inherent relation between them, as described in *Default Relation between Base and Blend Surfaces* on page 121. Therefore, it is not necessary to animate them specifically using an inverse kinematic (IK) chain.

When using a model as an envelope for an IK chain, it is preferable to:

- Apply the unblended model parts as an envelope to the chain *before* blending them to the main body part.
- Leave the blend surfaces outside the IK/envelope hierarchy as shown below. In this example, the top-level null connects the

character hierarchy and the blend in a way that allows proper animation and blending.



Tips for Animating

Some tips for animating blended models are:

- When animating simpler characters, you may want to include the blend while creating the animation in order to have real-time interaction with the blend.
- When animating complex characters, try animating the characters before blending. Interaction is faster and you can concentrate on the animation task.

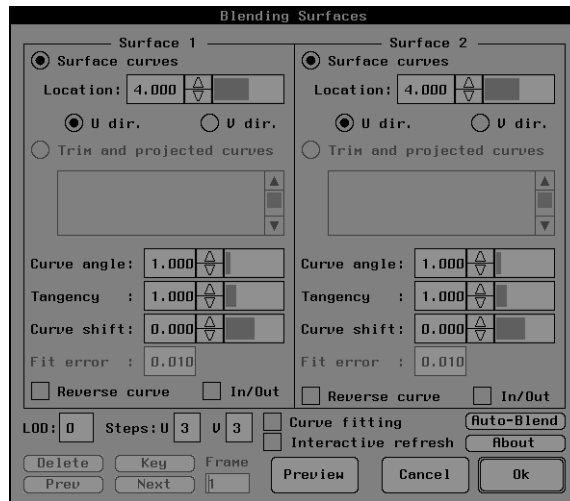
If you do this, however, you won't be able to see how the blend reacts during animation. If you anticipate problems, it may be a good idea to do a "stress test" by including the blend during a part of the animation you think may cause problems.

Texture Limitation

Textures on models with blending are not seamless: they tend to "slide" over the blend area. This is because SOFTIMAGE 3D does not currently support hierarchical textures.

Blending Surfaces Parameters

This section describes the parameters in the Blending Surfaces dialogue box.



Surface 1, Surface 2

The following parameters are identical for each of the base surfaces.

Surface curves, Location, U dir., V dir.

Allows you to select a surface curve (U or V isocurve) as the base curve for the blend. By default, **Surface curves** is selected and a U isocurve is highlighted in magenta on the object. Use the **Location**, **U dir.**, and **V dir.** parameters to choose the precise location of the surface curve.

Trim and Projected Curves

Allows you to select an existing trim or projected curve on the surface as the base curve for the blend. Choose the desired projected curve in the list box: your selection is highlighted on the base surface object.

Curve Angle

Specifies how sharply the blend surface bends away from the base curve on the associated base surface. Larger values cause the blend surface to bend more sharply. The slider range is from 0.010 to 10, with a default of 1, but you can type in numbers higher than 10.

The relative smoothness of the blend is also controlled by the **Tangency** option.

Tangency

Specifies how far the blend surface follows the base surface along the length of the tangent to the surface direction. The distance is expressed in SOFTIMAGE units.

The slider range is from 0 to 5, with a default of 1. Larger values cause the blend surface to mold itself more to the base surface along a greater distance. This produces a progressively smoother, flatter blend to the surface.

Such flatness is also controlled by the **Curve angle** option.

Curve Shift

Offsets the beginning of the base curve to avoid twisted blend surfaces. This option is similar to the **Effect → Curve Controls** command except that the slider values are expressed as positive or negative percentage values rather than in number of points. For example, you can shift the start of the selected curve by 6% or -6%, etc.

Fit Error

If **Curve fitting** is selected, **Fit error** specifies the error tolerance permitted in fitting a cubic curve to the linear samples of the base curve, which determines the closeness of the fit.

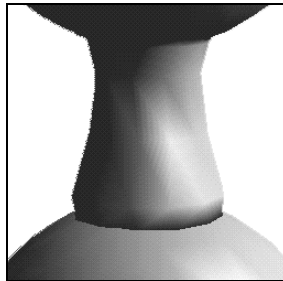
The default is 0.01.

In/Out

Each surface curve of the blend surface that goes from one base surface to the other intersects the base curves at approximately 90 degrees. At each point of intersection, there are two vectors: one is the tangent of the base curve at that point and the other is perpendicular to the tangent.

The **In/Out** option lets you toggle the direction of this perpendicular vector inward or outward with the result that the blend either

smoothly continues the base surface or billows out to join the base surface in a cusp.



Here the blend smoothly continues the base surface.

Here the blend billows out from the base surface.

To control the size of this “in/out” effect, set the **Tangency** and/or **Curve angle** values.

Reverse Curve

Reverses the direction of the associated base curve. This can resolve the problem of a “twisted” blend surface.

LOD (Level of Detail)

This is an optimization option which is accessible at any time. **LOD** allows you to specify a curve step for the base curves. By entering a value other than 0, you override the usual curve sampling.

Values between 4 and 9 give a fairly crude appearance to the blend surface, but allow fast interaction. Values higher than 10 achieve a smooth appearance while still maintaining fast interaction.

Values as high as 100 to 200 achieve high resolution.

Steps: U and V

For the blend surface, this option specifies the number of steps in U and V.

Curve Fitting

The blend operation uses linear samples to match the shape of base curves, which can result in a heavy blend surface.

If **Curve fitting** is selected, the blend operation fits cubic curves to the sample data, using the **Fit error** option value as a guideline for the closeness of the curve fitting. While curve fitting considerably reduces the number of control points in the blend surface, interaction with the model can be significantly slower due to the

related calculations. You can improve interaction by changing the LOD (Level of Detail) value.

Interactive Refresh

Displays the result interactively when you change parameter values. The refresh is slower if this option is selected.

About

Provides a brief summary of the Blending Surfaces custom effect.

Auto-Blend

Automatically applies the “best guess” values for the **Curve angle**, **Tangency**, **Curve shift**, **In/Out**, or **Reverse curve** options.

The **Auto-Blend** option is useful as a first try at the blend. Based on the results, you can adjust one or more of the values. However, if you adjust any of the values, clicking **Auto-Blend** will override them and simply reapply the best guess values.

Next, Previous, Delete, Key, and Frame

These options are available only after you have set initial parameters and clicked Ok. To reaccess the dialogue box, select the blending icon and choose the **Effect → Custom → Edit Parameters** command.

You can then use the dialogue box interactively with the time line to keyframe the result. You can create, delete, and edit keyframes without having to exit the dialogue box again.

- **Next** advances to the next keyframe.
- **Previous** returns to the previous keyframe.
- **Delete** removes a keyframe.
- **Key** sets a keyframe at the frame specified in the **Frame** text box.

Preview

Displays the result of the parameter changes only when you click this button (if **Interactive refresh** is not selected).

Cancel

Exits the dialogue box without applying the settings.

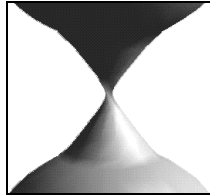
OK

Applies the settings and exits the dialogue box.

Troubleshooting

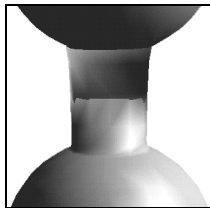
The following illustrations show some common blending problems and their solutions.

Problem: The blend surface is twisted.



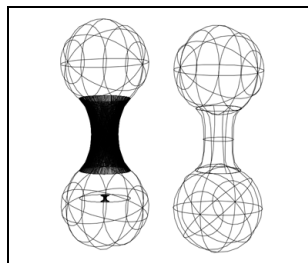
Solution: Try using the **Curve shift** option for one of the base curves and viewing the result.

Problem: The normals of the blend surface are inverted.



Solution: Try reversing one of the base curves by selecting the **Reverse curve** option.

Problem: The geometry of the blend surface is extremely heavy.



Blending with
Curve fitting off

Blending with
Curve fitting on

Solution: Select the **Curve fitting** option.

Animation

This section includes a description of:

- Improvements to the Midi channel driver
- A new channel driver called MidiOut (see page 141).
- Function curves for SOFTIMAGE SDK custom effects (see page 142).

Midi Channel Driver

MIDI (Musical Instrument Digital Interface) is commonly used by musicians to generate music on various instruments, and can easily be used by animators to generate animation in SOFTIMAGE 3D. It makes use of MIDI controllers such as keyboards, sliders, and switches. Some of these generate discrete events, such as those generated by pressing or releasing MIDI keyboard keys or turning MIDI switches on or off. Others generate events of a continuous type, such as those generated by sliders and the “pitchbender.”

Altogether, the MIDI specification defines 256 possible types of events. For those unfamiliar with MIDI, here is a simplified description of these events:

- MIDI keyboard note messages account for 128 event types.
- MIDI continuous controllers account for 64 event types. These controllers can be either 7-bit or 14-bit.
 - A 7-bit controller generates one event when its value changes.
 - A 14-bit controller generates two events because there is more information to transmit.

Because of the varying number of events associated with the controllers, your MIDI device can have 32 7-bit controllers or 64 7-bit controllers, or 32 14-bit controllers.

These potential 64 controller events can be classified in two sub-types: the first 32 controller events are called the MSB events (Most Significant Byte), and the last 32 are called LSB events (Least Significant Byte). As the names suggest, the MSB events carry the most important information (the coarsest level of detail) from any controller while the LSB events carry the finest level of detail.

A 7-bit controller sends only MSB events; 14-bit controllers can send MSB and/or LSB events. Some programmable MIDI

controllers allow you to use MSB and LSB events independently, giving 64 DOFs (degrees of freedom) in SOFTIMAGE 3D.

- MIDI switches account for 32 event types. (Switches are also classified as continuous controllers.)
- MIDI system messages account for the last 32 events, but these are not yet available in the Midi channel driver in SOFTIMAGE 3D.

What's New for the Midi Driver?

In previous versions of SOFTIMAGE 3D, the Midi driver understood only MIDI note messages; in other words, you could only animate objects using a device such as a MIDI keyboard.

In this version, the Midi driver also understands information from continuous controllers, switches, and a pitchbender. Objects in your scene can now respond to this type of MIDI input. By acquiring inexpensive MIDI equipment and hooking it up to SOFTIMAGE 3D, you can achieve animation quite easily using channels.

Also, the Midi driver now works on Windows NT.

Degrees of Freedom

Each channel driver gives you a named set of channels in the Channels List in the Channel Setup dialogue box. Each named channel represents a degree of freedom (DOF) for the device, such as mousepos and mouseypos for the x and y position of the mouse.

In previous versions, the degrees of freedom associated with MIDI notes looked like this:

midi.C0 (if C and Octave 0 were selected)
midi.Db6 (if DB, Octave 6)
midi.F17 (F, Octave 17)

This is the new naming convention for the degrees of freedom associated with controllers and switches:

midi.cXX (for controllers)
midi.sXX (for switches)
midi.PitchBender (for pitchbender)

The remaining characters are numbers, indexed to event types. When the name of the specific controller has been generally agreed upon by the MIDI community, this name is appended, such as midi.c01_ModWheel.

Using the Midi Driver

1. To connect the MIDI interface to SOFTIMAGE and activate the Midi channel driver, follow steps 1 to 4 on page A-25, Appendix A of the SOFTIMAGE 3D *Reference Guide*.

The Midi Channel Driver dialogue box is displayed.

Midi Channel Driver

☒ Active ☐ Debug ☒ Flush Events

☐ Controllers ☒ MSB ☐ Both ☐ LSB ☐ Combine ☐ PitchBender ☐ Switches ☒ Normalize

MIDI Channel Number (0 for all channels) **1**

MIDI Port ☒ Default ☐ Specify

	A	Bb	B	C	Db	D	Eb	E	F	Gb	G	Ab
Octave 00				☐ 0	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	☐ 8
Octave 0	☐ 9	☐ 10	☐ 11	☐ 12	☐ 13	☐ 14	☐ 15	☐ 16	☐ 17	☐ 18	☐ 19	☐ 20
Octave 1	☐ 21	☐ 22	☐ 23	☐ 24	☐ 25	☐ 26	☐ 27	☐ 28	☐ 29	☐ 30	☐ 31	☐ 32
Octave 2	☐ 33	☐ 34	☐ 35	☐ 36	☐ 37	☐ 38	☐ 39	☐ 40	☐ 41	☐ 42	☐ 43	☐ 44
Octave 3	☐ 45	☐ 46	☐ 47	☐ 48	☐ 49	☐ 50	☐ 51	☐ 52	☐ 53	☐ 54	☐ 55	☐ 56
Octave 4	☐ 57	☐ 58	☐ 59	☐ 60	☐ 61	☐ 62	☐ 63	☐ 64	☐ 65	☐ 66	☐ 67	☐ 68
Octave 5	☐ 69	☐ 70	☐ 71	☐ 72	☐ 73	☐ 74	☐ 75	☐ 76	☐ 77	☐ 78	☐ 79	☐ 80
Octave 6	☐ 81	☐ 82	☐ 83	☐ 84	☐ 85	☐ 86	☐ 87	☐ 88	☐ 89	☐ 90	☐ 91	☐ 92
Octave 7	☐ 93	☐ 94	☐ 95	☐ 96	☐ 97	☐ 98	☐ 99	☐ 100	☐ 101	☐ 102	☐ 103	☐ 104
Octave 8	☐ 105	☐ 106	☐ 107	☐ 108	☐ 109	☐ 110	☐ 111	☐ 112	☐ 113	☐ 114	☐ 115	☐ 116
Octave 9	☐ 117	☐ 118	☐ 119	☐ 120	☐ 121	☐ 122	☐ 123	☐ 124	☐ 125	☐ 126	☐ 127	

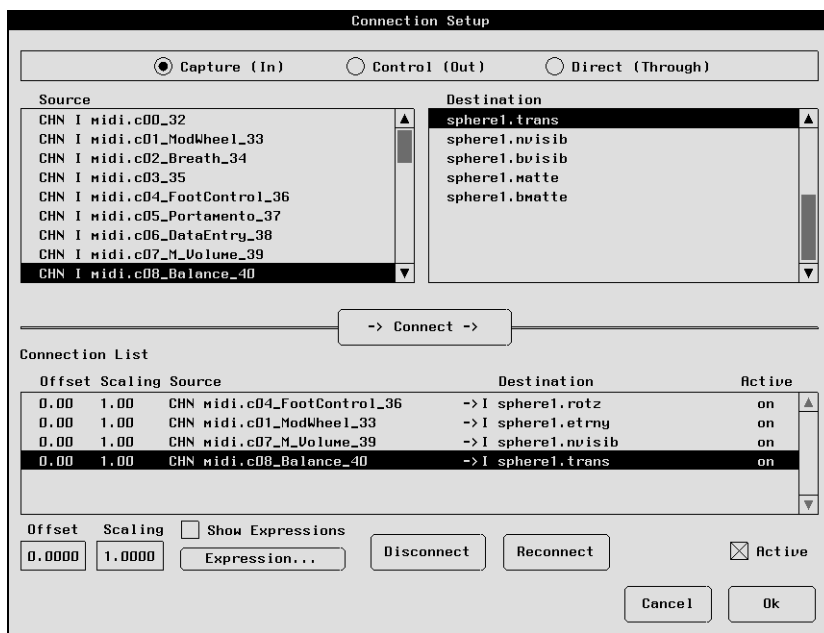
☒ Not velocity sensitive ☐ Velocity sensitive ☐ Both

Global Attack Time (sec) **1.0000**
Global Delay Time (sec) **1.0000**
Global Decay Time (sec) **1.0000**

Cancel **Ok**

2. Select one or more types of input: Controllers, Switches, and Pitchbender (and notes, as before).
3. Select one the processing options: **MSB**, **LSB**, **Both**, or **Combine**.
4. Select or deselect **Normalize**, depending on how you wish to scale the value of input.
5. In the Connection Setup dialogue box (**Channel** → **Connection Setup** command):
 - Select the relevant degree(s) of freedom in **Source**.
 - Select the appropriate fcurve(s) for the selected object in **Destination**.

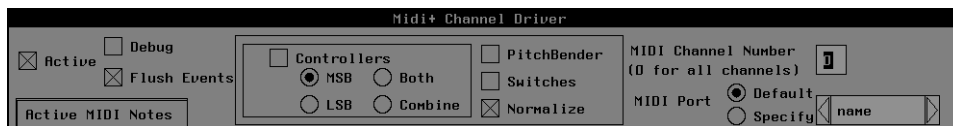
- Click the -> Connect -> button.



- Choose the **Channel → Channel Run → Sequence I/O** command to start a channel run and keyframe to record moves.
- During the channel run, moving the physical slider on the MIDI interface that relates to the degree of freedom moves the object in SOFTIMAGE 3D.
- Create keyframes using the middle mouse button. If the scene has lots of connection points, you may need to hold down the middle mouse button for several seconds for the keyframes to be saved properly.

New Midi Parameters

The following are descriptions of only new parameters in the Midi Channel Driver dialogue box.



Controllers

With this option, the Midi driver can interpret events from the controllers supported by the MIDI specification. A 7-bit controller can send its data within a single event; a 14-bit controller requires two separate events (MSB and LSB) to send all of its information.

Note

For information on the resolution of the controllers on your MIDI device, see the documentation for the device.

Select one of the processing options below.

- **MSB:** The driver listens only to the Most Significant Byte events from the controllers. This gives you access to controllers 0 to 31 in 7-bit resolution. In the channels list, there are 32 degrees of freedom listed, named as follows:

midi.c00, midi.c01, ... midi.c31

For more information on MSB events, refer to *Midi Channel Driver* on page 134.

- **LSB:** The driver listens only to the Least Significant Byte events from the controllers. This gives you access to controllers 32 to 63 in 7-bit resolution. In the channels list, there are 32 related degrees of freedom, named as follows:

midi.Lc00_32, midi.Lc01_33, ...midi.Lc31_63

For more information on LSB events, see *Midi Channel Driver* on page 134.

- **Both:** The driver listens to MSB and LSB events from controllers, but does not combine the values of both events for you. You can combine the MSB and LSB information manually, such as by using an expression. In the channels list, there are 64 DOFs (degrees of freedom), named as follows:

midi.Mc00 to midi.Mc31

midi.Lc00_32 to midi.Lc31_63 (indicating this is the first LSB event and it is indexed to controller event type 32)

Note

Some programmable MIDI controllers allow you to use MSB and LSB events separately, giving 64 DOFs from 64 controllers in SOFTIMAGE 3D. If you are not sure whether your device is 7-bit or 14-bit, select the **Combine** option.

- **Combine:** Combines any LSB and MSB events into one value. The result is 32 DOFs (either a 7-bit or a 14-bit number, depending on your device).

Pitchbender

Creates one degree of freedom called Pitchbender. This is always 14-bit and mirrors the value of the pitch bend wheel.

If **Normalize** is also selected, this degree of freedom has values between 0 and 1. If **Normalize** is deselected, the values are between 0 and 16383.

Switches

Allows the driver to interpret events from any of the 32 switches supported by MIDI. When there is a generally accepted name for the switch, that name is used as the degree of freedom in the list.

Switches can only be on or off.

If **Normalize** is also selected, the values for the switch are 0 for off and 1 for on. If **Normalize** is deselected, the values for the switch are 0 for off and 127 for on.

Normalize

Scales values for the degree of freedom of all 7-bit and 14-bit controllers to a range between 0 and 1. If deselected, this value can be between 0 and 127 for 7-bit controllers, and between 0 and 16383 for 14-bit controllers, and the pitchbender. This option is selected by default.

See *Notes and Tips* on page 140 for more information.

Flush Events (on IRIX only)

If selected, each loop of the channel driver consumes all pending events. If deselected, each loop of the driver consumes only one event. By default, this option is selected.

On Windows NT, all pending events are always consumed each loop.

MIDI Port (on IRIX only)

Specifies the name of the MIDI port interface to use. You can configure this to be the internal loopback one, for example. For more information, refer to the IRIX manual pages for MIDI support (these are available by typing `man mdInt ro` in an IRIX shell).

Notes and Tips

On IRIX, more information is available in the IRIX manual pages on MIDI. Type `man mdIntro` to get the information.

Some points to remember are:

- On IRIX, you can configure an "internal" MIDI connection as follows: If you have IRIX 6.2, you can use another process to generate and send MIDI events to the named internal MIDI port; you can listen into this internal port using the SOFTIMAGE 3D Midi driver.
- On most fader boxes, you can set up a key sequence that will send the entire current state of the sliders in one burst of events.
- On IRIX, you can have multiple active Midi drivers, each listening to a different channel. This is because the MIDI support on IRIX is intelligent enough to feed all incoming events to all processes listening to MIDI on the selected port. Therefore, if one Midi driver is listening to channel 3, it can safely throw away any events it receives not meant for channel 3, while any other driver actively listening for such events will still receive them. This does not work dependably on IRIX 5.3.
- You may find it easier to adjust scaling values in the channels interface with the **Normalize** option selected.
- During a channel run (**Channels → Channel Run → Sequence I/O**), you can keyframe using the middle mouse button. If the scene has lots of connection points, you may need to hold down the middle mouse button for several seconds for the keyframes to be saved properly.

For more information on the IRIX hardware support for MIDI, contact Silicon Graphics, Inc.

MidiOut Driver

The MidiOut driver is a new output channel driver. It is similar to the Midi (input) channel driver, except that with MidiOut, you send animation information *out* from SOFTIMAGE 3D, generating events and feeding them to the notes or controllers on the MIDI physical keyboard or fader box.

This allows you to:

- Generate sound from animation.
- Recalibrate sliders on a MIDI fader box with flying (motorized) faders after using the Midi (input) driver to capture animation.
- Generate live performances using animation from SOFTIMAGE 3D or SOFTIMAGE Live to regenerate slider events or to drive a fader box with flying faders.

The steps to use the MidiOut driver are the same as those for using the MIDI driver (see *Using the Midi Driver* on page 136).



MidiOut is presently supported only on IRIX.

Note Events

For notes, a value of 0 on a degree of freedom means that the note is off. When the degree of freedom transitions to non-zero, a Note on event is generated. When the degree of freedom changes back to 0, a Note off event is generated.

Controller Events

New events are sent when the value of any degree of freedom for a controller changes.

MidiOut Parameters

The MidiOut dialogue box is almost identical to the Midi Channel Driver dialogue box with the following exception:

In the MidiOut dialogue box, the **Normalize** option is changed to **Normalized** because the MidiOut expects already-normalized values.

If **Normalized** is selected, the MidiOut driver expects values on the controller/switch DOFS to be in the range of 0 to 1. If deselected, this value can be between 0 and 127 for 7-bit controllers, and between 0

and 16383 for 14-bit controllers and the pitchbender. This option is selected by default.

Function Curves for Persistent SOFTIMAGE SDK Custom Effects

Function curves for persistent custom effects created with SOFTIMAGE SDK are now available for use in the Expressions Editor and in the Channel Connection Setup dialogue box, exactly as other function curves.

Starting in SOFTIMAGE 3D version 3.5, animating a custom effect developed with SOFTIMAGE SDK could generate function curves.

Note This applies only to custom effects built with SOFTIMAGE SDK. SI Custom Effects (formerly Minerva), 3D Extreme Effects (formerly Ray Rebels), and DKit custom effects do not generate function curves, so they are not available for expressions or channel connections.

To view the function curves for these custom effects:

1. Select the custom effect icon.
2. Choose the **FcrvSelect** → **Custom** command in the Motion module. The menu is dynamic and displays the name of the selected custom effect and a sub-menu with its function curves, such as **FcrvSelect** → **Custom** → **Motion/Chase** → **All**, or **spd**, or **psXX**.
3. Choose one of these sub-commands to view the desired function curve, and edit as usual.

Use in Expressions

In the Expression Editor, you can now access these function curves and use them as either:

- Part of the expression
- or
- The target of the expression

If the function curve is the target of an expression, the written value overwrites the value written by the custom effect update (that is, expressions override function curves/custom effect update).

1. Select the custom effect's icon.

2. Choose the **Expressions** ➔ **Edit** command to display the Expressions Editor dialogue box.
3. Click on the new **Custom** option. If there are function curves associated with the selected custom effect, the list is displayed. You can either select a custom function curve from the list or type in its name directly. If there are no function curves for the effect, no list is displayed.

Naming Function Curves

Since these function curves are associated with the icon for the effect, their names are created as follows:

<icon_name>.<custom_fcurve_name>

such as **chase.spdPrp**.

When naming custom function curves:

- Do not use a period (.) in custom function curve names: this confuses expressions.
- Avoid using standard model function curve names, such as **etrx**, **etrxz**, **rotx**, **roty**, etc.

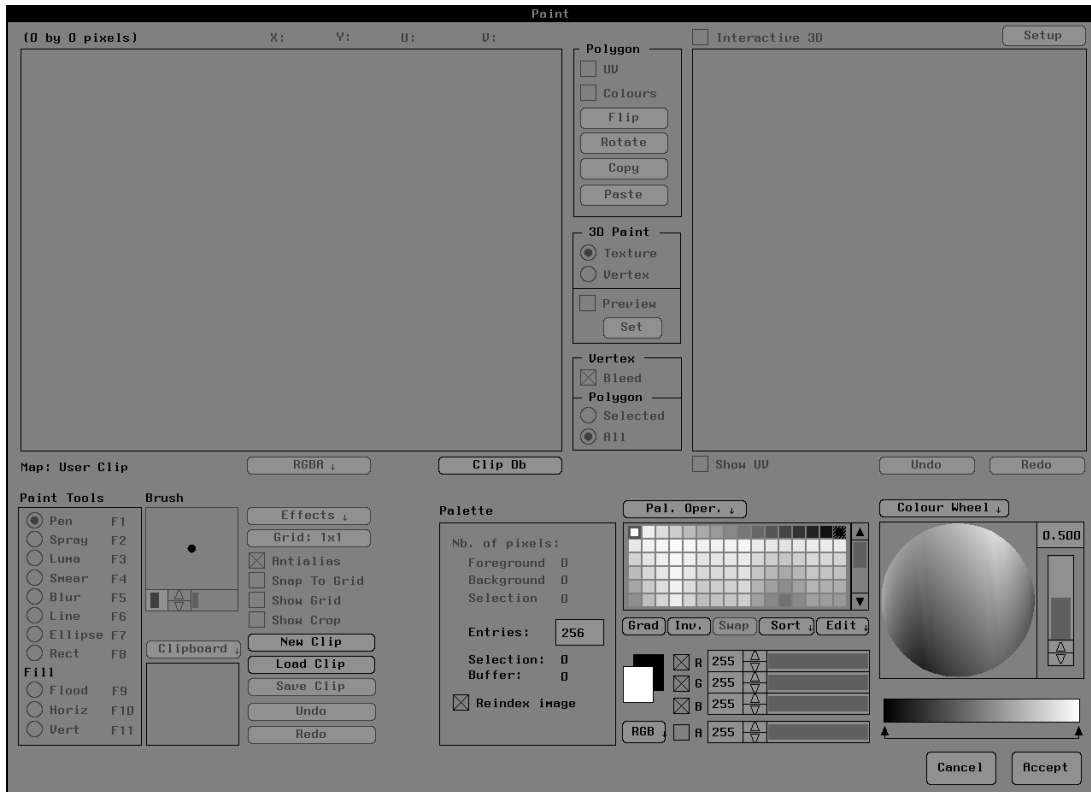
Use in Channel Connections

Function curves for a custom effect are available in the Connection Setup dialogue box (**Channel** ➔ **Connection Setup** command). Their names are appended to the bottom of the list of function curves in the **Destination** list; they can also be accessed by clicking the **Expression** button in the same dialogue box.

You can select and make connections as with any other function curve type. For example, you could hook up a Midi channel driver to alter one of the parameter function curves for a persistent effect, key that information, and so on.

Paint

There have been a number of changes to the Paint dialogue box in this version: some new features have been added, some existing features are now available as Supra keys, and some features have changed.



The following is an outline of all the new or changed features in the Paint dialogue box:

- Larger viewing area (see page 145).
- Access to the Paint dialogue box without having a texture or material on an object (see page 145)
- New **Interactive update** option (see page 145)
- New Paint Tool and Zoom, Select, and Colour picking Supra keys (see page 146)

- Creating a new image and resizing it (see page 147)
- Selecting textures by raycasting (see page 147)
- Selecting and highlighting multiple polygons (see page 148)
- Enhanced UV coordinate manipulation features (see page 149)
- Flip/Rotate/Copy/Paste UV coordinates and/or vertex colours (see page 150)
- Painting on textures or vertices (see page 153)
- Previewing, tagging, and painting colour at vertices (see page 154)
- New **Luma** option (see page 156)
- RGBA channel painting control (see page 156)

Larger Viewing Area and Access to Paint

For your viewing pleasure, the Paint dialogue box and its 3D View window are now both larger. When you open the Paint dialogue box, you see that the Paint dialogue box takes up more of the screen, the 3D View is larger, and menu cells are no longer visible at the sides of the screen.

Also, you no longer need to apply a texture or material to your object to access the Paint dialogue box.

Interactive 3D

When you select the **Interactive 3D** option in the Paint dialogue box, whatever function you do in one view (either 2D or 3D) is interactively and simultaneously updated in the other view.

For example, if **Interactive 3D** is selected and you do a brush stroke in the 2D view, you can see the result immediately in the 3D view.

Note

You should use the **Interactive 3D** only when used with SGI Impacts and /or O2, or on high-end OpenGL card for Windows NT machines. On Indy and Extreme machines, performance is very poor with this option since these machines handle texture display in software.

Paint Tool Supra Keys

The following Paint tools can now be accessed by these Supra keys:

Supra key	Paint tool
F1	Pen
F2	Spray
F3	Luma
F4	Blur
F5	Smear
F6	Square
F7	Line
F8	Ellipse
F9	Flood Fill
F10	Horz Fill
F11	Vert Fill

Zoom, Select, and Colour Picking Supra Keys

The **Zoom**, **Select**, and **Colour Picking** buttons are no longer located in the Paint dialogue box: you now access these functions only by using Supra keys.

You can access the Zoom commands using these Supra keys:

Supra key	Does this
z - left mouse button	Pans
z - middle mouse button	Zooms in
z - right mouse button	Zooms out

You can access Select and Colour Picking commands using these Supra keys:

Supra key	Does this
Space bar - left mouse button	Picks foreground colour in 2D and 3D views.
Space bar - middle mouse button	Picks background colour in 2D and 3D views.
Space bar - right mouse button	Draws a rectangular selection in 2D view.

Colour picking is also now available in the 3D View as well as in the 2D View.

Show Crop Option

The C Supra key no longer toggles the Crop mode. Crop mode is now accessed only by selecting **Show Crop** in the Paint dialogue box.

Creating and Resizing Images

To create a new image, click the **New Clip** option. This new image in the 2D View becomes the current image.

To resize your image, select **Effects → Resize Clip**. The Resize Clip dialogue box appears in which you can specify the new dimensions of the image and whether or not to use bilinear interpolation. Bilinear interpolation is a technique that allows image resizing with fewer aliasing artefacts. When resizing images, bilinear interpolation gives better results, but it can modify the colour content of the image. If you don't want to modify the colours, don't use bilinear interpolation.

Selecting Textures by Raycasting

You can now select a texture in the 3D View using raycasting. Instead of going into the Clip database and individually selecting the texture clip that you want to apply to your object, position the mouse pointer over this texture on your object in the 3D View and press s-right mouse button. This selects the texture in the clip database and this clip is then displayed in the 2D View.

If you press s-left mouse button, all the polygons that are mapped with this texture become selected.

If you press s-middle mouse button, all the polygons that are mapped are highlighted.

When you are in the Clip database, if you select a texture clip with the left mouse button, it selects the corresponding polygons in the 3D View. If you select a texture clip with the middle mouse button, it highlights the corresponding polygons in the 3D View.

Selecting and Highlighting Multiple Polygons

To select or highlight polygons on an object in the 3D view, you no longer have to be in UV mode.

Note

Tagging UV coordinates in the 2D View has the same effect as selecting polynodes in the 3D View since UV coordinate information is stored at each polynode. However, you cannot edit a UV coordinate in the 2D View unless the polygon is first selected. Polygons must be selected to show the UV coordinates in the 2D View.

Use the following Supra keys for selecting and highlighting polygons on an object:

Supra key	Does this
g - left mouse button	Selects polygons by raycasting.
g - middle mouse button	Deselects polygons by raycasting.
g - right mouse button	Toggles selection/deselection by raycasting.
h - left mouse button	Highlights polygons by raycasting.
h - middle mouse button	Unhighlights polygons by raycasting.
h - right mouse button	Toggles highlighting/unhighlighting by raycasting.

Highlighting is used as a guideline or visual cue. When you highlight polygons (**h**-left mouse button), you can see the position of the polygons over the 2D texture map before you perform an action or edit their properties. Highlighted polygons cannot be edited in UV: only selected polygons can be edited. Highlighted polygons are also useful for creating UV discontinuities at a specific vertex.

Supra key	Does this
Shift - h - left mouse button	Highlights all polygons on object.
Shift - h - middle mouse button	Unhighlights all polygons on object.

Supra key	Does this
Shift - h - right mouse button	Toggles highlight status of all polygons on object.
Shift - g - left mouse button	Selects all polygons on object.
Shift - g - middle mouse button	Deselects all polygons on object.
Shift - g - right mouse button	Toggles selection status of all polygons on object.

UV Manipulation Options

Modifying UV Coordinates

To modify the UV coordinates of the polygons, the texture map must be UV mapped. If it is not UV mapped, select **Effects** → **Convert UV** in the Paint dialogue box. When the Change Texture Mapping dialogue box appears, select **Change** and the texture map becomes UV mapped.

To select a polygon, press **g**-left mouse button (or **Shift-g** to select all the polygons on the polygon mesh object). If you select the **Show UV** box, it displays the UV handles and the UV outlines in the 2D view.

Support for Multiple UV Tags in 2D View

You can now edit multiple UV handles at the same time in the 2D view (when in UV editing mode). If you press the **t** key and draw a rectangle in the 2D view, this tags the UV handles of selected polygons in the 2D view. However for 2D tagging to be available, the texture must be UV mapped (see previous section).



Highlighted polygons in 3D View cannot be UV edited in the 2D View.

Support for Multiple Vertex/Polynode Tags in 3D

When the **Show UV** option is selected and the texture is UV mapped, tagging a polynode is exactly the same in both the 2D and 3D Views.

You tag polynodes (in either view) so that you can move the tagged handles with the **SRT** keys (UV editing). For vertex colour editing, use the **Preview** → **Set** option to snap the foreground colours to the tagged polynodes.

To tag vertices in the 3D View, press **t**-raycast.

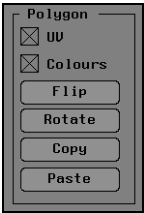
To tag all the vertices, press Shift-t-raycast.

SRT Transformations on Multiple UV Tags

When in UV editing mode, you can scale, rotate, and translate tagged UV handles by using these SRT Supra keys (in the 2D view):

Supra key	Does this
x - left mouse button and drag	Scales the UV tags in U (horizontal displacement) and V (vertical displacement).
c - left mouse button and drag	Rotates the tagged UV handles around the UV transformation center. Move the mouse to the right, the tagged UV handles rotate counterclockwise around the UV transformation center. Move the mouse to the left and they rotate clockwise.
v - middle mouse button and drag	Translates the UV tags.
x, c, or v- middle mouse button and drag	Moves the transformation centre.
x, c, or v - right mouse button	Resets the transformation centre.

Editing UV Coordinates and/or Vertex Colours



If you select the **Polygon → UV** option, the options that you choose (**Flip**, **Rotate**, **Copy**, or **Paste**) affect only the UV coordinates of the selected polygons.

If you select the **Polygon → Colours** option, only the vertex colours of those polygons are effected. For more information on what vertex colours are, see *Vertex Colours* on page 157.

To use these editing features, you must choose one option (**UV** or **Colours**), but both options can be selected at the same time if you like. For example, if you want to rotate the UV coordinates of selected polygons, select **UV** then click **Rotate** as many times you want the UV coordinates to rotate.

Copy and **Paste** are not new features, but you can now select a polygon and copy its attributes to any number of polygons.

Note The original polygon (the polygon that contains the texture you are copying) no longer has to have the same number of sides as the destination polygon (the polygon to where you are copying the texture).

To copy and paste to multiple polygons, follow these steps:

1. Select a polygon that contains a texture or vertex colours you want to copy to other polygons.
2. Click **Copy**.
3. Deselect the polygon with the texture you are copying (otherwise you will copy it back onto that polygon) and then select the polygons to where you want to copy the texture (see *Selecting and Highlighting Multiple Polygons* on page 148 for Supra key shortcuts).
4. Click **Paste** and the texture is copied to all of the selected polygons.

Example

The following example shows how to select polygons and do UV editing.

1. Apply a 2D local texture to a polygon object. There is a metallic rivet texture applied to the object in the illustration below.



2. Open the Paint dialogue box. To edit any UV coordinate, convert the texture projection method to UV mapping with **Effect → Convert UV**.
3. Select the **Show UV** option to make selected polygons visible.

- ## Release Notes

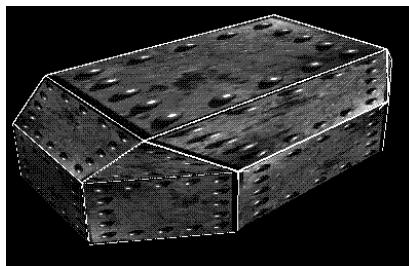


-

-

7. Select the polygon on which you want to paste the new coordinates with Supra key **g** or Shift-g to toggle all, select, and deselect polygons. Then click **Paste**. You can also click **Rotate** or **Flip** to make a specific selection fit better on its new polygon.

In the example below, the results of pasting to all other polygons look like this:



Painting with Textures or Vertex Colours

There are two new options which allow you to paint textures directly on an object in the 3D view or paint an object using vertex colours.

- If you select the **3D Paint → Texture** option, you can choose a paint tool then paint the texture directly on the object in the 3D View. The Paint tools that are supported in the 3D View are Pen, Spray, Luma, Smear, and Blur.
- If you select the **3D Paint → Vertex** option, you can paint colours on the polynodes (see below for definition of polynode). This option is used with the **Vertex** options (**Bleed**, and **Polygon → All** or **Selected** – see *Vertex Colour Painting and Tagging* on page 155). The supported Paint tools are Pen, Spray, and Luma. For more information on what vertex colours are, see *Vertex Colours* on page 157.

Note

A polynode exists for each vertex of a polygon (think of it as a “subvertex”). It contains the UV coordinates and vertex colours. Since there is a polynode for each polygon connected to a vertex, it allows UV and colour discontinuities at the vertex level.

Vertex Colours Preview Mode

If you want to change the vertex colour of multiple polynodes on your object at the same time, select the **3D Paint → Preview** option in the Paint dialogue box.

When in Preview mode, the paint tool temporarily applies the current foreground colour that you selected in the colour palette to the selected polynodes. If the **Preview** option is not selected, the original vertex colours are displayed.

To apply the foreground colour, click **3D Paint → Set**. This permanently pastes the colours on the polynodes. If you select **Preview** again before clicking **Set**, the vertex colours are not changed to the foreground colour.



You cannot raycast polynodes when Preview is selected: select the polynodes before selecting **Preview**. To see how to select the polynodes, see *Vertex Colour Painting and Tagging* on page 155.

To select a new colour and apply it to your polygon, follow these steps:

1. Select the **3D Paint → Vertex** option.
2. Select the polynodes (press **t**-left mouse button) that you want to edit. The **3D Paint → Preview** option becomes available when at least one of the polynodes is selected.
3. Select a foreground colour from the colour palette and select **3D Paint → Preview**. The **3D Paint → Set** button becomes available. This colour is now temporarily applied to the tagged polynodes.
4. Click **3D Paint → Set** to apply the foreground colour permanently to the tagged polynodes.



While in Preview mode, you can use the colour palette and colour sliders to change the vertex colours, and you can also see the interactive update in the 3D View.

Vertex Colour Painting and Tagging

There are two ways of vertex painting or tagging in the 3D View:

- Select the **Vertex → Polygon → Selected/All** option

or

- Select the **Vertex → Bleed** option.

Vertex tagging is done at the polynode level. This means that the polynodes of all the polygons that meet at the same vertex can be tagged individually.

You can also average vertex colours to create a more blended appearance using the **3D Paint → Vertex** option.

Selected/All

The **Vertex → Polygon → Selected/All** options are used in conjunction with the **Vertex → Bleed** option.

If you select **All** (the default), you can paint on the whole polygon mesh object with the foreground colour that you have selected from the colour wheel/spread or palette. If you select **Selected**, you can paint on selected polygons. You can also paint vertex colours by using the colour palette background entry (middle mouse button).

The same principle applies to tagging vertices: if you select **All**, then you can tag or untag any polygon in the object; if you select **Selected**, then you can tag or untag only selected polygons.

Bleed

The **Vertex → Bleed** option affects one or more polynodes of one polygon, or all the adjacent polygons to the raycasted vertex. If you select **Bleed**, all the polynodes of the vertex are selected. If **Bleed** is deselected and you tag the vertex, only one polynode is selected.

For example, if you want to tag only three of the polynodes on a vertex that has four neighboring polynodes, you have two options:

- Deselect **Bleed**, then move the mouse pointer to the polynode you want to tag (do this one polynode at a time). Press **t-left** mouse button to tag the polynode. Do this for the second and third polynode you want to tag.

or

- Select **Bleed** and press **t-left** mouse button to raycast the middle

vertex (all four polynodes are tagged). Then deselect **Bleed** and press **t-middle** mouse button on the polynode that you don't want tagged. That polynode is untagged and you are left with three tagged polynodes.

Averaging Vertex Colours

You can average the vertex colours on an object to create a more blended appearance. To average the vertex colours, select the **3D Paint → Vertex** option and position your mouse on the vertex you want to modify. Press the Shift key, then click the left mouse button. The average for all the colours is calculated and your vertex colours appear to blend together.

You can also average selected polynodes on a polygon. For example, if you want to average only three polynodes, select three polygons by clicking on them with the Supra key **g**, select the **Vertex → Polygon → Selected** option, and press Shift-left mouse button. Only the three polynodes that you have chosen are averaged.

Luma Option

The new **Luma** option allows you to add brightness or darkness (luminance) to a texture. This is useful for adding a lighting effect or shadows to your scene.

If you select the **Luma** option and then left-click, you can add a light effect when you paint on your texture. If you press Shift-left mouse button, you can add constant brightness to your texture.

If you select **Luma** and then paint on your texture using the middle mouse button, you can add darkness or shadows to your scene. If you press Shift-middle mouse button, you can add constant darkness.

You can also use the Alpha slider to control the intensity of the brightness and darkness that you add to your texture.

RGBA Channel Painting

You now can have the R, G, or B colour channel affect only that colour component in the image or on a vertex. To do this, click the **RGB** button under the Colour Palette.

The Alpha channel is also affected, but to see the alpha channel you must select **Effects → Alpha Only** in the Paint dialogue box.

Vertex Colours

Vertex colours is a rendering technique that works by displaying a linear interpolation of colours attached to the tessellated (triangulated) geometry of a polygon mesh object. This means that there is one colour per vertex per triangle on the object's surface. This rendering technique is similar to Constant shading in that it is not influenced by the lights in the scene. It interpolates the colours on each polygon and gives you interesting lighting and colouring effects, such as simulating shadows on an object.

The advantage of vertex colours is that it gives you these lighting effects at a reasonable cost in terms of performance and memory. Vertex colours create the appearance of having light and colour information, so you can actually get rid of the lights in your scene. Since you can get rid of the lights in your scene, this saves on rendering time. This feature is especially useful for games developers who require fast render and display times.

Using Vertex Colours

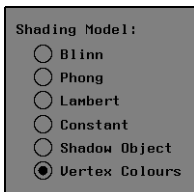
There are four ways in which vertex colours are implemented in SOFTIMAGE 3D. You can:

- Paint vertex colour information directly on an object's geometry using the **3D Paint → Vertex** option in the Paint dialogue box. See *Painting with Textures or Vertex Colours* on page 153 for more information.
- Edit vertex colours using the **3D Paint → Vertex** option (as mentioned above) or the Generate Vertex Colours plug-in (see page 159).
- Display vertex colours using the **Vertex Colours** option in the Material dialogue box (see *Displaying Vertex Colours* on page 158).
- Generate vertex colour values using the **Vertex Colours** option and the Generate Vertex Colours plug-in (these work in conjunction with each other). The Generate Vertex Colours plug-in generates the colour values that are stored in the vertices. **Vertex Colours** interpolates the colours stored at each vertex after you have applied a material to this polygon. See *Generating Vertex Colours* on page 159 for more information.

Note

Flock animation now supports both UV coordinates and vertex colours.

Displaying Vertex Colours



Only polygon mesh objects support vertex colours. A polygon has one polynode (a “subvertex”) for each vertex. Every polynode in a polygon mesh object contains the UV texture coordinates, a normal, and an RGBA colour. When you create a polygon mesh object in SOFTIMAGE 3D, default colour values are stored in the geometry (R, G, and B = 0.7), which are the same as the default material’s Diffuse colour values. Vertex colour shaded materials are propagated in the same way as all other materials.

To specify that you want a polygon displayed using its vertex colours, choose the **Material** menu cell to open the Material dialogue box. Then assign a material with the new **Vertex Colours** Shading Model option selected. The colour controls and the shading ball are ghosted in the Material dialogue box when **Vertex Colours** is selected.

The colours stored in the polynodes are then visible when you view the object in the Shade view mode. The values stored in the polynodes are also visible when rendering with either the SOFTIMAGE 3D or mental ray renderers.

Note

You can also set the **Vertex Colour** material shading model in the Spreadsheet window.

Non-polygonal Objects

Although non-polygonal objects do not support vertex colours, they can use materials that use the **Vertex Colour** shading model. In this case, the tessellation process (responsible for creating the geometry used to display in the Shade view and for rendering) automatically assigns default colour values (R, G, and B = 0.7) to each vertex of each surface triangle, which creates a grey material.

If you assign a vertex colour shaded material on a NURBS surface, a patch, a face, or a Meta-clay element, you will see a constant grey shading in the Shade view mode.

If you convert a non-polygonal object to a polygon mesh object (choose the **Effect** ➔ **Convert** command in the Model module), the polygons containing these default grey values can then be edited in

the Paint dialogue box (see page 153) or automatically modified using the Generate Vertex Colours plug-in (see page 159).

When you edit or apply modelling effects to the object's geometry, all the modelling effects that supported the UV texture coordinates now also support vertex colours.

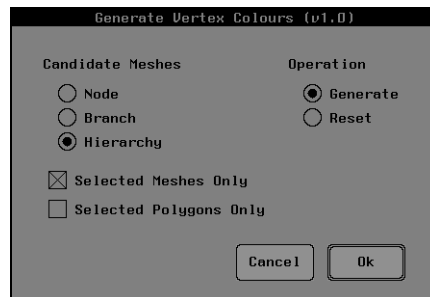
Note

You can load scenes created in this version (3.7) into previous versions of SOFTIMAGE 3D because of backward compatibility. However, since vertex colour shading is new in this version, vertex colour shaded materials are replaced by a Constant shaded material when loading a scene into a previous version of SOFTIMAGE 3D.

Generating Vertex Colours

The Generate Vertex Colours plug-in automatically generates vertex colours for one or more polygon mesh objects in a single hierarchy. The plug-in takes into consideration their material attributes, polygon selection attributes, normal values, and the lights in the scene. It then computes the light influence by using a mental ray camera lens shader.

To access this plug-in, choose the **Mat_Oper** → **GenerateVertexColours** command in the Matter module. The Generate Vertex Colours dialogue box appears.



Parameters

Candidate Meshes

Candidate meshes refer to the polygon mesh objects that are used by this plug-in. For example, if you select **Hierarchy** but have the **Selected Meshes Only** option selected, this means that only the selected polygon mesh objects are candidates for this effect.

- **Node:** (the default) only the polygon mesh object that you select is a candidate (unless you select the **Selected Meshes Only** option and the polygon mesh is not selected, then it is not considered a candidate and the effect won't run).
- **Branch:** the polygon mesh object and all of its descendant polygon mesh objects are candidates (unless you select the **Selected Meshes Only** option, then only the selected objects are candidates).
- **Hierarchy:** (the default) all the polygon mesh objects in the selected polygon mesh hierarchy are candidates (unless you select the **Selected Meshes Only** option, then only the selected objects are candidates).

Selected Meshes Only

Only the selected polygon mesh objects are candidates.

Selected Polygons Only

Only selected polygons in candidate objects are candidates.

Operation

- **Generate:** computes the vertex colours for all candidate polygons using their polygon attributes (materials and normals) and lights in the scene (for materials using Lambert, Phong, or Blinn shading).
- **Reset** sets the colours of all the candidate polygons to the default material diffuse colour (R, G, B = 0.7). It works on all candidate polygons whether or not they are assigned a material.

How Vertex Colours are Generated

Vertex colours are generated for a polygon if its material uses Constant, Lambert, Phong, or Blinn shading. Constant shaded materials are not influenced by light, therefore, the light shader is not used by this plug-in to generate vertex colours for Constant shaded materials. However, Lambert, Phong, and Blinn shading types are influenced by light, so you can create interesting effects using these shading types on models, then converting them to vertex colours.

Unless there is a material assigned to your object or a vertex colour shaded material is inherited from parent models in the hierarchy, the generated colours are not visible on your object. Therefore, one or more vertex colour shaded materials (depending on the selected object) are automatically created so that the new generated colours are visible on your object.

When this vertex colour material is automatically assigned to your object, any materials that are not assigned to polygons are eliminated. If only a subset of the polygons using a material is selected, and you have selected the **Selected Polygons Only** option in the Generate Vertex Colours dialogue box, a new vertex colour material is created for the selected polygons, but the original material is not eliminated because it is still being used by some of the polygons.

This process takes advantage of hierarchical material propagation so there are no redundant vertex colour materials created. In this case, a vertex colour material is inherited from parents in the hierarchy.

Notes

- If there are no materials on the object (either the current object or through propagation), a default Phong shaded material is used for the candidate polygons.
- If there are no lights in your scene, a default infinite light (the same default light used in SOFTIMAGE 3D) is used for illuminating the candidate polygons that use a material that has Lambert, Phong, or Blinn shading.
- If there are lights in your scene, only the visible lights are used by the illumination process. If no lights are visible, the colours are generated as if the material used Constant shading.
- Undo/Redo operations cannot be applied on immediate effects. It is recommended that you work on duplicated models until you are satisfied with the results.

All material shading types that are influenced by lights (for example, Lambert, Phong, and Blinn) are handled as Lambert in the vertex colour generation process.

Phong and Blinn specularities are not generated.

Vertex Colour Shader

The vertex colour shader (soft_vertex_colour) interprets the XYZ texture coordinate components as an RGB colour, it sets the alpha value to 1.0, and the resulting colour is completely opaque.

Texture Pre-lighting

The Texture Pre-lighting plug-in lets you modify a texture map using the lights in your scene. Using a mental ray camera lens shader, this plug-in gathers lights at specific points on the geometry of your object and then renders the texture map by blending the light contribution with the texture. You can then delete the lights in your scene and the lighting effect remains visible in the texture. This is useful for real-time games since lighting can be costly: you don't require as much memory to store lights, and rendering is faster.

This plug-in also supports an option that generates an illumination map (with the same resolution as the original texture). The illumination map is the light information of each pixel of the texture map saved as a distinct picture. This is useful for games development where light effects are managed by animating the blending of texture maps and illumination maps in real-time instead of rendering true lights.

The result of using texture pre-lighting is a generated image that approximates the quality of an image you can get by rendering with either the SOFTIMAGE or mental ray renderer. The higher the number of pixels, the better the approximation.



Texture image before and after using texture pre-lighting

Note

This plug-in does not support animated textures, and uses the lighting as the current frame: it does not generate a texture sequence if there is an animation in the scene.

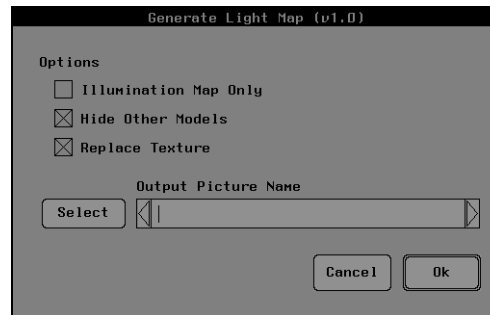
Also, it works only on lights that are currently visible in your scene. If you don't want to use all of the lights in your scene, you can hide them before using this plug-in. If there are no lights in your scene, the default light is used.

Texture pre-lighting does not take bump maps into consideration when computing light values.

Using Texture Pre-lighting

To use the Texture Pre-lighting plug-in, follow these steps:

1. Select an object and apply a 2D local texture map. Open a Schematic window and select the Matter mode in it.
2. Define the lights in the scene (choose **Light** ➔ **Define**).
3. In the Matter module, choose **Txt_Oper** ➔ **GenerateLightMap**.
4. Click on the Texture 2D Local icon in the Schematic window, and the Generate Light Map dialogue box appears.



5. Click Ok to accept the default settings (see next page for parameter descriptions).
6. The original texture map (default settings) is now replaced with the new texture map. The material shading model is set to Constant to ensure that the lights remaining in the scene do not affect this texture.

Notes

There are a few points to remember when using this plug-in:

- The default name that is specified in the dialogue box is the name of the texture image followed by **_light.pic**.
- It is not necessary to choose UV as your mapping method before using the Texture Pre-lighting option. The effect works with whichever mapping method you choose.
- Shadows in your scene are also rendered if the mental ray settings are selected (choose the **Render** menu cell, select mental ray as the

Rendering Type, click the **Options** button, and select the **Shadow** option) and some lights use raycast shadows.

- This plug-in supports texture cropping.

Parameters

Illumination Map Only

If selected, the new image contains the light information for each pixel of the cropped area of the texture map. If this option is deselected, the new image contains a blend of the original texture and scene lighting.



An illumination map can be blended with any texture map in a game by multiplying the RGB values of pixels of the illumination map and the texture map together (if they are expressed as values going from 0.0 to 0.1).

Hide Other Models

If selected, all models in the scene are hidden except for the model that had the texture attached to it before computing the light influence. This is useful when the mental ray **Shadow** option is selected and the lights are projecting shadows, but you want to illuminate a texture without shadows.

If this option is not selected, the visibility status of models in the scene does not change.

Replace Texture

If selected, the new image replaces the current picture that is being used by the texture. The material shading model is set to Constant to eliminate any light contribution to the illuminated texture map.

If this option is not selected, it does not modify the original texture map.

How Texture Pre-lighting Is Calculated

Once you select a texture node and set the parameters in the Generate Light Map dialogue box, the Texture Pre-lighting plug-in finds the associated material and model.

Geometry information is gathered along with each object triangle's UV texture coordinates. The plug-in then generates a reference table that indicates which texture pixels are being used by which triangles.

Since each texture pixel can be mapped on multiple triangles that do not overlap, a list of geometry references is maintained for each texture pixel.

The texture map is pre-rendered (that is, the texture map is pre-blended with its material) using its parameters (blending, ambient, diffuse, specular, cropping, etc.), as well as the parameters of its associated material.

This information is written to a temporary file and the Texture Pre-lighting plug-in renders a one-pixel image using mental ray (this image is written to a temporary directory and is automatically deleted when the operation is complete). This launches the light sampling lens shader that reads the temporary file and uses it to sample the light information in the scene. The computed ambient and diffuse values are used together with the light information to generate the final shaded value of each texture pixel. These values are then written to the temporary file that is read back by the Texture Pre-lighting plug-in when rendering is complete.

The original image is read by the Texture Pre-lighting plug-in, the modified pixels are stored, and the image is saved. If the **Replace Texture** option is selected, the texture is modified to use the new image and the texture's material is set to Constant shading.

The Texture Pre-lighting plug-in can be used on any type of geometry as long as the UV regions do not overlap. For example, it doesn't work if you project an XY texture map on all of the polygons of a sphere because certain pixels in the texture map are illuminated in two different regions of the geometry (front and back). You can use a projected texture if it is mapped locally on a material that does not contain polygons that overlap given the projection method.

Smooth or Faceted Edges

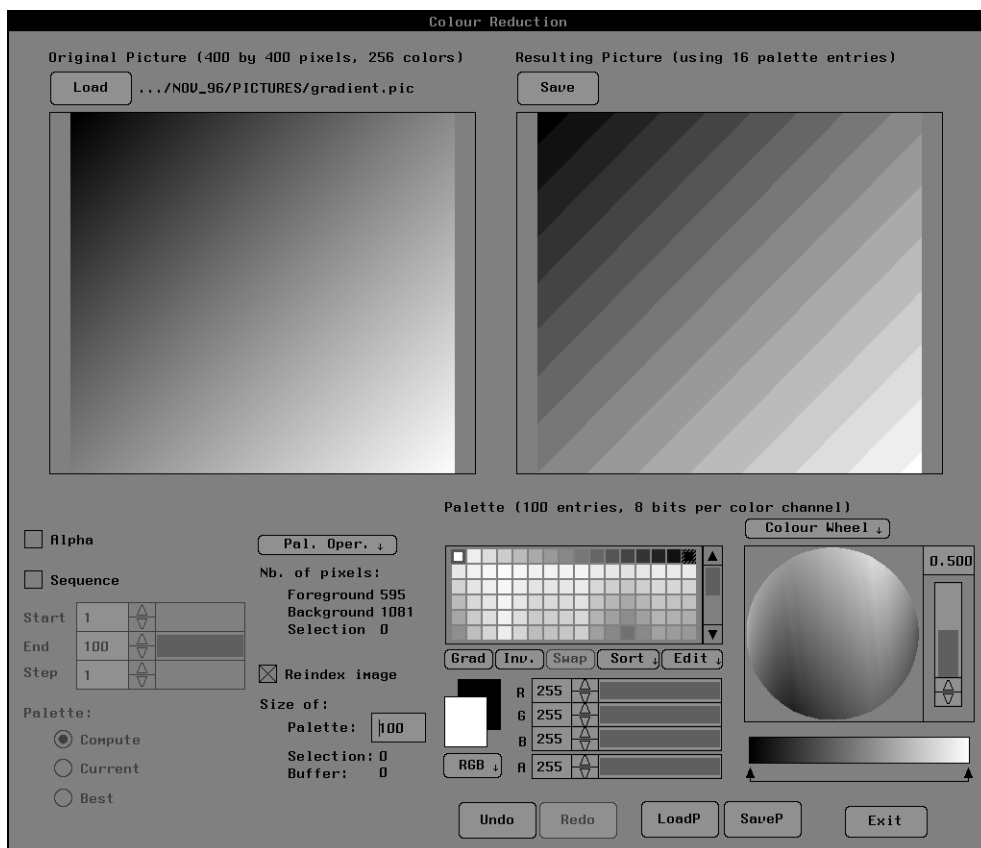
If you select a polygon mesh object and choose the **Automatic Discontinuity angle** option (choose the **Info** ➔ **Selection** command for that option), the corresponding angle is used to determine if an edge between two polygons is smooth or faceted. If you select the **Faceted** option, all edges are considered faceted.

You can also set the discontinuity angle on an edge-by-edge basis by choosing the **Edge_Flag** ➔ **Discontinuity** command in the Matter module. These options let you determine whether the rendering is smooth or faceted.

Colour Reduction

With the **Colour Reduction** command in the Tools module, you can now generate a palette for a sequence. Here's how:

1. Choose the **C_Reduction** menu cell in the Tools module.
2. In the Colour Reduction dialogue box, select the **Sequence** option to generate a palette for a sequence.



3. Select **Generate** from the pull-down menu and it generates the best palette for the desired sequence.
4. Enter the start and end frame numbers in the **Start** and **End** text boxes. For example, if you put 1 for **Start** and 10 for **End**, it computes the best palette only for frames 1 through 10. This replaces the current palette.

Games Conversion and Viewer Tools

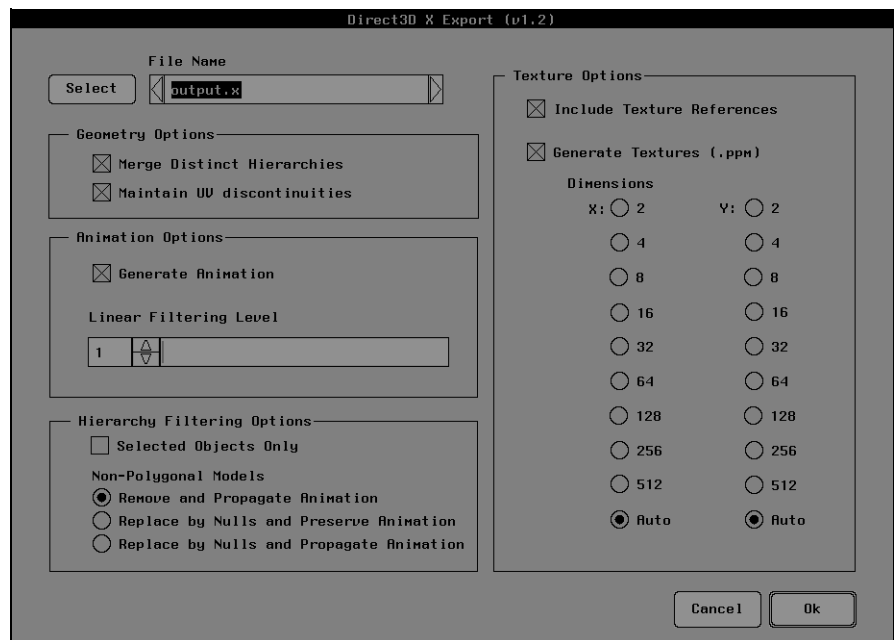
The following are improvements made to certain games conversion and viewing tools in SOFTIMAGE 3D:

- There are some changes to the Direct 3D Export, Import, and Viewer tools that let you generate titles using Microsoft's Direct 3D API (see the section below).
- The VRML Export tool is now located in the **Export** menu in the Tools module and contains some new features (see *Exporting as VRML Files* on page 171).

Direct 3D X Converters

Exporting as Direct 3D X Files

In the Direct 3D X Export dialogue box, accessed by choosing the **Export → Objects → direct3DXExport** command in the Tools module, there is a new **Linear Filtering Level** option in the Animation Options area. This option filters (reduces) the number of keyframes by detecting a possible linear interpolation between the keyframes.



The valid range of values for this option is between 0 and 100. This number indicates the acceptable deviation from linearity in the keyframe values.

If you specify 0, all keyframes are kept and there is no change. If you specify 100, only the first and the last keyframes are kept since tolerance for linearity is at its greatest possible value.

Filtering marks every keyframe it thinks can be recomputed (depending on the value of the threshold) as part of the linear interpolation between frames. These keyframes are then deleted. If you enter a large value, more keyframes are removed and the result is more distorted. The higher the value, the greater the tolerance for deviation from linearity. The lower the value, fewer keys are removed and the final object positions are closer to the original.

If you export two different animations that have the same threshold, but the first one (animation A) is more linear than the second one (animation B), the filtered version of animation A (animation A1) generally has fewer keyframes than the filtered version of animation B (animation B1). Furthermore, to get the same amount of keyframes in B1 as in A1, you would have to increase the threshold, thus distorting the animation.

Hierarchy Filtering Options

In the Direct 3D X Export dialogue box, there are also new **Hierarchy Filtering Options**.

You use these options if you want to:

- Work with selected/unselected models.
- Preserve or lose hierarchy structures.
- Preserve or propagate animation.

Selected Objects Only

Specifies whether or not you want to process unselected models.

If one tree is completely unselected, then it is not processed. At least one model on the tree must be selected for the converter to process it.

Non Polygonal Models

Controls the hierarchy filtering that occurs when exporting SOFTIMAGE 3D models into the Direct 3D file format.

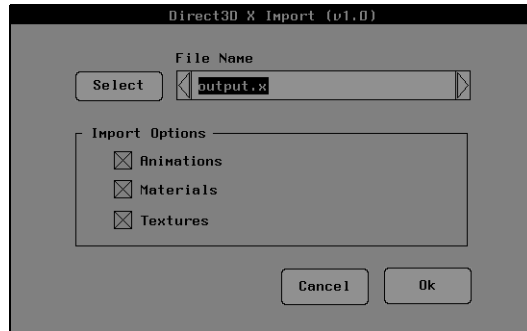
- **Remove and Propagate Animation** removes all the non-polygonal models from the hierarchy and propagates their animation into the next available children. This is the default setting.
- **Replace by Nulls and Preserve Animation** transforms all the non-polygonal models to nulls and keeps their animation. This option allows you to preserve the hierarchical and animation structure.
- **Replace by Nulls and Propagate Animation** transforms all the non-polygonal models to nulls but propagates their animation. This means that all the transformations for these models are reset to Translation (0,0,0), Rotation (0,0,0), and Scaling (1,1,1). Their original transformations are propagated to the next available children (it works the same as **Remove and Propagate Animation**, but it preserves the hierarchical structure).

Note

When building models using any of the SOFTIMAGE 3D Export tools, you must choose the menu command **Preferences → Classical Scaling**. Even though the SOFTIMAGE 3D Scaling is a more flexible method for processing the transformations of a hierarchy, there is no direct way to convert the scaling type from SOFTIMAGE 3D to Classical. Therefore, Classical Scaling should be selected as the scaling type for any scenes to be exported. If there are objects in a hierarchy that do not have frozen scaling (**Effect → Freeze → Scaling** in the Model module), they will not always export correctly. This is because SOFTIMAGE 3D scaling affects the way scaling values for individual objects are propagated through their hierarchy.

Importing Direct 3D X Files

The Direct3D X Import dialogue box, accessed by choosing the **Import → Objects → direct3DImport** command in the Tools module, allows you to import scenes that are .x files into SOFTIMAGE 3D.

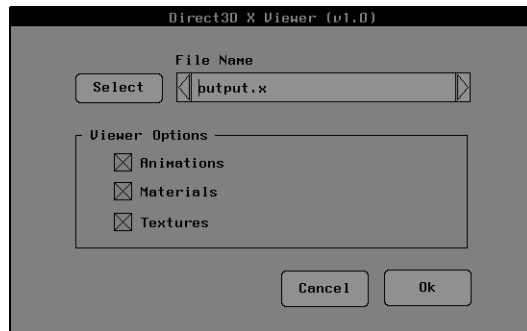


The dialogue box contains the following Import options:

- **Animations** imports animation from an .x file into SOFTIMAGE 3D.
- **Materials** imports material from an .x file into SOFTIMAGE 3D.
- **Textures** imports textures and UV texture coordinates from an .x file into SOFTIMAGE 3D.

Viewing Direct 3D X Files

The Direct3D X Viewer dialogue box, accessed by choosing the **Viewer → direct3DViewer** command in the Tools module, allows you to import scenes that are .x files into the Direct 3D X Viewer.



The dialogue box contains the following Viewer options:

- **Animations** imports animation from an .x file into the Viewer.
- **Materials** imports material from an .x file into the Viewer.
- **Textures** imports textures and UV texture coordinates from an .x file into the Viewer.

Exporting as VRML Files

The **Save → vrml** command is now available as the **Export → Objects → vrml** command in the Tools module.



VRML (v. 1.0) now supports texture and material propagation the same way as does SOFTIMAGE 3D.

In SOFTIMAGE 3D, there is no material propagation if a node already has a material assigned to it. For example, if you have three parented cubes, and only the root has a material assigned to it, then all three cubes use the same material as is assigned to the root. However, if the second cube also has a material, then the third cube uses the same material as the second cube. The same behaviour occurs in VRML Export.

VRML automatically extracts UV textures so there is no need to manually convert your texture mapping into UV mapping.

- The **Attach URL plug-in** option has changed: you now don't have to select an object and run it to put the address into a model. Now you run the plug-in and then select a polygon mesh object.
- You can now choose whether global textures override local textures. When you render in SOFTIMAGE 3D, global textures automatically override local textures. With the new **Prefer Global Textures over Local Textures** option, you can override this behaviour.

If you have an object that has a local texture on top of a global texture

and you select the **Prefer Global Textures over Local Textures** option, the global texture overrides the local texture when you render and you can't see the local texture (because the global texture is on top of it). If you don't select this option, the global texture does not override the local texture and you are able to view the local texture on top of the global texture.

Rendering

The following are some improvements and new features for rendering in this version:

- There are two new command line options for the rendering standalone (**soft -R**).
- Enhancements have been made to the lightning volume shader (see next page).
- The new **Info** ➔ **MentalHost** command in the Matter module lets you interactively select rendering host machines (see page 175).
- Information for shader developers using IRIX 6.x (see page 176).
- Information on latest version of mental ray (v1.9.10.10) (see page 177).

soft -R

Two new command line options have been added to the rendering standalone (**soft -R**). They are:

-m [<base-outfile-name>]]

-M [<base-outfile-name>]]

-m [OUTFILE] Forces the rendering to a single output file.
The base name of the outfile is the one stored in the Render Setup dialogue box.

An optional parameter (OUTFILE) allows you to specify the base name in the form *filename[.mi]*. The **.mi** extension is optional and will be added if it does not appear in the specified file name.

-M [OUTFILE] Same as **-m**, but creates multiple **.mi** output files.
One output file is produced per frame.

Usage

```
soft -R my_scene.1-0.dsc -m <filename>
```

Renders a single output file such as *filename.mi*

```
soft -R my_scene.1-0.dsc -M my_outfile
```

Renders multiple output files such as:

```
filename.1.mi
filename.2.mi
```

... up to *filename.N.mi* assuming a render sequence of frames 1 to N.

Lightning Volume Shader

You can now specify multiple source and destination pairs for a single instance of the lightning shader. In previous versions, when you specified multiple source and destination pairs, only the first pair was accepted and the rest were ignored.

This enhancement means that you can attach a model to a single instance of the lightning shader, which in turn references any number of source/destination pairs of lightning bolts. This makes it possible to create complex lightning effects.

You cannot use the same model name more than once in either the **Source** or **Destination** text box. If you want to create two bolts with a common source point (null1), you would:

- Duplicate the source point (null1)
- Name it null1_dup

This table illustrates some ways of specifying source/destination pairs, with different results.

Source	Destination	Does this
null1 null2	null3 null4	Creates two lightning bolts: one between null1 and null3, another between null2 and null4
null1 null1_dup	null3 null4	Creates two lightning bolts that share a common source point.

Interactive Selection of Hosts (mental ray)

The new **Info → MentalHost** command in the Matter module lets you interactively select rendering host machines.

This means that you no longer have to iconize SOFTIMAGE 3D and edit the **.rayhost** file in your HOME directory to modify host information, and then return to SOFTIMAGE 3D to start the render.

To make this command available, you must use the new **mr_cusgen** standalone to define the servers which the users can select at runtime.

Defining Servers Using the mr_cusgen Standalone

The **mr_cusgen** standalone allows you to define the host servers available to users through the MentalHost interactive plug-in. Typically, this task is performed by the system administrator, who uses the **mr_cusgen** standalone each time the network changes (for example, when hosts are added or removed).

After using **mr_cusgen**, the results are:

- Users can choose the **Info → MentalHost** command in the Matter module. In the related dialogue box, they can select the host servers to be used for rendering from among the currently available host servers.
- Upon exiting the dialogue box, the **.rayhost** file in their HOME directory is automatically updated with this information.

To set up this command:

1. Create an ASCII file listing the names of servers available for rendering on the network. List one server per line, for example:
host 1
host 2
host 3
2. Separate hosts into groups by placing a line between them that begins with the hash (#) character. These host names will appear in the dialogue box displayed when users choose **Info → MentalHost** in the Matter module.
3. Save this file under any name, such as **<filename>.rayhost** in your home directory (\$HOME on IRIX and Windows NT).

4. At the command line, type:

```
mr_cusgen <file name>
```

using the file name you created in step 3.

This generates a **mentalHost.cus** file in the directory pointed to by the **SI_CUSTOM_MATTER** environment variable. This file contains the related information, which is global to the network.

Selecting Hosts for Rendering

Before rendering in SOFTIMAGE 3D, you can:

1. Choose the **Info → MentalHost** command in the Matter module. The following dialogue box is displayed.



2. Select or deselect the server hosts for the rendering job. Your local **.rayhost** file is automatically updated so that the rendering job will use the hosts you selected.
3. Render using the mental ray renderer.

Special Case for Shader Developers Using IRIX 6.x

The mental ray renderer and the shaderball previewer both allow dynamic compilation of shaders, which is useful for testing purposes when developing a shader. In this case, the shaderball previewer or mental ray compiles the shader code “on the fly,” and then links in the resulting object file dynamically.

In this process, the shader code passes through the C compiler and the default compilation flags used are determined by the operating system. In IRIX 5.3, the default compilation flag is **-32**, which produces object files only usable on **mips1** and **mips2** executables. In IRIX 6.x, the default compilation flags used are **-n32** (for **mips3** executables) and **-64** (for **mips4** executables).

You cannot mix MIPS versions of executables; for example, if you load a mips2 shader into a mips3 or 4 shaderball previewer, this leads to unpredictable results in the shader.

To avoid problems, do the following

- If you are on IRIX 6.x and you are using a MIPS1 or MIPS2 version of mental ray or the shaderball previewer *and* you want to use dynamic compilation, you must set the SGI_ABI environment variable as follows:

```
setenv SGI_ABI -32
```

This instructs the C compiler to compile MIPS1 or MIPS2 object files for your shader instead of the default MIPS3 or MIPS4 object files.

- If you are on IRIX 6.x and using a MIPS 3 or 4 version of mental ray or the shaderball previewer *and* you want to use dynamic compilation, make sure the above variable is *not* set. If it is set, unset it as follows:

```
unsetenv SGI_ABI
```

mental ray Release Notes for Version 1.9.10.10

SOFTIMAGE 3D version 3.7 uses mental ray version 1.9.10.10. This section outlines the changes that have been made in mental ray since the release of SOFTIMAGE 3D version 3.5 for IRIX.

Changes in mental ray Version 1.9

- Faster motion blur that now also uses recursive sampling.
- Disk path mapping for Windows NT has been implemented.
- If raytracing is disabled, refraction now behaves like transparency instead of terminating the evaluation and returning black.
- mental ray does not calculate shadows if raytracing is disabled. Before, mental ray turned raytracing back on if shadows were enabled.
- Large free-form surface and polygon mesh objects are now tessellated significantly faster.
- Memory-mapping image files that contain data formats other than RGBA are now supported.
- Introduced time contrast values on the command line and in the .mi scene file that permits setting contrast values for motion

blurring independently of the regular spatial contrast values.

- Added four new shader interface functions to access scalar and vector frame buffers.
- Added the `soft_vertex_colour` texture shader that supports vertex colours.

Problems Fixed in Version 1.9.10.10

- On some platforms, the 2D and 2D noise functions in the shader interface returned different results than on others.
- The SOFTIMAGE 3D material changer was changed to skip bump map calculations if one of the bump map deltas reached into undefined UV space where the texture on which the bump map is based is not defined.
- Sampling was adjusted to account for Window NT's non-standard rounding of floating-point numbers.
- Fixed motion blur on 3D textures.
- Workaround for Windows NT compiler bug causing speckles.
- Bump mapping now works correctly across texture seams. This fix introduces two new shader parameters for the SOFTIMAGE 3D material shader and only works in conjunction with the updated translator that generates these parameters.



SOFTIMAGE 3D v3.51 shaders are incompatible with SOFTIMAGE 3D version 3.7. You *must* recompile all of your shader libraries with version 3.7.

- The `-focal infinity` command line option did not work.

Conversion Tools/Standalones

Several new options have been added to the Tools module and the **imgconv** standalone:

- Kodak Cineon files are now supported.
- **imgconv** now supports Kodak Cineon files, Targa 16-bit files, and has a new **-sequence** option.
- There is a new command in the Tools module called **Export → Objects → WavefrontExport**.
- Three new standalones (**ddr_record**, **ddr_grab**, and **ddr**) let you record SOFTIMAGE .pic files as frames on a Digital Disk Recorder, and to grab frames from a disk recorder and save them as .pic files.

Kodak Cineon Files

SOFTIMAGE 3D now supports the following types of Kodak Cineon files:

- 10-bit logarithmic (the .fido extension)
- 8-bit XBGR
- 8-bit RGB

This change affects the **C_Reduction** menu cell (in the Tools module), the **Paint** menu cell (in the Matter module), and the **imgconv** standalone.

With **C_Reduction** and **Paint**, you can load a fido type file, edit it, and then save it as a .fido file or other file format such as .pic, .bmp, and so on.

Using the **imgconv** standalone, you can read 8-bit and 10-bit Kodak Cineon files, but currently you can save only as 10-bit (fido) type. Upcoming versions will support saving to other sub-formats.

Usage

```
imgconv <filename>.pic <filename>.fido
```

Converts a .pic file to a 10-bit (fido) Kodak Cineon file.

```
imgconv <filename>.fido <filename>.pic
```

Converts a 10-bit (fido) Kodak Cineon file to a .pic file.

Improvements to **imgconv**

Targa 16-bit Files

The **imgconv** standalone can now read Targa 16-bit files. This is in addition to the formats which were already supported: Targa 8-bit black and white and colour map, 24-bit, and 32-bit.



While you can import a Targa file of any of the formats mentioned above using **imgconv**, you can only save it back in Targa 24-bit format.

Usage

```
imgconv <filename>.tga <filename>.pic
```

where *<filename>.tga* is any currently supported Targa file format and is converted to **.pic** format.

```
imgconv <filename>.pic <filename>.tga
```

converts a **.pic** file to a Targa 24-bit file.

Sequence Option

The **imgconv** standalone has a new **-sequence** option which allows you to convert sequences of images.

Usage

```
imgconv <filename>.pic <filename>.tif -sequence 1 100
```

converts

```
<filename>.1.pic to <filename>.1.tif
```

```
<filename>.2.pic to <filename>.2.tif
```

```
<filename>.3.pic to <filename>.3.tif
```

.... up to

```
<filename>.100.pic to <filename>.100.tif
```

You can add effects on the same command line, as in the following example, which scales (“zooms”) the images down by 50 per cent:

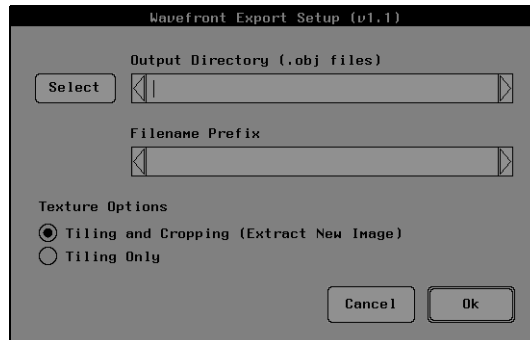
```
imgconv <filename>.33.pic <filename>.77.tif  
-sequence 1 100 -processor zoom ".5 .5"
```

Wavefront Export

There is a new command in the Tools module called **Export → Objects → WavefrontExport**. This is in addition to the existing **Export → Objects → Wavefront** command.

The **WavefrontExport** command allows you to preserve UV texture mapping when exporting SOFTIMAGE scenes to Wavefront format, and resolves problems in texture placement when exporting scenes to Wavefront. The **WavefrontExport** command exports all objects in the scene, whereas the **Wavefront** command exports only selected objects.

When you choose this command, the Wavefront Export Setup dialogue box appears.



Parameters

Output Directory (.obj files)

Specifies the target directory in which the generated files will be stored (can include object, material, and texture files).

Filename Prefix

Adds a prefix to all generated file names.

Texture Options

- **Tiling and Cropping:** Cropping and tiling information associated with the texture map is preserved in the resulting Wavefront texture file, by generating a new texture map.
- **Tiling only:** Only tiling information is preserved in the resulting Wavefront file and cropping information is lost.

Digital Disk Recorder Conversion Tools

Three new standalones (**ddr_record**, **ddr_grab**, and **ddr**) can be used to record SOFTIMAGE 3D images (.pic files) to frames on a Digital Disk Recorder (DDR) such as an Abekas, Accom, or Diskus, or to grab frames from a DDR to be saved as SOFTIMAGE 3D .pic files.

The **ddr_record** and **ddr_grab** standalones each convert in only one direction and use a command line interface. However, the **ddr** standalone converts in either direction and uses a graphical interface instead of a command line interface, and works only on Windows NT.

The existing conversion menu commands in the Tools module (**Video → Abekas/Accom → Record/Grab**) are still supported. Here are a few differences between the Tools menu commands and the new standalones:

- The menu commands in the Tools module support conversion with SCSI, but do not work reliably with Ethernet. The new standalones currently work only with Ethernet.
- The new standalone tools have some options not currently available in the corresponding Tools menu commands, such as:
 - **True Black** option
 - **Alpha Channel** only
 - Specifying beginning frame locations either through the (usual) frame number or using the corresponding time code location in PAL or NTSC.

During installation, these standalones are placed in the **3d\bin** directory. A corresponding **ddr.rsrc** file is created in the **3d\bin\rsrc** directory.



The **ddr.rsrc** file is a configuration file used only by the **ddr** standalone. It allows you to list the names of your DDR devices, such as Accom, Abekas, and so on.

Before You Begin

To use these standalones, the following conditions apply:

- The TCP/IP protocol must be installed.
- The **soft2tga** and **extract** standalones must be installed, and **rcp** must be installed in the **winnt\system32** directory.
- The names and IP addresses of your DDR device must be defined in the **winnt\system32\drivers\etc\hosts** file on Windows NT or in any valid DNS server. On IRIX, the DDR names must be defined in **/etc/hosts**.
- For the **ddr** standalone, names of DDR devices other than Accom, Abekas, or Diskus must also be defined in the **3d\bin\src\ddr.rsrc** file, which contains instructions for editing.

Note

If your DDR is an Accom, Abekas, or Diskus, you do *not* need to define it in the **ddr.rsrc** file. These DDR types are displayed by default in the related **ddr** dialogue box. Redefining the names in the **ddr.rsrc** file would cause them to be repeated unnecessarily in the dialogue box's pull-down menu.

To check that your DDR is properly connected, open a shell and type:

```
ping <DDR name>
```

where *<DDR name>* has been defined in the **hosts** file.

Setting the Default DDR Name

ddr_record and **ddr_grab**

The **ddr_record** and **ddr_grab** standalones assume that you are using an Accom DDR and look for Accom among the IP addresses. To use another type of DDR, you can either:

- Use the **-a <DDR name>** option (such as **-a abekas**) when invoking the standalones.

or

- Add the desired DDR name to the IP address line in the **hosts** file for a more permanent solution. For example:

```
<IP address> accom abekas
```

This means that the standalone accepts both Accom and Abekas as the device name.

ddr

In the **ddr** dialogue box, the DDR Name menu allows you to choose a DDR device name. The default name displayed is Accom.

You can change this default by editing the **ddr.rsrc** file as follows: add an asterisk (*) anywhere on the appropriate line in the **ddr.rsrc** file. For example, enter:

```
* abekas.
```

If there is more than one line with an asterisk, the last such line is used.

ddr_record

The **ddr_record** standalone records SOFTIMAGE 3D .pic files as frames on a Digital Disk Recorder (DDR). The DDR name must be defined in the **winnt\system32\drivers\etc\hosts** file on Windows NT or in the **/etc/hosts** file on IRIX.

At the command line, type one of the following:

- **ddr_record -i** to display a series of interactive prompts.
- **ddr_record** or **ddr_record -h** to display a list and definitions of all required parameters and options.

Usage

```
ddr_record <input> <start> <end> <step> <frame>  
[-a <DDRname>] [-b] [-m] [-v]
```

where

<input>	Name of the SOFTIMAGE .pic file without the .pic extension.
<start>	First frame of the sequence
<end>	Last frame of the sequence
<step>	Frame step of the sequence
<frame>	Frame location on the DDR to start recording

Options

- a <DDR name> Specifies the name of a DDR device if this is other than Accom.
- b Specifies True Black

- m Outputs only the alpha channel of the specified frames.
- v Verbose information.

Example

```
ddr_record image 1 50 2 100 -a abekas
```

records SOFTIMAGE 3D **image.1.pic** to ... **image.50.pic** with a step of 2 to frame 100 on a DDR called **abekas**.

ddr_grab

The **ddr_grab** standalone program grabs frames from a DDR and converts them to SOFTIMAGE 3D **.pic** files. The DDR name must be defined in the **winnt\system32\drivers\etc\hosts** file on Windows NT or in the **/etc/hosts** file on IRIX.

Usage

```
ddr_grab <output> <start> <end> <step> <frame>  
<framestep> [-a <DDRname>] [-v]
```

ddr_grab-i Displays a series of interactive prompts.

<output> Name of the output SOFTIMAGE file, without the **.pic** extension.

<start> First of the output sequence

<end> Last of the output sequence

<step> Step of the output sequence

<frame> Frame location on the DDR to start recording

<framestep> The step of the frames grabbed from the DDR

Options

- a <DDRname> Specifies the name of a DDR device, if this is other than Accom.
- v Verbose information.

Example

```
ddr_grab d:\grab\image 100 250 3 200 2 -a diskus
```

grabs a sequence of 50 frames with a step of 2 starting at frame 200 on a DDR name **diskus**. The output is a SOFTIMAGE 3D sequence of **.pic** files with a step of 3, saved under the **d:\grab** directory as:

image.100.pic

image. 103.pic

... to

image.250.pic

ddr (Windows NT Only)

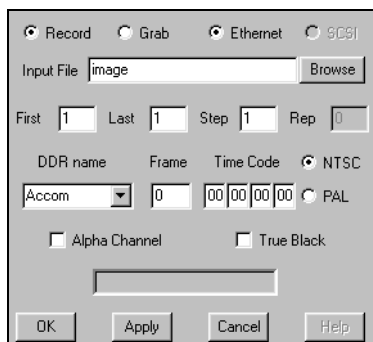
The **ddr** standalone combines the features of the **ddr_record** and **ddr_grab** standalones into a single graphical interface, allowing you to either record SOFTIMAGE 3D **.pic** files as frames on a DDR or convert frames to **.pic** format.

For the **ddr** standalone, DDR names must be defined both in the **winnt\system32\drivers\etc\hosts** file and in the **3d\bin\ddr.rsrc** file, which contains instructions for editing.

Note

The **ddr** standalone is currently available only on Windows NT.

1. At the command line, type **ddr** to display the related dialogue box.



2. Select either the **Record** or **Grab** option.

The **Ethernet** option is automatically selected because **ddr** does not currently work on SCSI.

3. In the **Input File** text box, enter either the name of the SOFTIMAGE 3D .pic file to be recorded or the frame to be grabbed.

Note

You can grab only whole frames, not fields.

4. Fill in the **First**, **Last**, and **Step** values to define the first and last frames, and the number of steps.
5. Select a name from the **DDR name** menu. By default, Accom, Abekas, and Diskus are listed. To list any other DDR type in the menu, the device name must be defined in the 3d\bin\src\ddr.rsrc file.
6. Indicate the location on the DDR at which to start the operation by entering either a **Frame** number or a **Time Code** value:
 - If you enter a **Frame** number, it does not matter whether you select **PAL** or **NTSC**.
 - To specify the **Time Code** location, select **PAL** or **NTSC** first, then enter the time code. The **Frame** value is automatically calculated according to the PAL/NTSC and time code settings.

Note

The time code is only used as a reference for calculating the frame number: it is the frame number that is actually used in grabbing or recording.

7. Click **Apply** to apply the settings without exiting the dialogue box, **OK** to apply the settings and exit, or **Cancel** to cancel the operation.

Parameters

Record

Records the specified SOFTIMAGE 3D .pic files onto the DDR as a series of frames.

Grab

Grabs the specified frame sequence from the DDR and converts them to a sequence of SOFTIMAGE 3D .pic files.

Ethernet

Uses the Ethernet network connection.

SCSI

Uses the SCSI interface for network connections. This option is not currently available.

Input File

Allows you to select the name of the SOFTIMAGE 3D .pic file to be recorded or the frame to be grabbed. The default name is "image."

Browse

Opens a browser to find the desired file or frame name. If you select the **Record** option, the **Browse** button allows you to open a SOFTIMAGE 3D .pic file. Using the **Grab** option, the browser allows you to find a frame and save it as a SOFTIMAGE 3D .pic file name.

First, Last, Step

Specifies the first and last frame number, and the step value for recording.

Rep

Not currently available.

DDR Name

Allows you to select the name of the DDR that you want to use. By default, Accom, Abekas, and Diskus are listed. Other DDR types are listed only if they are defined in the 3d\bin\src\ddr.rsrc file.

Frame

Indicates the location at which to start recording or grabbing on the DDR in terms of the frame number. If you enter the frame number, it does not matter whether you select the **NTSC** or **PAL** option. You can also automatically calculate the frame number by selecting **NTSC** or **PAL** and then entering a value in the **Time Code** text box. The values are updated after moving the mouse pointer to other options.

Time Code

Indicates the location at which to start recording or grabbing in time code format: **hour:minute:second:frame**. The specified time code value is used only as a reference to automatically calculate the value for **Frame**. Before specifying the time code value, select either **NTSC**

or PAL. Values are updated after moving the mouse pointer to other options.

NTSC and PAL

Specifies how the corresponding time code and frame number are calculated on the DDR,. This is based on 25 frames per second for PAL and 30 frames per second for NTSC. Frame 0 = time code 00:00:00:00.

Alpha Channel

Indicates that you want to record or grab *only* the alpha channel.

True Black

If you select this option when recording, the black area of the frame outside the rendered image is recorded with a value of 0.0 and not the usual 7.5.

Black areas within the rendered model still have a black value of 7.5; the black value will be 0.0 only in the area of the frame lying outside the rendered model.

This option is not available when **Grab** is selected.

OK

Applies the settings and exits the dialogue box.

Apply

Applies the settings and does not exit the dialogue box. You can then grab or record more sequences.

Cancel

Exits the dialogue box without applying the settings.

