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Copyrights and Disclaimers

Interface Notes

Following is a summary of important points concerning the **trueSpace2** interface:

* To select a tool, click on it with the left mouse button. If the tool uses control panels to adjust settings, etc., they automatically open. Right-click on a tool to open its property panel, if it has one. These panels automatically go away when another tool is picked with the left mouse button.

* Left click and hold brings up a menu of tool variant icons.

* If you select a tool, then decide not to use it, simply move the mouse away from the tool before releasing the mouse button. Active, highlighted tool icons and settings buttons appear blue and "pushed in." Also, tool icons that are not currently available, for example because no object is selected, are "grayed" and cannot be selected.

* Right click brings up a tool's property panel. To access a variant's property panel without invoking the variant, use the right mouse button, and drag to display the pop-up menu.

* When a tool's property or control panel is accessed, the panel itself may be moved anywhere in the workspace by clicking and dragging the panel away from the tool icons. The panel will remember its previous position when it is next opened.

* To close any panel manually, right click on in any gray area in the panel or on a panel button, and drag outside the panel. When you see an "X" appear across the entire panel, release the mouse button, and the panel will be closed.

* If the titles option is enabled (in the preference settings), you can close a panel by clicking on the close box in the top left of the panel. You can close all panels in the workspace by pressing the Close All Panels button .

* You can dock all displayed property panels, queuing them immediately above or below any displayed tool groups, with the Dock All Panels tool , found near the right end of the View Group.

* All tool groups except the View Group automatically open in a special left-to-right queue formation immediately above or below the menu bar, depending on whether the menu bar is at the bottom or the top of the screen. If there is no more room for new tool groups next to the menu bar, the queue is continued immediately above (or below) the previous row. If there are any panels there, they are moved up (or down) out of the way. When in the queue, if a tool group is closed, the remaining queued groups close ranks (that is, those following the removed group advance to fill in the gap). Tool groups, unlike panels, cannot be repositioned by the user.

* Control and property panels automatically open in a special left-to-right queue formation immediately above or below any displayed tool groups. If there is no more room for panels immediately next to the menu bar, the queue is continued immediately above (or below) the previous row. If a

queued panel is closed or moved to a different part of the screen, the remaining panels close ranks (that is, those following the removed panel advance to fill in the gap).

* To place a panel at the end of the queue, drag it to within a few pixels of the menu bar or any groups thereon. To insert a panel at a specific location in the queue's first row, drag it to that location, placing the panel's bottom (or top) edge within a few pixels of the menu bar.

* To open or close a tool group, select it from the Group menu.

* To move a non-maximized (smaller than full-screen) view window, click on the text box near the lower left corner and drag the mouse.

* Initially the menu bar appears at the bottom of the screen; you can position it at the top by selecting the Top Menu item in the File menu's preferences panel. If the **trueSpace2** window is not at full-screen width, you may not be able to see all menu headings.

Help Bar

By enabling the Help Bar option from the Help menu, you can take advantage of **trueSpace2**'s context-sensitive help mode while learning the program and using unfamiliar tools. When the mouse pointer is positioned over any tool icon, the help bar displays its description plus a keyboard shortcut, used for accessing the tool from the keyboard.

Also, when certain tools are active and the mouse pointer isn't over any other tools, the help bar displays brief directions for using the tool. For example, the Polygon tool's directions are: "Click to add points. Right-click to close polygon."

Keyboard Shortcuts

Keyboard shortcuts provide a way to create keyboard equivalents to onscreen icon buttons. By assigning keyboard shortcuts to frequently used tools, you can concentrate mouse actions on object manipulation, and keyboard actions on tool selection.

To assign a keyboard shortcut to a tool, place the cursor over the tool's icon then press the Ctrl and F1 keys at the same time. The Key Shortcuts dialog pops up. Once the dialog is up the cursor can be moved away from the tool's icon. Press the New Key button then type the keystroke to be used as the shortcut. Any combination of Ctrl, Alt, and Shift plus an alphanumeric, punctuation or function key is legal. Note that Ctrl, Alt, and Shift need not be used.

To find out what and if a shortcut is assigned to a particular function press Find, then the keystroke. If there is a tool assigned, it will show up in the dialog. If a tool has a keyboard shortcut assigned to it, the keystroke appears in the help bar when the cursor passes over the tool's icon. Many tools already have shortcuts assigned.

Draw Modes

trueSpace2 has four ways of displaying objects:

Bounding Box Mode

Box mode temporarily displays bounding boxes for objects to greatly decrease redraw time and works within the other draw modes. The threshold for switching to bounding boxes is controlled in the preferences panel. A large number redraws all objects either in wireframe or solids during manipulation and a small number will temporarily switch unselected objects to boxes. The Preferences panel is found under the File menu.

Wire Mode

Objects are drawn as transparent wireframes consisting of vertices, edges, and faces. Wire mode is most useful for point editing.

Solid Mode

Objects are shaded and may also have textures displayed. The effects of lights on a scene are rendered in real time for production oriented design. **trueSpace2** takes advantage of Intel's 3DR real time rendering technology. To switch the current window's mode from wire mode to that of 3DR, make the selection from the Object Mode pop up located next to the render tools. Right click on the same pop up to open the solids property panel. There you can enable textures, and the solid grid mode (see Object Mode in the View Group section). For more on real time rendering and how you can take advantage of 3D accelerated video cards, see the Chapter 1 of the User's Guide. Since we will be adding support for other renderers and 3D acceleration cards in the future, please check the Read-Me file for the latest status.

Photorealistic Mode

When objects are rendered, they are smoothly shaded and can have textures, bump maps, transparencies, environments, and even shadows. With the option of raytracing, reflections and refractions are also rendered adding to the over all photorealism of the image. Because a raytraced image can take anywhere from a few minutes to many hours to finish, the option is disabled by default. Enable it by right clicking on any render tool and opening the Render dialogue box. There the Raytrace option can be turned on. **trueSpace2** also has a variety of other rendering effects like motion blur, depth cue, fog, and support for 3rd party Photoshop Plug ins.

Preference Settings

trueSpace2 has some program options that are available in the Preference Panel. The Preference Panel can be accessed from the File menu.

Related Topics:

Dynapick (Dynamic Pick)

OrthoNav

Top Menu

Titles

SaveState

LoadScene

Thold (Threshold Time)

Tablet

Scene Detail

Default Lights

Dynapick (Dynamic Pick)

When Dynapick has been enabled, an object can be selected and manipulated with the current tool without having to release the mouse button. The benefit is that many objects can be manipulated quickly by simply clicking and dragging on each. If two objects are under the cursor, selection alternates between them with each successive mouse click. If more than two objects are under the cursor, selection is most reliable when the cursor is positioned over a specific object's edge or vertex. If no object is under the cursor, the currently selected object is used.

Turning off Dynapick can help avoid accidental selection of objects while manipulating a complex scene. When Dynapick is disabled, an object must be selected with a mouse click, then manipulated by a second mouse click (and hold). This mode is useful when you wish to work with one object that is positioned on top of others. With an object selected, the cursor need not be over the object to manipulate it.

OrthoNav

When enabled, the left mouse button controls horizontal and vertical navigation in the Front and Left *orthographic* views. When disabled, the right mouse button controls vertical navigation. Note that OrthoNav applies only to the Front and Left orthographic views, the Top view shows the XY plane whose navigation is by default, mapped to the left mouse button.

Top Menu

The default position for **trueSpace2**'s menu bar is at the bottom of the screen. Select this item to place the menu at the top of the screen.

Titles

When this toggle button is on, all program panels have standard Microsoft Windows title/drag bars across the top. These can be closed with a single click on the Close box in the upper left corner.

To close a program panel with no title bar, place the cursor over a blank area of the panel. Press and hold the right mouse button while dragging it outside of the panel. Release the button and the panel will close.

SaveState

SaveState determines whether workspace is "remembered" when you quit the current session. With SaveState on, **trueSpace2** saves everything when you quit. The next time you run the program, it starts in the same state as when you last quit the program, with all objects and motion automatically reloaded, and open panels right where you left them. With SaveState off, the program restarts in a default mode, with no panels open or objects loaded.

LoadScene

If this switch is turned on when you quit the program, the last scene saved or loaded during the current session is automatically reloaded the next time you start **trueSpace2.**

Thold (Threshold Time)

As you transform objects in **trueSpace2**'s workspace, the program attempts to maintain maximum feedback by continually redrawing wireframe or solid objects during manipulations. However, with complex objects and/or many simultaneously open views, forcing everything to continually redraw can cause unwanted delays, in which case the program resorts to using bounding boxes during transformations.

This setting determines the maximum redraw time in milliseconds before a scene is simplified with bounding boxes while transforming objects. The lower the setting, the greater the likelihood that simplification will occur. If more than one view window is open, the total redraw time in all windows is taken into consideration. If not all windows need to be simplified, the current window is simplified last. In other words, if you have a small Top view window open and you're dragging a complex object in the main Perspective view, it may appear as a bounding box in the Top view but as a wireframe in the Perspective view.

When working with hierarchical objects, there is an additional level of detail between wireframe and bounding box, which is hierarchical bounding box. This creates a bounding box for each member of the hierarchy, rather than a single one for the entire object.

Tablet

Enables input from graphics tablets. **trueSpace2** does not have any special support for tablets (other than for proportional scaling) so they should be set up to run under windows in mouse emulation. With this option enabled, scaling with the left mouse button is proportional on all three axes. Disable one or more axes in the Coordinates property panel to scale objects non-proportionally. For proper tablet installation, refer to your tablet documentation.

Scene Detail

These settings affect the way the scene is redrawn. Render All is the most detailed representation but you can speed up your work significantly with complex scenes by choosing Always Boxes.

Boxes

Unselected objects will switch to boxes while the selected object is manipulated.

Always Boxes

Unselected objects will always be displayed as boxes until a new selection is made.

Wireframe

Unselected objects will switch to wireframe while the selected object is manipulated.

Always Wire

Unselected objects will always be displayed in wireframe until a new selection is made.

Render All

All objects are rendered.

Default Lights

This pop up contains three choices for default lighting. Selecting a new light choice deletes all lights in the workspace and replaces them with the new default setup.

White Lights

These are four infinite lights pointing towards the center of the workspace. These lights provide sufficient illumination from all angles and are good for modeling.

Colored Lights

These are three local lights of different colors arranged in a triangle formation over the workspace. Colored lights give a better sense of depth while working in solid mode.

No Lights

No default lights are placed in the scene.

File Menu

Scene: New

This clears all objects from the workspace, and leaves all other settings (e.g. Material) of program operation.

Scene: Load...

This restores set-ups saved previously with the Scene: Save As... command, including objects, lighting, animation, and so on. When the Load Scene file dialog appears, select the file to load, then click on OK.

Scene: Save and Save As...

This saves to disk all aspects of the current scene, including objects, lighting, animation, eye position, and so on. When the Save Scene file dialog appears, select the file to save over, or enter a new file name, then click on OK.

Object: Load...

This allows loading of 3D object files. Supported formats, automatically recognized by the **trueSpace2** loader, include trueSpace, DXF (AutoCAD), 3D Studio Binary, 3D Studio Projects, 3D Studio ASCII files, LightWave, Wavefront, Imagine, VideoScape, Caligari Amiga, and Postscript files. When the Load Object file dialog appears, select the file to load, then click on OK. If you don't see an object file you saved, select "All Files *.*" from the List Files of Type pop-up at the bottom left of the file dialog.

To restrict the listed files to a particular type, use the pop-up under "List Files of Type:" in the dialog. For specific information on 3D file formats supported, see the Appendix.

Object: Save

Saves the current object over the file from which it was loaded, or the last saved version. If the object was created in **trueSpace2**, the Save command works the same as Save As..., opening a file dialog so you can name the object.

Object: Save As...

This allows saving of objects in trueSpace, DXF and 3D Studio ASCII (text) formats. When the Save Object file dialog appears, select the file to save over, or enter a new file name, then click on OK.

The format under which files are saved is determined by the file name extension you enter. If you use ".cob" the file is saved in trueSpace format, and if you use ".asc" the object is saved in 3D Studio ASCII format. If you use ".DXF" the object is saved in AutoCAD format. To see the available formats and the associated file name

extensions, use the pop-up under "List Files of Type:" in the dialog. The program does not add file name extensions automatically.

Preferences

Opens the Preferences Panel documented earlier in this section.

Exit

Quits the program. A confirmation dialog appears: Click "Yes" to quit, and "No" to return to the program.

Edit Menu

There are four tools related to modeling available within this menu: Undo, Redo, Erase, and Copy. These four functions are replicated as icons are covered in depth in the Edit Group.

The Image Utilities will make special conversions of images for texturing purposes. These utilities are covered at the end of the Rendering section.

Groups Menu

Use this menu to open and close **trueSpace2's** different tool groups, each of which is described in detail in its own section. When a check mark appears next to an item, that means the group is currently active and displayed.

Help Menu

Help Bar

Use this item to toggle the display of **trueSpace2's** context-sensitive help feature covered earlier this section.

About

Displays basic program information, including the current display mode. To close the information box, right-click on it and drag outward, or if the Titles switch is enabled, select the Close box in its upper left corner. You can also close it with the Close All Panels tool from the Edit Group. The About box also contains pertinent version information which maybe of use in case you require technical support.

Contents

This opens a standard Window's help file. It includes definitions, explanation and description of individual **trueSpace2** functions. It is much more extensive than the Help Bar, but is not context-sensitive.

Object Mode

This pop up found on all windows determines how the scene is drawn while you work within **trueSpace2**. You can opt to work in wire mode for Point editing, etc... or use Intel 3DR to render your scene in real time as you work. Right click on either variant to open the Render Quality panel where the smoothness maybe set for the solid mode as well as textures, enabling the solid grid, and displaying the background image in the workspace.

Render Wire

This tool serves two functions. It can be used to refresh wireframe display in the current window or to disable solid rendering. In wire mode, selected objects are white and unselected are blue.

Render Solid

Choosing this option switches the current display mode in the current window from wire display to real time solid rendering. A 3D cursor follows the currently selected object or group of objects but changes to the shape of a local axis when the hierarchy is navigated through to display the current hierarchical level.

Related Topics:

Render Quality Panel

Render Quality Panel

Faceted

No smoothing is performed. However, shading within individual faces is performed. This mode is faster than smooth rendered.

Smooth

Smooth shades objects in the scene.

Textures

Enables the use of textures while shading objects in solid mode. This is the slowest mode of solid operation. The pop up beneath textures allows you to set the maximum resolution textures displayed while rendering. The higher the resolution, the slower the render. Changing the display size of textures does not change the actual texture nor does it affect the quality of the final render. Please keep in mind that some hardware accelerators will not support textures.

Solid Grid

Turns on the solid grid for the solid mode window. Solid grids are helpful for the placement of lights in your scene but will slow down redraw time if you don't have a 3D accelerator.

Show Background

This switch enables the display of the current background image (set in the Render Quality panel) in the workspace and applies to both solid and wire frame views.

Render Tools

The Render pop-up menu is the second from the left of each window's tools group. These tools let you render the current object or all objects in a scene to the window from where the tool was selected. The scene may also be rendered to disk. Rendering can be stopped anytime by pressing the Esc key or by a double right click on the mouse button. Access the Render Options panel by right-clicking on any Render tool.

Render Current Object

Renders the current object to the display which maybe be either a wireframe display or a solid view. If a camera, light, or a deform primitive is selected, nothing happens. Shadows are not rendered.

Render Scene

Renders all objects to the display, using the Render Options panel settings.

Render Scene to File

Renders the scene to disk using the Render Options panel. The render can be a current frame or a sequence of frames. The possible file formats are Targa (.TGA), Windows Bitmap (.BMP), JPEG (.JPG), Flic (.FLC), or Video for Windows (.AVI). Selecting Render Scene to File opens the Render to File dialog. Settings in the dialog include file name, file type, resolution, animation file parameters, motion blur, field rendering, and depth of field.

Related Topics:

Render Options Panel

Render to File Dialog

Render Options Panel

Access the Render Options panel by right clicking on any of the render variants. This allows you to set several render effects:

Raytrace

Enable this option to raytrace the current scene for accurate shadows, reflections, and refractions. Raytracing may be keyframed on and off during the course of an animation. See the Keyframe Monitor in the Animation Group section for more information.

Reflect

This is related to the Shininess settings of an object's material. For example, when an object's shininess is set below this value, no reflections are traced for it when raytracing a scene. This helps save time when raytracing. This value may also be animated with a raytrace keyframe.

Draft

By default, trueSpace renders objects and scenes at the full video quality of your display. For faster test rendering at full size but one-fourth resolution, turn Draft on.

AntiAlias Level

Antialiasing reduces jagged edges in images that should only contain smooth edges. Select the AntiAlias switch to turn the effect on. An X appears in the white box to indicate that this feature is active. This pop-up menu offers four levels of antialiasing: 1X, the default; and 2X, 3X and 4X. The greater the antialiasing, the more smoothing of edges, but the longer the amount of time required for rendering. When raytracing, a special type of adaptive antialiasing takes place which is faster and uses fewer system resources.

Fog

Fog affects object color and shading depending on the distance from the "eye" or camera point, creating a convincing illusion of a fog in the scene. Select the Fog switch to turn the fog effect on. An X appears in the white box to indicate that this feature is active. Fog state, color, percent, and extents may all be keyframed to change over time. See the Keyframe Monitor in the Animation Group section for more information.

Fog Color

Use the Fog Color button to specify the color of the fog. Use a black fog to simulate distance attenuation and medium to light grays for normal fog.

Fog Maximum Percentage

Use this setting to determine the relative fog density at and beyond the Far distance. For the illustrations, fog extents were kept constant but the Maximum percentage value was changed from 50 to 100%.

Fog Extents

A scene with fog normally consists of three zones: the clear zone starts at the eye and ends at the Near point; the transition zone, in which the fog gradually becomes thicker, starts at the Near point and ends at the Far point; and the "maximum percent" zone starts at the Far point and extends to infinity. The Near setting lets you set the distance in World units to the point where the fog starts affecting the scene. The Far setting lets you set the distance to where the fog reaches maximum density.

Background

You can set a solid background color or specify a background image for rendering.

Background Color

To set a color, select the Background Color button. An RGB dialog appears that allows you to set a color with the mouse and sliders, or click on the number boxes and set new values from the keyboard. The background color also applies to the workspace color while working with a solid mode view. The color value may be animated. Please see the Keyframe Monitor for more color information.

Background Image

To set a background image, click on the Background Image File Name button and select an image file from the file dialog. If the image is not the same size as the image to be rendered, **trueSpace2** automatically scales it to the proper size during rendering. Use the Background Image switch to enable and disable use of a loaded background image. On and Off states may be keyframed to change over time.

Animate

For animated backgrounds, **trueSpace2** allows for sequentially numbered files or an .AVI file. If Animate is enabled, the program will cue up each frame of the animated background for each frame of actual animation. If the file is an .AVI, then the rate at which the frames are cued is according to the base rate of the .AVI file. For example, if the base rate is 15 fps (frames per second), then each frame is repeated twice for the background in the final animation (assuming 30 fps for final render). If there are more frames in the animation than in the background, the background will loop. The same thing occurs if there is a break in sequentially numbered files.

Global Env(ironment)

A global environment works like a regular environment map but is automatically applied to all objects that do not have an individual environment map. You can set a solid color or you can specify an environment map. Note that these do not appear in the scene, but are reflected by reflective objects.

Global Environment Color

To set a solid color, select the Global Environment Color button. An RGB dialog appears that lets you set a color with the mouse and sliders, or click on the number boxes and set new values from the keyboard. The Global Environment settings and image state may be keyframed to change over time. See the Keyframe Monitor for more information.

Global Environment Image

To set a global environment map image, click on the Global Environment Map Image File Name button and select an image file with the file dialog. Use the Global Environment Map Switch to enable and disable use of a loaded image.

Animate

For animated environments, **trueSpace2** allows for sequentially numbered files or an .AVI file. If Animate is enabled, the program will cue up each frame of the animated environment for each frame of actual animation. If the file is an .AVI, then the rate at which the frames are cued is according to the base rate of the .AVI file. For example, if the base rate is 15 fps (frames per second), then each frame is repeated twice for the environment map in the final animation (assuming 30 fps for final render). If there are more frames in the animation than in the environment map, the environment will loop. The same thing occurs if there is a break in sequentially numbered files.

Render to File Dialog

File Name

Enter a file name with the proper extension in this box: .tga, .jpg, .bmp, or .dib (same format as .bmp) for still files or the two choices for animation formats: .flc and .avi.

List Files of Type

To view available file formats and their file name extensions, click on the box under "List Files of Type:". Specifics for available formats are documented in the Appendix.

Resolution

Renderings can be output at any resolution up to 8,192 x 8,192 pixels. Select Window to render at the same size as the current active window, whose resolution is shown. To render at a different size, select Other and set the desired frame size in pixels in the Width and Height boxes. There are also many preset resolutions available from the Preset drop down box.

Animation

Select Current Frame Only, All Frames, or a specific range of frames. To render a range, select From and enter a frame range in the boxes to the left and right of the word To.

Frame Rate

trueSpace2 uses a frame rate of 30 frames per second internally but this can be changed in the Animation property panel. If you choose to render at a lower frame rate, then **trueSpace2** will skip frames to output at the correct rate. (i.e. if you choose 15 frames per second, then only every second frame will be output.) When saving AVI-format animations the frame rate is recorded in the file so the playback will occur at the correct speed.

Pixel Aspect Ratio

The Pixel Aspect Ratio setting is used primarily in desktop publishing applications to match the setting required by certain software. If an image created with **trueSpace2** that is loaded into another application appears out of proportion, this setting may require adjustment. Consult the application's documentation for the proper ratio value.

Effects and Settings

Motion Blur and Depth of Field are grouped together in the Render to File dialog box. They share one parameter, the Blur/Depth field. This field functions the same for both (allowing them to be used together).

Motion Blur

The motion blur is a global control for the entire scene. Everything will be blurred that has motion including reflections, shadows, ray-traced effects, etc. The length field controls how much animation time will be displayed in a single image. A value of 1.0 means that there will be a blur representing time from where each frame begins until the time when the next frame begins. A value of two will cause the blur to span the time of two frames, etc. You can even display the entire animation in a single frame by putting the length equal to the number of frames in the animation.

The frames field controls the quality of the blurring and should be used in conjunction with the length field. This value is equal to the number of frames that will be rendered and combined together to form a single motion blurred image. If you have a very short length value, then you can also probably use a small frames value. Likewise, a long length will require a large number of frames. In the example below, where all the motion will be displayed in one image, if you set the frames equal to the number of frames in the animation, then you will not only see the entire motion, but also at the exact frame positions for all of the objects. A frame value of one effectively turns off motion blur.

Note: Since you are blurring objects it motion, if everything in the scene moves, you may be able to turn off anti-aliasing and only use the blurring to anti-alias.

Depth of Field

The buttons in the Depth of Field window function as follows: The on/off radio buttons enable and disable depth of field functionality respectively. The Focus field is used to set the sharpness of the image. Larger values result in images which are blurrier the further polygons are from the focal point. The F. Dist field sets the distance from the current eye/camera position to the focal point of the image. This distance goes straight into the screen Z axis and follows the World units. If the current frame has a Look At key, then the focal point will be the axes of the object being looked at and the Focal Distance field will be ignored.

Field Rendering

Enabling field rendering causes **trueSpace2** to render two separate frames (or fields) for each frame of actual animation: one frame with the even scan lines and the other with the odd. This option makes for smoother output when creating animations for broadcast or video.

Render

Select this button to render and save the select frame or frames. During this time the mouse pointer turns into an egg timer to indicate the computer is busy. You should also see your hard disk busy light activate. When rendering is finished, the hard disk busy light goes out and the mouse pointer returns to the shape of an arrow. If **trueSpace2** is minimized while rendering, it will beep to alert you that the rendering is finished.

View Select Tools

This command is used to set the main view mode: perspective (default), top, left, front or camera. Each window can be set to a different view, and different windows can be set to different camera views simultaneously.

Perspective View

Perspective is the default view, being the one in which the program normally starts, and for most users it is the most flexible in which to work. In perspective mode, the point of view or "eye" can be positioned anywhere, pointing in any direction. However, appearances from an angle can be deceiving so the view can be made into an orthogonal view for the proper positioning of objects.

Front View

The front view is orthogonal (no perspective), looking down the world Y axis. The view can be moved and scaled but not rotated.

Left View

The left view is orthogonal (no perspective), looking down the world X axis. The view can be moved and scaled but not rotated.

Top View

The top view is orthogonal (no perspective), looking down the world Z axis. The view can be moved and scaled but not rotated.

Camera View

The camera view is the view from a selected camera, light, or object. The orientation of the view is in regard to the selected object's Z axis. This view can be moved, rotated, and scaled either with Eye Navigation tools or by manipulating the selected "camera" object.

Eye Move

The eye can be moved within all three coordinate systems.

In the WORLD system, clicking the left mouse button and dragging causes the eye to "fly" over the XY reference grid. Clicking the right mouse button and dragging, causes the eye to change altitude over the XY reference grid.

Eye movement in the SCREEN system gives you the easiest way overall of navigating in the workspace. Eye movement is simplified to horizontal and vertical screen movement (left mouse button) plus a straight in and out (SCREEN Z-axis) direction using the right mouse button.

Eye Rotate

Though the coordinate system controls for eye rotation appear the same as for other navigation tools, they have different meanings. Regardless of which coordinate system is chosen, eye rotation (turning about its own axis) and revolution (orbiting) is based on the SCREEN coordinate system.

By selecting the WORLD coordinate system, the eye will orbit the world center, even if the eye does not directly point at it.

By selecting the OBJECT coordinate system, the eye will orbit the active object's center (see below) even if the eye does not directly point at it. If no object is active, the eye will orbit the world center.

By selecting the SCREEN coordinate system, the eye will rotate (pan and tilt) about its own axes which are congruent to the screen axes.

Eye Scale

Zooming in a perspective or camera view is analogous to changing the focal length of a lens. You can zoom from fish-eye to super-telephoto. The photographic effects of the eye's real-world counterparts are apparent in **trueSpace2**. For example, when the eye is zoomed to telephoto ranges, objects will appear to be crowded together. Zooming in an orthographic view moves the eye in and out without visual distortion.

Eye zoom is independent of any coordinate system; it moves along an axis perpendicular to the screen. Within a perspective view, the amount of zoom on the eye is limited. To "pull out" of a scene, use the Eye Move tool in the SCREEN Coordinate system.

New Window Tool

The New Window tool variants, found only on the main window, allow opening up to three auxiliary windows as perspective, front, left or top views. Auxiliary windows have standard Viewpoint Navigation and View Select tools as well as Render tools. A window can be set to show the view from the currently selected camera, light or object by selecting Camera from its View Select pop-up. These windows can be used for everything the main view can, including object manipulation, animation, and rendering. Orthogonal views can be moved and scaled but not rotated. Windows can be moved by clicking on the blue text box near the left end of the window bar and dragging, and can be resized by the edges and corners using standard Windows mouse techniques. The maximum size of auxiliary windows is limited to about one-fourth of the screen resolution. To close a window, click once on its Control-menu box, then on the Close item, or simply double-click on the Control-menu box.

General Tools

Reset View

This tool let you return the currently active window's view to its default settings. In Perspective view, the default view is the one in which the program always starts, with the "eye" pointed diagonally down at the working grid, situated halfway between the X and Y axes. The orthogonal Left, Front and Top views, which cannot be rotated, are returned to their original eye position. If a window is set to Camera view, this tool doesn't affect it.

Look At Object

In Perspective view, this tool centers the eye to point at the current object. In orthogonal views, which cannot be rotated, Look At Object centers the view on the object. Look At Object has no effect on a camera view. To use Look at Object select the object to which the view is to be oriented then select the Look at Object tool.

Dock All Panels

All open panels are automatically placed in orderly rows immediately above or below any displayed tool groups.

Close All Panels

All open panels are automatically closed.

Undo Tools

Undo

The Undo Tool reverses previous operations. Undo remembers not just the last operation, but several operations back. Repeated clicks on Undo lets you continue to "back up" as far as you like. Undo has the option to save a temporary file in order to reverse destructive operations like delete and booleans. To enable this option, make sure that "File Undo" is enabled in the Undo settings panel (right click on Undo). The Undo property panel that allows you to have some control over the un/redo process. From the pop up, you can now specify that you want un/redos to only be those that apply to objects and not the viewpoint. This is handy when changing the view on a model while editing it. This option is called "Un/redo object only", while the other option which is identical to the previous un/redo scheme is called "Un/redo previous action."

Redo

The Redo tool repeats the last operation undone by Undo. Repeated clicking on Redo after an Undo causes the operation to be applied cumulatively as many times as the button is clicked on. For example, move an object, then click on Undo. It moves back to its original position. Click on Redo. It moves back to where you placed it. Click on Redo again. It moves an equal distance past that point, and so on.

Erase

Normally, selecting this tool deletes the currently selected object. However, if you're working with Point Edit or Deform, Erase exits the selected tool first and upon a second click, deletes the current object.

Copy

This tool makes an identical yet independent copy of the currently selected object. The new copy initially occupies the same space as the original, and should be moved to distinguish the two. Animation paths are passed on from the original object but not animated deformations. In this case, the copy assumes the shape of the deformed object at the frame it was copied.

Glue Tools

Glue as Sibling/Glue as Child

These tools are used not just for grouping together objects but they define relationships between objects in a hierarchy format. These relationships define how the individual objects in a group behave during animation. Once constructed, a hierarchical object can be edited as a whole with other tools of **trueSpace2** (point editing, deform, painting, etc...) but can also be navigated through to edit individual sub-objects. Hierarchies can be dismantled with the Unglue tool.

Each simple object (those having no sub-objects) has a symbolic node associated with it.

The glue tools differ in the way they attach a sub-object to an existing hierarchy.

You can glue a sub-object to any part of the complex object's hierarchy.

Unglue

To unglue parts of a hierarchy, the desired members must be first isolated by scrolling through the hierarchy either with the hierarchy navigation tools in the Navigation Group or with the up and down arrow keys on your keyboard. When working in wireframe display, selected hierarchical objects are white and un-selected are brown. In solid mode, the 3d cursor changes to local axes only for the selected parts of the hierarchy. Once a member or group of members is isolated, select the Unglue tool and they are detached from the hierarchy.

Material Library

Once created, materials can be stored in a special graphic list called a material library, which can be saved to and loaded from disk.

Selecting this icon opens the Material Library. It automatically loads the Material Library named simple.mlb if it is present. Otherwise the Material Library panel is empty when first opened.

The panel displays up to eight at a time of the current library's materials in a horizontal graphic list as sample spheres or planes. If there are more materials in the library than can fit in the panel, use the scroll bar to scroll through the rest. To set the current material used by the Paint tools to one in the panel, select the new material from the panel with the mouse (a red bar indicates the current material in the panel). To rename a material, select it, then enter a new name in the material name field in the lower right corner and press return.

Add

Clicking on this icon adds the current material to the library.

Delete

Clicking on this tool deletes the currently selected material from the library.

Related Topics:

File Functions

File Functions

If a Material Library was loaded or saved previously during the current session, this box shows the file name of the current library. Click on the box to display a pop-up menu of file functions:

New

This tool clears any materials from the current library.

Load

Permits loading of a Material Library previously saved. When the Load Material Library file dialog appears, select the file to load, then click on OK.

Save

This command saves the Material Library currently in memory to the file from which it was loaded or last saved. If no library was loaded or saved previously during the current session (that is, the File Functions box is blank), this command works the same way as Save As.

Save As...

Save As permits saving the current library to disk. When the Save Material Library file dialog appears, select the file to save over, or enter a new file name, then click on OK.

Path Library

This function lets you build libraries of spline paths and save them to disk for later retrieval. Whenever a path or a spline polygon is selected in the workspace, you can store it in the Path Library, or substitute any other preset path for the current one. Selecting the Path Library tool opens the Path Library panel. It automatically loads the basic.plb library if it is present.

The names of current stored paths are shown in a scrolling list at the right of the panel, with the current path's name highlighted. Use the arrows and slider at the right side to scroll through the list of names. For more on Path Library functionality, see the section directly following the path library definitions.

Add

First select a Sweep Macro, spline polygon, or animation path in the workspace. Then select Add to insert the current path in the path library. Sweep paths are automatically named Macro, animation paths are named Anim, and spline polygons are named Path. If a path already has one of those names, a comma and a sequence number (e.g., Macro,1, Macro,2, etc.) are appended to the default name.

To change a path name, select it from the library list, then click on the name field in the white space to the left and enter a new name from the keyboard.

Delete

Deletes the current path from the library, but not the workspace.

Related Topics:

File Functions

Path Library Functionality

File Functions

If a Path Library was loaded or saved previously during the current session, this box shows the file name of the current library. Click on the box to display a pop-up menu of file functions:

New

Clears any paths from the current Path Library.

Load

Permits loading of a Path Library previously saved. When the Load Path Library file dialog appears, select the file to load, then click on OK.

Save

Saves the Path Library currently in memory to the file from which it was loaded or last saved. If no Path Library was loaded or saved previously during the current session (that is, the File Functions box is blank), this command works the same way as Save As...

Save As...

Permits saving the current Path Library to disk. When the Save Path Library file dialog appears, select the file to save over, or enter a new file name, then click on OK.

Path Library Functionality

To Create a Polygon:

Open a Path Library and without any paths tools active, select a closed path. A polygon is added to the workspace which can be immediately manipulated with other modeling tools (see the Model Group). A polygon cannot be saved back to a Path Library.

To Create a Spline Polygon:

Select the Spline Polygon tool and then a closed path from a Path Library. The desired spline shape is drawn in the workspace and can be edited in a spline fashion (see the Spline Polygon tool). To save a spline polygon to a Path Library, create one with the Spline Polygon tool (open or closed) and select Add from the Path Library panel.

To Use a Path as a Macro Sweep:

Select a polygon, face, or group of faces then select the Macro Sweep tool. The last sweep applied in **trueSpace2** will appear as a green path connected to the polygon, face, or group of faces. Select a path (open or closed) from a Path Library. The desired path will then replace the original macro. To execute the macro, select the Sweep Macro tool once again. To store a new macro in the Path Library, first define it by executing the sweep/modify sequence to be stored. Then select the Macro Sweep tool to display the path. To save the macro click on Add in the Path Library panel (see the Macro Sweep tool).

To Use a Path as an Animation Path:

Select an object to apply the animation path to. Then select the Animation Path tool and a path (closed or open) from a Path Library. The path used for animation may also have scaling, and rotation information. The new path will become attached to the object and may be edited like any animation sequence. To save an animation path from the current object, make the desired path (closed or open) visible by selecting the Animation Path tool then select Add from the Path Library panel.

Primitives Panel

Primitives are the basic building blocks of 3d design. Left click once on the Primitives Panel tool to open the Primitives panel. Within the panel are six built in geometric primitives, cameras, lights, text tools, and free standing objects for deformation.

Related Topics:

Geometric Primitives

Camera

Text

Lights

Deform Primitives

Geometric Primitives

Each of the available six primitives has a property panel that is accessible by right-clicking on the icon of the primitive. Using large values for resolution, latitude or longitude will make the object more complex in terms of redraw response time during manipulation (for both wireframe and solid modeling), rendering time, and processor resources. Left-clicking on a primitive's icon creates an instance of it located at the center of the XY grid and just above it. Once created, a primitive can be manipulated in **trueSpace2** like any other object.

Plane

The plane primitive has a single property called resolution. The resolution value squared is the number of subdividing squares that make up the plane. The default resolution value is 1.

Cube

The cube also has the single resolution property as the Plane primitive which indicates the number of subdividing cubes that make up the object.

Cylinder

You can utilize the properties of this primitive to create not only cylinders, but also cut (truncated) cones. The cylinder has three properties, latitude, longitude, and top radius.
The latitude value indicates how many cross sections or floors there are along the length of the cylinder. This value may be as little as 2 (cylinder top and bottom) and as great as memory will permit.

Longitude indicates how many polygons make up the circumference of the cylinder. The greater the longitude value, the smoother around the cylinder will be. Longitude values can be as little as 3 (this will create a triangular prism) and as many as memory will permit.

Top radius values can range between 0.01, to create a (nearly) sharp cone, and 1.00, to create a cylinder.

Cone

The cone's latitude and longitude values work analogously to those of the cylinder. The cone primitive is perfectly sharp, sharper than a cylinder with a top radius of 0.01.

Sphere

Latitude is the number of horizontal circles that make up the sphere. Longitude is the number of vertical circles that make up the sphere. Larger values for both latitude and longitude create a finely divided sphere suitable for smooth sculpting, and precise point editing.

Torus

The latitude value determines the roundness of the torus cross

section, its minimum value is 3. The longitude determines the roundness of the torus itself, its minimum value is 3. The outer radius of the torus is fixed so manipulating the inner radius changes the size of the cross section, thereby increasing or decreasing the thickness of the torus.

Camera

This adds a new camera to the scene. The camera can be moved, and rotated but not scaled. To change the zoom factor of the camera eye, select Object Scale and drag on the camera. A scene may contain as many cameras as you wish. To change a view to a camera's viewpoint, select the camera, then access the window's View pop-up and select the Camera icon.

Note: The eye of a camera can be automatically constrained to look at an object or to always look forward with the Look At and Look Ahead tools in the Animation Group.

Text

There are two variants of the Text tool: vertical text and horizontal text. Choose one with the left mouse button, then click anywhere in the workspace and start typing. To change the cursor location and start a new text object, move the mouse and click the left mouse button. When finished entering text, select a different tool to exit the text tool.

Once created, the text is a polygon that can immediately be swept by selecting the Sweep tool.

When creating text, **trueSpace2** groups all the letters in a word as siblings so that they can be manipulated individually (for more on siblings see the section on hierarchies). Change fonts by right-clicking on either variant.

Vertical Text

The Vertical Text tool is used to create vertical 2D text objects for extrusion and beveling with the Sweep tools. Enter text from the keyboard, which instantly becomes polygons in the workspace. Vertical text stands at right angles to the ground plane. The text baseline is created at ground level, parallel to the current view plane and the axes for the object is placed at the position where text was first entered.

Horizontal Text

The Horizontal Text tool is used to create horizontal 2D text objects for extrusion and beveling with the Sweep tools. Enter text from the keyboard, which instantly becomes polygons in the workspace. Horizontal text is created horizontal to the ground, at ground level. The text baseline is created at ground level, parallel to the current view plane and the axes for the object is placed at the position where text was first entered.

Changing the Font

To change the font, right-click on either Text tool. This opens a file dialog listing all TrueType fonts currently installed in Windows:

Select a font, style and size by clicking on the desired selections. Use the Sample window as a guide. Then click on OK to close the dialog. Click anywhere in the workspace and begin entering text from the keyboard.

Lights

These are the three different types of lights that can be used in **trueSpace2**. Before adding any lights, the default lighting in the workspace consists of several default light sources which can either be colored or not (set the default lighting in the Preferences panel).To add a light source select on the desired light type and release the mouse button. Adding or selecting a light opens its control panel with settings for color, intensity, and shadows. Lights, cameras, and free-standing objects for deformation are always displayed in the workspace by default. Right click on any of the Light tool variants to open the Visibility control panel. There you may disable the display of lights, cameras, or free-standing deformation objects. Lighting technique is discussed in depth in Chapter 18 of the User's Guide.

Infinite Light

The infinite light source's only controllable setting is direction or rotation. It can be moved and scaled for viewing purposes in the workspace, but neither has any effect on lighting. The rays of light from this source cover a scene uniformly, all moving in the indicated direction. Its wireframe representation looks like a straight line with a four-sided cone at one end. The tip of the cone indicates the light's direction. As the light is infinite, its falloff cannot be constrained.

Local Light

A local light, also known as a point source or omni, has position but no direction or size. It radiates light uniformly in all directions. Its wireframe representation resembles a star.

Spot Light

A spotlight has direction and position. It resembles a cone, and creates a cone-shaped beam of light. You can adjust the cone angle with the Object Rotate tool and the intensity of the cone's hot spot by clicking and dragging on the green circle at the base of the cone with either Object Move or Object Scale. You can also open the aperture of the cone by selecting on the cone itself with Object Scale.

Light Control Panel

Light Color

Set the light color by clicking on the color hexagon. Right click on the Light control panel to set the hue numerically.

Light Intensity

Set the light intensity by clicking and dragging on the slider. Drag upward to increase the light's intensity, or downward to decrease its brightness. To set the intensity numerically, select the panel with the right mouse button.

Constant Falloff

The default falloff setting for new lights causes no falloff at all. The light's intensity does not diminish with increased distance. This setting does not apply to Infinite lights.

Linear Falloff

The light's intensity diminishes at a direct ratio to its distance. For example, if the light illuminates an object with a given intensity at a given distance, its intensity is half at twice that distance, and a fifth at five times that distance. This setting does not apply to Infinite lights.

Squared Falloff

The light's intensity diminishes at a direct ratio to the square of its distance. For example, if the light illuminates an object with a given intensity at a given distance, its intensity is one fourth at twice that distance, and 1/25th at five times that distance. This method is the closest to the way lights in the real world work. This setting does not apply to Infinite lights.

Shadow

To cause a light source to cast shadows, click on the Shadow button. Shadows are created only when rendering the entire scene, not individual objects. All lights can cast ray traced shadows or shadow maps. Right click on the Shadow tool to set shadow properties.

Shadow Property Panel

Ray

The selected light will cast ray traced shadows. The scene must be raytraced for the shadows to be seen. Raytraced shadows are sharper and are properly cast through transparent object.

Map

This is the default shadow type for lights. Shadow mapping works without the necessity of ray tracing and it can be considerably faster. A shadow map is actually a sort of rendered image, and can be quite large in size. The map file is written temporarily to the disk before being applied to the scene.

Shadow Map Size Low/Med/High

Size in this case refers to the amount of memory used by the shadowmap, not the physical size of the shadow and does not apply to ray traced shadows. Smaller shadowmaps are faster to render and use less disk space (or memory). However, larger shadowmaps are sharper, and they look better because they are anti-aliased. For most purposes, Med(ium) is the optimum setting.

Image Dependent

The Image Dependent option creates a shadow map in proportion to the final output resolution. In this case, setting the Map size to Low creates a map 1/16 the final resolution. Setting it to medium creates

one at 1/4 the resolution and setting it to High, 1:1.

Shadow map Sharpness Low/Med/High

This sets the shadowmap's "fuzziness." The lower the sharpness, the fuzzier the shadow. This helps obscure graininess in smaller shadowmaps.

Deform Primitives

Selecting one of these tools adds a deform object that can be used to change the shape of standard objects dynamically, and opens the Deformation panel. A deform primitive shows up as a semi-transparent object in a solid mode window and as an orange object in a wireframe view.

While this object does not render, it conforms in every other way to the rules outlined in the Object Deform tool in the Model Group section. That is, its subdivision is changed by moving the mouse pointer away from the object, pressing and holding either or both mouse buttons, and dragging up or down. The only difference is that by subdividing the number of control outlines, the Deform Primitive is also subdivided so as to remain flexible. Its shape can be changed by choosing any of the Object Deform tools from the Deformation panel. Its position, orientation and overall size can be modified with the standard Object Navigation tools. Then, when connected to an object with the Start Deforming by Stand-Alone Deform Primitive, the object conforms to the deform object's shape. Deformation on a deform primitive can also be keyframed to take place over time (see the Keyframes Monitor). Dynamic division is not possible with a deform primitive.

Deform Plane

The Deform Plane is good for animating surfaces like ripples in water.

Deform Pipe

The Deform Pipe is good for "squeezing" objects through animation like droplets of color in a lava lamp.

Deform Object

The Deform Object is good for character animation effects to a character without having to key deformations to the original object. That way you can apply the same deformations to other characters in your scene.

Object Tool

Select the Object tool to enter object selection mode and to exit other modes like painting, point editing, etc... It is not necessary to use the Object tool to pick new objects while working in different modes as the selection can be made simply by clicking on a new object. When the Object tool is active, select it with the right mouse button to open the Object Info panel.

Note: An alternate way of picking objects is to use the left and right arrow keys on the keyboard.

Object Info Panel

The Object Info property panel displays location, rotation, and scale information for the currently selected object or selected entities (vertices, edges, and faces). Other information regarding the object such as name, number of vertices and faces, and selected unit systems are also displayed. When the panel is left open, all operations on the object or entities, such as scale, rotate, and move are reflected in the panel automatically. The fields for name, location, rotation, and size can be modified with keyboard entry. To change the value in a field, place the cursor on the desired field and select once with the left mouse button. When the cursor appears, enter the new value and press return.

Dynaunits

If Dynaunits is disabled, the numerical displays are based on the World's unit system. If Dynaunits is enabled then the numerical display for location, rotation, and size are according to the unit system assigned to the current object. The unit systems do not have to be the same for both World and Object as one can be in inches and the other centimeters. For example, to change the unit system for either World or Object, click and hold the left mouse button over the unit system name until a pop up of different values appears. Drag the mouse to the new desired system and release. The possible variants are millimeters, centimeters, meters, kilometers, inches, feet, yards, miles, and points.

Location

These three settings show the current object's position in the world according to the axis of the current object. The unit of measurement displayed is either in the World or Object system, depending on whether Dynaunits is disabled or enabled. Change the position values by clicking on the X, Y and Z boxes, entering a new value from the keyboard, and pressing Enter. Location values may also be entered as formulas involving addition, subtraction, multiplication, and division functions. Parentheses may be employed within formulas. As an example: 43+67-5 or 43*(8+7).

Rotation

These three settings show the current object's alignment in degrees. Change the alignment by clicking on the X, Y and Z boxes, entering a

new value from the keyboard, and pressing Enter. Rotation values may also be entered as formulas involving addition, subtraction, multiplication, and division functions. Parentheses may be employed within formulas.

Scale

These three settings show the current object's absolute scale values which are displayed either in the World or Object system, depending on whether Dynaunits is disabled or enabled. Change the scale by clicking on the X, Y and Z boxes, entering a new value from the keyboard, and pressing Enter. Scale values may also be entered as formulas involving addition, subtraction, multiplication, and division functions. Parentheses may be employed within formulas.

Name

This shows the object's name and lets you change it. Objects other than primitives, cameras, and lights are automatically called NoName when created. Click on the field next to Name and enter a new name from the keyboard, then press Enter.

Vertices

This shows the number of vertices in the current object. Since the only way to change this value is by interactive editing, it cannot be changed in the property panel.

Faces

This shows the number of faces or polygons in the current object. Since the only way to change this value is by interactive editing, it cannot be changed in the property panel.

Object Move

Select this tool to move an object or a group of glued objects in the current coordinate system. The left button controls movement along the X axis by mouse movement parallel to the X axis, and movement along the Y axis by mouse movement parallel to the Y axis. Using only the right mouse button controls movement along the Z axis.

An object always rotates around its own axis which may or may not (especially with objects not created with **trueSpace2**) be positioned in the center of the object. Right click on Object Move to open the Coordinates property panel where a coordinate system can be selected for the current tool and also where you can constrain transformations to certain axes. The Object Move tool defaults to World coordinates. If Orthonav is enabled in the settings panel, object navigation temporarily switches to Screen coordinates for navigation within orthographic views (Top, Front, or Left views). For more information on Coordinate systems see the discussion in the View Group section.

Related Topics:

Coordinates Property Panel

Coordinates Property Panel

Right-click on any Navigation tool to open the Coordinates property panel. The upper row of buttons determines the coordinate system in which a transformation is to occur. The lower row lets you constrain transformations to certain axes.

Alternatively, you can use the Coordinates panel at the right end of the Help Bar. There are three buttons for enabling and disabling the X, Y and Z axes, and to the left of these, a pop-up for setting Object, World or Screen coordinates. Both panels function identically: that is, they show and allow control of the settings for the navigation tool currently in use.

Transformations can take place within three possible coordinate systems: Object Coordinates, World Coordinates, and Screen Coordinates. The three system are covered in depth in the **trueSpace2** Environment section of the User Manual. Regardless of the current Coordinate system, if OrthoNav is enabled in the Preferences panel, object navigation temporarily switches to Screen coordinates for navigation within orthographic views (Top, Front, or Left views).

Object Coordinates

Navigation operations in the Object coordinates system are constrained to the local axes of the selected object or entity. The axes can be displayed for objects by selecting the Axes tool but not for entities like face groups or for tools like Surface Sculpt. Changing the orientation and the position of an object's axes will have an effect on how the object translates, rotates, and scales. For more on axes, see the Axes tool in the Utilities Group section.

World Coordinates

Navigation operations in the World coordinates system are constrained to the orientation of the World Axes: the World X axis runs along gridlines from the top-right to the bottom-left of the screen, the Y Axis runs from the top-left to the bottom-right, and the Z axis runs at ninety degrees from the XY reference grid.

Screen Coordinates

The Screen Coordinates system is oriented relative to the plane of the screen: the X axis run horizontally, the Y axis runs vertically, and the Z axis runs perpendicular to the plane of the screen. If OrthoNav is enabled in the Preferences panel, all navigation within Orthographic views are constrained to the Screen coordinates system.

Object Rotate

Select this tool to rotate an object or a group of glued objects in the current coordinate system. The left button controls rotation around the X axis by mouse movement perpendicular to the X axis, and rotation around the Y axis by mouse movement perpendicular to the Y axis. Using only the right mouse button controls rotation around the Z axis, by mouse movement perpendicular to the Z axis.

An object always rotates around its own axis which may or may not be positioned in the center of the object (see the section on axes). Right click on Object Rotate to open the Coordinates property panel where a coordinate system can be selected for the current tool and also where you can constrain transformations to certain axes. The Object Rotate tool defaults to Object coordinates. If Orthonav is enabled in the settings panel, object navigation temporarily switches to Screen coordinates for navigation within orthographic views (Top, Front, or Left views).

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Screen Coordinates

The Screen Coordinates system is oriented relative to the plane of the screen: the X axis run horizontally, the Y axis runs vertically, and the Z axis runs perpendicular to the plane of the screen. If OrthoNav is enabled in the Preferences panel, all navigation within Orthographic views are constrained to the Screen coordinates system.

Object Scale

Select this tool to scale an object or a group of glued objects in the current coordinate system. The left button controls scaling on the X axis by mouse movement parallel to the X axis, and scaling on the Y axis by mouse movement parallel to the Y axis. Using only the right mouse button controls scaling on the Z axis. If both buttons are pressed, the scaling is uniform on all axes.

An object always scales from its own axis which may or may not be positioned in the center of the object (see the section on axes). Right click on Object Scale to open the Coordinates property panel where a coordinate system can be selected for the current tool and also where you can constrain transformations to certain axes. The Object Scale tool defaults to Object coordinates. If Orthonav is enabled in the settings panel, object navigation temporarily switches to Screen coordinates for navigation within orthographic views (Top, Front, or Left views).

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Navigation operations in the Object coordinates system are constrained to the local axes of the selected object or entity. The axes can be displayed for objects by selecting the Axes tool but not for entities like face groups or for tools like Surface Sculpt. Changing the orientation and the position of an object's axes will have an effect on how the object translates, rotates, and scales. For more on axes, see the Axes tool in the Utilities Group section.

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Navigation operations in the World coordinates system are constrained to the orientation of the World Axes: the World X axis runs along gridlines from the top-right to the bottom-left of the screen, the Y Axis runs from the top-left to the bottom-right, and the Z axis runs at ninety degrees from the XY reference grid.

Screen Coordinates

The Screen Coordinates system is oriented relative to the plane of the screen: the X axis run horizontally, the Y axis runs vertically, and the Z axis runs perpendicular to the plane of the screen. If OrthoNav is enabled in the Preferences panel, all navigation within Orthographic views are constrained to the Screen coordinates system.

Hierarchy Navigation Tools

These tools, available from a pop-up, are used for navigating vertically through hierarchical objects and are disabled when the current object is not a hierarchical model. See Glue for information on creating hierarchical objects.

Use the up arrow for moving to higher levels, and the down arrow for moving to lower levels of a hierarchical model. Selected sub-objects are drawn as white wireframes, while unselected sub-objects are drawn as brown wireframes. Keyboard equivalents are the up and down cursor keys, usually marked as arrows.
While maneuvering through hierarchies, you can select siblings, or parts at the same level as the currently selected object, by clicking on them. You can also maneuver horizontally through hierarchy levels by pressing the left and right cursor keys.

Point Edit Tools

The Point Edit tool variants lets you select and manipulate individual points, groups of points, individual edges, groups of edges, individual faces, and groups of faces. Selection can be context-sensitive, or you can limit selection to one type of entity. The pop-up menu lets you choose the selection mode. When one or more entities are selected, you can immediately move, rotate, and scale them using the Point Navigation controls. While in Point Edit, a small "P" is attached to the cursor as an indication.

Selecting any Point Edit selection tool automatically opens the Point Edit control panel. The panel contains navigation tools for moving, scaling, and rotating entities as well as two other functional tools: slice and separate. To exit Point Editing and return to editing objects, select the Object tool.

Context Selection

In this default selection mode you can select faces, edges, and points depending on where you click. To select a face, click near its center, away from any edges. To select an edge, click directly on it, away from any vertices. To select a vertex, click directly on the intersection of two or more edges. To select multiple entities, hold down the Control key while clicking on the second, third, and so on. Selected entities change color.

Note: If two (or more) selected faces are connected with a single vertex (for example, one is to the upper left of the other), they cannot be swept. If a Sweep is attempted, an error message is displayed.

Face Selection

Only faces can be selected. To select a face, click near its center. Multiple faces can be selected that share vertices and edges. These groups can be manipulated just as other point edit entities.

Edge Selection

Only edges can be selected. To select an edge, click directly on it, away from any vertices. A new edge can be created by holding the Shift Key and left-clicking on another edge (thus creating another new vertex) or vertex.

Vertex Selection

Only vertices can be selected. To select a vertex, click directly on the intersection of two or more edges. A new vertex can be created on any existing edge. With no other entities selected, press the Shift key prior to left-clicking anywhere on an edge. The new vertex will be highlighted in green.

Related Topics:

Selection Modes/Dimensional Promotion

Point Edit Control Panel

Point Edit Property Panel

Selection Modes/Dimensional Promotion

To select the first point, edge or face, select an object, select the Point Edit tool, then click on the desired entity. Selected entities are highlighted in green. The context-sensitive selection mode eliminates the extra step of choosing a selection mode−you can select faces, edges, and points at the same time. Or you can restrict the type of entity to be selected by choosing one of the dedicated selection tools.

To select multiple entities, hold down the *Control* key while clicking on the second, third, and so on. In Context mode, you can select different types of entities for simultaneous manipulation (for example, you can move points and faces at the same time). Also, you can create edges and, more importantly, select entire sections of objects using the Shift key and **trueSpace2's** unique *dimensional promotion*.

Dimensional Promotion

For dimensional promotion operations it is best to use the Context Selection tool.

The Shift Key in conjunction with mouse clicks can create entity groups through a process called dimensional promotion. Dimensional promotion turns a vertex into an edge (0 dimensions to 1 dimension), or an edge into a face (1 dimension to 2 dimensions). These two processes are already incorporated into the Edge Selection and Face Selection tools. There are two more important dimensional promotion processes: turning an edge into a cross section (1 dimension to 2 dimensions), and turning a cross section into a three-dimensional part (entity) of the object. A cross section is one where the last edge shares a vertex with the first edge.

To create a cross section, first select an edge, then press the Shift Key and select any vertex on the object (except the two vertices that make up the edge). An exception to this procedure arises when creating a cross section on an object where a vertex, though separate from the edge, is still part of the same line (a subdivided cube for example). You must then select a vertex that is off of that line. To create an edge set that is not a cross section, select contiguous edges. Cross sections become a permanent part of the object (though they can be undone just after their creation, while still in point editing).

To create a three-dimensional portion entity, first create a cross section. Then, while holding the Shift Key, click on any vertex within the portion. The entire three-dimensional entity will be highlighted in green.

Point Edit Control Panel

When in Point Edit, an additional panel appears with three buttons for Point Navigation functions, and two for Slice and Separate. The Navigation buttons are used to move, rotate, or scale selected points, point sets, etc., separately from entire objects, but in the same way. With this additional navigation tool, you can switch instantly between manipulating an object and manipulating its points. This makes it convenient to work in different areas of the object at the same time.

Right-click on any Point Navigation tool to open the Coordinates property panel. This uses the same principles as the Object Navigation Coordinate property panel in that a coordinate system can be selected for each Navigation tool. Axis navigation can also be enabled and disabled in this property panel.

It's important to keep in mind that when using the Object coordinate system that each selected entity−point, edge, or face−has its own axes, which cannot be made visible. Each entity's axes' origin is at the entity's center, with the Z axis pointing out of the object perpendicular to the entity. Therefore, if you, for example, move several selected faces on the Z axis in the Object coordinate system, each moves perpendicularly in and out of the object.

Point Move

Click on this button to move the selected entities in the current coordinate system. The left button controls movement along the X and Y axis. Using only the right mouse button controls movement along the Z axis.

Point Rotate

Click on this button to rotate selected entities in the current coordinate system. The left button controls rotation around the X and Y axis. Using only the right mouse button controls rotation around the Z axis.

Point Scale

Click on this button to scale entities in the current coordinate system. The left button controls scaling on the X and Y axis. Using only the right mouse button controls scaling on the Z axis. If both buttons are depressed the scaling is uniform in all three axes.

Slice

The Slice function lets you subdivide an object one or more times parallel to a cutting plane. Slice can also subdivide a face parallel to a cutting line. The first application is handy for creating a series of cross-sections of an object parallel with each other or with one of the faces of the original object. Such cross-sections can be moved "through" the object's surface to any part of the object as part of the Slice operation.

Note: You must be in Point Edit mode with at least one edge, face, or

cross section selected to be able to use Slice.

To use a cutting line, which can "slice" a polygon, select an edge, then select Slice from the Point Edit Tool property panel. Click the left mouse button and drag the mouse in different directions to move a copy of the edge through the polygon or polygons adjoining the edge. Whenever you release the mouse button, a new edge is formed at that location.

To use a cutting plane, select a polygon or edge set, then select Slice. Press the left mouse button and drag the mouse in different directions to move a copy of the polygon edges or edge set through the object parallel to the original edge plane. Whenever you release the mouse button, a new edge set is formed at that location. As you drag the sliced cross-section through an object, notice that it is always scaled properly to encompass the whole object.

If you use the *right mouse button* while slicing, all newly created edges or edge sets remain selected, and available for immediate transformation with the Point Edit navigation tools after slicing.

Note: To abort the Slice operation, select Undo from the Edit menu or the Edit Group. To select a different entity for slicing, click on Slice to turn off the highlight, then select the new edges or face, then click on Slice again. To accept the changes and go on to another operation, select the Object tool. To cancel the change, click on Undo before doing anything else.

Immediately after a new cross-section is created, it can be moved, rotated, and scaled as with any other object.

Separate

This function can be used to detach any selected entities from the object (or sub-objects in hierarchical objects) to which they belong. This should generally be done with sections of objects that have been selected with the Shift key using dimensional promotion—see Dimensional Promotion for details. Individual edges, faces, and vertices can also be separated but the separate function does not remove entities from an object, it creates a copy of the entities.

To detach part of an object or objects (as sub-objects of a hierarchical object), select the parts to detach, then select the Separate button. After separating the parts, the program exits Point Editing, leaving the remaining part of the object or objects selected.

Point Edit Property Panel

To access the this property panel, right-click on any point edit selection tool icon.

Draw

The Draw attribute determines how **trueSpace2** redraws the object's wireframe when manipulating entities. The choices are object or edited.

Object

trueSpace2 will continually redraw the entire object, as selected entities are manipulated. While this gives the you better modeling feedback, but it can slow down redraw response when working with complex objects.

Edited

trueSpace2 redraws only the selected entities and adjacent edges as they are manipulated. The remainder of the object wireframe is invisible until the mouse button is released. This gives faster redraw response when working with complex objects.

Note: If a solid modeling view is used, the draw mode will not affect the redraw response time, as the object is continually being re-rendered.

Subdiv (Dynamic Subdivision)

Dynamic subdivision determines how **trueSpace2** automatically subdivides polygons that are made nonplanar during point editing. This tool is available because some editing operations may cause a loss of planarity in polygons with more than three vertices.

If you notice rendering errors, you could try to break these polygons that may have become non-planar down into smaller planar triangles or quadrangles by choosing the Quadrangles or Triangles option.

Sweep Tool Variants

The Sweep Tool variants provide a powerful and versatile array of functions for extruding and lathing faces. Entities suitable for sweeping include individual and multiple faces which should first be selected with Point Edit tools. If you create a polygon with any polygon tool or text with the Text tool, you can use Sweep immediately. Each of these variants is featured within the tutorials in the User Manual directly following the Sweep discussion.

Related Topics:

Sweep

Bevel

Tip

Macro Sweep

Lathe

Sweep

This tool enables the user to repeatedly extrude 2D and 3D shapes with optional manipulation of interim stages. Sweep works by first copying selected polygons and edges, then moving them away from the original along the local Z axis (perpendicular to the polygon surface) or the specified path. Finally, it creates new polygons to connect the sides. This function is similar to Extrude in other 3D programs, but is superior in that multiple faces can be extruded in different directions simultaneously. Also, the extrusion can be done in any view, including Perspective. Each Sweep operation can have a user defined number of intermediate segments plus a floor, which is the outermost new polygon.

After the Sweep operation, the new floor is selected and highlighted and the program is placed in Point Editing, which lets you immediately move, rotate, and scale the floor, and then re-sweep. If a floor is re-swept, then any transformation done to it originally is added on to the next floor. For example, if you scale a floor 50% and then re-sweep, the next floor will be 50% smaller or 1/4 the original size. You can also re-select previous floors, indicated by their dark green color, and transform them as well. While Sweeping, each of the floors can be scaled, moved, and rotated affecting the over-all shape of the object as spline nodes. After exiting the sweep with the Object tool, the shape is frozen and can no longer be manipulated in such a fashion. A sequence of Sweep operations can be saved as a Macro and re-used on other polygons with the use of the Macro Sweep tool.

To sweep using the default settings, select the entity or entities to sweep, then left click on the Sweep tool. Right click once on the Sweep tool to open the Sweep property panel and change sweep settings numerically.

Sweep Property Panel

Segment

This numeric value sets the number of subdivisions or intermediate segments created between floors during a Sweep operation. The default value is 1 segment. Change the value by clicking on the number and entering a new one from the keyboard, or by clicking on the double-headed arrow and dragging left and right. The more subdivisions you use, the better definition you'll obtain for spline interpolation of segments (i.e., smoother transitions), at the cost of rendering time.

Move X - Move Y

These two settings let you specify horizontal offsets for the swept polygon. If you move the new floor interactively after sweeping, the amount is placed in these fields.

Move Z

As sweeping is always done perpendicular to the swept surface, the Z value sets the total sweep extent in grid square units. The default

length is 0.5 units. Change the value by clicking on the number and entering a new one from the keyboard, or clicking on the double-headed arrow and dragging left and right. Of course, you can also change the selected polygon's Z position by dragging with the right mouse button in the workspace.

Default Mapping of Swept Objects

When you use Sweep to create a 3D object, a special type of default UV mapping is automatically applied. Flat UV mapping is applied to the object's flat ends, while its length is mapped with a special type of cylindrical mapping that conforms to the object's shape. For more details, see the UV Mapping tool.

Bevel

Bevel is a special form of the sweep function, which is most often used to give an angled edge to 3D text for extra visual interest. Select one or more polygons, then select the Bevel tool. This causes extrusion of a new polygon for each selected polygon. The new polygon is offset from the original by the current Bevel numeric setting, which defaults to 0. By clicking and dragging the right mouse button, thus moving the new polygon vertically, it is also automatically scales the new surface smaller by a proportional amount, thus creating a beveled surface in front of the original polygon.

To open a panel for setting the Bevel amount numerically, right-click on the Bevel tool. The default setting is 0 or the most recently used value. Change the bevel amount by clicking on the number and entering a new one from the keyboard, or clicking on the double-headed arrow and dragging left and right.

To use the Bevel tool, select or create polygons to be beveled. If you've just created text or polygons, you can bevel them immediately (generally, though, you'd use the Sweep tool first to give the text or polygons some depth). Then select the Bevel tool. This causes the selected polygons to be extruded immediately. Adjust the beveled surface by holding the right mouse button and dragging the mouse vertically. This causes the beveled surface to be scaled down and moved away from the original at the same time, with real-time visual feedback. To accept the bevel settings and exit beveling, select the Object tool.

Note: Please must keep in mind that narrow polygon edges, such as those at the ends of certain swept serif characters may not bevel properly as high bevel edge settings can result in crossed over polygons. **trueSpace2** does not prevent the cross over so one must opt to bevel at a lower setting or use a smoother polygon. You could also try to fix the crossed geometry. For more info, please see the Utilities Group section.

Tip

This tool sweeps a selected polygon, face, or group of faces to a point, creating a cone-shaped object. The Tip tool uses the same property panel as the Sweep tool. After execution, a tip can be moved with Point Move but not rotated or scaled.
Right-click to access the Sweep property panel.

Macro Sweep

This tool allows the user to apply a macro created by a sweep and/or tip procedure. Used in conjunction with the Path Library, the Macro tool also allows objects to be swept along paths created for spline polygons or animation paths. You might think of this tool as a path extrusion function. However, its macro capabilities are quite powerful. You can use it to quickly and easily set up a macro after a sweep, save it to a path library, and then apply it again to a new polygon, face, or a selected group of faces. Right-click on the Macro tool to open the Macro property panel.

Macro Property Panel

Rotation

This shows the current rotation of the macro path with respect to the polygon's vertical axis. The value can be changed in the requester by dragging on the double arrow and by clicking on the number and entering a new value from the keyboard. You can also change the Rotation value with the mouse by clicking directly on the path and dragging.

Bend

When using Macro to sweep along a path, bend acts to keep the integrity of a sweep. In some cases, sweeping shapes around a curve can cause unexpected results, such as partial flatness, because the shape isn't rotated while being swept. If Bend is on during a macro sweep, each subdivision and floor is rotated to be perpendicular to the current path direction. If Bend is off, the swept shape retains its original alignment throughout the sweep.

To Execute a Macro

After selecting a polygon or polygons to be swept, the first click on the Macro tool displays the most recently stored or executed macro path, if any, connected to the currently selected polygon. To choose a different path for sweeping, open up a path library and select it from the list of path names. The new path will replace the original macro. Before executing the macro, the path can be rotated around the polygon's vertical axis by clicking on it and dragging. Very complex objects can be created by sweeping a polygon along a succession of different paths.

To execute the macro sweep, click on the Macro tool a second time. After the macro is executed, the last edge is highlighted and the Point Navigation panel appears. Like sweeping, individual floors can be manipulated affecting the overall shape of the spline object. After exiting the Macro Sweep tool with the Object tool , the shape is frozen and can no longer be manipulated in such a fashion.

To Create a Macro

To store a new macro in the Path Library, first define it by executing the sweep/modify sequence to be stored. Then select the Macro

Sweep tool to display the path. Next select the Path Library tool from the Libraries Group, then click on Add in the Path Library panel. The macro is stored with a new name. To change the name of the macro, select it on the Name Field and type from the keyboard.

To use a spline polygon or animation path as a sweep path, create the path using the appropriate tool, open a paths library and click on Add Path in the Path Library panel.

Lathe

This tool sweeps a shape along a modifiable circular or spiral path. Lathe is a true 3D tool because all parameters can be set by direct manipulation of the path. No numeric entry is required, although it is possible.

When you select this tool, a circular path of white line segments with a green segment at the end appears. At the end of this path is a perpendicular straight green line (handle) and connected to that is a crossbar. The crossbar represents the lathing axis, around which the lathed outline is spun.

The path can be manipulated interactively in three dimensions by clicking and dragging on different parts. The illustration below indicates which Lathe settings, as described immediately below under Lathe Property Panel, are affected by clicking and dragging on the associated Lathe path part. A second click on the Lathe tool executes the lathe with the current settings.

As with the Sweep tool, immediately after lathing, the program goes to Point Editing. Each copy of the swept polygon or polygons is outlined in green, meaning that they are now available for standard Point Edit navigation functions. Until another object is selected, the whole object consists of polygons connected by splines, so a change to any polygon affects the entire shape. Select a polygon by clicking on it, then use Point Move, Rotate or Scale functions as described in the Point Edit section.

Right-click on the Lathe tool to open the Lathe property panel. Lathe settings can also be set from here by clicking on a number and entering a new value from the keyboard, followed by Enter. You can also click and drag horizontally on the arrow button next to the value to change.

Lathe Property Panel

Segment

The number of path segments, which controls the smoothness of the path. This value can be changed interactively by clicking and dragging on the white part of the circular path.

Angle

Sets the extent or distance of the lathe in degrees, which normally ranges between 0 and 360 degrees. If Helix is set to any value other than 0, then the Angle value can be any amount. To set interactively, click on the handle, the perpendicular green line at the end of the curve, and drag the mouse.

Radius

Sets the distance from the curve's center (indicated by the crossbeam position) to its edge. Radius and Rotation can be set interactively by dragging the crossbeam with the mouse. To change

the radius only, click on the crossbeam's center point and drag. If the crossbeam is dragged near a polygon edge, it snaps to that edge, so the edge is used as the lathe axis.

To change Radius and Rotation at the same time, depending on which direction you drag the mouse, click anywhere on the handle between the center and ends of the cross bar.

Rotation

Sets the angle of the path to the polygon. To change the Rotation only, click on either of the crossbeam's endpoints and drag.

To change Rotation and Radius at the same time, depending on which direction you drag the mouse, click anywhere on the handle between the center and ends of the cross bar.

Helix

Lets you create a spiral path. Most effective with Angle settings above 360. Set interactively by clicking on the last segment of the circular path, which is green, and dragging.

There is a "click stop" for the interactive setting of Helix at the zero point. If you drag it near zero, it "catches," and you have to drag a bit farther to disengage the zero setting.

Default Mapping of Lathed Objects

When you use Lathe to create a 3D object, a special type of default UV mapping is automatically applied. If you lathe a shape 360 degrees with Helix set to 0, which means the object has no ends but is a continuous circle, the default UV mapping is applied cylindrically, but is then bent around to match the object's circular shape. If the lathed shape has ends, a flat UV mapping space is applied to each end. For more details, see the UV Mapping tool in the Render Group section.

Object Deform Tools

Deform comprises a versatile tool set that is divided into two parts: local and outline deformations. The Deformation navigation panel for this tools is brought up when the tool is first selected. This lets you choose between local and outline deformations and determines how mouse moves affect the deformation. Other controls can be found on the Deformation property panel, invoked by right-clicking on the Deform tool. Deforming techniques and principles are covered in Chapter 13 of the User's Guide.

Local deformations let you grab a point or outline on an object and work it like a piece of clay. You can stretch or push on the object, rotate, or scale it. The parts of an object that can be grabbed and worked with are dependent on the structure of the Deform control outlines. These outlines are the intersections of the green cross sections in the X, Y, and Z planes, which can be viewed by selecting the Outlines option in the Deformation property panel.

You can increase or decrease the number of control outlines by clicking and dragging outside of the object before selecting a point or outline to manipulate. The left mouse button and vertical dragging controls the number of cross sections in the object Y-axis. Horizontal dragging controls the number of cross sections in the object X-axis. The right mouse button controls the number of cross sections in the object Z-axis. Even if the Outlines switch is not enabled in the Deform property panel, floors and vertices will be visible during this adjustment and highlighted in green while the mouse button is pressed.

Note: Once you have deformed an object, you can change the number of cross sections only by using the Erase tool or delete key while the Deform tool is active, then reselecting the Deform tool and clicking and dragging outside the object.

The area of an object that is affected by deformation depends on how densely the control outlines are distributed over the object's surface. As the number of control outlines increases, the Deform tool affects an ever smaller area of the object. If dynamic subdivision (DynDiv) is enabled, **trueSpace2** automatically smoothes the area local to the deformation. You can control the extent of smoothing by using the numerical entry field to the right of the DynDiv checkbox. The range is between .01 and 1. The higher the number, the smoother the deform.

The Deform tool, visible only if the Handles in the Deformation property panel is selected, is a cluster of control handles that can be manipulated as a unit or individually.

Four of the five control handles form a crosshair tangent to the surface clicked on, and the fifth (not always present) is perpendicular to the other four. With outline deformation, the tool has only two control handles. Click on any of these and drag to see how they affect the underlying mesh. Or click on the center or away from the tool and

drag to pull the mesh. The best way to experiment with the Deform tool is with a simple object, such as a plane or sphere. Starting from the perspective view, add new Top and Front views in the upper left and right screen corners, then manipulate the tool while watching all three views.

Related Topics:

Deform Navigation Panel

Deform Property Panel

Deform Navigation Panel

When using the Deform tool, the above control panel appears. The top group contains navigation tools to move, rotate and scale the current control vertex or outline, and thus the mesh points affected by it. With this additional navigation tool set, you can switch instantly between manipulating an object and manipulating its deformation. This makes it convenient to work in different areas of the object at the same time. Right-click on any of these tools to invoke the Coordinates panel, letting you set the coordinate system and enable or disable axes. The lower area lets you set local or outline deform, and set up and enable or disable Dynamic Division.

Push/Pull

Click on this button to move the Deform tool, control outline, or components in the current coordinate system. The left button controls movement along the X axis by mouse movement parallel to the X axis, and movement along the Y axis by mouse movement parallel to the Y axis. Using only the right mouse button controls movement along the Z axis.

Twist

Click on this button to rotate the Deform tool, control outline, or components in the current coordinate system. The left button controls rotation around the X axis by mouse movement perpendicular to the X axis, and rotation around the Y axis by mouse movement perpendicular to the Y axis. Using only the right mouse button controls rotation around the Z axis.

The Deform tool always rotates around its own center, but the effect of mouse movement during rotation depends on the coordinate system currently in use.

Stretch

Click on this button to scale the Deform tool, control outline, or components in the current coordinate system. The left button controls scaling on the X axis by mouse movement parallel to the X axis, and scaling on the Y axis by mouse movement parallel to the Y axis. Using only the right mouse button controls scaling on the Z axis. If you press both buttons, scaling is uniform on all three axes.

Local Deformation

This mode lets you deform objects by clicking on cross-section intersections and dragging. To deform a different part of the object, simply click on another cross section.

Outline Deformation X/Y/Z

These modes lets you perform deformation on an outline perpendicular to the X, Y or Z axis by clicking on such a cross section and dragging. The active outline turns white and a two-section handle appears at its edge. To deform a different part of the object,

simply click on another outline. Once you've deformed an object, you can change the number of outlines only by using the Delete tool (icon) or key while the Deform tool is active, then reselecting the Deform tool and clicking and dragging outside the object.

Dyn(amic) Div(ision)

Automatically subdivides the deformed surface to avoid loss of planarity and to smooth out the deformation. Usable values lie between .01 and 1. The larger the number, the more subdivision occurs at the cost of rendering time and interactivity.

Deform Property Panel

RealTime

If RealTime is selected, the complete deformations are updated in real time while working with the deform tools. Otherwise, an approximation to the deformed shape is displayed while the object is being manipulated.

Handles

If enabled, Deform tool handles appear and can be manipulated independently.

Outlines

If enabled, the cross sections appear highlighted in green.

Draw

Click on the box to the right of Draw to display the Object/Deformed pop-up menu. The Draw option determines how the object wireframe is redrawn while being manipulated by the Deform tool. If set to Deformed, the program redraws only the parts of the object that change—the rest of the wireframe is invisible. This provides for faster feedback with complex objects. With Object enabled, the entire object is continually redrawn. This gives you a better idea of the deformation in the context of the entire object, but with complex objects feedback can be slowed down a great deal.

Surface Sculpt Tool

The surface sculpt tool is used to deform the surface of a subdivided object. The greater the number of subdivisions, the smoother the sculpted surface will be. With this tool, you can grab a part of the surface and pull or push it in any direction. When the surface sculpt tool is first selected, a control panel appears. The sculpt tool has two modes which are set in the control panel, the sculpting mode and the scope adjustment mode. In the sculpting mode (default mode), you create the deformation by moving and adjusting the sculptor and its cross hairs. In the scope adjustment mode, you can change the area affected by the sculpt tool, change the orientation of the sculpt deformation, and move the deformation to other parts of the surface.

To deform an active object, first select the surface sculpt tool, then place the cursor over the desired deform spot and click. The sculpt tool will appear as a green crosshair that floats directly above the chosen deform spot. The surface sculpt tool contains a number of parts that perform different roles in deforming a surface. Deforming may be performed in any of the coordinate systems. By default, it is the Object coordinate system that is used.

Notes: The object coordinate system is based on the sculpt tool itself with the Z-axis perpendicular to the crosshairs. To move the tool as a unit, left click on the middle point of the tool and drag.

Sculpt Mode

To move a single handle, left click on the endpoint of a handle.

To move a handle pair which are two handles opposite each other, left-click on either of the two handles themselves.

To bank a handle pair, right click on either of the two handles. A right click on an endpoint banks only one handle.

Scope Mode

To change the orientation (rotation) of a deformed area, click on the endpoint of any handle.

To change the scope of a deformation, click on any of the control handles and drag. Changing the scope of one handle symetrically changes the scope of the handle's pair.

To move a surface deformation to a different part of the surface click on the center point of the tool and drag.

Related Topics:

Surface Deform Control Panel

Surface Deform Control Panel

Erase Deformation

Erases the current deformation. Once you make a new deformation, you cannot go back to a previous one to delete it.

Copy Deformation

Copies the deformation to another place on the same surface. To execute select the Copy Deformation tool and then select a new location on the surface.

New Deformation

Allows you to pick a new surface location to sculpt.

Scope Mode

Enables scope mode and disables sculpt mode.

Sculpt Mode

Enables sculpt mode and disables scope mode.

Dyn(amic) Div(ision)

Automatically subdivides the sculpted surface to avoid loss of planarity and to smooth out the deformation. The range is from 0 to 1. The higher the number, the more division occurs to the surface.

Boolean Operations

The Boolean variants allow for union, subtraction, and intersection operations on solid objects. To perform a boolean operation, first make an object current by selecting it, choose from one of the variants, (note that the cursor becomes a glue bottle) and then select a target object. The original objects are then deleted and replaced by the resulting object of the operation. Surface attributes like UV space, mapping, and materials are preserved into the new object.

Note: Boolean operations may not work reliably with objects that are imported from other programs. In case of a failed operation, both objects will be deleted. To undo a boolean operation, make sure that File Undo is enabled in the Undo property panel (right click on the Undo tool). Sometimes the program may offer advice on how to complete the operation by highlighting trouble edges.

The Boolean variants now have a property panel that allows you to the precision of the boolean operations (right click on any boolean variant). This property panel has a single numerical entry named "Identity." This value here is a distance in 1/100 of a millimeter for identifying near coincident vertices. It sometimes helps to set this value lower or higher when the booleans fail with the default value of 50.

Object Union

The Object Union tool joins the currently selected object and the target object together. Unlike the glue tools which group objects, the Object Union tool creates a new object which cannot be separated. To perform a union operation, first make an object current by selecting it, then choose the Object Union tool, and finally select the second object.

Object Subtraction

The Object Subtraction tool subtracts a target object from the currently selected one. To perform the operation, select the first object, select the Object Subtraction tool, and finish by selecting the target object.

Object Intersection

The Object Intersection tool creates a new object from the intersecting areas of the current object and a target object. To perform the operation, select the first object, select the Object Intersection tool, and finish by selecting the target object.

Polygon Tools

These tools allow for three different methods of creating flat multi-sided polygons. Freehand and Regular polygons are made of straight line segments and can interact with each other or previous spline polygons using Boolean math. The Spline Polygon tool lets you create polygons from spline curves.

New polygons may be drawn only in the Perspective and Top views, and they are always created parallel to the ground plane. These polygons can be used as is, combined with other objects using Glue, manipulated with Deform, and can be extruded into three-dimensional shapes with the Sweep tools.

To change the type of polygon to be drawn, click on the tool, then drag the mouse slightly, until a pop-up appears. Drag the mouse to the type of polygon desired on the pop-up, then release the mouse button. With regular polygons, you can also select the type of polygon from the Polygon property panel.

Selecting the Freehand or Regular Polygon tool automatically activates the Polygon control panel and selecting the Spline polygon tool activates the Spline polygon control panel.

Regular Polygon

This tool automatically creates a polygon all of whose sides are the same length. The more sides you use, the closer the shape resembles a circle.

To change the number of sides in new regular polygons, select on the numeric slider of the Polygon control panel.

To draw the polygon, click the left mouse button on the work area, and drag outward to specify the polygon's maximum radius. Release the mouse button to finish the polygon. Upon the creation of a polygon, the user can create more polygons, do boolean operations to the original polygon, or exit by selecting the Object tool. Finished polygons can then be manipulated with other modeling tools.

Freehand Polygon

The Freehand Polygon tool allows the user to create polygons by defining each vertex of the finished shape. To draw a freehand polygon, define vertices by left clicking in the workspace. To finish the polygon, click the right mouse button, which connects the last point with the first. Upon the creation of a polygon, the user can create more polygons, do boolean operations to the original polygon, or exit by selecting the Object tool. Finished polygons can then be manipulated with other modeling tools.

Spline Polygon Tool

A spline polygon is created the same way as a freehand polygon, but the polygon has curved sides. To draw a spline polygon, select this

tool, then click the left mouse button on each vertex in turn. Each point you define sets a new spline node for the polygon, with an intermediate number of interpolated points or "frames" in between. New spline polygons can only be created from the Top or Perspective views, and all points are placed at ground level. While drawing a spline polygon, you can switch between adding new points and editing existing ones using the Draw and Edit controls in the Spline control panel. To close a spline polygon with a spline, click the right mouse button, which connects the last point with the first. At this point, you can edit the polygon or add the spline to a paths library for later use, but you can't add new spline points to a closed spline. Also, you can add a new spline polygon to the workspace by selecting a closed path from the Path library after selecting the Spline Polygon tool. After exiting spline mode, the shape is frozen and can no longer be manipulated as a spline in a 2D fashion.

Upon activation of the Spline Polygon tool, the Spline control panel opens. A right click in turn opens the Spline property panel.

Related Topics:

Polygon Control Panel & Boolean Modes

Editing Splines

Spline Control Panel

Spline Property Panel

Spline Parameters Panel

Polygon Control Panel & Boolean Modes

This property panel appears automatically when the Freehand or Regular Polygon tool is selected. These controls also apply to spline polygons after the spline curve becomes a polygon (see the Spline Polygon tool). The four buttons let you determine whether and how newly drawn polygons will interact with previously selected ones. The numeric setting lets you set the number of sides for new regular polygons only.

New Polygon

With New Polygon enabled, a polygon is drawn in the workspace and is independent of previous drawn polygons. The remaining three options in the Polygon property panel give the user different ways of combining new polygons with existing ones.

Union

New polygons are joined to the previously selected polygon. In this case, polygons don't have to overlap to be joined. You can have a single object consisting of a number of discrete, separate polygons.

Subtract

New polygons drawn in this mode are subtracted from the previously selected polygon or group of polygons. If the new polygon overlaps the previous one, then the area of intersection is subtracted out of the first one. If there is no overlap, then the new polygon is deleted.

Intersect

A new polygon is created from the overlapping area between a polygon drawn in this mode and the previously selected one. If there is no overlap, then the new polygon is deleted.

Number of Sides

Use the numeric setting to determine the number of sides of subsequently drawn regular polygons. To change the setting, click on the double-headed arrow and drag left and right, or click in the number box, enter a new number from the keyboard, and hit return.

Editing Splines

A spline has four properties which you can alter:

Position

Changing the position of a node in relation to its neighbors will affect the overall shape of the polygon without affecting the node's other spline properties. Positional changes to a control node will affect its immediate neighbors' spline properties. To change the position of a node, select a node and with the left mouse button pressed, move the node to a new location.

Tension

Tension controls how sharply the curve bends. When increasing tension, not only does the curve sharpen, but frames from either side are pushed toward that vertex, causing de-acceleration into the curve and acceleration out of the curve (although this only applies to spline animation paths). To change the tension value for a spline node or nodes, select on a control handle while holding down the **shift** key and drag from left to right.

Continuity

Continuity affects the way curves flow into control nodes. A continuity value of 1 causes the curve to over shoot the node on both sides. A value of -1 has the opposite effect. To change the continuity value for a spline node or nodes, select on a control handle while holding down the **right** mouse button and the **Ctrl** key and drag the mouse vertically. Continuity has no effect on acceleration.

Bias

Bias creates discontinuity in a curve by over shooting only on one side of a spline node. A negative bias value over shoots the curve on the left side of a node or nodes. A positive value over shoots on the right. To change the bias value for a spline node or nodes, select on a control handle while holding down the **left** mouse button and the **Ctrl** key and drag the mouse vertically. Bias has no effect on acceleration.

Spline Control Panel

When you select the Spline Polygon tool, the Spline/Path control panel opens.

Edit

To move path points and spline handles, select this button. Draw and Edit are mutually exclusive.

Draw

If before closing a spline polygon, you select Edit to modify spline points or handles, you can return to adding points by selecting this button.

New

Closes the existing polygon with a sharp edge and lets you immediately start placing points for a new polygon.

Segments

This setting determines the number of vertices between spline points when drawing a polygon. Click and drag on the arrow button to change, or click on the number and enter a new value from the keyboard. The higher this number, the smoother the outline, and the greater the number of resultant polygons.

Frames

This button toggles the display of individual frames, shown as blue hash marks along the path.

All Handles

Handles are the green lines emanating from the nodes on the path. When a path is displayed, this setting determines which handles are visible. With All Handles on, all handles are drawn. Otherwise only the handles attached to the currently selected path vertex are displayed. As path vertices tend to be hard to see, this option helps locate the active vertex.

Spline Property Panel

Right-click on the Spline Polygon tool to open the Spline property panel. Spline characteristics can be changed during and after the creation of a spline with the controls on this panel.

Spline Presets

The buttons in the top row contain preset combinations of spline settings for fast adjustment of all three settings at once. Also, you can access the Spline parameters panel for numeric settings by right-clicking on any of the preset buttons. The presets are:

The first preset removes any smoothing, causing the spline segments to act like straight lines. The other two presets implement smoothing as described by their names.

Interpolated Value

The second row of buttons is for selecting whether the adjustments use location, rotation, or scaling values for interpolation. Normally when you edit the spline settings, you're changing how the program interpolates between the spline points' different location values. Rotation and scaling interpolation does not apply to spline polygons but rather for spline animation paths. Changing settings with either of the two buttons active does not alter the polygon's shape.

Local

By default this switch is on, which means only the current node is affected by changing settings. Selecting Local turns off Global.

Global

All spline nodes are affected by changing settings via the presets or the parameters panel. Selecting Global turns off Local.

Spline Parameters Panel

To open the Spline parameters panel, right-click on any of the Spline presets buttons in the Spline property panel. This allows numeric adjustment of path spline settings: Tension, Continuity and Bias. Change values by clicking on the numbers and entering new values from the keyboard, or clicking on the double-headed arrows and dragging left and right. While any numbers can be set, the most useful values range between -1.5 and 1.5.

Paint Tools

The Paint tool variants let you create and modify Materials and apply them to objects. Materials determine a surface's color, texture, shininess, transparency, bumpiness, and other attributes. When you select any Paint tool except Paint Object, all Materials panels−Material preview, Color, Attributes and Shader Attributes−open automatically. These panels can also be opened with a right click on any Paint tool variant.

Paint Face

The Paint Face tool applies the current material to a face on an object. To paint a face, select the Paint Face tool then select on desired faces. Each painted face is rendered instantly. The precision of the paint face tools depends on how finely the object is subdivided. The more subdivisions, the greater the control. When you select the Paint Face tool all Materials panels open automatically so that settings may be changed while painting. To temporarily change the Paint Face tool to the Inspect tool, press and hold the Shift or Control key before clicking. The mouse cursor changes to a lens to indicate Inspect mode. While the cursor is still in Inspect mode, click on a face to make its material settings current. Paint Face does not paint over a material rectangle. If you hold down the Shift key while painting, then the painted face colors will be removed.

Paint Vertices

The Paint Vertices tool paints a radial gradient centered on a face's vertex. Like the Paint Face tool, the precision of the Paint Vertices tool depends on how finely the object is subdivided. The only property inherited from the current material is its base color and all other attributes like texture, smoothing, shininess, etc... are ignored. To paint vertices, select the Paint Vertices tool then select on each vertex in turn. To remove the paint on a vertex, hold down either the Shift or Control key and click on each vertex with the Paint Vertices tool.

Inspect

Like Paint Face, Inspect works on a polygon-by-polygon basis. But instead of applying color, it determines the face's color, attribute and texture values and sets them to current in the Material property panels. To use the Inspect tool, select the tool then click on any object. The current Material is set to that of the polygon under the mouse pointer when you clicked. All Material panels change to show the new material settings. The Inspect tool has a second function which is to show the keyframes set for a material's properties. These keys are shown in the Keyframe Monitor panel.

Paint Over

The Paint Over tool applies the current material over a target material which may cover all of an object or just faces. To use Paint Over, select a new material to replace an old one, select the Paint Over

tool, then click on the material to be replaced. The object is rendered instantly to show the changes to the object. Paint Over does not change the material of a material rectangle nor does it change the areas painted with the Paint Vertices tool. To temporarily change the Paint Over tool to the Inspect tool, press and hold the Shift or Control key before clicking. The Paint Over tool also has a second function for animation. Painting over a material at a frame other than 0 will create a keyframe for that material. See the Keyframe Monitor for more details.

Paint Object

The Paint Object tool paints all of the selected object with the current material. To paint an object, click on the Paint Object tool. The selected object is rendered instantly to show the new material.

Material Property Panels

Painting objects and faces uses the current material, which defaults to a dull white. Newly created objects also use the current material. Once created, a material can be saved to a materials library (see the Libraries Group section) for later use. When you select any Paint tool except Paint Object, all Materials panels−Material preview, Color, Attributes and Shader Attributes−open automatically. These panels can also be opened with a right click on any Paint tool variant.

Note: For **trueSpace2** to be able to render the material properly, the necessary image files must be in the same directory as the scene file.

Related Topics:

Material Preview

Color Property Panel

Attributes Panel

Shaders

Shader Attributes

Texture Map

Bump Map

Environment Map

Procedural Maps

Material Preview

This panel lets you instantly view the results of material changes. Whenever you change a material setting with the other material property panels, this material preview is automatically re-rendered with the new settings. By default the material is displayed rendered on a sphere but to see the effects on a square, click once on the material preview. Click on the rendered square again to return to a sphere. When saved to a material library, the material will be displayed in the same mode as when it was saved.

Color Property Panel

The base color for the material can be chosen with either RGB or HSV color systems. HSV stands for Hue, Saturation and Value. In the HSV color property panel, the color spectrum ROYGBIV (red-orange-yellow-green-blue-indigo-violet) is spread around the sides of a hexagon. The colors around the edges represent hues at full saturation, with saturation decreasing as you travel toward the center. As saturation decreases, the amount of white added to the color increases. The slider bar next to the hexagon determines the Value for the color. Right click on the property panel to open the RGB sliders. The RGB color system works by combining red, green, and blue color values ranging from 0 to 255 for each component. If the material has a texture map, then the base color will only show in areas of texture transparency (see Image Utilities and Texture Overlay). The base color can be keyframed (see the Keyframe Monitor) to change over time.

Attributes Panel

The Attributes property panel lets you set material properties other than color. The first column sets smoothing, the second sets the shader type, the third column lets you apply images for different rendering effects, and the fourth enables procedural textures.

Smoothing

Object surfaces in **trueSpace2** are made up of flat polygons. Normally this causes rendered objects to have a facet-like appearance. While this may be preferable in some cases, such as with a cube, in most cases, such as with a sphere, a smoothed surface looks better. Part of a Material's specification includes whether the surface is to be faceted, fully smoothed, or auto-faceted. The three smoothing choices, only one of which may be active are found in the left-most column in the Attributes property panel.

Faceted

No smoothing is performed. However, shading within individual faces is performed.

Auto-Facet

Smoothing is performed only when the angle between two polygons is less than a user-specified threshold, while faces that meet at a greater angle retain a sharp appearance. This works best when an object's surface contains smooth as well as faceted parts, such as the example above. AutoFacet works well for most cases.

To change the threshold for AutoFacet, right-click on the AutoFacet icon. The default threshold, 32, is best for most purposes. Higher values produce more smoothing, and lower values produce less smoothing.

Smooth

Smoothing is performed on all polygon intersections. This works best if the object does not have any sharp edges.

Shaders

trueSpace2 employs three basic shading models, found in the Attribute property panel's second column: Flat, Phong, and Metal. To select the Shader type for the current Material, select one of the three icons in the Attribute property panel's second column. To select further options for the current Shader type—Ambient light, Shininess, Roughness, Transparency and Refraction—use the Shader Attributes panel.

Flat

Surfaces are rendered with no shading at all. The Flat Shader does not use the Ambient, Shininess or Roughness options. The Flat Shader is useful for fast previewing, or when you don't want things to be lit, like when simulating neon.

Phong

The Phong Shader is best for most surfaces. It produces smoothly shaded surfaces with attractive highlights. Transparency and ambient illumination can be controlled by options. Diffuse illumination as well as highlight intensity can be controlled by the Shininess option, and highlight size can be controlled by the Roughness option.

Metal

The Metal Shader is used to model highly reflective surfaces, such as metal and glass. While both the Flat and Phong Shaders can also use transparency, only the Metal Shader causes transparency to fall off near the edges, more closely simulating real-world glass.

Shader Attributes

Each option is shown as a column of five spheres showing the range of effects available with the current shader selected. A vertical slider shows the current setting. To change the setting for any Shader option, simply move the slider to a new setting. All values can be set numerically by a right click on the panel. Shader attributes may be keyframed to change over time (see the Keyframe Monitor).

Ambient Light

This setting simulates indirect lighting by setting the amount of illumination on an object not provided by actual light sources. It thus determines the degree of shading on the object's surface. Low ambient illumination is used for stark, dramatic shading effects. For most objects, about 10% ambient lighting, near the bottom end of the scale, is adequate. The bottom end of the scale represents 0% ambient lighting, and the top end of the represents 100% ambient lighting.

Shininess

This setting determines the intensity of specular reflections when used with the Phong and Metal Shaders. It also determines reflectivity when ray tracing or the intensity of environment maps. When used with the Phong Shader, it also determines diffuse illumination, or the amount by which light spreads out on the surface. The bottom end of the represents 0% shininess, and the top end represents 100% shininess.

Roughness

This setting determines the relative size of specular highlights on Phong and Metal shaded faces. The bottom end of the scale represents low specularity with large highlights, and the top end of the scale represents high specularity with small highlights. The smaller the highlight, the glossier the surface appears. The larger the highlight, the rougher the surface appears.

Transparency

This setting determines how much light passes through an object. Possible values range from fully transparent at the top to fully opaque at the bottom. The transparency value does not affect a material with a texture map or procedural materials. Procedural materials have their own control panels for transparency. For a texture to have transparency, it needs either an alpha channel or a conversion through the Image Utilities (see Image Utilities).

Index of Refraction

This setting determines the index of refraction, a property of transparent substances such as glass, crystal and liquids that causes light to bend as it passes through them. This creates visual distortions that can be accurately rendered in **trueSpace2** only if raytracing is enabled. If a transparent object is set to an index higher

than 1 (at the bottom of the scale) and the scene is raytraced, light rays that pass through the object are bent, causing objects behind it to appear distorted.

Texture Map

An image is mapped onto the object surface according to the object's UV space (see UV space). if the image has transparency information (such as a 32 bit .TGA or a .TXR) those areas can be set to be transparent or can be used as overlay masks to show the material's base color and surface attributes. To enable texture mapping click on the Texture Map icon. To select an image file, right-click on the Texture Map icon to open the Texture Map panel.

To load an image for texture mapping, select the box in the panel's upper left corner, then use the file selector that appears to select an image file. Currently the program can use files in these formats: .BMP (Windows bitmap), .TGA (Targa), .TXR (Rendition antialiased Mipmap texture), .JPG (JPEG), and .AVI (Video for Windows) for animated textures. The new texture is immediately mapped onto the example sphere in the Material preview panel. Texture map parameters may be keyframed to change over time (see the Keyframe Monitor). Animated textures can be played back in solid mode, but will look jerky without a 3D accelerator. Since AVI files stay in memory, playback is quicker the second time through.

Overlay

If a Targa or Texture (TXR) image file contains transparency information, this can be used either to cause the bitmap to become transparent in those areas (Overlay on), revealing the underlying surface. Or it can be used to make the underlying surface transparent (Overlay off).

Anim(ate)

For animated textures, **trueSpace2** allows for sequentially numbered files or an .AVI file. If Animate is enabled, the program will cue up each frame of the animated texture map for each frame of actual animation. If the file is an .AVI, then the rate at which the frames are cued is according to the base rate of the .AVI file. For example, if the base rate is 15 fps (frames per second), then each frame is repeated twice for the texture in the final animation (assuming 30 fps for final render). If there are more frames in the animation than in the texture, the texture will loop. The same thing occurs if there is a break in sequentially numbered files.

U Repts

Sets the number of times the image is repeated in the horizontal direction up to 100 times. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. Images can be repeated by fractional amounts.

V Repts

Sets the number of times the image is repeated in the vertical direction up to 100 times. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its

left and set a new value by dragging the mouse sideways. Images can be repeated by fractional amounts.

U Offset

Sets the amount by which the image is offset horizontally from the start of the UV mapping space. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. The U offset value ranges from 0 (left edge) to 1 (right edge).

V Offset

Sets the amount by which the image is offset vertically from the start of the UV mapping space. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. The V offset value ranges from 0 (top edge) to 1 (bottom edge).

Bump Map

The image's brightness is used to simulate roughness on a surface. The brighter the pixels, the higher the apparent bumps, and vice versa (this can be reversed). This effect doesn't actually affect surface height, so bumps cannot be seen in profile. To enable bump mapping, select the Bump Map icon. To select the image file, right-click on the Bump Map icon. This opens the Bump Map Panel.

To load an image for bump mapping, select the box in the panel's upper left corner, then use the file selector that appears to select an image file. Currently the program can use files in these formats: .BMP (Windows bitmap), .TGA (Targa), .TXR (Rendition antialiased Mipmap texture), .TAB (Rendition Bump Table), .JPG (JPEG), and .AVI for animated bumps. The new bump map is immediately mapped onto the example sphere in the Material preview panel. Bump map parameters may be keyframed to change over time (see the Keyframe Monitor).

Amp(litude)

Determines the bump height (positive numbers) or depth (negative numbers). A value of 0 has no effect. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. A good value for the amplitude is 0.1.

Animate

For animated bumps, **trueSpace2** allows for sequentially numbered files or an .AVI file. If Animate is enabled, the program will cue up each frame of the animated texture map for each frame of actual animation. If the file is an .AVI, then the rate at which the frames are cued is according to the base rate of the .AVI file. For example, if the base rate is 15 fps (frames per second), then each frame is repeated twice for the bump map in the final animation (assuming 30 fps for final render). If there are more frames in the animation than in the bump map, the bump map will loop. The same thing occurs if there is a break in sequentially numbered files.

U Repts

Sets the number of times the image is repeated in the horizontal direction up to 100 times. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. Images can be repeated by fractional amounts.

V Repts

Sets the number of times the image is repeated in the vertical direction up to 100 times. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. Images can be repeated by fractional amounts.

U Offset

Sets the amount by which the image is offset horizontally from the start of the UV mapping space. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. The U offset value ranges from 0 (left edge) to 1 (right edge).

V Offset

Sets the amount by which the image is offset vertically from the start of the UV mapping space. Click on the white box and enter a new value from the keyboard, or click on the double-headed arrow to its left and set a new value by dragging the mouse sideways. The V offset value ranges from 0 (top edge) to 1 (bottom edge).

Environment Map

Environment mapping makes shiny objects in the scene appear to reflect their environment without having to ray trace the scene. As the objects move the reflections change, enhancing the illusion. The intensity of the environment is determined by the shininess value in the Shader Attributes panel. Ordinary image files can be used as environment maps, and **trueSpace2** can use 1D and 2D (cubic) environment maps made with the Image Utilities (see Image Utilities). A 1D map creates the effect of a horizon reflecting on the object's shiny surface. A 1D map file, which has a .T1D file name extension, is essentially a linear gradient. A 2D map (.E2D) simulates reflections of an actual environment without the time cost of ray tracing. The drawback is that 2D environment map files must be created for each reflective object, and with animations, for each frame as well. To enable the environment map, select the Environment Map icon. Right click on the Environment Map icon to open the property panel.

From there select on the name field to display the file requester for selecting the environment map image file. Currently the program can use files in these formats: .BMP (Windows bitmap), .TGA (Targa), .TXR (Rendition antialiased Mipmap texture), .T1D, .T2D, .JPG (JPEG), and .AVI for animated environments. Environment map parameters may be keyframed to change over time (see the Keyframe Monitor).

Anim(ate)

For animated environments, **trueSpace2** allows for sequentially numbered files or an .AVI file. If Anim is enabled, the program will cue up each frame of the animated texture map for each frame of actual animation. If the file is an .AVI, then the rate at which the frames are cued is according to the base rate of the .AVI file. For example, if the base rate is 15 fps (frames per second), then each frame is repeated twice for the environment map in the final animation (assuming 30 fps for final render). If there are more frames in the animation than in the environment map, the environment will loop. The same thing occurs if there is a break in sequentially numbered files.

Procedural Maps

Procedural Granite

Enabling procedural granite disables texture mapping. A procedural texture is created from an algorithm and applies to an object regardless of the object's UV space. To enable procedural granite, click on the Procedural Granite tool. Right click on Procedural Granite to change granite settings.

Color

The Granite texture uses four different colors, called Color 1, 2, 3, and 4, that are randomly combined in a mottled mixture. These default to successively darker shades of gray. To change a color, click on the rectangular color swatch to the right of its name, then use the Color property panel to set the hue, brightness and transparency.

Amount

Each color has an Amount setting between 0 (minimum) and 1 (maximum), which determines its relative weight in the overall texture. Give higher values to colors that should predominate, and lower values to colors that should contribute less

Scale

There are three settings for scaling on the X, Y and Z axis. The pattern can be scaled independently on each axis between 0 (maximum) and 10 (minimum). That is, for larger splotches of color, use smaller Scale values.

Seed

This is a random seed for varying the texture.

Sharpness

The sliding vertical Sharpness scale at the right side of the panel is used to set amount of "noise" in the texture. The default and maximum value is 1, which results in a "granity" appearance. Setting Sharpness to 0 results in a one-color texture.

Procedural Marble

Enabling procedural marble disables texture mapping. A procedural texture is created from an algorithm and applies to an object regardless of the object's UV space. To enable procedural marble, select the icon. Right click on Procedural Marble to change marble settings.

Color

The Marble texture uses two colors. Stone color (stonecol) defaults to a dark pink and the Vein color (veincol) defaults to a light pink. To change a color, click on the rectangular color swatch to the right of its name, then use the Color property panel to set the hue, brightness and transparency. The Marble texture is predominantly that of the

Stone color with the Vein color running through it.

Turbulence

This setting determines the smoothness of the veins, with 0 being very smooth and 10 quite swirly.

Sharpness

This setting, which ranges from 0 to 1, determines the amount of veins that appear. Lower values give fewer veins.

Grain

The Marble texture has a predominant direction called the Grain. You can specify whether it should follow the X, Y or Z axes by selecting the appropriate button. These axes correspond to the object's own axis alignment.

Scale

There are three settings for scaling on the X, Y and Z axes. The pattern can be scaled independently on each axis between 0 and 10. For more veins, use higher Scale values.

Procedural Wood

Enabling procedural wood disables texture mapping. A procedural texture is created from an algorithm and applies to an object regardless of the object's UV space. To enable procedural wood, select the icon. Right click on Procedural Wood to change wood settings.

Color

The Wood texture uses two colors. Spring wood (springwd) defaults to a light brown and Summer wood (summerwd) defaults to a dark brown. To change a color, click on the rectangular color swatch to the right of its name, then use the Color property panel to set the hue, brightness and transparency.

Spr:Sum

This value, which ranges between 0 and 1, sets the relative weights of the two colors in the texture. Using a low number allows the Summer wood color to predominate, and using a high number makes the texture mostly Spring wood.

Ring Density

This setting, which ranges between 0 and 10, controls the density of rings in the texture. Using a high value creates more rings.

Width Vary

This controls the variation in width from ring to ring. A value of 0 gives nearly equal widths, while a value of 1 gives disparate widths.

Shape Vary

This parameter controls how much the rings deviate from an actual circular shape. A value of 0 yields near circles, while a value of 1 gives greatly varying shapes.

Seed

This is a random seed for varying the texture.

Grain

The Wood texture has a predominant direction called the Grain. You can specify whether it should follow the X, Y or Z axis by selecting the appropriate button. These axes correspond to the object's own axis alignment.

Scale

There are three settings for scaling on the X, Y and Z axis. The pattern can be scaled independently on each axis between 0 and 10. For more and smaller rings, use higher Scale values.

UV Projection Tool

When you use images as components of materials, the images are mapped to the object according to the UV space assigned. UV space is assigned to an object by different modes of projection: planar, cylindrical, and spherical. The term UV space comes from a mathematical way of describing any point on an object's surface with the parameters U (horizontal distance around the object from a given point) and V (vertical distance around the object from a given point). Objects made in **trueSpace2** are assigned default UV space but imported objects usually lack projection so textures do not apply correctly. When you select the UV tool, a new UV space, depicted as a wireframe, appears over or around the object and the UV Projection panel opens with the various choices. Note that this is not the object's current or default space, which can't be depicted once set. The brown edge on the projection is the seam where the texture wraps around. UV projection can be rotated with Object Rotate. Cylindrical and Spherical projections can also be moved with Object Move. To exit UV mapping mode and save the current mapping space, click on Apply. If any textures were previously applied to the object, they are automatically remapped using the new UV space.

Planar

Specifies a rectangular image space. Use Object Rotate to reposition the mapping plane, which is squashed and stretched to match the object's cross-section as it is rotated about the object. The image is projected "through" the object, and appears on the "front" and "back" sides.

Cylindrical

Specifies a cylindrical mapping space, much like the label on a can of food. This space can be moved as well as rotated.

Spherical

Specifies a spherical mapping space. This space can be moved as well as rotated.

Default UV Mapping

Default UV space can be replaced with a new UV projection but cannot be manipulated. An object cannot be re-assigned to its default UV space.

When you use Sweep to create a 3D object, a default UV mapping is automatically applied. Flat UV mapping is applied to the object's flat ends, while its length is mapped with a type of cylindrical mapping that conforms to the object's shape.

When you use Lathe to create a 3D object, a different type of default UV mapping is automatically applied. If you lathe a shape 360 degrees with Helix set to 0, which means the object has no ends but is a continuous circle, the default UV mapping is applied cylindrically, but is then bent around to match the object's circular shape. If the lathed shape has ends, a flat UV mapping space is applied to each

end.
A primitive cube has a planar projection that is bent around the six faces to cover the shape properly.

Material Rectangle

This tool lets you place an isolated material rectangle on an object's surface. It is superior to painting faces in that the rectangle can be freely moved and scaled around the surface of an object. Up to eight rectangles can be placed or "stacked" on an object. Material rectangles can be deleted, moved, or sent to the front of the stack. The bump map property of the object's base material is inherited in all the placed rectangles.

The material rectangle moves and scales around the object comforming to the object's UV space and will disappear into the projection's seam (see UV projection). If the object has a planar projection, then the rectangle will be applied to both sides of the object. Selecting the Material Rectangle tool opens its control panel. Both position and scaling of material rectangles can be animated as well as the material for each rectangle. See the Keyframe Monitor for more information.

New

Creates a new Material rectangle, and displays it on the object's surface. Up to eight Material rectangles can be added to an object.

Del

Deletes the current Material rectangle.

Move

Lets you move the Material rectangle interactively around the object's surface by dragging the left mouse button. Horizontal and vertical mouse movements translate respectively to U and V movement. Right click on Move to constrain movement either to U or V space.

Scale

Lets you scale the Material rectangle interactively by dragging the left mouse button. Horizontal and vertical mouse movements translate respectively to U and V scaling. Right click on Scale to constrain scaling either to U or V space.

< / >

These two buttons cycle through an object's Material rectangles, if there are more than one. The material preview does not update to show the material on the current rectangle.

Paint

Left click to paint the material rectangle with the current material.

Inspect

Left click on Inspect to see the current material rectangle's material

displayed in the Material preview panel if it is open. Right click to open all Material property panels.

Material Rectangle to Front

When an object has multiple Material rectangles that overlap, select this tool to bring the current Material rectangle to the "top of the stack". Normally when rectangles overlap, the topmost is the last created.

Plug-ins

Plug-ins are effect filters for paint programs. Included with **trueSpace2** are Pixelwind, Diffuse More, Sharpen Intensity, Find Edges (Soft) and 3D Stereo Noise from HSC Software. **trueSpace2** provides support for standard third party Adobe Photoshop filters. Filters included with Adobe Photoshop will not work because they are required to be run inside Photoshop. When you select Plug-ins for the first time, a standard file requester will open asking for the location where your plug-ins are installed. Select an .8bf file from your plug-in directory then select OK. Once the program is made aware of the directory, it will save the location as default from there on but it can be changed through the Plug-ins property panel.

After the directory is set, the Plug-ins control panel opens with the various choices for applying the filters. The Material preview panel also opens to show a preview of the Plug-ins' effects. To see the filters applied to the scene, you must render the scene either to screen or to disk. Up to four filters maybe used for the scene and are applied to the scene in the order listed in the panel from top to bottom. Plug-ins' parameters may be keyframed to change over time (see the Keyframe Monitor). The order that the plug-ins process affects the outcome of the image.

Related Topics:

Plug-ins Control Panel

Plug-in Property Panel

Plug-ins Control Panel

Plug-in name

This field shows the current plug-in. The drop-down box contains a list of available plug-ins in the target directory. Selecting one initializes the plug-in's parameters panel where individual settings may be set if applicable. To change the plug-in's settings again, the plug-in must be re-selected from the drop-down box. If you hold down the Ctrl key while re-selecting the same plug-in, then the previous settings will be retained.

About

Selecting About opens the plug-in's about box. Additional plug-in documentation may be found through a Help option.

Mask Options

This pop up contains 5 mask options on how the filter is applied to the scene.

No Mask

The filter is applied to the scene as a whole including the objects in the scene and the background.

Object Mask

The filter is applied to a single object. It defaults to the currently selected object but can be changed by selecting a new object and then Object Mask again.

Inverse Object Mask

The filter is applied to all objects in the scene other than the object masked. It defaults to the currently selected object but can be changed by selecting a new object and then Inverse Object Mask again.

Scene Mask

The filter is applied to all objects in the scene. The background is not filtered.

Inverse Scene Mask

The filter is applied to the background in a scene, all objects are left un-filtered. This is handy for using a filter to create the background or to filter the background image.

Filter Image/Filter Mask

This pop up dictates the scope of the image that the plug-in will filter. Filter Image means that the plug-in will be applied to the whole image and then displayed according to the mask setting. Filter Mask means that the plug-in will filter only the area within the scope of the current mask setting. This effectively changes the scale of the effect.

Foreground Color/Background Color

Some filters make use of the notion of a current foreground and background color. These colors maybe used for different processing effects within filters. To select a color from an HSV model, left click on the color to change to open the HSV color picker. Right click on the color hexagon to open the RGB color slider.

Plug-in Property Panel

Right click on Plug-ins to open the property panel.

Show Plug-in Passes

Enabling this option redraws the screen as a plug-in finishes processing before the next one starts (assuming more than one plug-in is in use). Disabling this option saves processing time.

Use Plug-ins

When this is turned off, the settings in the plug-in set-up panel will not be used when the scene is rendered.

Change Plug-in Path

Selecting this button opens a file requester to change the default Plug-ins' directory. Select a .8bf file from your plug-in directory then select OK. Once the program is made aware of the directory, it will save the new location as default.

Image Utilities

This menu item found under the Edit menu opens a panel with several image conversion functions.

The left side of the panel is concerned with the creation of transparency maps for texture mapping, and the right side contains tools for creating environment maps.

Related Topics:

Input Image

Alpha Conversion

Convert Image

1D Environment Map

2D Environment Map

Input Image

This field contains the name of the image file to be processed either for 1D, 2D, or alpha conversions. To choose a file, select on the name box to open a file dialogue.

Alpha Conversion

If you convert a bitmap to a Mipmap (.TXR) texture, you can use it as a texture map with transparency information (thus creating an alpha channel). Within the conversion pop up are choices for what information from the original image will be used to create the alpha channel. An alpha channel can be used either to cause areas of a material to be transparent (like placing a sticker on a window) or cause those areas to be used as inverse masks over the material's base color (see overlay).

None

No alpha conversion is done to the image.

Top Left

The color of the image's top left pixel will become transparent in the Mipmap texture.

Intensity

The intensity values of the image will become transparency values in the Mipmap file. The ranges are from 0 to 255 for both intensity and transparency. An intensity value of white (255) creates an area of full transparency and a value of black (0) creates an opaque area.

Black / White

Either black or white pixels can be used as transparent colors in the Mipmap texture.

Image

Uses the intensity values of a different image to create the alpha channel (see intensity). At the time of conversion, **trueSpace2** will prompt you for the name of the second image.

Convert Image

Selecting this button creates a new texture file from the original image with an optional alpha channel according to the Alpha Conversion setting. A standard file dialogue opens and you can set the name, location, and type of file to be saved. The three choices are:

Mipmap Texture *.TXR

Creates a .TXR color image with alpha channel (transparency) information added if any conversion was performed. These textures are considerably smoother in the rendered image but take up more memory.

Mipmap Bump Table *.TAB

Creates a special bump-map file that can only be used as a bump-map image. This renders faster than a standard image used as a bump map. Alpha conversion information is ignored.

Targa File *.TGA

Creates a Targa-format color image with alpha channel (transparency) information added if any conversion was performed.

1D Environment Map

A 1D environment map is a special image containing a one-dimensional color gradient. Used with metallic and glass objects it can create colorful simulated reflections at a minimal cost in memory. The 1D gradient is extracted from the input image along its left or right edge, or vertically down its center according to the setting in the Column pop up. Selecting the 1D environment button opens a standard file dialogue. Type the name of the new 1D environment then select OK.

2D Environment Map

A two-dimensional environment map, also known as a cubic map is used to simulate reflection of an actual environment, rather than an image, and is much faster than ray tracing. Six small images are taken in different directions from an object's point of view, then applied to that object as an environment map. A cubic map is always created from the point of the current object and works best with curved objects. Choose from the pop-up next to Resolution to set the size of the reflection maps. The choices are Low, Medium and High. Select the Image Utility panel button marked "2D Envr Map," and in the file requester enter a name for the environment map, followed by .E2D. The six different views are rendered on the screen as you watch, then saved as a 2D environment file. The environment map can now be used in a material with the Environment Map tool in the Attributes panel.

Animation Tool

Selecting the Animation tool opens the Animation property panel, which contains VCR-like controls for playing animations, recording and deleting key frames, and moving between animation frames. Unlike traditional animation techniques where one must draw every frame to create motion, in **trueSpace2** you define the important points in time where actions take place (known as keyframes) and the program then draws all the in between frames. Many actions can be keyframed including movement, rotation, scaling, deformations, camera zooms, look at and ahead constraints, material attributes, plug-ins, and background colors. Path animation is useful for easily animating object movement, but it has no provision for controlling object rotation and size. To set a key frame for an object, simply move to that frame and manipulate the object with navigation tools or object deformation tools. When you release the mouse button, the X button on the Animation panel changes from ghosted to active (assuming no previous key existed), indicating that a key is set in this frame and can now be deleted. Creating keyfames for position also creates an animation path for the object which can then be displayed with by selecting the Animation Path tool. Select the Play tool with the right button to open the Animation property panel.

Related Topics:

Animation Panel

Animation Parameters Panel

Keyframe Monitor

Animation Panel

Record Key

Sets a key frame for movement, rotation, scaling, or deform for the current object at the current frame. The type of key set depends on the current tool active. There are two modes for the Record Key tool and are set by a right click on the record tool. With Autorecord enabled, a key is set every time an object is manipulated at a frame other than 0. If Autorecord is disabled then the Record Key must be selected each time to create a keyframe.

Unset Key

Deletes the current key for movement, rotation, or scaling−depending on which navigation tool is active−for the current object or the eye at the current frame. This button is ghosted unless there's an active key. For example, if you set a movement key for an object at frame 10, then select the Object Rotation tool , the Unset Key icon becomes ghosted, unless a rotation key had previously been set for the object at that frame.

Play

Plays the animation to screen in wireframe or solid mode depending on the current screen mode according to the settings in the Play property panel.

First Frame

Jumps to the animation's first frame.

Rewind

Jumps to the previous key frame.

Fast Forward

Jumps to the next key frame.

Last Frame

Jumps to the animation's final frame.

Previous Frame

Rewinds to the previous frame.

Next Frame

Forwards to the next frame.

Frame Number Field

Displays the current frame number. Set the current frame from the keyboard in the numeric field, or by dragging the mouse horizontally

on the left-right arrow.

Animation Parameters Panel

Right-click on the Play tool to open the Animation parameters panel. Settings here include the animation start and end frame, whether the current object or the entire scene is animated, looping controls, and base rate controls.

Draw Object/Scene

This determines whether the current object or the entire scene (all objects) is animated when the Play button is activated. If two or more windows are open, including the main view, Object animates in all windows. Scene animates only in the active window.

Base Rate

The rate at fps (frames per second) that the animation will play at. The choices are 30 fps for NTSC, 25 fps for PAL, and 24 fps for film.

Loop

Loops the animation during screen play back only. The Esc key or the double right click interrupts play back. It can be combined with Tog.

Toggle

Plays the animation forward then backward.

Start/End

These values show the current start and end frames for animation preview. By default Start is set to 0, the first frame, and End is set to the last frame in which animation for the currently selected object ends. Change either value by clicking on the numbers and entering new values from the keyboard, or by clicking on the double-headed arrows and dragging left and right. You can also change these in the Project window.

Keyframe Monitor

The Keyframe Monitor is opened by a right click on any of the Animation panel tools other than Play or Record. It has three rows for the different types of keyframes that can be displayed; object, material, and scene as well as a tools column on the far right for manipulating keyframes.

Each icon in the three keyframe display rows has four states.

* An icon row is **light gray** when it is active and can display keyframe information for its functions. As an example, you may be working with just object keyframes so that display row will be active (or light gray) while the other two are inactive.

* An icon row is dithered or **dark gray** when it is inactive.

* A specific function icon (in an active row) will turn **blue** (the same color as a selected icon) when there is a keyframe associated with that function at the current frame on the animation panel. As an example, the Object Rotate key would turn blue at frame 15 if the current object has a rotation key at that frame. Moving then to frame 16 would return the function icon to its active or light gray state.

* A Function icon is **red** when that type of keyframe has been disabled from operation. A type of key may be disabled by selecting its corresponding function key in the Keyframes Monitor. As an example, you may have both rotate and move keys at a particular frame and want to unset only the move keys. Making the rotate key red and selecting the Unset Key tool would then only remove the move key at that frame

Once a specific keyframe or keyframes are blue (isolated), they can be removed with the Animation panel's Unset Key tool, or they can be manipulated with the three keyframe tools at the right end of the panel. Remember that the keyframes you set depend on the active tool, not on any active or blue function keys in the monitor.

Note: Some of the keyframing functions are slightly modified when the Keyframes monitor is open: **Unset** (Unrecord): only destroys those keys that are not red. **Go to previous/next keyframe**: goes to the next keyframe of blue tinted function keys.

Copy Keyframe

Copies all the keyframes that are active and blue to another place in the animation. To copy a keyframe, first move to the frame where the original keyframe or keyframes were set (the function key for those tools should turn blue at that frame). Then select Copy Keyframe and enter the destination frame number in the number field of the Keyframes Monitor (not the Animation panel). If there are two kinds of keys at that frame for the object (like rotate and move) then both key types are copied.

Shift Keyframe

Moves all the keyframes that are active and blue to a different place

in the animation. To copy a keyframe, first move to the frame where the original keyframe or keyframes were set. Then select Shift Keyframe and enter the destination frame number in the number field of the Keyframes Monitor (not the Animation panel).

Stretch Keyframe

Stretch is similar to shift, except that all keyframes which are before the current active keyframes are shifted proportionally with the active keyframe - their relative times are proportionally stretched. Stretching also creates a sense of acceleration towards the stretched keyframes.

Object Keyframes

The top row of icons contains function keys for the different object keyframes: move, rotate, scale, look constraints, deformations, and material rectangles. Object level keyframes are active in the monitor when an object is selected. Object keyframes are created by manipulating the object with the following tools at a frame other than 0. If Autorecord is disabled in the Record property panel, then the Record Key must be selected each time to create a keyframe.

Move, Rotate, and Scale Keys

These keys are set by selecting the specific navigation tool and manipulating the object at a frame other than 0.

Look Constraints Keys

Look At and Look Ahead can both be keyframed either as on or off (only one can be active on an object at a time). To set a key, enable or disable constraints at a frame other than 0. To disable a constraint, select the tool once to return it to its light gray state (in the Animation Group, not the monitor).

Deformation Keys

Any deformation on an object (does not include the surface sculpt tool) either as object deformation or as plane deformation may be keyframed like any other action. Deform primitives may also be animated in the same fashion.

Material Rectangle Keys

Material rectangles can be keyframed to move and scale over time. To record a key, move or scale a material rectangle at any frame other than 0. The material on each rectangle can also be animated but to see the keyframes, you have to select the texture with the Inspect tool from the Material Rectangle panel (more in the following section) first. Then as you scroll through frames in the animation panel, the Sample Material panel will update for each frame to show the animation on the material. To see Material rectangle keys, the Material rectangle tool must be active for the current object.

Material Keyframes

The material keyframes row displays keyframe information for the

current material which **must** be selected first with the Inspect tool. Then as you scroll through frames in the animation panel, the Sample Material panel will update for each frame to show the animation on the material. Color, shader attributes, textures, bumps, and environments may be keyframed. Keyframes for materials are set when the Paint Over tool is applied to an object at any frame other than frame 0.

Color and Attribute Keys

All values may be keyframed.

Textures and Bump Map Keys

All numerical values may be keyframed as well as the image files for each effect. Changing the files does not create a transition but rather changes between files abruptly. Numerical values are interpolated though for smooth transitions.

Environment Keys

The image file may be changed at a specific time in the animation just like texture and bump maps.

Scene Keyframes

Scene keyframes include plug-ins, fog, ray tracing, backgrounds, and global environments. To enable the Scene keys, be sure that "scene" is enabled in the Animation Parameters panel (right click on the play button). Scene keyframes are set by changing global scene parameters at a frame other than 0.

Plug-ins Keys

Individual settings in the Plug-ins panel maybe keyframed to change over time but not settings in the interface of the Plug-in itself. The icon for plug-ins can only show the keys for one slot at a time, so right clicking on the plug-in icon in the keyframe monitor brings up a panel with four plug-in icons. Each of these four icons represent one of the four plug-in slots (leftmost - topmost slot, rightmost - bottommost slot). The keyframes of whichever of these is highlighted will be shown in the plug-in icon in the keyframe monitor. All keyframe functions (copy, shift, stretch, unset, previous, next) work with the active plug-in if Scene playback is selected in the animation properties panel

Fog Keys

Color, fog extents, and maximum percentage can be keyframed as well as the on and off state.

Background Keys

A background bitmap may be keyframed on and off as well as changed during an animation. Changing image files does not create a smooth transition. Background color can also be keyframed.

Global Environments

An environment bitmap may be keyframed on and off as well as changed during an animation. Changing image files does not create a smooth transition. Environment color can also be keyframed.

Ray Tracing Keys

Ray Tracing may be keyframed on and off during an animation. The reflect value can also be keyframed.

Animation Path

An animation path is created the same way as a spline polygon. To draw an animation, select the target object and then select the Animation Path Tool. Click the left mouse button in the workspace on each vertex in turn. Each point you define sets a new spline node for the path, with an intermediate number of interpolated frames in between (there are thirty frames per second of animation). New spline paths can be created from any view. Points drawn in either Perspective or Top view are placed flat on the grid. While drawing a spline path, you can switch between adding new points and editing existing ones using the Draw and Edit controls in the Spline control panel. Spline paths are edited in the same way as spline polygons (see the Spline Polygon tool). To close a spline polygon click the right mouse button, which connects the last point with the first. At this point, you can edit the polygon or add the spline to a paths library for later use, but you can't add new spline points to a closed spline path except by adding position keyframes with the Animation Panel. It is not necessary to close an animation path, exit by de-selecting the Animation Path tool. Also, you can add or change a path spline to the workspace by selecting a path (closed or open) from the Path library after selecting the Animation Path tool.

Upon activation of the Animation Path tool, the Spline control panel opens. A right click in turn opens the Spline property panel.

Related Topics:

Spline Control Panel

Spline Property Panel

Spline Parameters Panel

Spline Control Panel

When you select the Spline Polygon tool, the Spline/Path control panel opens.

Edit

To move path points and spline handles, select this button. Draw and Edit are mutually exclusive.

Draw

If before closing a spline polygon, you select Edit to modify spline points or handles, you can return to adding points by selecting this button.

New

Deletes the existing path for the selected object and lets you create a new one.

Segments

This setting determines the number of vertices between spline points when drawing a polygon. Click and drag on the arrow button to change, or click on the number and enter a new value from the keyboard. The higher this number, the smoother the outline, and the greater the number of resultant polygons.

Frames

This button toggles the display of individual frames, shown as blue hash marks along the path.

All Handles

Handles are the green lines emanating from path control points. When a path is displayed, this setting determines which handles are visible. With All Handles on, all handles are drawn. Otherwise only the handles attached to the currently selected path vertex are displayed. As path vertices tend to be hard to see, this option helps locate the active vertex.

Spline Property Panel

Right-click on the Spline Polygon tool to open the Spline property panel. Spline characteristics can be changed during and after the creation of a spline with the controls on this panel.

Spline Presets

The buttons in the top row contain preset combinations of spline settings for fast adjustment of all three settings at once. Also, you can access the Spline parameters panel for numeric settings by right-clicking on any of the preset buttons. The presets are:

The first preset removes any smoothing, causing the spline segments to act like straight lines. The other two presets implement smoothing as described by their names.

Interpolated Value

The second row of buttons is for selecting whether the adjustments use location, rotation, or scaling values for interpolation. Normally when you edit the spline settings, you're changing how the program interpolates between the spline points' different location values. Rotation and scaling interpolation is not displayed in a path but can be edited nonetheless by enabling either the Rotation or Scale Interpolation buttons. Changing settings with either of the two buttons active does not alter the path's shape.

Local

By default this switch is on, which means only the current spline is affected by changing settings. Selecting Local turns off Global.

Global

All spline nodes are affected by changing settings via the presets or the parameters panel. Selecting Global turns off Local.

Spline Parameters Panel

To open the Spline parameters panel, right-click on any of the Spline presets buttons in the Spline property panel. This allows numeric adjustment of path spline settings: Tension, Continuity and Bias. Change values by clicking on the numbers and entering new values from the keyboard, or clicking on the double-headed arrows and dragging left and right. While any numbers can be set, the most useful values range between -1.5 and 1.5.

Look Tools

Look At

This command is used to make an object, camera, or light continually realign itself during an animation to remain pointed at another object. The program accomplishes this by automatically pointing the original object's Z axis at the second object's axis location (see the Axes tool). To use Look At, select the object that is to be constrained, select Look At, then select the target object. When an object is under Look At's influence, it is constrained and cannot be rotated manually. Look At and Look Ahead are mutually exclusive operations.

The Look At tool has two states that can be keyframed: enabled (icon pushed in) and disabled (icon in default state). When enabled the constrained object will continually update its orientation during an animation to that of the target object. In disabled state the object will cease to update itself at the "disable" keyframe. Subsequently the object can then be keyframed to look at a new target during the course of the animation. Note that keyframing a new target on the same frame as the old one was disabled will not create a smooth transition, rather the constrained object will jerk suddenly to re-orient itself. The proper action in this situation is to skip ahead many frames and then keyframe the new Look At target.

Look Ahead

This command is used to make an object point forward along its motion path during animation. The program accomplishes this by automatically pointing the object's Z axis along the path, re-aiming for each frame. To use Look Ahead, select the object to be constrained and then the Look Ahead tool. Objects like text, cameras, and spot lights will work automatically with Look Ahead but other objects will need to be adjusted to work properly (see the Axes tool). The Look Ahead tool requires that the object's Z axis points to the "front" of the object and that the Y axis points towards the "top" of the object. When an object is under Look At's influence, it is constrained and cannot be rotated manually. Look Ahead and Look At are mutually exclusive operations.

Look Ahead has two modes that can be keyframed: enabled (pushed in) and disabled (default state). When enabled, the constrained object will orient itself to the path until a "disable" keyframe is set. Subsequently the object can then be keyframed to look ahead again or to look at a target with the Look At tool. Note that keyframing a Look At action on the same frame as Look Ahead was disabled will not create a smooth transition, rather the constrained object will jerk suddenly to re-orient itself. The proper action in this situation is to skip ahead many frames and then keyframe the Look At target. To set Look Ahead parameters, right-click on the Look Ahead button.

Related Topics:

Look Ahead Control Panel

Look Ahead Control Panel

Bias

Determines the amount of "overshoot" when the object moves around curves.

Tension

Determines the degree by which the object tries to follow its original orientation.

Bank

When enabled, the animated object "leans" into curves in the motion path. The bank amount can be specified numerically by degrees.

Animation Project Window

The Animation Project window graphically displays animation actions and allows for interactive animation editing. There is a separate horizontal channel for each object in the current scene. The object's name is at the left end of its channel. A black "action" bar appears in each animated object's channel. This represents the end and start point of an object's animation but can be changed interactively with the mouse. Change the action bar's start or end time by dragging the beginning or end part of the bar. You can also move the action bar in time by dragging the entire bar from its center. By moving the action bar away from frame 0 you are creating the same effect as keyframing two "empty" keyframes (see the section on keyframe techniques) where an object will stay in place for an amount of time then take action. In all cases, you're changing the length or speed of the action only—the action itself remains the same. You can also remove the action bar by right-clicking on the action bar and dragging away from the window at the same time. This action deletes that object's animation track.

Above the action bar is a scale showing the time in seconds. The green bar on the scale indicates the current preview range. This is set by the program to the range of any animation, but can be changed interactively with the mouse. Change the preview start or end point by dragging the beginning or end part of the bar. You can also change both start and end points while maintaining the length by dragging the entire bar from its center.
Also found in the scale is a black vertical triangle. This marker, called the Frame Pointer, indicates the current frame displayed on the screen. To go to a different frame, click on the triangle and drag it left or right. As with changing the frame in the Path Control panel, the display updates as you drag the pointer. Below and to the right of the time channels are standard Windows scroll bars for displaying parts of the display currently out of view. There are also two Time Zoom controls: zoom in and zoom out. These let you see a shorter time period in greater detail and a longer time period in less detail respectively. Repeated clicking zooms cumulatively.

Related Topics:

Repeat Action

Stop Repeat

Copy Action

Local Action

Repeat Action

This command is used to repeat an action from its endpoint. Click on Repeat, then on the action bar that's to repeat. This causes it to repeat its action for the remainder of the animation. The repetitions are depicted as a gray bars to the right of the action bar, with diagonal hash marks showing the loop points. The bars can not be edited, but any change to the original action bar is updated in the repeat cycles.

When a motion is repeated, it continues from the last point rather than returning to the start point. For example, if an object moves forward and right, repeating its motion causes it to continue along the same diagonal path indefinitely. Repeating an action can have a cumulative effect. If an object moves up from the grid and ends at 10 units above the grid, the repeated animation track will be applied to the object starting at the new height. The result is that the object will end up 10 units higher (20 total) at the end of the first repeat and so on. If this is an unwanted effect as in the case of local actions like tires rotating on a car, just be sure that there is no discrepancy between the first and last frames on that type of keyframe. In this case, make sure that rotation starts at 0 degrees and ends at 360 degrees (a full rotation) before setting the action to repeat.
To delete repeated tracks, hold the right mouse button over the gray bar and drag it out of the window.

Stop Repeat

Stop is used to split a repetition. Click on Stop, then on the repeat portion of an action bar—that is, the gray part. An extra diagonal line appears at the split point. The gray bar is split in two and can be manipulated separately for movement, scaling, and delete action operations.

Copy Action

This command is used to copy an action verbatim within the same channel. Click on Copy, then on the action bar to copy. The bar is immediately replicated to its right. This bar can be manipulated independently within the channel, but can't be moved to other channels. Unlike repetition, copied action bars start over at the beginning point of the original action. The "notch" between copied action bars can be used as a reminder of this fact.

Local Action

This command is best used with hierarchical animation. This tool allows separation of all current sub-hierarchy motions from overall object motions, so that the sub-hierarchy motions can be edited as an action bar separately from the overall motion. For example, if you set up a swinging motion for a robot's arm and one for its leg, you can have those repeat automatically while the robot moves forward. A local action can be edited like any other action bar with the Repeat Action, Stop Repeat, Copy Action, and delete functions. Once an object's motion is made local, the motion itself can no longer be edited either with keyframes or the Animation Path tool. An action cannot be made "un-local" once localized. In the example, once the robot's swinging arm and leg are made local, the angle of the swing cannot be changed, although Project-oriented parameters (e.g., start time, duration, repetition) can still be edited. For complicated hierarchy animations, don't use the Local Action but rather keyframe all of the individual actions.

To use Local, first create animation either by keyframing or by drawing paths for the sub-objects of a hierarchy. Select the Local Action tool and then click on the action bar next to the "parent" object of the group. The bar is then copied underneath the original action bar with the word "local" written on it. Now you can create animation for the group as a whole and have a separate action bar.

Grid Snap

The Grid Snap tool sets navigation constraints for moving, rotating and scaling objects in adjustable increments and can be set for each different type of navigation action: movement, rotation, and scale. Select the Snap Grid tool once to enable constraints, select the tool again to disable constraints. Right click on the Grid Snap tool to open the Grid Snap property panel and to change settings. Switching from one type of navigation tool to another will update the Grid Snap property panel to reflect the different constraint settings for movement, rotation, and scale. If Dynaunits is enabled in the Object property panel (right click on the Object tool) then the grid constraints are according to the unit system of the current object. If Dynaunits is disabled, then the grid constraints are according to the World system. For example if the snap for movement is set to 1 and the current unit system is meters, then moving the object will be constrained by increments of 1 meter. If the current unit system is centimeters, then the constraints are in increments of 1 centimeter. Rotation functions are independent of the current unit system and are always displayed as degrees. To disable constraints on individual axes, deselect either X, Y, or Z in the Snap Grip property panel.

Axes Tool

Selecting this tool will display the axes for the currently selected object. Once active, the axes can be moved, rotated, and scaled and any manipulation to the original object is disabled. To keep the axes visible and return to editing the object, select the Navigate Up tool or the up arrow cursor on your keyboard. To subsequently hide the axes, select the Axes tool again.

Axes Location

The location of the axes determines the way the source object rotates, scales, and follows paths regardless of the coordinates system used. For rotation, the placement of the axes is the pivot point or hinge for an object. As an example, the axes on a cube are located in the exact center of the object so rotating it on its Z axis (right mouse button) will make it spin about its center. If the axes are moved to a corner and the same operation is repeated, you'll see that the cube rotates around the new pivot point like a door. Move the axes farther out and the cube will appear to orbit the axes when rotated.

For Scaling, the axes is the source of scaling or where the object will scale from regardless of the coordinates system used. When scaling a default cube, it grows nicely from its center equally in all directions. Move the axis of the cube to the bottom edge of the cube and it will then scale from the new source or from the "ground up". Move the axis out of the cube and you'll see that the cube will not only scale from its new source but will also move away from it at the same time as the distance between source and object is scaled also.

Axes location also determines where an object's attachment point is to an animation spline and where the "hot spot" of an object is for Look At operations (see the Look At tool).

Axes Rotation

The rotation of an object's axis affects the way an object moves, rotates, and scales in the Object coordinates system only (see coordinates system). Navigating an object in the Object coordinates system restrains navigation to the local axis of an object. It is usually not advantageous to rotate an object's axis except to satisfy the requirement of a special animation function like Look At and Look Ahead.

Axes Scale

The scale factor for an object's axis does not have any effect on the way the object is manipulated either in modeling or animation. Scaling an object's axis do make them more visible, especially when dealing with small objects.

Related Topics:

Default Axes

Default Axes

Objects created from primitives have axes that are automatically centered to the object and are oriented to the World axis. There are a few exceptions for both default placement and orientation of axes to other objects created in **trueSpace2**.

Text

The axes for text are placed at the bottom left corner of the object where the text cursor was first activated in the workspace. The Z axis points forward and the Y points straight up. This is true for both horizontal and vertical text. The axes for text are oriented such that Look At and Look Ahead functions can be executed automatically without first adjusting the axes of the object.

Sweeps

The axes for a swept object are located at the center of the original polygon swept regardless of how many times sweep is applied and how many transformations the shape undergoes. The axes are oriented to the World axis.

Cameras & Spot Lights

The axes for cameras and spot lights cannot be displayed or manipulated. They are located in the center of the object with the Z axis pointing straight forward towards the eye (camera eye or light target) and the Y axis facing straight up. The axes are oriented such that Look At and Look Ahead functions can be executed automatically without first adjusting the axes.

Axes Utilities

Normalize Rotation

The Normalize Rotation tool will orient an object or an object's axis to the orientation of the World Axis. To Normalize rotation, first select the target object or axis then select the tool.

Normalize Location

The Normalize Location tool will move an object or an object's axis to the center of the World at 0,0,0. To Normalize location, first select the target object or axis then select the tool.

Normalize Scale

The Normalize Scale tool will scale an object on all dimensions equally so that the target object or axis fits nicely within the workspace. To Normalize scale, first select the target object then select the tool.

Center Axis

Moves the axis of an object to the exact center of the bounding box. The object's axis do not need to be showing for this operation to take place.

Object Utilities

Quad Divide

Quad divide subdivides selected polygons by a ratio of n to 1, where n is the number of sides in a given polygon. By quad dividing an object, you quad divide all of its faces. For example, if you quad divide a cube, the resultant object will look the same but will have 24 polygons. To subdivide faces you must be in Point Edit mode with one or more faces selected. Not all polygons can be quad divided.

Smooth Quad Divide

Smooth Quad Divide attempts to physically smooth the surfaces of subdivided objects or faces, taking advantage of the extra resolution provided by the subdivision. Whether or not this takes place at the intersection of two given polygons depends on the interior angle between them and the Smoothing Angle setting. Smoothed objects tend toward a spherical shape. Right-click on the Smooth Quad Divide button to open the property panel, which lets you set the smoothing angle.

Angle

This sets the internal angle between polygons below which smoothing occurs. The higher this number, the more likely that a given internal angle between polygon edges will qualify, and thus the greater the smoothing that occurs. Experiment on a simple object such as a cube with different smoothing amounts to observe the results. With very low smoothing amounts, subdivision may not occur. The default smoothing angle is 40 degrees.

Triangulate Object

This tool divides all of a selected object's polygons into triangles. Triangulating an object will sometimes eliminate rendering artifacts resulting from deformation.

Decompose

Decompose will break down surface groups in an object into separate objects. Decompose is useful for separating elements of imported objects. Once executed, the new objects are grouped as siblings and can then be removed by navigating through the hierarchy.

Mirror

The Mirror tool reverses an object's geometry, essentially mirroring the object. The object's geometry is reversed along the World XZ plane. In the default Perspective view, that's the line running from lower left to upper right. The Mirror eases construction of complex formal geometric objects. To Use Mirror, select the target object and then the Mirror tool.

Fix Bad Geometry

This tool attempts to fix objects with incorrect geometry, such as overlapping faces, etc. These are typically created in point editing, with the Bevel tool and by importing objects from other formats. In particular it is easy to create self-intersecting faces with Bevel tool, which then show up as artifacts when ray-traced. The Clean Up Geometry tool will attempt to correct those problems on the selected object.

Reverse Normals

Reverses all the normals of an object. Some objects that are imported show up inside out while in a solid mode view. This tool attempts to correct the problem by reversing all the normals.

3D Import Formats

Import Settings Panel

All supported formats except PostScript and DXF employ the use of a standard settings panel which comes up each time an object is imported.

Object Unit Scale

Converts the object to either a desired unit system, no unit system, or to fit on screen.

Center Object

Places the object at the World center (0,0,0).

Fix Normals

Reverses the normals for the object. Use this option if objects appear to import inside out.

Amiga Caligari Import

All of the information present in the Amiga Caligari .SOB file will be converted including hierarchy, color and smoothing.

3D Studio Binary Import

Separate objects within a .3DS file will be loaded as sub-objects of a single parent, lights and cameras are not currently supported. Hierarchy information is not currently maintained. Object colors are taken from 3DS diffuse color. All materials default to auto-facet. Texture mapping coordinates are preserved and texture formats supported will also transfer. When loading 3DS objects that have texture maps, the directory where the 3DS object is stored is now the first one searched for texture maps. If a requested texture cannot be found there, then **trueSpace** will search in any directories specified in the user selected 3DS.SET file. It will prompt you for the location of the 3DS.SET file if it is not found.

3D Studio ASCII Import

Separate objects within a file are loaded as sub-objects of a single parent. There is no hierarchy information in the file, so it cannot be correctly converted. There is no material information in ASCII files beyond simply labeling different polygons with different material group names. Polygons which are supposed to have different materials are recognized and each different material group in the file will be represented as a different shade of gray. Texture mapping coordinates are preserved.

DXF Import

Certain DXF entities and options are not currently supported as follows: lines with no width, extrusion vectors, bulges in polylines, polyarcs, 3dlines, traces, text, shapes, and types.

Extract One Layer

Only a desired layer is imported. The layer name is to be typed into the Layer name field. Objects not associated with any layers are always imported. Subsequently, layers are preserved as separate objects.

Center Object

Places the object at the World center (0,0,0).

Resolve Holes

Properly imports holes associated with some variations of .DXF files. If holes are not imported properly, enable this option.

Close Arcs

Any arc entities in the file will become solid polygons with edges that go around the arc and to its center point.

Fix Normals

Reverses the normals for the object. Use this option if objects appear to import inside out.

Object Scale

Converts the object to either a desired unit system, no unit system, or to fit on screen.

Arc/Circle Segments

Sets the resolution of arcs and circles when they are converted to polygons.

Line/Arc/Point Width

Sets the size of polygons when DXF entities are converted from 2D to 3D.

Imagine Import

As with 3D Studio binary files, each different object within an Imagine file will be loaded as a sub-object of a single parent object. Although there is hierarchy information in the file, it is not currently converted. Colors are converted. All materials are set to auto-facet.

LightWave Import

Surface details and one- and two-point polygons are not converted. All surface information possible including smoothing, glossiness and color are converted.

PostScript Import

trueSpace2 can import .EPS, .PS, and .AI files. This includes both .EPS and .AI files.

Curve resolution

This allows you to control the quality of the conversion from curves to **trueSpace** polygons. Set according to your needs, but Low should be adequate for most anything unless your artwork/text is extremely small (i.e. 12 point text).

Data types to convert

Controls what sort of PostScript entities will be loaded:

* Standard Text is the kind you get when you type in a word processor. This is different from the kind of text that you generally type in a structured drawing program. With this turned off, you can, for example, read in a page containing text and graphics and only have the graphics converted.

* Filled curves are generally solid colored regions like circles and other closed curves.

* Stroked curves are generally outlines and thin, maybe unclosed curves or lines.

Inter-object step

This allows you to "layer" the different curves, characters, text, etc. as they are loaded. Larger values can be used to exaggerate the spacing between shapes and create some interesting special effects.

Inter-page step

This is similar to Inter-object step but is the amount of space that will be put between all of the shapes in one page and all of the shapes in the next page in multi-page PostScript documents. In addition each PostScript page will come in as a separate **trueSpace** object.

Center object

This will cause the PostScript graphics to be centered about the origin of the World.

Video Scape Import

Surface details and one- and two-point polygons will be ignored. All VideoScape material numbers (including 2.0 additions) are correctly converted.

Wavefront Import

Since Wavefront files can have object groups which conflict with trueSpace hierarchies (this is typically the case), grouping information is not preserved. Material names will be run through a name parser with associated color information in an attempt to convert well named materials to actual colors with transparency (e. g., "light blue" will be recognized and result in a color of R173 G216 B230 A100, as will "ltblue" and many other variants).

3D Export Formats

DXF Export

3D Studio ASCII Export

Object Animation

DXF Export

Material numbers for each face will be written as the color number for each DXF face. This will cause all faces of a certain **trueSpace** material to be shown as a different color when re-read. Faces which have more than four sides will be triangulated before writing. Currently, no layer information is written to the file. Some DXF readers may require that all entities be associated with a layer.

3D Studio ASCII Export

All faces will be triangulated when written to the 3D Studio file. This is a requirement of 3D Studio. Sub-objects within a **trueSpace** object will be written as separate objects within the 3DS file. True hierarchies cannot be represented in 3D Studio ASCII files so this at least preserves grouping information. There is no material information in ASCII files except for a material name. This name will be set to the RGBA value of the **trueSpace** material, so reconstructing at least this much information is easy.

Object Animation

trueSpace2 can save a file that contains only the animation information on an object. This is useful primarily for game developers who want to save several animation paths for one object. These .CAN files cannot be read back into **trueSpace2**.

2D Rendering Formats

AVI (.AVI)

Bitmap (.BMP, .DIB)

Flic (.FLC)

JPEG (.JPG)

Targa (.TGA)

AVI (.AVI)

This is an animation file which can be played out of Windows Media Player. Bit depth depends on the type of compression used. Rendering an .AVI file to disk opens a compression settings panel.

Compressor

This list contains all available compressors currently installed. This depends on the version of Microsoft Video for Windows installed.

Compression quality

This option may not be available for all compressors and determines the final quality of the image. A high number means better image quality with less compression.

Key frame every

This option determines how many frames will be saved to file (this does not affect the frame rate of the animation) and how many will be in-betweened. A value of 2 means that the first frame would be saved to disk whole and only the changes to the second frame would be recorded, and so on. This is an effective way to compress simple animations but does not yield good results for animations where there is much camera movement.

Data rate

Allows you to optimize the file for the target hardware device.

Configure

This option allows access to a secondary settings panel for a specific compressor if one exists.

Bitmap (.BMP, .DIB)

This is a standard Windows bitmap file and contains 24 bit color depth information.

Flic (.FLC)

This is an 8 bit animation file that can be played back either in DOS or Windows. Rendering a .FLC file to disk opens a settings panel.

Universal color palette

The animation uses a preset 8 bit palette suitable for most animations.

Create palette on first frame

The animation uses a palette created from the colors from the first frame of the animation. This option does not work well if new colors are introduced during the animation.

Create palette for each frame

Creates a palette for every frame rendered but is not suitable for playing back on an 8 bit display.

Dither frames

Enables dithering to avoid color bands created because of the color limit. This sometimes causes artifacts on animations.

JPEG (.JPG)

This is a compressed 24 bit file. Rendering a JPEG file to disk opens a settings panel for the quality level. A high value means better image quality and less compression.

Targa (.TGA)

This file can be either 24 or 32 bits. A 32 bit file contains an additional 8 bit "alpha" containing transparency information (areas in the scene where the background color is seen). Targa files also have the option of compression. Rendering a .TGA file to disk opens a settings panel.

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