

TIPS AND TRICKS

Tips and tricks for using many of Extreme 3D's features are contained in the following topic sections: Modeling, Animating, Lighting and Materials, Rendering, Performance, and General Tips. Choose the topic you are interested in. Also, be sure to check Macromedia's web page Tech support topic for daily updates to tips and tricks and for illustrated tips and tricks.

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<2> MODELING

<3> MODELING TOOLS

Center Arc Tool

The center arc tool can be used to measure angles between three points. Read the values from the tool space

Line Tool

MEASURE THE distance between any two points by 3D-snapping a line between them and watching its length in the tool field. To find a point midway between two other points, 3D-snap a line between them, then scale this line to 50% in the Object browser.

EXTEND A line along a vector by controlling its length in the Object browser.

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Move Object Center Tool

THE OBJECT'S center point defines an object's center of rotation and scale and the origin of scale for scaling groups of control points on an object. The center point also defines the position of a customized material. (Orientation and scale of the material are defined by the material placement and orientation tools.) Finally, the object's center point also affects how certain deformations operate.

VERTEX EDITING sometimes produces more of a spiny look than is appropriate for your object. If so, try moving the object's center close to a group of polygon vertices, select those vertices and scale them. Then move the object center back to its original position. This will produce a smoother surface. Points nearest the object's center scale least.

AN OPTION to moving the object center is to lock link the object to a construction axis at the desired location. Although the Move Object Center Tool can be used to change center of rotation, this technique is less destructive

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Deformation Tools

ALL DEFORMATIONS are, by default, limited to the extent of the object. You can change this area of influence to greater than or less than the object's extents - by pressing the Alt (Windows) or Option (Macintosh) key and clicking or dragging deformation boundaries on part of an object.

SWEPT OBJECTS are sometimes better created along straight lines and then deformed. Because all deformations need intermediate control points, sweeping the profiles along a straight line and increasing the number of sections before simplifying allows deformations of swept objects to function as expected.

UNIFORM SMOOTHING can be used to change the subdivisions of an object being bent with bend tool. Increase the row or column values in the areas where the object bends the most.

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MULTIPLE OBJECTS can be deformed. To demonstrate multi-object bending, create three rectangles in a horizontal row. (For descriptive purposes we'll call these rectangles Left Arm, Torso, and Right Arm.) Select all of them. Double-click the bend tool to open its preferences dialog box. Set the bend axis to X and click OK. Select the bend tool. Use Option-click (Macintosh) or F3-click (Windows) to set the beginning of the bend. This can be at the left edge of the left arm. Click the end of the bend past the right of the Right Arm.

Drag the mouse and all three objects will bend as one object. All objects in a multiple object deformation use the same axis.

Fillet Tool

You can use the fillet tool on multiple profiles. For example, if you draw a line through the center of a circle/ellipse you can use the fillet tool to fillet the ellipse and the line (click once on line, once on ellipse). The fillet creates an arc with the radius specified in the tool space wherever it intersects both points.

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Intersection Tool

END CAPS must first be separated from end-capped objects before you attempt object intersections with them. After end caps are separated, the object becomes three objects: the main body and two end caps. Perform the intersection on each of these three objects separately. For another suggestion, see the cross section tip below.

CROSS SECTION objects do not have end caps. Therefore, using the cross section tool to create objects such as cylinders or cubes simplifies performing intersection and trim operations on these kinds of objects.

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Skin Tool

Although splines provide definition for the skinned object, depending on the arrangement of control points, the splines do not necessarily fully enclose the final skin. For some kinds of objects this can offer great flexibility in manipulating skinned shapes. Edit control point locations and their spline handles after the skin is created to experiment with different shapes.

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<3> MODELING COMMANDS

Fit Polylines

This command is most useful if you have many points along a polyline and wish to find the most efficient curve which approximates them. It is also useful for making imported 2D DXF files more efficient.

Join Profiles

For detail work, it is useful to zoom in on the profiles to be joined and snap objects to each other before joining them.

Align

The align command aligns objects with the position and/or orientation of its parent. Creating a “dummy parent object” by linking objects to be aligned to a construction point or axis is a quick way to align multiple objects.

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Smooth Polyline

You can smooth the corners of a rectangle by converting the rectangle into polylines. First use the Simplify Geometry command; then choose Smooth Polyline.

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ANIMATING

This topic covers tips and tricks for using specific animation commands and procedures.

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Animating Links

Links cannot be animated. That is, an object cannot change its parent over time. However, you can link to parent A, submit those frames to the render queue, then link to parent B and submit those frames to queue before finally entering render mode, in order to give exactly the same effect.

Watch Links

To change the axis along which an object looks at a target, lock link the object to a construction axis which watches the target, and change object's orientation in the Objects browser.

Align Camera To View

This command is useful for setting up a series of establishing shots and then having the camera animate among them. Edit the resulting path in score by establishing key frames at critical points to control the camera's interpolation.

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Inheriting Tracks From Parent Objects

Child objects can inherit position, orientation, and scale tracks from the parent. For all other tracks, children receive copies of the parent's track when the track is changed and applied downtree. For example, when the "Deform Down Tree" option is used and the parent is deformed, the children get a deformation track as well. Compare this to changes in the parent's and child's position, orientation, and scale tracks, where children do not get tracks when these tracks change for the parent.

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Free-Form Deformation Animation

EVERY DEFORMATION operation creates another track. To animate a single deformation, add key frames to an existing deformation track in the score and editing the deformation value in the text entry field.

DEFORMS DONE at time zero are permanent. This is very important when animating deformations, particularly of linked objects. Anything done at time zero changes the actual shape of the object. One work around, if this is not your desired behavior, is to set the first deformation at a frame other than zero, say 10 and start your render at frame 10. Another work around is to model and animate the deformations with parent objects then duplicate with links to make the child objects. The animation data is copied as well. Yet another work around is to animate one object and then copy and paste tracks, one at a time, into the other objects.

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Dynamic Animation Using ASCII Files

DYNAMIC OR physically accurate animation, such as animated explosions, fountains, or swarms of many objects may be accomplished in Extreme 3D by creating motion data with another animation source and importing it as an ASCII text file. Possible animation generation sources include applications such as Macromedia Director or Swivel 3D that have their own scripting languages, standard programming languages such as C or C++, or polhemus or other motion capture devices. Extreme 3D does not provide a conversion utility for animation data generated from one of these sources. You must convert your animation data into the ASCII text file format specified below before it can be imported into Extreme 3D.

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EXTREME 3D recognizes position and orientation data for objects. Position data must be written as discrete x, y and z values. Orientation data must be written as quaternion rotations. Extreme 3D also recognizes two types of sampling rates— uniform and non-uniform. Uniform sampling evenly distributes the motion data events along the track, assigning each one a key frame in the score. Non-uniform sampling distributes the motion data events along the track at the times you designate, assigning each one a key frame in the score. The sampling rate you choose depends, in part, on the method you use to generate your motion data and, in part, on the animation effect you wish to achieve. When you import Extreme 3D tracks you are actually importing E3D animation information that has been translated into this ASCII format.

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UNIFORM ASCII tracks follow the form:

```
track
objName;trackName
uniform startTime stopTime
%g %g %g...
endTrack
```

TRACK AND endTrack lines define the limits of one track in the ASCII file.

The objName argument is the name of the Extreme 3D object to which this track will be assigned when the ASCII file is imported. The trackName argument should be either position or orientation.

UNIFORM MUST be the first word in the next line. This word must be followed by two numbers that define the starting and ending times for the track.

Each line of data that follows represents one key frame and must have the exact number of values appropriate for that track. For example, position must have 3 values; orientation must have 4 values.

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NON-UNIFORM ASCII tracks follow the form:

```
track
objName;trackName
nonuniform
time %g %g %g...
endTrack
```

THE STRUCTURE of the first two lines and the last line are exactly the same for a non-uniform track as they are for a uniform one. The first word in the third line must be non-uniform. The time for the key frame is specified by the first value on the next line. The remaining values on that line are interpreted as the position or orientation values for that key frame. Each line of data that follows represents one key frame, the time for that key frame always being specified by the first value in the line. As with uniform tracks, each line must have the exact number of values appropriate for that track. Position must have 3 values; orientation must have 4 values.

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BEFORE AN ASCII text file can be imported into Extreme 3D, each object name in the ASCII file must match an object of the same name in the .E3D file. Data whose object names do not match the name of Extreme 3D objects will not be imported. To import ASCII file animation data for a single object, either select the object in the workspace or its position or orientation track in the score. Choose Import from the File menu and then choose Extreme 3D tracks.

To import data for multiple objects, select the objects in workspace. In both cases, when the file is imported, Extreme 3D adds key frames to the selected objects' appropriate tracks that correspond to the motion data in the file.

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Using 3D Script Files

Another source of dynamic animation data that may be imported into in Extreme 3D is Macromind 3D or other applications, like Working Model, that output 3D scripts. These files do not need to be converted into ASCII text files for use in Extreme 3D. As with ASCII text files, however, each object name in the 3D Script file must match an object of the same name in the .E3D file.

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LIGHTING AND MATERIALS

This topic covers tips and tricks for using specific lighting and materials commands and procedures.

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Mondo Maps

You can achieve very subtle or complex shadowing effects, at little extra cost in rendering time, through use of Ambient, Diffuse, and/or Specular maps in the Mondo Map default material. Doing a quick render of the scene looking directly down on a floor produces a guide for painting in the lighter and darker areas.

Fog Depth

To determine this value so that a particular object is at the 50% point, go into an appropriate view where you can see both camera and object, and either estimate by looking at the camera's "distance" line, or 3D-snap an actual line between camera and object, noting its length in the tool field.

Ambient Color

Each object's reaction to this color can be animated quickly by copying and pasting tracks in the score.

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Set Background

The background you choose from Set Background is rendered into the background at final render. Customizing bit maps by tracing them may give you a better quality background pictures for some animated projects. To take advantage of zooming while tracing, use Macromedia FreeHand to trace curves .

Opacity

If an object is at zero opacity, you can speed rendering by making it invisible in Object browser.

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Chrome + Glass

TO VARY the intensity of a reflection, offset the object a small amount to create an "envelope" Make the outer object reflective and partly transparent, and assign the inner object a surface color. Reflections require curved surfaces to

be sensible. Flat surfaces don;t look as realistic, because this material uses the surface normal to reference the map -- if normal does not change, then neither does the reflection.

THE PART of a reflection map shown at a point on a surface depends on camera orientation to world and the surface normal. Use material orientation tool to adjust where the reflection occurs. On flying logo text, for example, rotating the object will not affect the position of the environment map in the reflection.

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Organic Magic

THE TWO colors need not differ...sometimes just variance in the reflective properties is enough. You can achieve a nice effect from changes in roughness parameters. Changes in opacity, with smooth complex blending, produces clouds. Edge blending makes a snaky pattern at proportions of 50%. The first color is used in the blending area between the two patterns while the second color fills the body of both patterns.

Plastic

SET SPECULAR and Roughness colors to the surface color, to get good metals.

SET DIFFUSE value to zero and the ambient value to one, to create flat, cartoon-style surfaces. Turn Specular and Roughness colors to black and make global ambient color lighter.

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Tiles

OVERLAY a grid upon an object, even an object which changes shape. by duplicating the object and scaling it up by 1% or offsetting it, and applying a grid with one purely transparent element. Changing shapes are particularly effective with a grid that is surface-mapped.

WIRESH MESH MATERIAL can be created with the Tiles Material by using a grid pattern at a small scale and making one color transparent. Because the edges of patterns are anti-aliased, they can be used as a high quality wireframe.

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Negative Lights

Dark lights or negative lights are useful for subtle shadows, penumbras, the gentle darkness in the corner of a room. Fuzziness of a spotlight cone determines penumbra. Spotlights with falloff can create a gentle darkness in the corners of a room. A dark light with a white or gray color to the light is most predictable, but a dark light of the same hue as the regular light results in Maxfield Parrish-like lights of complimentary color. All lights can have negative values.

Lights And View Or Camera Perspective

Omni lights and spotlights do not render as expected in orthographic perspective. Use any other perspective before doing a final render or final render to screen.

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Alpha Channel Maps For Lights

Spotlights and omni lights do not produce alpha channels because they are 3D light effects, not 2D surfaces. However, you can create alpha channel maps for lights by rendering stills using the lights for which you want alpha channel maps. Creating alpha channel masking maps based on the luminance of the lights in Photoshop or another image processing program and composite these images with the rendered stills of the image minus the lights.

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RENDERING

This topic covers tips and tricks for using specific rendering commands and procedures.

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Rendering Animations

For predictable final rendering of an animation, it is best to always render from a window displaying the view through the camera.

Motion Blur

Motion blur can be simulated in post-processing by rendering your scenes in layers, and then compositing these layers, offset a frame each in time. Blur the with the rearward ones in compositing (optionally in direction of motion) and optionally faded to give a simulation of camera-based motion blur. You can do this in Adobe Premiere or another digital compositor/video editor. By rendering at sub sampled times (rendering at 60 or 120 fps) and compositing four frames into one (at 25% contribution for each) 'blur' will be lengthened for fast moving objects and in the appropriate direction (per object).

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Smoothness Settings

Final smoothness for both Adaptive and Uniform Smoothing is related to scale of object -- if something has been dramatically resized you may wish to tweak its smoothness before rendering.

Output To Video

Temporally over sampling when you render works well for outputting to video. For example, output at 60 frames per second. Then interlace these frames as fields at 30 frames per second in Premiere or another compositing/editing tool.

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PERFORMANCE

This topic contains tips for optimizing Extreme 3D's performance.

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Creating A Library

Cutting and pasting objects to temporary files is an excellent way to reduce display time, experiment with a copy of a model in a new file, build a complex scene, or create a library of objects, views or camera views which you can copy into other scenes. To create a library, open a new Extreme 3D scene and name it "library." Then when you create objects, views or camera views that you might want to use again, copy them into the library. When you want to use the item in another scene, copy it from the library. To avoid time-consuming screen redraws, keep the library scene small and copy and paste items between browsers. Also, see the topic Grouping Techniques under GENERAL TIPS.

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GENERAL TIPS

This topic contains tips about Extreme 3D Preferences, file organization and other issues of general interest.

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Directory Structure

The E3D directory contains: Scripts, Help, Presets and, by default, any scene files you create.

SCRIPTS CONTAINS the default.E3D file, the preferences file, a file called material and a file called Extension. The folder/directory called Material inside Scripts contains lights that are cataloged (.LIT files), materials that are cataloged (MAT files), and texture maps (TEX files)

HELP CONTAINS help

PRESETS CONTAIN Folders/directories that contain over 200 preset materials

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Grouping Techniques

Grouping is supported in E3D through layers (see Using Extreme 3D), hierarchies, naming and materials.

-- Naming. Name objects that you want to select as group with a consistent leading name or group of letters, Chair or AA for example. Use Find with Add to Selection to select that group of objects.

-- Hierarchies. Linked objects can be shown, hidden and manipulated as a group for a number of procedures. Operations which go down tree include applying materials with the bucket tool. scaling and offsetting animation tracks, and deforming objects with the deformation tools.

-- Materials. When pasting an object from one scene to another, add a material of default plastic type with the object's material name. Then you can transfer the

material from the previous scene and assign it to the pasted objects in the new scene by using Select applied.

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Finding Things

A quick way to find an object in the World Browser list is to type the first letter of the object's name while the list is highlighted.

Using DXF Files

DXF FILES treat holes in objects differently than Extreme 3D. If you are exporting a model with holes to DXF, you may wish to create it with a slight seam connecting the inside of the hole to the outside.

DXF HAS difficulties with holes; create the object so that the surface is not actually punctured.

USE SIMPLIFY and edit the object's control points to optimize the size of file.

Number Of Polygons In A Scene

To find out how many polygons will be rendered in a scene, deselect all objects and update both the interactive and final smoothness settings to have the same value. Then check the polygon count that appears on the About Box.

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Measuring Spaces And Objects

You can make rulers using Construction Grids for visual measurement.

The placement tool can snap a grid flush to a surface. Opening the geometry of a grid and pulling control points will size it to fit any object.

Preferences

-- Cap Ends

You may want to leave this preference on as you can change your mind later and remove any inadvertent end caps using Separate End caps.

-- Nudge Position

When you are doing repeated duplication operations, setting this to a value of one unit lets you quickly realign a duplicate with the original.

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Importing 3D Scripts And Extreme 3D Tracks

See Dynamic Animation under ANIMATION TIPS.

Importing MacroModel Models

After importing MacroModel models, choose Select All from the Edit menu and then choose Render Style from the Object menu to change the rendering style of all objects from smooth to shader. This fixes the interactive rendering bug that manifests itself when displaying MacroModel models that are saved with the Gouraud shading mode.

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