

Callisto™ 3D

Version 1.0

Documentation



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Documentation for Callisto™ 1.0

April 1998

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What is Callisto™?

Callisto™ is a shareware plug-in for Adobe Photoshop® that allows Photoshop® users to create terrains and spheroidal objects (“planets”), and also import and render 3DMF models (3D models conforming to Apple’s Quickdraw™ 3D standard). You can model 3D objects in Callisto™ and output them either as 2D renderings or as 3DMF files. (Most commercial 3D packages can import 3DMF geometries.)

The 3DMF-import capabilities afforded by Callisto™ are similar to those of the commercial products Vertigo 3D Dizzy (by Vertigo Technology, Inc.) and QuickSpace (by Plastic Thought). Using Callisto™, you can quickly import any 3DMF model, manipulate it on the screen (swivel it on any axis, enlarge or reduce it, etc.), and make adjustments to lighting and background before rendering it out as a PICT file. Hitting the plug-in’s OK button causes the rendered image to open in a new Photoshop® window automatically.

The terrain-making capabilities of Callisto™ allow you to convert any 2D image to a “height map” or 3D terrain with full Phong shading and control over height. The terrains you create can be swiveled, moved, enlarged/reduced, etc., just like any 3D model. Once you have set the positioning and lighting of your terrain just the way you want it, you can hit the plug-in’s OK button and have the final rendered terrain appear in a new Photoshop® window automatically.

The most advanced feature of Callisto™ is its planetizing feature, which allows you to create complex, organic objects easily, based on 2D input. In essence, you can **wrap terrains onto a sphere**, while deforming the spheroidal geometry in a controllable fashion. The end result can be anything from a planet or asteroid to a piece of fruit or highly complex, organic shape.

What’s more, Callisto™ allows you to **apply texture maps to terrains and spheroids** to create objects with stunningly realistic detail. Any 2D PICT image can be applied to any Callisto™-generated terrain or planet, just like applying a decal to a plastic model.

And, you can save your 3D models as 3DMF files. (The 3DMF or 3D Metafile format is Apple’s cross-platform file format for storing 3D geometries.) That means you can create a “planet” or terrain in Callisto™, then open it in your favorite 3D program and use it like you would any other 3D object.

Callisto™ takes advantage of Apple’s Quickdraw™ 3D technology to make 3D visualization easy,

quick, and natural. Models can be drawn against any color background (with color changes made on the fly), manipulated in 3D space in real time, and lighted using any color of light, controlled by a realistic dimmer. Also, models can be drawn in any of three styles (fully shaded, wireframe, or dots), with or without backface removal. Changes to lighting and rendering style occur on the fly. Final renderings appear in a new Photoshop® window automatically.

Because Callisto™ operates as a plug-in, it's quick and easy to import 2D artwork (of any format that Photoshop® can open) as a starting point for terrains or spheroidal objects. Likewise, you can save rendered 2D output in any file format that Photoshop® can output. It's not necessary to switch programs in order to create 3D artwork: You can do everything in Photoshop®.

Is It Free? Is It Crippled?

Callisto™ is **\$20 shareware**. Non-commercial users may use and distribute copies of Callisto™ without charge, but you will see a splash screen on each startup and will only be able to render at a final output resolution of 320x240. (This is more than adequate for many purposes, of course.) **To get rid of the splash screen and enable rendering at higher output sizes, you must register by sending \$20 to:**

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Online, contact:
< Callisto3D@aol.com >

NOTE: Commercial users must pay the registration fee. That means if you use Callisto™ in a work environment (graphic arts studio, ad agency, effects house, service bureau, publishing house, etc.), **registration is mandatory.**

The plug-in is not crippled in any way. All of the Save features work, and all of the functionality of the registered version is present in the shareware version you have, except for final 2D output resolution, which is limited to 320x240 pixels for the unregistered shareware version. If you can live with 320x240 resolution, don't mind seeing the splash screen, and don't ever want support, you are welcome to use the plug-in **free of charge, indefinitely.**

If you do register, please feel free to submit questions, suggestions, etc. to the author at Callisto3D@aol.com.

Note: When registering, please supply your e-mail address (which will not be used for solicitations or any purpose not pertaining to Callisto™ support). Failing that, be sure to include a reliable postal address so that we can inform you of enhancements, bug fixes, etc.

*** **Please support 3D shareware.** Shareware of this type takes an incredible amount of time and effort to produce. The registration fee for Callisto™ is exceptionally modest considering the plug-in's features (and how much fun it is to use!), and also considering the cost of commercial 3D-ware. If there is a good

enough response to Callisto™, I'll be motivated to continue developing 3D plugs-ins and apps for the Mac. The Mac needs all the good software it can get (now more than ever), so if you can see your way clear to pay the registration fee, please do so. ***

Can I Distribute It?

The plug-in and all bundled files are Copyright 1998 by Kas Thomas and all rights are reserved. However, you are encouraged to distribute Callisto™ and its accompanying files via any means at your disposal, including CD-ROM, diskette, ftp/website, etc., so long as you keep the complete suite intact.

System Requirements

Callisto™ is PowerPC-native software. It runs as a plug-in **under Adobe Photoshop® 3.0 or higher** on any **Power Macintosh** using System 7 or 8.

In addition to Photoshop® and a Power Macintosh, you must also have **Quickdraw™ 3D** (version **1.5.3** or higher) installed on your computer. Quickdraw™ 3D is available free of charge from Apple Computer (see their web site).

Callisto™ requires 32-bit color to run. If your monitor is set for 8-bit color (256 colors) or 16-bit color ("thousands of colors"), the plug-in will not run. An alert box will come up reminding you to reset your monitor to 32-bit color mode.

In summary, you need:

1. A PowerPC Mac running System 7 or higher.
2. Adobe Photoshop® 3.0 or higher.
3. Quickdraw™ 3D 1.5.3 or higher.
4. Monitor set to 32-bit color mode.

No special hardware boards are required, although you can expect to see significant performance (speed) gains if you install a 3D accelerator such as one of the Xclaim boards from ATI.

RAM Requirements

The plug-in itself has no special RAM requirements, but Quickdraw™ 3D does require a certain amount of system memory. If your Mac has less than 32 megabytes of total RAM, it's unlikely you will have enough memory to accommodate Photoshop®, Quickdraw™ 3D, and System software simultaneously, unless Virtual Memory is enabled (in which case you may experience slow operation).

There is no need to adjust Photoshop's memory partition. Quickdraw™ 3D uses System memory for most operations. The only time you may need to increase Photoshop's partition size is if you are outputting large images. The plug-in (as explained above and below) has a default image output size of 320 by

240 pixels. This requires 300K of memory in order for the plug-in to render the image offscreen in 32-bit color before handing it off to Photoshop®. In the registered version of Callisto™, images can be output at 320x240, 640x480, 1280x960, or 2560x1920 pixels. The respective RAM requirements are as follows:

320x240	300K
640x480	1.2 MB
1280x960	4.8 MB
2560x1920	19.2 MB

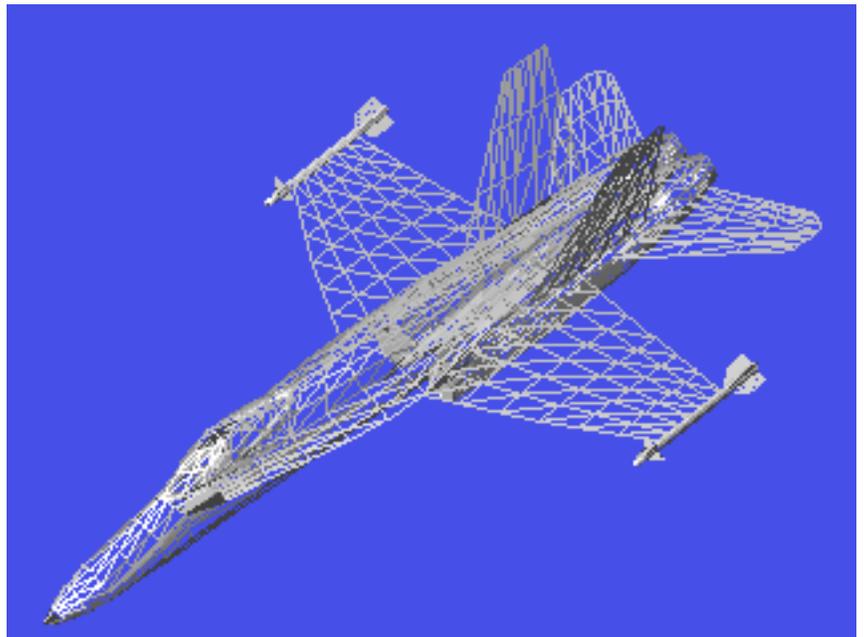
As you can see, the amount of memory required to render images at the larger sizes increases quite dramatically. You must have this much additional unused memory, either in Photoshop's partition or in unused machine memory (so-called Temporary Memory; memory not being used by loaded programs), in order to render large images. The plug-in will look for memory in Photoshop's partition first, then unused machine memory. Thus, to render an image at full 2560x1920 resolution, you must either increase Photoshop's memory allowance by 19.2 megabytes (over and above the recommended minimum set by Adobe), or you must have 19.2 MB of free memory remaining in your system after all other running programs are accounted for. (You do NOT have to increase Photoshop's memory partition if your system has an extra 19.2 MB of unused memory available at the time you wish to render a 2560x1920 image.) In any event, if the plug-in requires more memory than is available, it will put up an alert box telling you so.

The output-resolution RAM requirement only applies if you are using a registered copy of Callisto™. Unregistered shareware copies render at 320x240 pixels **only**. To render at this size requires only 300K of free memory, either in Photoshop's partition or in unused system memory. Most users should not find this to be a problem.

Installation

Installation is easy. Drag Callisto™ to the folder where you normally keep Photoshop® plug-in filters, then launch Photoshop® (or relaunch it if it was already running). The Callisto® plug-in will show up on the "Other" submenu under the Filter menu.

Note: Although Callisto™ imports 3DMF files, Callisto™ is a **Filter** plug-in, not an Import plug-in.



Above: By using a dark background color and choosing Wireframe rendering mode, you can achieve a "bleuprint" look.

Basic Operation

Note that like most plug-in filters, Callisto™ can be used only when there is an image window open in Photoshop®. (Otherwise, the filter menu is disabled and you can't get to it.) So begin by opening an image window, even if it's just a blank window. You can open (or create) any kind of image, except a bitmap-mode (1-bit black and white) image or an indexed-color image.

Note that your monitor **must** be in “millions of colors” mode (i.e., 32-bit color), not 256 colors (game) mode, nor 16-bit (“thousands of colors”) mode. Nevertheless, the image you open does not have to be an RGB image: It can be a Grayscale image.

Go to the Filters menu and find Callisto™ on the “Other” submenu. When you select it, the Callisto™ dialog window will open. (First you will see a splash screen or logo screen, which has a 5-second count-down timer associated with it. After the timer count runs out, you can dismiss this screen with a mouse click. *Note that you can get rid of this screen entirely by registering your copy of Callisto™.*) The preview screen, a 320x240 pixel area within the main dialog window, will be blank (white) when the Callisto™ dialog first appears.

When Callisto™ is running, you can open a 3DMF model by hitting the Open 3DMF... button. (You can also do this by selecting “Open 3DMF” in the File menu. Note that the menu bar is active when Callisto™ is running.) This will bring up a Standard File navigation dialog in which the only items visible will be folders, and files of type ‘3DMF’ (Apple 3D Metafile). If you do not have any 3DMF files on your disk, you will not see any file choices show up. Tip: You can obtain 3DMF files from various web sites (see Apple's Quickdraw™ 3D site or do a search using your favorite web search engine); see www.viewpoint.com, for example.

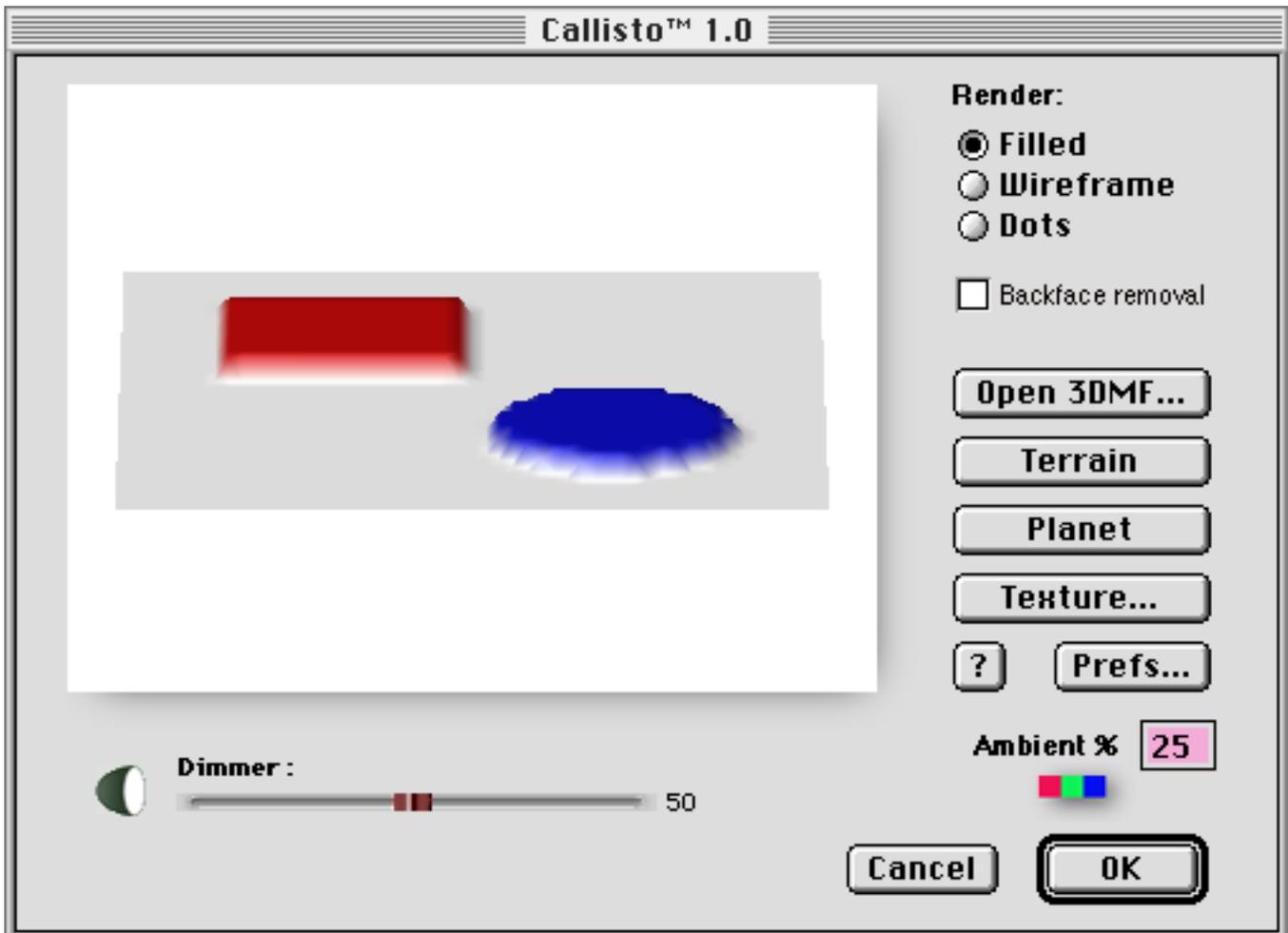
If you select a 3DMF file and hit Return, that file will open as a 3D model in Callisto's preview screen.

Once the model is visible, you can swivel it by dragging with the mouse. You can rotate the model on various axes by holding either the Shift or Control keys down while dragging the mouse on the object. Shift constrains rotation to either X or Y axes (depending on which way the mouse was moving); Control constrains rotation to the Z axis, which can be visualized as coming straight out of the computer screen, towards you.

To make the model look bigger, hit the plus (+) key. To make it appear smaller, hit the minus (-) key. Hit the keys repeatedly if necessary.

To reposition the object in the window, hold down the x, y, or z key on your keyboard and drag the object with the mouse. Holding the ‘x’ key will constrain movement to the x-axis (side to side), holding ‘y’ will constrain movement to up and down (y-axis), etc.

A summary of basic commands and actions can be seen by clicking on the ‘?’ button to the right of the preview screen.



Callisto™ main dialog. White area (320x240) is the preview screen.

Terrain Creation

To create a terrain, first draw something in a Photoshop® window (or open a Grayscale or RGB image). Then activate Callisto™ and hit the Terrain button. After a few seconds, the preview screen will contain a representation of your source image, but in 3D. Callisto™ uses the color intensity of the pixels in the 2D source image to decide how high to make the peaks on the 3D terrain. The darker the color, the higher the terrain.

Once a terrain is visible in the preview screen, you can twirl it, move it, and manipulate it in all the same ways that you can manipulate a 3DMF model. You can also adjust the lighting, etc. (See below.)

Note: You can “grow” the terrain interactively, in real time, by holding the Command (Apple) key down and dragging the mouse up or down. Drag the mouse *up* to “grow” terrain features vertically; drag the mouse *down* to flatten the terrain.

To do a “terrain swivel,” *hold the Option key down while dragging with the mouse or while pressing left or right arrow keys*. The Option key constrains movement to the terrain’s up-and-down axis (not the world y-axis, but the terrain’s own y-axis). It’s easier to see this than to explain it, so try it yourself.

Note that you can click on the various Rendering radio buttons to switch from shaded view to wireframe or dots, in real time.



Source image (created in Photoshop).



Source image (left) made into “planet”.

Planet Creation

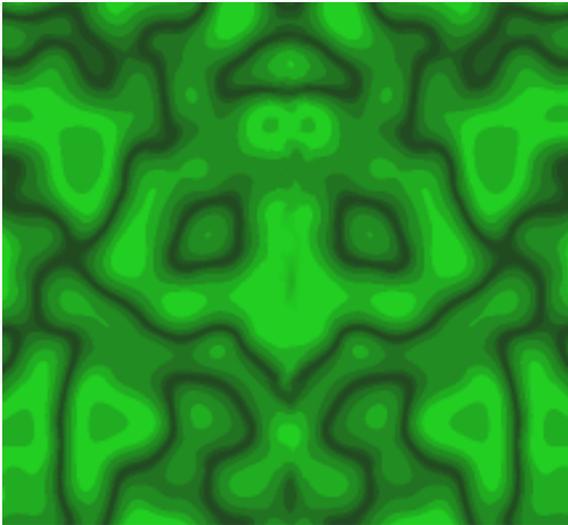
The most advanced feature of Callisto™ (a feature not found in any other 3D plug-in, as far as we know) is its ability to create height-mapped **planetary objects** based on 2D input. This works much the same as terrain generation (see above), except your terrain is height-mapped onto a sphere. The resulting geometry can be exquisitely complex, resembling anything from a meteor or asteroid to a rock, hand grenade, prickly pear, or piece of popcorn (to mention just a few).

Start by opening an RGB image in Photoshop. (Or create a new blank window. But be sure your monitor is set to 32-bit color mode.) The input image can be anything you want: a scanned photo, hand-drawn art, noise, patterns, gradients, etc. Open the Callisto™ dialog window, and hit the “Planet” button. Within seconds, your 2D image will be converted to a complex, height-mapped 3D spheroidal object.

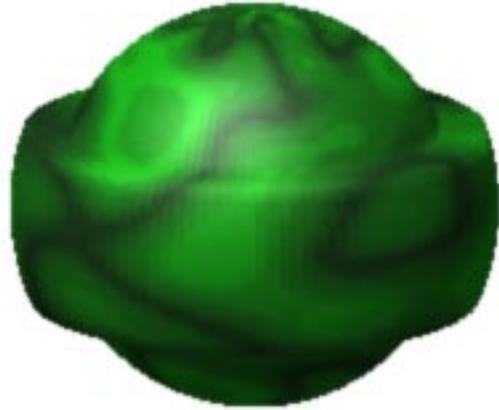
Your planetary object can be swiveled, moved, resized, etc., just like any 3D object in Callisto™. It can also be texture-mapped (see below).

Note that Option-dragging does a “rotate-about-the-north-and-south-pole” on your object.

As always, the Shift key constrains rotation to either X or Y axes (depending on which way the mouse was moving). The Control key constrains movement to the roll axis (Z axis).



A PICT image created in Photoshop.



The PICT image applied as a texture to the object on the preceding page.

Texturing

One of the more sophisticated (and useful) features of Callisto™, something typically found only in commercial 3D packages, is full texture-mapping based on the use of PICT files. **Any PICT file created by Photoshop® (or by any other program) can be overlaid onto any terrain or planetary object created by Callisto™.** This means you can give any texture you want (wood, marble, rainbow patterns, turbulent organic patterns, etc.) to your 3D terrains and planets. In no time, you can achieve spectacular effects normally possible only in 3D packages costing hundreds of dollars.

Saving Your Work

Callisto™ will let you save your work in two ways. You can save your work as 2D art, or as a 3D object file. (These features are NOT disabled in the unregistered shareware version of Callisto™. You don't have to pay to save your work!)

Saving 2D art is easy: When you have a terrain or 3D model positioned and illuminated just the way you want it, click on the plug-in's **OK** button. Callisto™ will then render the object at final output resolution, save it to disk as a PICT file, and have it appear in a new window in Photoshop®. You can then edit the image (or not) and tell Photoshop® to save it in any format using Photoshop's own Save As command.

If you want to save your 3D object, go to the File menu (on the menu bar at the top of the screen) and choose "Save 3DMF." A "Save As" dialog will appear, to let you choose a name and destination folder for your file. The saved file will be in Apple's 3DMF format, which is a format that saves 3D geometry. When you go to open your 3DMF model again, it will appear just as you saw it before in the preview window. (Many commercial 3D programs can import 3DMF files, which means that any objects you create in Callisto™ can be transferred to other 3D programs.)

Note that when you save an object as a 3DMF file, not only does Callisto™ save the bare 3D object, but it also saves any textures that you have applied to the object. In other words, the “colored” object is saved, colors and all.

Copying to the Clipboard

Callisto™ will copy your preview screen contents to the Clipboard if you type Command-C (for Copy) while a model or terrain is in view in the preview screen. The copied version will be 320x240 pixels in size and can be pasted into any Photoshop® window or into the Scrapbook or into any application that supports cut-and-paste of PICT images. (If you experience difficulty with this command, be sure the cursor is inside the 320x240 preview screen before typing Command-C.)

If You’re New to 3D

Navigating a 3D world or setting up a 3D scene can be tricky if you’re not familiar with the basic concepts of 3D computer graphics. If you already know how to use a 3D program like Infini-D or Lightwave 3D, then you already know the basics. If not, you should consult one of the many excellent introductory books on 3D computer graphics. A particularly good book for Mac users is The Mac 3D Handbook by Craig Lyn. Another good one is Animation & 3D Modeling on the Mac by the Foleys.

The 3D space used by Callisto™ is one in which the x-axis goes horizontally across the screen, the y-axis goes up and down, and the z-axis runs along a line perpendicular to the computer screen. It’s important to remember that not only the object (3D model), but also the lights and virtual camera (or viewpoint of the viewer), have definite 3D locations in 3D coordinate space. It is possible, in other words, to make an object look bigger either by moving it closer to the camera, or moving the *camera* closer to the *object* (or by scaling the object up or down in size). With Callisto™, you have the option of moving the object or moving the camera. It matters which one you choose, because the light source doesn’t move with the object. If you move the camera closer to the object, the object’s shadowing doesn’t change. But if you reposition the object in space, the shadows will move because the object’s position relative to the light source has changed.

With Callisto™, you have full 3D control over the position of your lighting. A special dialog box (see below) enables you to enter 3D coordinates for your light source. It’s a good idea to play with this feature (entering positive AND negative values in the dialog) until you are comfortable with the idea of working in 3D space. Note: Objects created by Callisto™ always start out at the “origin” (i.e., coordinates of 0,0,0).

Command Summary

Note: Mouse-drag operations should commence somewhere inside the preview screen (i.e., click the mouse in the image itself, not in the outer portions of the dialog or outside the window). **The cursor**

will change to a hand when it is within the drag-action area of the preview screen. It will change to a fist when you click the mouse button within the image, successfully initiating an action.

To **rotate** (swivel) an object: drag the mouse. The object will “free swivel” unless you constrain motion by holding the Shift key down. Dragging with the Control key down constrains rotation to the z-axis.

Tip: You can also constrain motion to one axis by using the Arrow keys. The arrow keys rotate the object in **15-degree increments**. Six hits on an arrow key will rotate an object exactly 90 degrees.

To do a **terrain rotation** (rotate an object on its native y-axis, in object space rather than world space), *hold the Option key down* while dragging or using left/right arrow keys.

To **reposition** (translate) an **object**: Drag it with the mouse, but first hold down the x, y, or z key on the keyboard, depending on whether you want to constrain movement to the x, y, or z axis.

To **reposition** (translate) the **camera**: Drag the mouse while holding the Option key down, but also hold down the x, y, or z key on the keyboard, depending on whether you want to constrain movement to the x, y, or z axis.

Tip: It’s usually faster to reposition the camera than to reposition the object. If the object isn’t moving fast enough, use the Option key.

To **stretch** a terrain vertically (make mountains higher), hold the Command key down while dragging the mouse up or down in the image. (Doing this on a “planet” will stretch the planet on its polar axis.)

Command-period exits the dialog.

Return or **Enter** exits the dialog and opens a new Photoshop® window containing the rendered object in RGB format at the chosen output size (default: 320 x 240 pixels). Note: A PICT file is written to disk as part of this operation. If you do not want to write anything to disk, do a Copy operation with Command-C. (Be sure the mouse is in the preview screen area when typing Command-C.)

Lighting

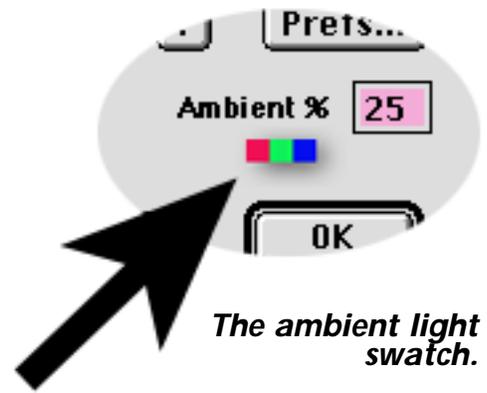


There are two intensity controls for lighting. The percentage of **ambient lighting** is controlled by typing a number (from 1 to 100) in the text-edit box in the main dialog window. The default is 25%, which is appropriate for most situations. **Directional lighting** is controlled by the dimmer slider near the bottom of the dialog window. The default intensity here is 50%. Experiment with this slider to achieve the lighting you want.

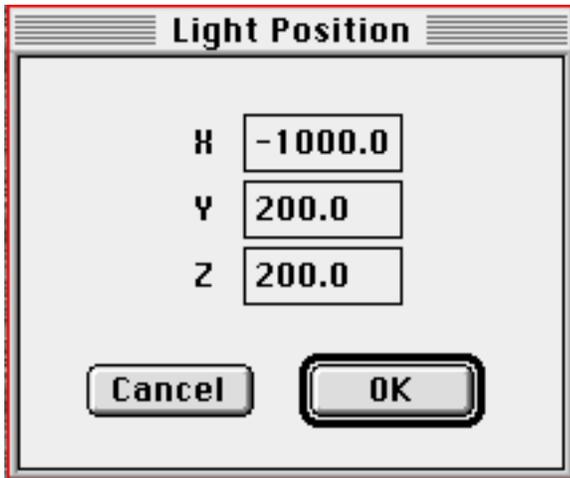
To change the **color** of the ambient light, click on the RGB (red-green-blue) swatch underneath the Ambient control in the main window. A color picker dialog will appear. Use the slider in the picker window as well as mouse hits within the color wheel to choose a new color. The default is white light. **To see color choices, you must move the saturation slider (in the lower portion of the window) to**

the left, then click inside the color wheel.

Ambient light comes from all directions and affects all portions of an image equally without creating shadows. This makes it useful for applying color tints to uncolored objects. Set the ambient light color to red to make an object look reddish, green to make it greenish, etc. Note that because ambient light comes from all directions, it has no x-y-z location in space. It is “everywhere.”



Directional lighting is supplied by a so-called “point light” (think of a bare light bulb) whose location in space is finite and whose



intensity is governed by the dimmer slider in the main dialog window. **The exact location of this light in 3D space can be changed to any x,y,z coordinates of your choosing, just by clicking on the “lamp icon” to the left of the dimmer.** When you click on the lamp icon, a small dialog window will appear, with three text-edit boxes for typing x,y, and z coordinates for the light. The default position of the light is 0, 2000, 2000. Note that you can enter positive or negative numbers in any of the boxes, and the numbers can be decimal or whole numbers. Typing a positive number in the ‘x’ box moves the light to the right of center. A negative number in the ‘x’ box moves the light left of center. A positive number for

‘y’ moves the light higher in 3D space; a negative ‘y’ number moves the light lower (below the object). A positive ‘z’ value moves the light away from the origin (“into” the computer screen); a negative ‘z’ value moves the light toward you.

Note: All objects normally appear centered at 0,0,0 (the origin of 3D space) when initially created.

No matter where in space you move the light source, it always shines light at your 3D object. (It behaves like a bare light bulb.) But the location is important, because moving the light source to a different point in space will affect how the shadows fall on your object. (Experiment with this and you’ll see what we mean.)

Notice that changes in light position occur in real time, as soon as you enter a new coordinate in one of the text-edit boxes. (Some delay can occur here if the object contains a large number of polygons.)



Render Modes

Three render modes are supported: Filled, Wireframe, and Dots. Changes occur in real time, so feel free

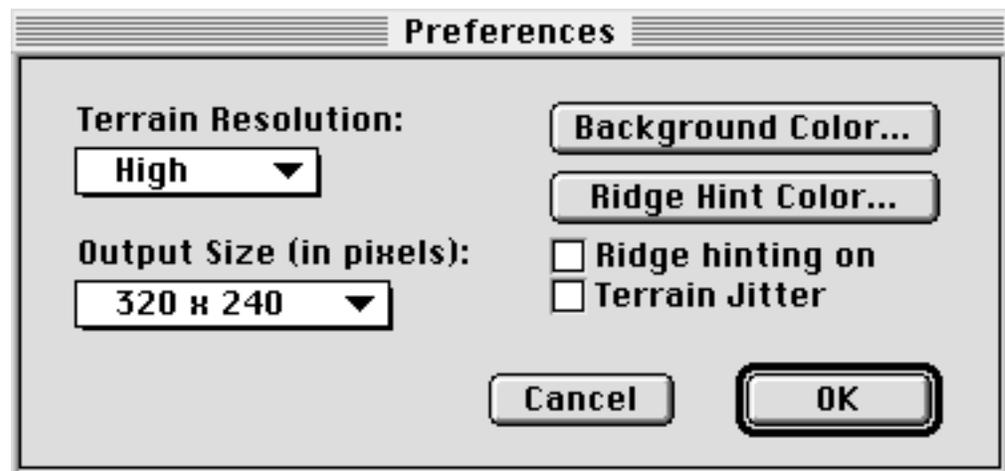
to experiment with the radio buttons. It is particularly interesting to select a dark-colored background (see “Background Color” under Preferences, below), then choose Wireframe mode and turn the lighting dimmer up high. This is a good way to achieve a “blueprint” look.

When Filled is selected, a model’s surfaces are rendered in solid colors using Phong interpolation. (See any good 3D graphics text for an explanation of Phong rendering.) The interpolated nature of the surface coloration is especially apparent when rendering terrains. Some 3DMF models (such as the ubiquitous Teapot) render smoothly as well. Most 3DMF models do not render in a smooth fashion but instead show faceting. The reasons for this are somewhat technical. Callisto™ calculates so-called vertex normals for all terrains that it makes (hence all terrains render smoothly), but does not calculate vertex normals for 3DMF models. Some 3DMF optimizer programs can fix this by adding vertex normals to models. Callisto™ 1.0 does not do this, although future versions may.

If you want to see your terrain render in faceted (flat-shaded, non-interpolated) form, hold the Shift key down when clicking on the Terrain button. Your terrain will come out flat-sided (i.e., no vertex normals). The default, if you don’t hold the Shift key down, is smooth Phong-shaded terrains.

Backfacing

The Backface Removal checkbox allows you to turn backface removal on or off. Usually, turning it on will cause faster renders. (Tip: If you want to see what this option does, open a complex 3DMF model or terrain and view it in Wireframe mode, then toggle the backfacing checkbox. Wires on the far side of the model will disappear as the box is enabled.)



Preferences

The **Prefs...** button will bring up a dialog box containing two drop-down menus (for terrain grid quality and image output size), two buttons (for background color and hinting color), and two checkboxes (for ridge hinting and terrain jittering).

Terrain Resolution

There are four options in the terrain resolution drop-down menu: Low, Medium, High, and Highest.

Here's what it means. When you create a terrain, you're telling Callisto™ to create a wire grid the size of your input image. If you select "Highest" resolution, Callisto™ actually creates one vertex on the grid for every input pixel. This can make for some pretty huge grids, if your input image is at all large. Most of the time, 1:1 sampling is overkill. It's usually adequate (and a lot faster!) to subsample the input image when creating a terrain grid or "planet" (spherized) grid.

The default ("Low") option generates a terrain grid containing one-sixteenth as many vertices as when "Highest" is selected. "Medium" makes a grid with one-ninth as many vertices as "Highest." Finally, "High" makes a grid with a fourth as many vertices as "Highest."

As a rule, you'll find it a good idea to do your rough work in "Low" resolution (the default), then recreate the object in higher resolution when you're sure you've got what you want.

Note that **after each change to the terrain resolution setting, you must regenerate the terrain** (by hitting the Terrain button). This does not zero out any of your previous settings for lighting, background color, or hinting. All it does is generate an updated mesh at the higher resolution.

Image Size

The second drop-down menu in the Prefs dialog controls the size of the image that Callisto™ will create when you exit back to Photoshop® by hitting the main dialog's OK button. The default is 320 x 240 pixels. This is the only size supported by the unregistered shareware program. *To get higher-resolution settings to work, you must register your copy of Callisto™ as described further above.* (Please register. It only costs \$20.)

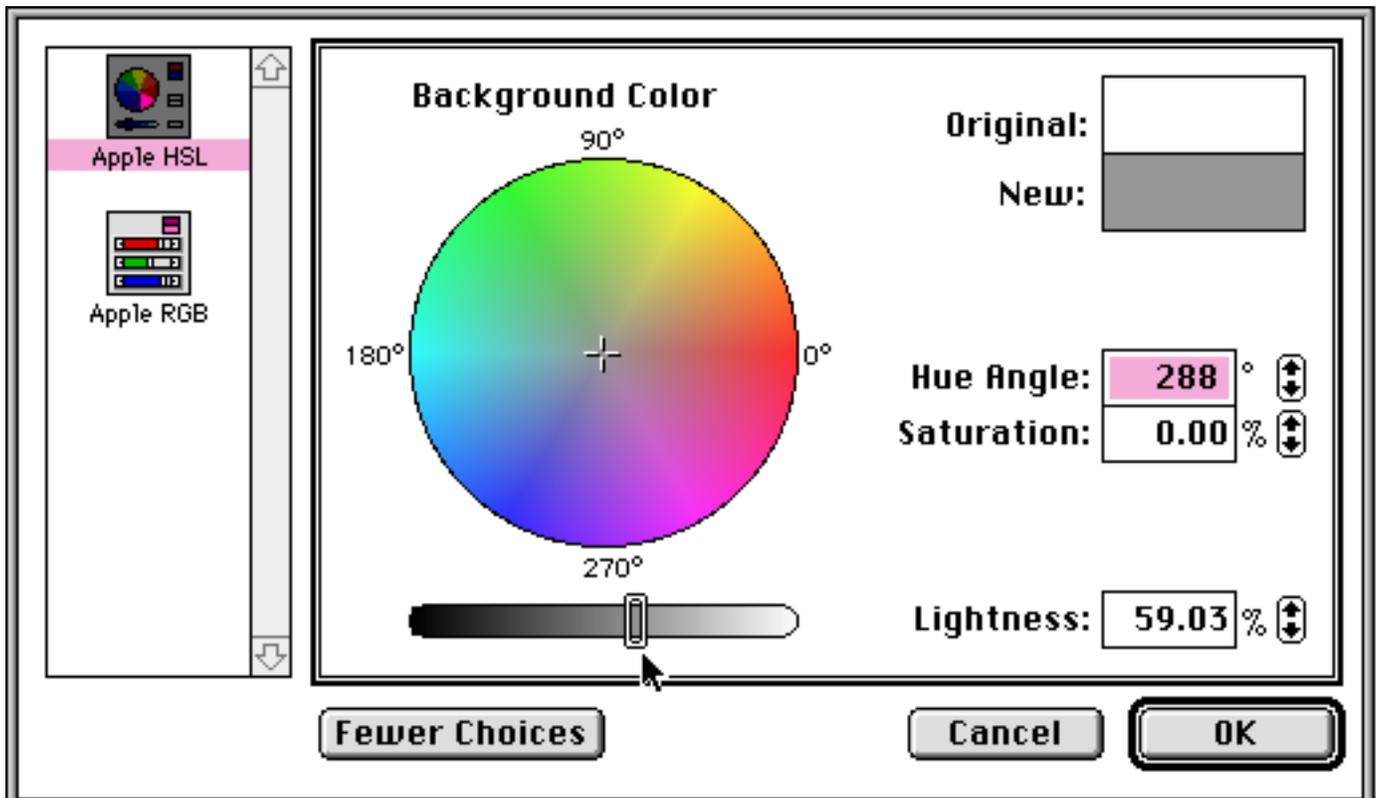
What if you want to output at a size not shown in the menu? Choose the next-higher size, then (when you've exited the plug-in and your image has opened in Photoshop®) use the Image Size menu command in Photoshop® to down-adjust the resolution to exactly what you need. Photoshop® will antialias the image as you downsize it.

Background Color

You can make changes to the background color of your renderings on the fly. Hit the Background Color button to bring up a color picker dialog. Note that the default color is white. **To get colors to show up in the color wheel, move the saturation slider (near bottom of dialog) to the left.** Then click on your favorite color in the wheel itself. The color will show up as the background color in your preview image automatically, as soon as you exit the color picker dialog. This feature works for both terrains and 3DMF models.

Ridge Hint Color

An experimental feature of Callisto™ 1.0 is ridge hinting, which is not to be confused with elevation cueing. Ridge hinting (which is in effect only when the Hinting On checkbox is enabled; the default is Off) selectively applies a color of your choosing to the most highly convex and concave portions of a



The Background Color picker. Note the cursor, positioned at the saturation slider. This slider must be adjusted toward the left in order to make colors appear in the color wheel.

terrain. (Note: This feature works only for terrains and planets that you create, not 3DMF models.) That is, ridge tops and gullies will be tinted. The spikier or more curved the ridge, the deeper the color. The flatter the section of terrain, the less color. This feature is intended to help make more natural-looking terrains, with subtle color gradations based on geometry rather than altitude.

The color picker dialog for ridge hint color works much the same as the color picker dialogs for background color (above) and ambient lighting color. Your color choice will stay the same across plug-in sessions, but not across Photoshop® sessions. That is to say, you can close and relaunch the plug-in, and still have the same colors (and other Prefs) you chose, but if you close and relaunch Photoshop® itself, you'll start from the defaults again.

Be sure to click the Hinting On checkbox after selecting a ridge hinting color. Also note that **you must regenerate the terrain for changes to go into effect.** (Throughout this discussion, we've been using the word "terrain," but these tips also apply to planet-type objects.)

Terrain Jitter

Another experimental feature, Jittering introduces small, random displacements to individual vertices in the terrain grid, but in a selective way: The higher the terrain, the more the jitter. Peaks will thus tend to be craggier while lowlands will tend to be smoother (not unlike most natural landscapes). Note that

because of the elevation biasing, you will not see any noise or jitter in the white (or low-pixel-intensity) regions of a terrain.

After turning this checkbox on, you should regenerate the terrain in order to see the effect.

(Again, this is available with planets as well as terrains.)

Known Problems

The Copy operation doesn't work unless the cursor is inside the preview screen when you type Command-C.

Disclaimers

Callisto™ has been tested on a G3 Power Mac under System 7.5.2, with Photoshop® 3.0.4 and Quickdraw™ 3D 1.5.3, with and without an ATI XclaimVR board. No conflicts have been found with Apple system software, Adobe Photoshop®, or the various extensions that have been tried so far (too numerous to list here). Nevertheless, no warranties are made as to performance, merchantability, or fitness for a particular purpose. Reasonable effort has gone into making this software operate correctly and run bug-free. Still, no guarantee is made that Callisto™ will never crash your computer, lose data, or perform erratically. (In particular, this plug-in has NOT been tested with Adobe Premiere™, Illustrator™, or any other software products that may claim to be able to take advantage of Photoshop® plug-ins.)

The user assumes all risk for any and all consequences of using this software, whether a shareware fee has been paid or not. Payment of the shareware fee is made voluntarily, as a donation rather than a purchase, and constitutes full agreement with these terms. The user, as a precondition of using this software, agrees to indemnify Kas Thomas, his heirs, and his assigns, and hold same harmless against any claims arising from the use of this software.

Questions, comments, bug reports, etc. should go to Callisto3D@aol.com. Or write: Kas Thomas, Post Office Box 477, Wilton, CT 06897 USA.

Acknowledgements

Thanks to the QD3D team for making Quickdraw™ 3D the great tool it is; thanks to Adobe for making plug-ins possible (and distributing an excellent SDK free, on the web); thanks to Rita, Mallory, and Justin for letting me put the hours in; thanks to you, the user, for making shareware possible.

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