The ElectricImage™ *Tutorial*

An instructional guide for the

demo version of ElectricImage

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Overview

This tutorial introduces you to the basic functions of ElectricImage while guiding you through the steps to create the photorealistic image shown below (except that your image will be in color!).

By working with this tutorial, you will learn:

- How to create a new ElectricImage project, including how to add models to the project, position the Camera and the models in a scene, and render an image.
- How to apply surface attributes such as color, reflectivity and transparency to models.
- How to apply textures and reflections to models.
- How to use lighting to achieve a photorealistic effect.

What You Will Need

To complete this tutorial, make sure that all of the ElectricImage application files and folders (including the Tutorials folders) have been installed on your hard disk in the same folder.

The models and textures you will need are located in two folders within the **Tutorial 1** folder:

- The **Models** folder, which should contain the following files:
  - Sphere
  - Cone
  - Room Model
  - Lamp Model
- The **Textures** folder, which should contain the following files:
  - Plaster SM
  - Sandstone SM
  - Weird Hi-Con

For processing, you will need at least 32 MB of RAM allocated to the Camera application, either physical or virtual (though processing will be extremely slow using virtual RAM).

Please note: It is very important that you pay close attention to detail during the course of this tutorial. Successful completion of this project depends on text entry of many precise values, and it only takes one misplaced decimal point to produce unwanted results. Should you find, at any time, that your results do not match those shown in the tutorial, it may be due to an incorrect or missing value, and you should go back over the steps to locate the error.

Also: This is a lengthy tutorial, and it has been split into sections so that you can take breaks between them. Remember, you don't have to complete the entire tutorial in one sitting. At any time you can save your project file and quit ElectricImage to return at another time.

Creating a Project File

The first step in creating an image (or animation) is to create a new project file.

1. Open the ElectricImage folder and double-click on the ElectricImage™ icon to launch the ElectricImage application.

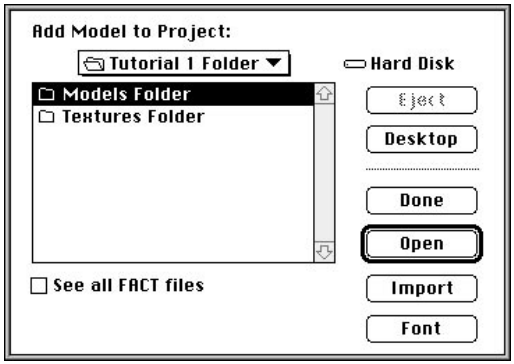
   Information about ElectricImage will appear, with a request that you click to continue.

2. Click the mouse to continue.

3. Select **New...** from the File menu (keyboard equivalent is ⌘**-N**).

A directory dialog box opens, requesting that you name and save the new project file.

4. Type “Tutorial 1 ” in front of the word “Project” and either click **Save** or press *return*.



Another directory dialog box opens, this one prompting you to add a model to the project.

5. Locate and open the **Tutorial 1** folder, then the **Models** folder, and add the model named “Sphere.”

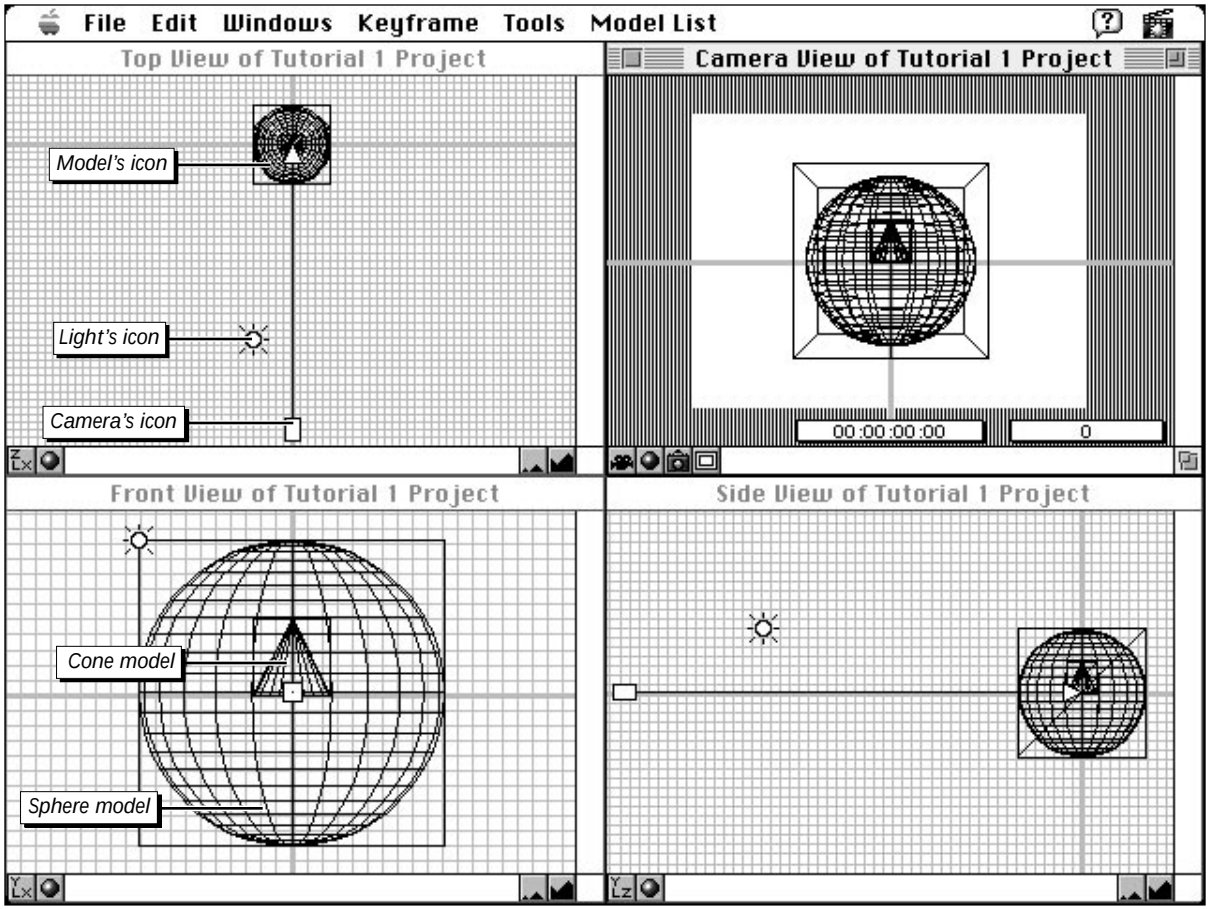
   The model is added to the project and the dialog box reopens.

6. Add the model named “Cone.”

   The model is added to the project and the dialog box reopens.

7. These are the only models we need right now, so click **Done**.

The ElectricImage workspace opens, with the three World View windows (top, front and side views) and the Camera View window arranged on your monitor as shown below.



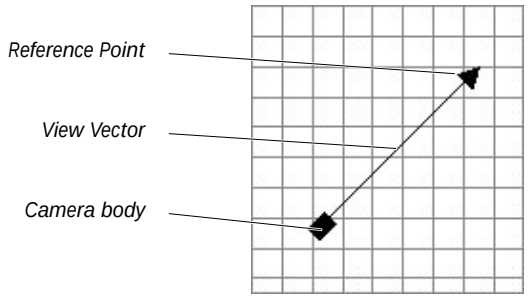
When a project is created, it contains a Camera and one radial light (plus any models that you've added). In the illustration above, we've indicated for you the appearance of the icons that represent the models, the Camera, and the light.

Getting Acquainted With the Workspace

At this point, take some time to get a feel for moving things around in the World View windows (Top, Front and Side). You can look at the Camera View window to see what the Camera sees.

8. First, drag each of the models around and watch how the Camera View window changes as you re-position the models.

9. Now move the Camera. First, drag the Camera body (the rectangle) only. Notice the effect of moving the Camera body without moving its reference point (the point at which the Camera is aimed).



Next, drag the reference point (the arrowhead) only, and watch the effect.

Finally, drag the view vector (the line), and watch the effect of moving both the Camera body and reference point simultaneously.

10. Now drag the light icon to re-position the light.

If it falls within the view of the Camera, you will see it in the Camera View window (though it will not be rendered as a visible object).

11. To preview the effect of the light on the models, click the shading button (the middle of three buttons) in the lower left corner of the Camera View window.

The models are shaded temporarily (until you change the scene).

This type of shading can be set as a permanent preference through the use of the Drawing... command in the Edit menu.

12. Now change the area displayed in the World View windows:

- Use the zoom icons in the lower right corner of each window to zoom in and out on your view of the models, Camera and light.
- Hold down the *option* key and drag a rectangle into which the view will zoom when you let go of the mouse.
- Hold down the *option* key while clicking either of the zoom icons in the lower right corner of the window; this action centers the objects in the window.

Throughout the tutorials in this book, when we say to "center the window," we are referring to this action—holding down the* option *key and clicking one of the window's zoom icons.

Now that you've had a chance to acquaint yourself with the workspace, we can clear the project of the Sphere and Cone models (we won't be using them for our final image).

13. Choose **Sphere** from the Model List menu, as shown at left.

14. Choose **Clear** from the Edit menu (or press *delete*).

The Sphere model is removed from the project.

15. Choose **Cone** from the Model List menu.

16. Choose **Clear** from the Edit menu (or press *delete*).

The Cone model is removed from the project.

Please continue on to the next part of the tutorial.

Building the Scene

Now we can set the scene for the final image we want to create (page 1-2). There are two models in your Tutorial 1 Models folder, one for the lamp and one combining all of the room elements.

Adding Models to the Project

ElectricImage offers two ways to add models to a project once you've created the project file. We'll use both methods, one for each model.

Using the File Menu

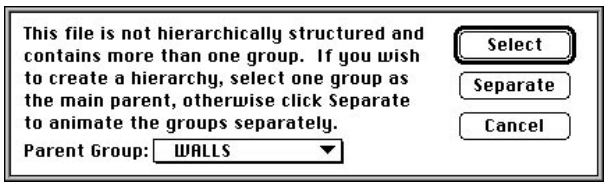
First we'll use the File menu to add the room model.

17. Choose **Add**, then **Model...** from the hierarchical File menu, as shown at left.

The directory dialog box used to add models to the project opens.

18. Find and select the model named "Room Model."

A dialog box opens, informing you that the model is comprised of groups that are not hierarchically structured.



19. We want the **WALLS** group to be the parent group (to which all other groups in the model are linked), and since WALLS is already selected (in the **Parent Group** pop-up menu) either click **Select** or press *return*.

The model is added to the project and the directory dialog box reopens.

20. Although we still have one more model to add, click **Done**.

Using the Object Palette

The other way to add a model is by using the Object Palette, which is a graphical interface for adding objects to the project. Let's use it to add the lamp model.

21. Choose **Object Palette** from the Windows menu (⌘-**E**).

The Object Palette opens.

22. Click on the first button in the palette, as shown at left (the button's icon represents a model in ElectricImage FACT format).

The directory dialog box used to add models to the project opens.

23. Find and select the model named "Lamp Model."

Again, you are asked what to do about the hierarchical structure.

24. We want the **GLASSBASE** group to be the parent, and since it is already selected, either click **Select** or press *return*.

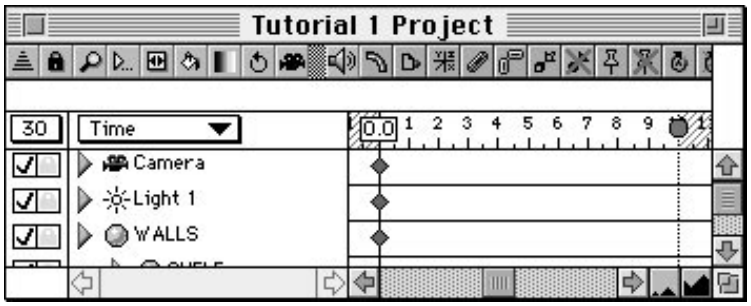
25. We now have all the models we need, so click **Done**.

As for the Object Palette, you can either drag it somewhere out of the way, or close it (we won't need it again for this tutorial).

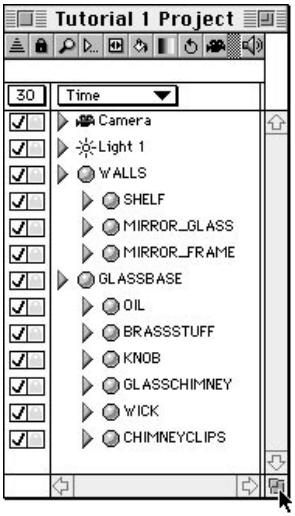
Opening the Project Window

Now let's open the Project window, where we can work with a listing of all of the project's elements.

26. Choose **Project Window** from the Windows menu (⌘-L).



The Project window opens, as shown at left.



27. Use the resizing icon in the window's lower right corner to resize the Project window as it is shown at left, then drag it where you want it (so that it does not block the Camera View window).

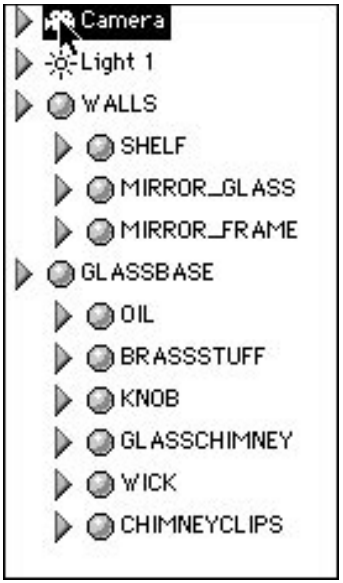
While the Project window provides a complete overview of all project data (and is used extensively in animations), we'll only be using it in this tutorial to select objects for modification and manipulation (other tutorials will show you more of its uses).

Note that there are 13 objects listed in the Project window for this project: Camera 1 (the Camera), Light 1 (the default light source), and the groups that comprise the Room Model and Lamp Model.

Also note how the groups are hierarchically displayed according to the hierarchical structure of the models. The "children" in each model are shown indented beneath their respective "parents." As children, they will inherit certain characteristics from their parents (such as position and rotation).

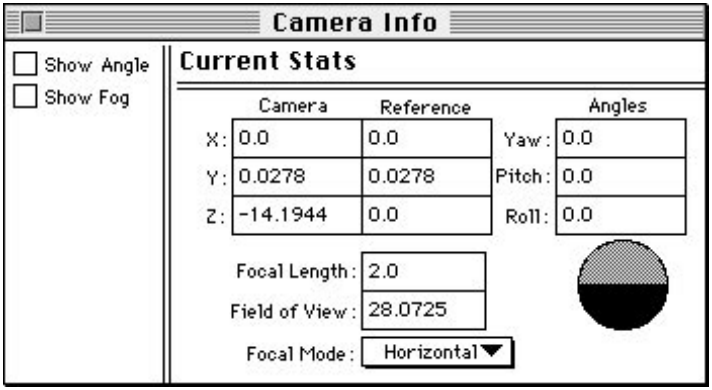
Positioning the Camera

Now it's time to position the Camera. As you've seen, the Camera and its reference point can be moved by dragging them in the World View windows. For more precise placement, however, exact coordinates can be entered. We'll use the Camera Info window to enter the coordinates.



28. In the Project window, double-click on the Camera's icon, as shown at left—or single-click it to select the Camera and then choose **Camera Info** from the File menu (⌘-I).

The Camera Info window opens.



	Camera	Reference
X:	2.3073	0.9503
Y:	6.1751	5.4302
Z:	-2.4111	0.8384

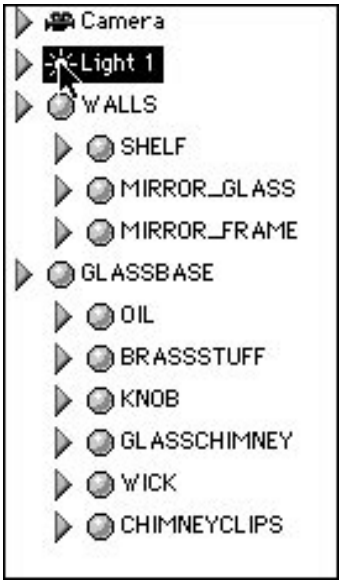
29. Position the Camera by typing the coordinate values shown at left in the X, Y and Z **Camera** and **Reference** edit boxes.

If you want to experiment with Camera roll, click and drag in the circle with the artificial horizon and watch the effect in the Camera View window. Just make sure you return the Roll value to 0.0 and that all of the values appear as shown at left.

30. Close the Camera Info window (⌘-W).

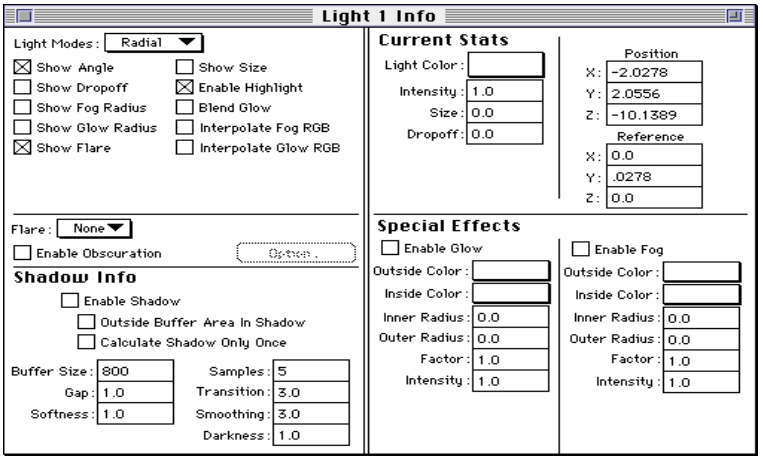
Positioning the Light

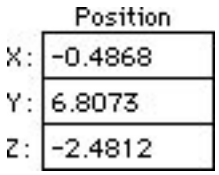
Now that we have our models in place and the Camera's coordinates have been set, let's place our default light source inside the Room Model so that we can see what's in there when we render the image.



31. In the Project window, double-click on the light's icon, as shown at left—or single-click it to select the light and then choose **Light Info** from the File menu (⌘-**I**).

The Light Info window opens.





32. Position the light by typing the coordinate values shown at left in the X, Y and Z **Position** edit boxes.

We are not considering the light's reference point at this time because the light is of the radial type—that is, it gives off light in all directions, and so we don't need to aim it. (When we're dealing with shadows, we will need to aim the light—but that's for later.)

33. Close the Light Info window (⌘-**W**).

Rendering the Image

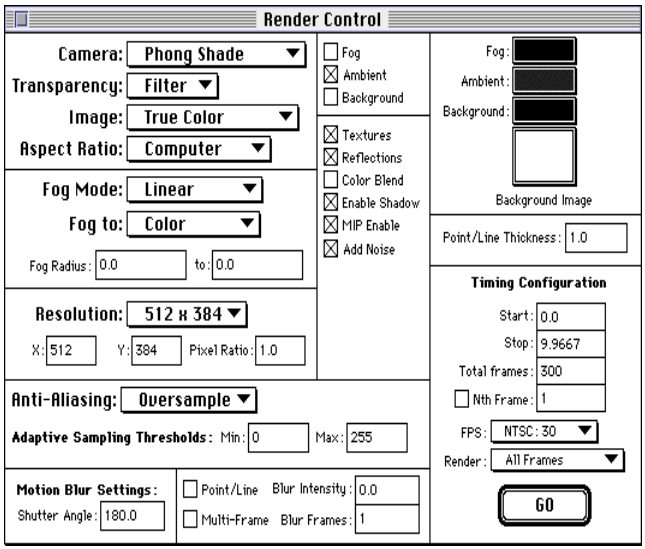
Now that the scene is set, let's save the project and render it.

34. Choose **Save** from the File menu (⌘-**S**).

As with any application, it is wise to save your work frequently.

35. Choose **Render...** from the File menu (⌘-**R**).

The Render Control window opens.



The Render Control window has extensive controls for image quality, for enabling special effects, for adding backgrounds, for selecting which frames of an animation to render, and for launching the ElectricImage Camera to render the project. For this tutorial, we need not be concerned about all of these controls—they are not, for the most part, applicable, and the default settings will produce very pleasing results.

36. Save the project file again (⌘-**S**).

37. Click **Go** or press *return* to launch the Camera application.

A dialog box opens, asking you to name and save the rendered image file (it defaults to "Tutorial 1 Image"):

38. Let's use the default name, so either click **Save** or press *return*.

The ElectricImage application closes and the Camera application is launched to render the project.

While your project is being rendered, you can watch the progress of the rendering; or, you can take a break and leave the computer to do its work (the faster your processor, the shorter the rendering time).

When the rendering has been completed, the Camera application closes and theElectricImage application is launched .

Displaying the Rendered Image

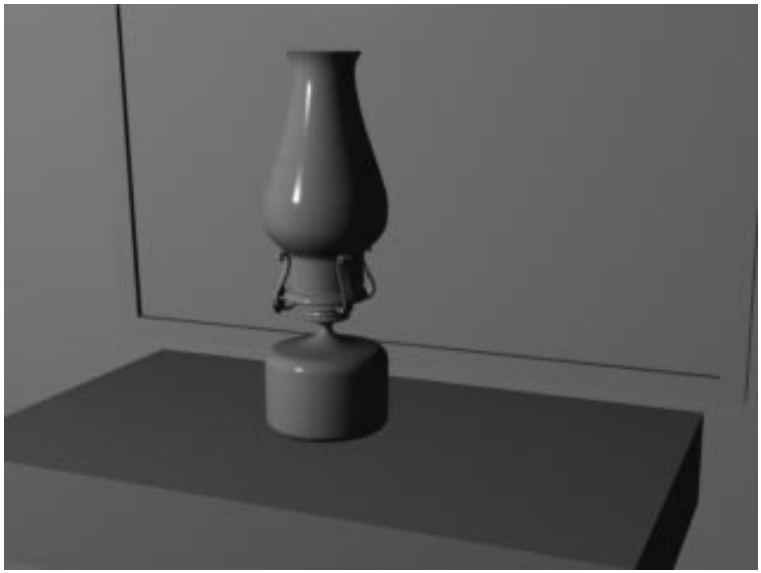
Let's take a look at what we've done so far.

39. Choose **Display...** from the File menu (⌘-**B**).

A directory dialog box opens for you to select the file to display.

40. Find and select "Tutorial 1 Image."

Your rendered image is displayed. It should look like the image below.



At this point in the project, the lamp, shelf, mirror and wall appear as solid, three-dimensional shapes, but they do not have any color or surface characteristics. Also, the mirror does not reflect and the glass elements of the lamp are not transparent. We'll attend to these details as the tutorial proceeds.

Now that you've seen what the image looks like without modifying the original models, and using only the default light source, let's take a break.

In the next section of this tutorial, we'll apply surface attributes to the group components of the models, the first step in achieving a photorealistic image.

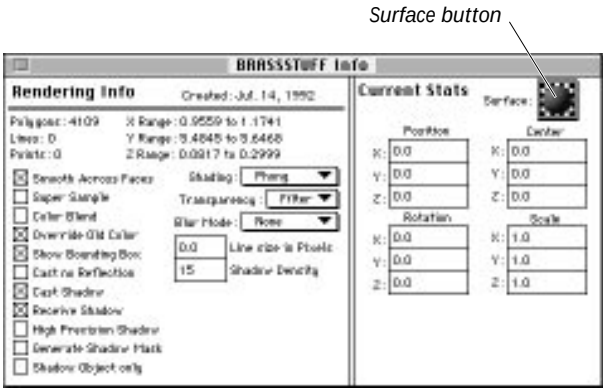
If you want, you can quit ElectricImage (⌘-Q) and reopen the project at another time, or continue on.

Applying Surface Attributes

Now it's time to apply surface attributes to our models (re-open the project if you had closed it at the end of the previous section).

The Brass Objects

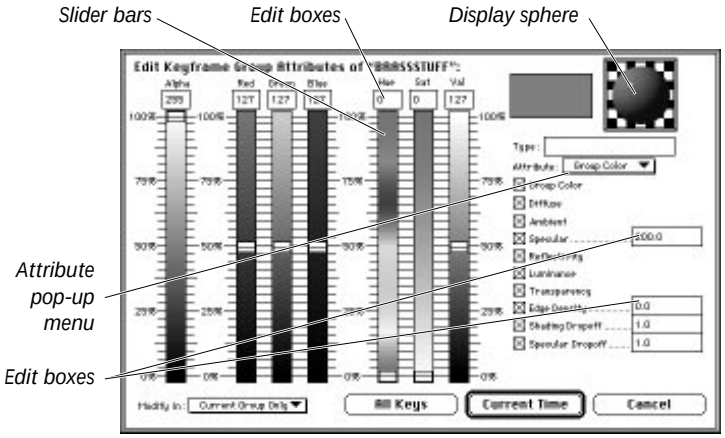
1. In the Project window, double-click on the group icon for **BRASSSTUFF**—or single-click to select it and then choose **Group Info** from the File menu (**⌘-I**).



The Group Info window for BRASSSTUFF opens.

Organize the workspace so that you can see both the Project window and the Group Info window at the same time (and be sure the Surface button in the Current Stats portion of the Group Info window remains visible).

2. Open the Surface Editor by clicking on the **Surface** button.



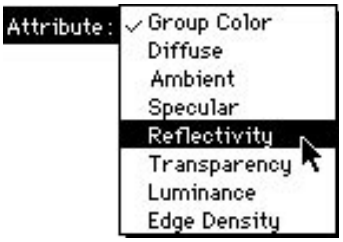
The Surface Editor opens, as shown at left.

We'll be using the following controls to apply surface attributes:

- The display sphere.
- The Attribute pop-up menu.
- The slider bars and edit boxes.

To apply surface attributes to a group, you either drag the slider bars (try it and see how the display sphere in the upper right corner of the Surface Editor changes) or enter specific values in the edit boxes above the slider bars. For this tutorial, we have specific values for you to use, and you can either set the slider bars to those values or type them into the edit boxes.

3. First we'll set the Group Color attribute (the group's base color). Change the values in the **Hue**, **Sat**(uration) and **Val**(ue) edit boxes to match those shown at left.



4. Now choose **Reflectivity** from the **Attribute** pop-up menu, as shown at left.

The Reflectivity attribute settings do not automatically cause the group to reflect its surroundings. They only enable and modify a reflection image which is assigned and defined in a separate procedure (more on this later).

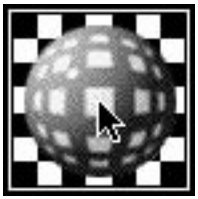
5. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

This will help to achieve a more brass-like effect by imparting a level of reflectivity with a brass-like tint.

Notice how the display sphere changes to indicate the new Reflectivity settings.

The checkerboard pattern is reflected in the display sphere.

The background for the display sphere can be changed from the checkerboard pattern to a solid black, white or color. Hold down the* option *key while clicking the display sphere. A pop-up menu opens to give you a choice of backgrounds. You can try different backgrounds, but be sure to return to the checkerboard pattern.



6. Now we want to copy these attributes (so that we can use them for the other brass objects). To do so:
   - Click on the display sphere to highlight it, as shown at left (unless it is already highlighted).
   - Choose **Copy Surface Color** from the Edit menu (⌘**-C**).

7. Close the Surface Editor by clicking the **Current Time** button (or press *return*).

Since we are working with a still image and not a sequence of frames, we'll use Current Time for all of our attribute settings.

The Chimney Clips and Knob

We now have the attributes for the brass objects defined and copied, so we can paste them into the Group Info windows for the chimney clips and knob.

8. In the Project window, double-click on the icon for the **CHIMNEYCLIPS** group.

   Notice that the Group Info window changes to show data for the CHIMNEYCLIPS group.

9. Choose **Paste Surface Color** from the Edit menu (⌘**-V**).

   The attributes from the BRASSSTUFF group are pasted to the CHIMNEYCLIPS group. Notice how the Surface button changes in the Group Info window.

10. Now repeat Step 8 and Step 9 for the **KNOB** group.

The Oil in the Lamp

Let's move on to the oil in the base of the lamp. (The oil wasn't visible in your first rendering because it is inside the base of the lamp; after we assign transparency to the base you'll be able to see it.)

11. In the Project window, double-click on the icon for **OIL**.

12. Open the Surface Editor for the group.

Hue	Sat	Val
30	140	255

13. Set the group's base color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

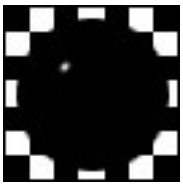
14. Choose **Diffuse** from the **Attribute** pop-up menu.

The Diffuse attribute determines the amount and color of light scattered from the group.

Hue	Sat	Val
0	0	0

15. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings, by reducing the diffuse level down to zero, will eliminate scattered light from the surface of the oil, helping to keep it transparent.



Notice how the display sphere changes to indicate the new Diffuse settings.

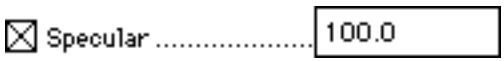
The display sphere appears black because the diffuse level is zero.

16. Choose **Specular** from the **Attribute** pop-up menu.

The Specular attribute controls the size and color of highlights that might appear on the object's surface (depending on its position relative to a light source). The quality of the highlight can affect the apparent texture of the object, ranging from hard and shiny to soft and dull.

17. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

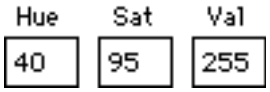
This setting will reduce the brightness of the oil's highlights.



18. Change the value in the **Specular** edit box to match that shown at left.

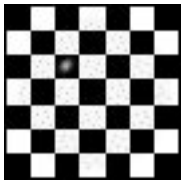
This setting will slightly increase the size of the oil's highlights (spreading them out).

19. Choose **Transparency** from the **Attribute** pop-up menu.



20. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

This will help to achieve a more realistic effect by imparting a level of transparency to the oil.



Notice how the display sphere changes to indicate the new Transparency settings.

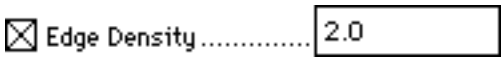
The display sphere becomes almost invisible in its transparency.

21. Choose **Edge Density** from the **Attribute** pop-up menu.

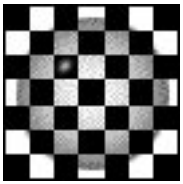
The Edge Density attribute is used to enhance the appearance of a rounded transparent object by increasing the apparent opacity of the object as seen through its edges.

22. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings impart a dark yellow tint to the oil.



23. Change the value in the **Edge Density** edit box to match that shown at left.



Notice how the display sphere changes to indicate the new Edge Density settings.

The checkerboard pattern is visible through the display sphere, however the sphere's edges appear denser.

24. Close the Surface Editor.

The Glass Base

Now let's do the glass elements of the lamp, starting with the base.

25. In the Project window, double-click on the icon for **GLASSBASE**.

26. Open the Surface Editor for the group.

27. Set the group's base color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

28. Choose **Diffuse** from the **Attribute** pop-up menu.

29. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings will help prevent the glass from washing out.

30. Choose **Ambient** from the **Attribute** pop-up menu.

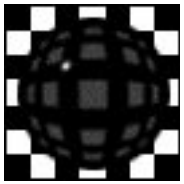
The Ambient attribute determines the amount and color of ambient light reflected by the group.

31. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings, by eliminating the sensitivity to ambient light, will also help prevent the glass from washing out.

32. Choose **Reflectivity** from the **Attribute** pop-up menu.

33. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

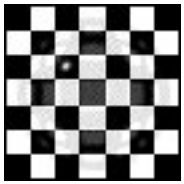


Notice how the display sphere changes to indicate the new Reflectivity settings.

The checkerboard pattern is reflected in the display sphere.

34. Choose **Transparency** from the **Attribute** pop-up menu.

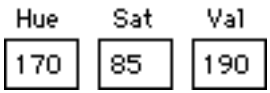
35. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.



Notice how the display sphere changes to indicate the new Transparency settings.

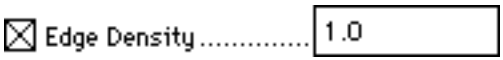
The checkerboard pattern is visible through the display sphere.

36. Choose **Edge Density** from the **Attribute** pop-up menu.

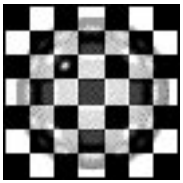


37. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings will impart a bluish tint to the glass.



38. Change the value in the **Edge Density** edit box to match that shown at left.



Notice how the display sphere changes to indicate the new Edge Density settings.

The checkerboard pattern is visible through the display sphere, however the sphere's edges appear denser.

39. Now copy these attributes by selecting the display sphere and choosing **Copy Surface Color** from the Edit menu (⌘**-C**).

40. Close the Surface Editor.

The Glass Chimney

We now have the attributes for the glass elements of the lamp defined and copied, so we can paste them into the Group Info window for the GLASSCHIMNEY group.

41. In the Project window, double-click on the icon for **GLASSCHIMNEY**.

42. Paste the attributes (⌘**-V**).

The attributes from the GLASSBASE group are assigned to the GLASSCHIMNEY group. Notice how the Surface Editor button changes in the Group Info window.

The Lamp's Wick

Now we'll do the wick of the lamp.

43. In the Project window, double-click on the icon for **WICK**.

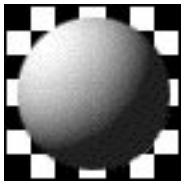
44. Open the Surface Editor for the group.

45. Set the group's base color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

46. Choose **Specular** from the **Attribute** pop-up menu.

47. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

Because we want the wick to appear soft and dull, we use these settings to eliminate any highlights from appearing on the group when the lighting is set up.



Notice how the display sphere changes to indicate the new Specular settings.

The specular highlight is now gone from the display sphere.

48. Close the Surface Editor.

The Walls of the Room

Let's turn our attention now to the Room Model, beginning with the WALLS group:

49. In the Project window, double-click on the icon for **WALLS**.

50. Open the Surface Editor.

51. Set the group's base color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

52. Choose **Specular** from the **Attribute** pop-up menu.

53. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings will eliminate any highlights from appearing on the group when the lighting is set up.

54. Close the Surface Editor.

The Shelf

Next, let's do the shelf:

55. In the Project window, double-click on the icon for **SHELF**.

56. Open the Surface Editor.

We'll use the default group color for the shelf because we're going to apply a texture map to it (in the next section of this tutorial), which will override the base color of the group. We will, however, need to assign a specular highlight value.

57. Choose **Specular** from the **Attribute** pop-up menu.

58. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

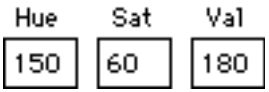
59. Close the Surface Editor.

The Mirror's Glass

Next, let's do the glass of the mirror:

60. In the Project window, double-click on the icon for **MIRROR_GLASS**.

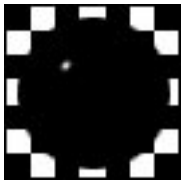
61. Open the Surface Editor.



62. Set the group's base color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

63. Choose **Diffuse** from the **Attribute** pop-up menu.

64. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.



Notice how the display sphere changes to indicate the new Diffuse settings.

The display sphere appears black because we have severely reduced the amount of light that will be scattered from the glass. If we were to use a high diffuse value, the image in the mirror would be washed out.

65. Choose **Ambient** from the **Attribute** pop-up menu.

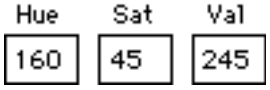
66. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

67. Choose **Specular** from the **Attribute** pop-up menu.

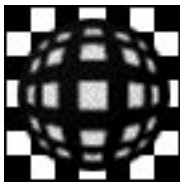
68. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

These settings will eliminate highlights when the lighting is set up.

69. Choose **Reflectivity** from the Attribute pop-up menu.



70. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.



Notice how the display sphere changes to indicate the new Reflectivity settings.

The checkerboard pattern is reflected in the display sphere, with a bluish tint to the reflection.

71. Close the Surface Editor.

The Mirror's Frame

The last group to surface is the mirror's frame. For this group, you have free reign to apply surface attributes as you please (go for it).

72. In the Project window, double-click on the icon for **MIRROR_FRAME**.

73. Open the Surface Editor.

74. Apply surface attributes as you see fit, using the display sphere as an indicator of your settings.

75. Close the Surface Editor when done.

Rendering the Image

Now that the surface attributes have all been applied, let's save the project and render it again to observe our progress.

76. Save the project file (⌘-**S**).

77. Open the Render Control window (⌘-**R**) and click **Go**.

A directory dialog box opens, asking you to name and save the rendered image file (it still defaults to "Tutorial 1 Image").

78. Save the file into the same folder as before.

*A dialog box will open to ask you what to do (cancel or replace)—click **Replace**. The ElectricImage application closes and the Camera application is launched to render the project.*

The rendering process will take longer than it did before, because the shading of objects is now more complex (particularly with transparent objects). So this might be a good time to take a break, unless you want to watch the progress of the rendering.

When the rendering has been completed, the Camera application closes and the ElectricImage application is launched.

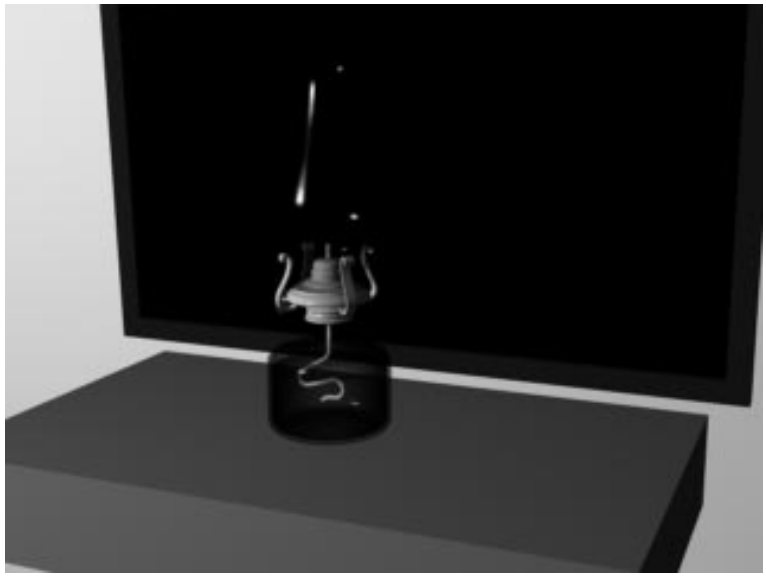
Let's take a look at what we've done.

79. Choose **Display...** from the File menu (⌘-**B**).

A directory dialog box opens for you to select the file to display.

80. Find and select "Tutorial 1 Image."

Your rendered image is displayed. It should look like the image below (except, perhaps for the mirror frame).



Now we can see color and transparency (though it is difficult to discern the lamp's glass chimney against the blackness of the mirror's surface, which still doesn't reflect anything). We need to add textures and reflections to the groups (that's coming next).

In the next section of this tutorial, we'll apply texture maps and reflections to the group components of the models.

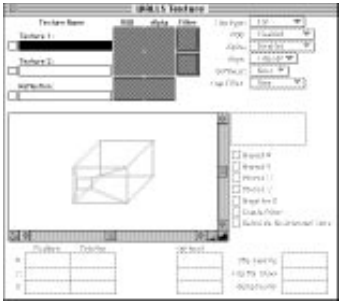
Applying Textures and Reflections

Now it's time to apply textures and reflections to our models (re-open the project if you had closed it at the end of the previous section).

Creating Textures

The Walls

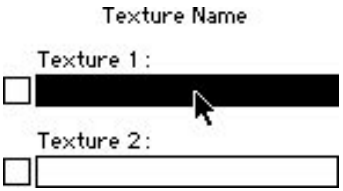
We'll begin with the walls of the room.



1. In the Project window, single-click the icon for **WALLS** to select it, then choose **Group's Texture** from the Tools menu.

Another way to open the Group Texture window is to click the Tool Palette's Group's Texture tool (if the palette is open). You can also press the Command key while double-clicking the group's icon.

The Group Texture window for WALLS opens, as shown at left.



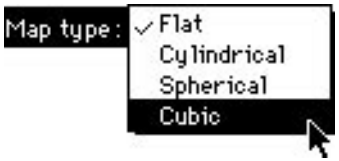
2. We're going to apply a single texture to this group (up to two textures per group are possible), so double-click on the **Texture 1** edit box at the top of the window, as shown at left.

A directory dialog box, as shown below, opens for you to select the texture file.

3. Open the Textures Folder folder within the Tutorial 1 folder and add the texture named "Plaster SM Image."

Either double-click on it, or single-click on it and either click **Add** or press *return*.

The texture is loaded into the project and appears in the ***Texture 1*** *boxes at the top of the window, as shown at left.*



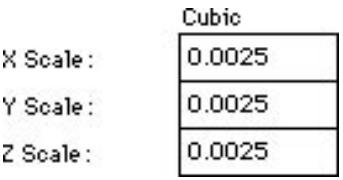
4. Choose **Cubic** from the **Map type** pop-up menu, as shown at left.

Textures can be mapped in a flat, cubic, spherical or cylindrical projection. Because the shape of the WALLS group is closest to that of a cube, using a cubic mapping projection will provide the most pleasing result.

Leave the **Align** pop-up menu set to **Midpoint**.

Textures can be aligned to the top, bottom, midpoint (the default), back, front, left and right sides of a group.

When a texture is mapped to a group, it is scaled to fit the entire group. This may cause unwanted distortions or a loss of resolution in the texture when it is blown up to fit, so we can scale the texture down in size and make it repeat in small sections or “tiles.”

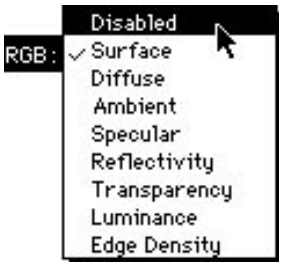


5. Notice that the bottom portion of the window contains edit boxes for the X, Y and Z scale of the texture. Type new values in these edit boxes to change the values to those shown at left.

6. Click the **Mirror X** and **Mirror Y** check boxes to *disable* them, as shown at left.

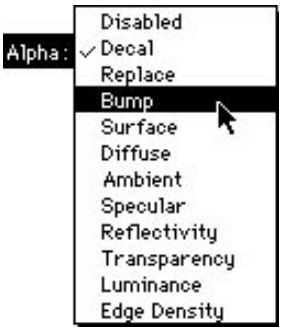
Mirroring, the default, would cause the texture to map into a pattern of adjacent tiles that are mirror images of each other. Disabling the function causes the tiles to repeat without mirroring.

Finally, let's set the texture's RGB and alpha channel usage.



7. Choose **Disabled** from the **RGB** pop-up menu, as shown at left.

By default, the group's surface color values are replaced with the RGB channel of the texture. For this image, however, we want to disable the texture's RGB channel (to maintain the base color of the group).



8. Choose **Bump** from the **Alpha** pop-up menu, as shown at left.

This setting uses the texture's alpha channel information to add some apparent surface texture to the group. The technique is referred to as "bump mapping." If the texture had no alpha channel, the RGB channel would be used for the information.

9. Close the Group Texture window (⌘-**W**)

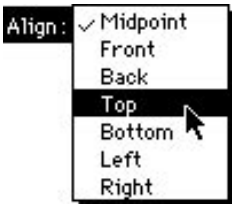
The Shelf

Now let's apply a texture to the shelf.

10. Open the Group Texture window for the group **SHELF**.

11. Add the texture called "Sandstone SM Image" as **Texture 1**.

12. Choose **Cubic** from the **Map type** pop-up menu.



13. Choose **Top** from the **Align** pop-up menu, as shown at left.

    This setting will cause the texture image to be mapped onto the top of the shelf rather than its midpoint.

Whereas we scaled down and tiled the texture for the WALLS group, we'll apply the texture in one section to the SHELF group. So let's just set the group's RGB and alpha channel usage.

14. Leave the **RGB** pop-up menu set to **Surface**.

    This setting will replace the group's surface color with the texture's RGB channel.

15. Choose **Bump** from the **Alpha** pop-up menu.

    This setting will use the texture's alpha channel information to create a "bump map."

16. Close the Group Texture window (⌘-**W**).

The Lamp's Base and Chimney

Let's turn our attention now to the lamp, and apply a bump map to the glass base and the glass chimney.

17. Open the Group Texture window for the **GLASSBASE** group.

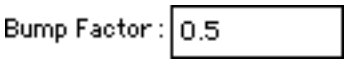
18. Add the texture called "Plaster SM Image" as **Texture 1**.

19. Choose **Cylindrical** from the **Map type** pop-up menu.

20. Choose **Midpoint** from the **Align** pop-up.

21. Choose **Disabled** from the **RGB** pop-up menu (since we only want to use the texture as a bump map).

22. Choose **Bump** from the **Alpha** pop-up menu.



23. Set the **Bump Factor** value to **0.5**, as shown at left.

This setting is used to create a "hand-blown" look to the glass. (Rendered glass often looks too perfect—adding a bump map makes it look more real.)

Now we want to copy this texture (so that we can paste it onto the lamp's glass chimney).

24. Choose **Copy Texture 1 Map** from the Edit menu (⌘-**C**).

25. Close the Group Texture window (⌘-**W**).

Now let's paste the texture onto the lamp's glass chimney.

26. Open the Group Texture window for the **GLASSCHIMNEY** group.

27. Choose **Paste Texture** from the Edit menu (⌘-**V**).

The texture is applied to the GLASSCHIMNEY group as Texture 1.

28. Close the Group Texture window (⌘-**W**).

Creating Reflections

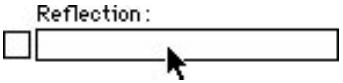
Applying textures is only part of the process to create photorealistic images. The surfaces of objects reflect light and the images of other objects, so we need to apply images to some of the groups as reflection maps. There are three ways to apply reflections to objects:

- Apply an image as a reflection.
- Apply automatic mirror mapping (for flat objects).
- Apply automatic environment mapping (for multi-sided objects).

Using a Reflection Image

First, let's see how to apply an image as a reflection (in this case to the GLASSBASE group).

29. Open the Group Texture window for the group **GLASSBASE**.



30. Double-click on the **Reflection** edit box at the top of the window, as shown at left.

A directory dialog box opens for you to select a texture. Notice that, unlike the dialog box you used to add Texture 1, this dialog box has two buttons at the bottom: Mirror and Environment. You can ignore these for now; we'll use them later.

31. Find and add the texture file called "Weird Hi-Con."

The texture is loaded into the project and appears in the Reflection box at the top of the window, as shown at left.

Now let's copy this reflection (so that we can paste it onto the brass elements of the lamp).

32. Choose **Copy Reflection Map** from the Edit menu (⌘-**C**).

33. Close the Group Texture window (⌘-**W**).

Now let's paste the image onto the brass elements of the lamp.

34. Open the Group Texture window for the **BRASSSTUFF** group.

35. Choose **Paste Texture** from the Edit menu (⌘-**V**).

The texture is applied to the BRASSSTUFF group as Reflection.

36. Close the Group Texture window (⌘-**W**).

37. Repeat Step 34 through Step 36 for the **CHIMNEYCLIPS** group.

38. Repeat Step 34 through Step 36 for the **KNOB** group.

Automatic Mirroring

Our next method of reflection mapping is automatic mirroring (in this case for the mirror on the wall).

39. Open the Group Texture window for the group **MIRROR_GLASS**.

40. Double-click on the **Reflection** edit box.

The directory dialog box opens for you to select a file. Notice that for reflections there are two additional buttons at the bottom of the box, one for Mirror, the other for Environment.

41. Instead of selecting a file, click the **Mirror** button, as shown at left.

Automatic mirroring is set for the group, as shown at left. That's all there is to it!

42. Close the Group Texture window (⌘-**W**).

Environment Mapping

Finally, let's apply automatic environment mapping (in this case to the lamp's glass chimney).

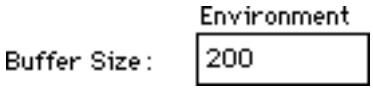
43. Open the Group Texture window for the group **GLASSCHIMNEY**.

44. Double-click on the **Reflection** edit box.

The directory dialog box opens for you to select a reflection.

45. This time, instead of selecting a file or clicking the Mirror button, click the **Environment** button, as shown at left.

Automatic environment mapping is set for the group, as shown at left.



46. Change the value in the **Buffer Size** edit box to match that shown at left.

This setting is sufficient for the image and will save rendering time.

47. Close the Group Texture window (⌘-**W**).

Rendering the Image

Now that we've applied textures and reflections to our models, let's save the project and render it again to see how things look.

48. Save the project file (⌘-**S**).

49. Open the Render Control window (⌘-**R**) and click **Go**.

A directory dialog box opens, asking you to name and save the rendered image file (which still defaults to "Tutorial 1 Image").

50. Save the file into the same folder as before.

*A dialog box will open to ask you what to do (cancel or replace)—click **Replace**. The ElectricImage application closes and the Camera application is launched to render the project.*

Rendering time will be considerably longer than it was on the previous renderings, as the environment and mirror maps must be rendered in addition to the other elements in the scene.

When the rendering has been completed, the Camera application closes and the ElectricImage application is launched.

51. Choose **Display...** from the File menu (⌘-**B**).

A directory dialog box opens for you to select the file to display.

52. Find and select "Tutorial 1 Image."

Your rendered image is displayed. It should look like the image below.

Now we have realistic renderings of surface textures and reflections. The next step is to control the lighting of the image.

In the next section of this tutorial, we'll make the lamp the light source that illuminates the scene.

Lighting the Scene

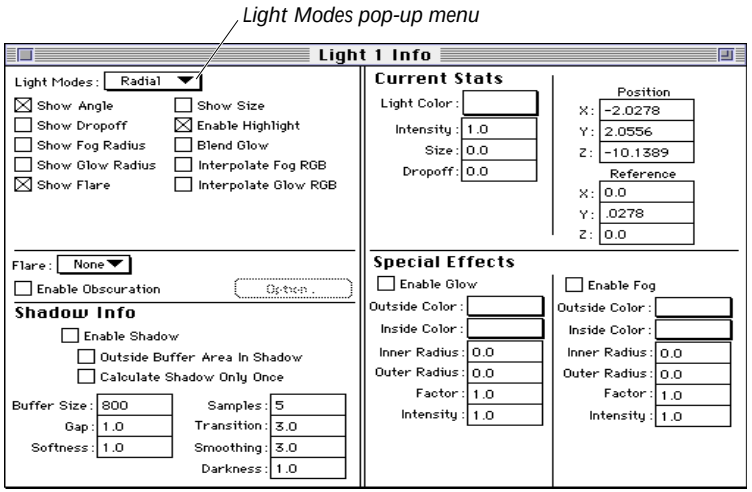
Now it's time to create the lighting effects for the final image, the last step in making it photorealistic (re-open the project if you had closed it at the end of the previous section).

Configuring the Light

We'll begin by using our existing light source (Light 1) and changing its position and characteristics.

1. In the Project window, double-click on the icon for Light 1—or single-click to select it and then choose **Light Info** from the File menu (⌘-I).

   The Light Info window for Light 1 opens.



Notice the **Light Modes** pop-up menu in the upper left corner of the window. This is where we set the type of light (such as Radial, Parallel, Spot, etc.).

Since the lamp in our scene is a light source that radiates light in all directions, it is appropriate to use a Radial light mode for this light. And since Radial is the default, we don't have to change the setting in the pop-up menu.

Let's set the light's position, color, intensity and dropoff distance.

Position	
X:	1.0652
Y:	5.7016
Z:	0.1912

2. Type the X, Y and Z **Position** coordinates shown at left in the Current Stats portion of the window.

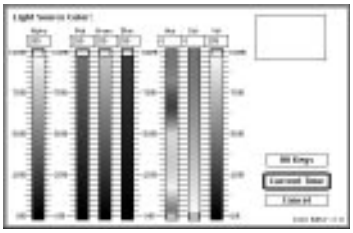
(We'll deal with the Reference coordinates later.)

Current Stats

Light Color :

3. Click the **Light Color** button in the Current Stats portion of the window, as shown at left.

The Color Editor opens.



This dialog box should look familiar to you, as it has slider bars similar to the ones you used in the Surface Editor.

Hue	Sat	Val
25	70	255

4. Set the light's color by changing the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

5. Click **Current Time** or press *return* to close the Color Editor.

Notice how the Light Color button in the Light Info window has changed to show the new color of the light.

Intensity :	1.0
Size :	0.0
Dropoff :	7.0

6. Type the **Intensity** and **Dropoff** values shown at left in the Current Stats portion of the window.

Dropoff refers to the distance from the light at which the light's illumination ends. The area beyond the dropoff distance will not be affected by the light. Intensity refers to the brightness of the light. It is especially important as a control when using multiple lights in a scene (to avoid "over lighting" the scene).

Creating Shadows

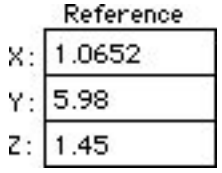
Now we'll set up the light's shadow casting qualities.

Lights do not automatically cast shadows in ElectricImage. You must enable shadows for each light. (By default, every group is set to cast and receive shadows, and you can disable shadow casting on a group level.)

7. Click the **Enable Shadow** check box in the Shadow Info portion of the window, as shown at left.

8. Notice that a new edit box, **Shadow Cone**, appears in the Current Stats portion of the window. Change the value in the edit box to that shown at left.

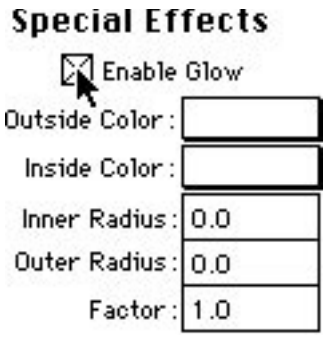
Even though the light source radiates light in all directions, you can control the angle of coverage for its shadow casting ability with the Shadow Cone value and the reference point coordinates.



9. Type the X, Y and Z **Reference** coordinates shown at left in the Current Stats portion of the window.

Creating a Glow Effect

Up to this point, the settings for the light will only affect what the light illuminates, not how the light itself will look as a visible object. By default, lights in ElectricImage are not visible. To make the light visible, we'll enable the Glow effect.



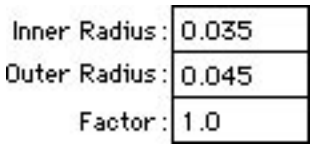
10. Click the **Enable Glow** check box in the Special Effects portion of the window, as shown at left.

A glowing light can be any color, and its color can modulate from the center of the light (the inside color) to its edges (the outside color). For this light, we want the inside of the glow to be white (the default), and the outside to be a pale yellow.

11. Click the **Outside Color** button, as shown at left.

The Color Editor opens.

12. Use the Color Editor controls to set a pale yellow color for the outside of the glow, then close the Color Editor.



13. Type the **Inner Radius**, **Outer Radius** and **Factor** values shown at left in the Special Effects portion of the window.

The inner and outer radii control the size and appearance of the glow. Within the inner radius the glow is opaque; at the outer radius it becomes clear. The rate of dropoff in opacity from the inner radius to the outer radius is controlled by the Factor value.

14. Close the Light Info window (⌘-**W**).

Adding a Light for the Mirror

Our lamp light is now set. There's one more thing to consider, however—the mirror. In reality, the light from the lamp would not only illuminate the room directly; it would bounce off the mirror. To simulate this additional illumination, we need to add another light.

There are a number of ways to add lights to the project, including the Add Light command in the File menu and the Add a Light tool in the Object Palette. What we'll do here is add another light by duplicating our existing light.

15. With **Light 1** still selected in the Project window, choose **Duplicate** from the Edit menu (⌘-**D**).

The new light appears in the Project window's object list, with the same name as the original and already selected, as shown at left.

16. Click on the name of the new light, as shown at left.

The name is put into the Project window's edit box so that you can edit it, as shown below. But you must first hit the enter key to enable editing.

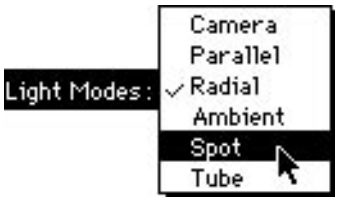
17. Hit the enter key to enable editing and then type the name "Light 2" and press *return*.

The new light is renamed.

Creating a Spot

Now we'll configure this second light to be a spot light.

18. Open the Light Info window for **Light 2**.

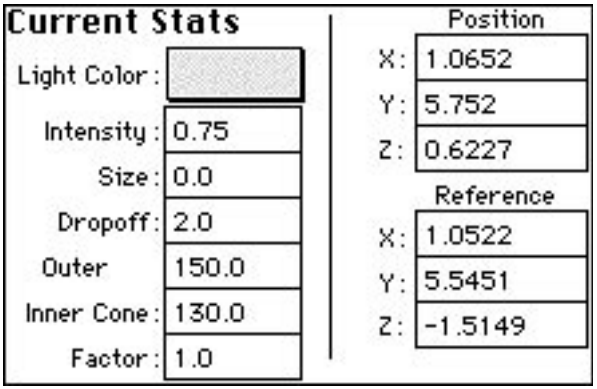


19. Choose **Spot** from the **Light Modes** pop-up menu.

This setting simulates a directional, limited area light source that places a pool of light over a specified area.

Because we created this light by duplicating our other light, it has the same attributes, including the glow effect. We don't want this light to be visible, however, so we need to disable the glow effect.

20. Click the **Enable Glow** check box in the Special Effects portion of the window to *disable* the function.



21. Type the **Position, Reference, Dropoff, Intensity, Outer Cone and Inner Cone** values shown at left in the Current Stats portion of the window.

These settings will cause the reflected light to be dimmer than the direct light, and to cast a shadow on the shelf.

The inner and outer cones control the angle of coverage for the light. Within the angle of the inner cone, the spot provides full illumination; at the outer cone, the illumination drops off. The rate of dropoff is controlled by the Factor value.

22. Close the Light Info window (⌘-**W**).

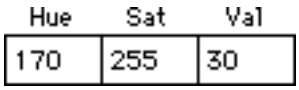
Changing the Background Color

The last thing we want to do is change the color of the background. When you last rendered the image, you could see a black background through a window reflected in the mirror (page 1-40). To heighten the realism of the image, let's change the background color to a dark blue (to simulate a night sky).

23. Open the Render Control window (⌘-**R**).

24. Click on the **Background** button in the upper right section of the window, as shown at left.

The Color Editor opens for you to set a background color.



25. Change the values in the **Hue**, **Sat** and **Val** edit boxes to match those shown at left.

26. Close the Color Editor.

Notice how the Background button in the Render Control window has changed to show the new color of the background.

Rendering the Image

That's it. The lighting is now set and the lamp should appear to be the light source for the room. Let's render the project one last time to see how the new lighting effects work.

27. Save the project file (⌘-**S**).

28. In the Render Control window, click **Go**.

A directory dialog box opens, asking you to name and save the rendered image file (it still defaults to "Tutorial 1 Image").

29. Save the file into the same folder as before.

*A dialog box will open to ask you what to do (cancel or replace)—click **Replace**. The ElectricImage application closes and the Camera application is launched to render the project.*

Rendering time will be considerably longer than it was on the previous renderings, as the lighting effects must now be rendered in addition to the other elements in the scene.

When the rendering has been completed, the Camera application closes and the ElectricImage application is launched.

30. Display "Tutorial 1 Image."

Your rendered image is displayed. It should look like the image below.

As you can see, the lighting has considerably changed the image, giving it a photorealistic effect.

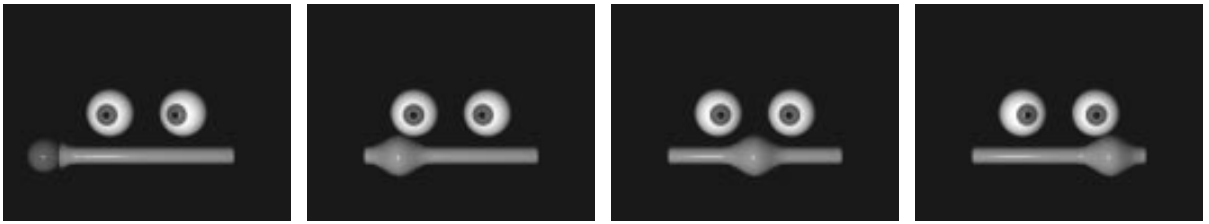
Congratulations! You've just completed your first ElectricImage tutorial. Now that you've created the image that we've set up for you, feel free to experiment with different settings and values for the many elements in the project, and see what you can create on your own. Then, when you have the time, go on to the other tutorials, in which you'll learn about the animation techniques of ElectricImage.

Tutorial 2 Creating a Simple Animation

Tutorial 2 Creating a Simple Animation

Overview

This tutorial introduces you to the basic concepts of deformation while guiding you through the steps to create a simple sequence, excerpts from which are shown below.



In this project, a ball travels through a narrow pipe which bulges outward to accommodate the larger diameter of the ball. A pair of eyeballs observe the action.

By working with this tutorial, you will learn:

- How to create a bulge deformation for a group.
- How to animate the region of deformation within a group.
- How to use the “Look at Object” function to force one object to always look at another object.
- How to output your animation directly to QuickTime.

What You Will Need

This tutorial builds on the knowledge you have gained from the previous tutorial. As such, it does not fully describe certain procedures that were introduced in that tutorial. For this reason, we strongly urge you not to attempt this tutorial until you have successfully completed Tutorial 1.

To complete this tutorial, make sure QuickTime™ (1.6 or later) is currently running and, as always, make sure that all of the ElectricImage applications and folders (including the Tutorials folders) have been installed on your hard disk in the same folder.

The files you will need is located in the **Tutorial 3** folder:

- Cylinder
- Sphere
- Eyeballs Model

Please note: It is very important that you pay close attention to detail during the course of this tutorial. Successful completion of this project depends on text entry of many precise values, and it only takes one misplaced decimal point to produce unwanted results. Should you find, at any time, that your results do not match those shown in the tutorial, it may be due to an incorrect or missing variable, and you should go back over the steps to locate the error.

Building the Scene

We'll begin by opening a new project in ElectricImage.

1. Launch ElectricImage and create a new project called "Tutorial 3 Project."

   Do *not* add any models to the project at this time (click **Done**).

2. Open the Project window (⌘-L).

   Re-size and position it so that it covers the Front View and Side View windows.

3. Center the Project window's Time Scale (*option*-zoom).

4. Set the duration of the animation to **3.0** seconds by dragging the red "stop sign" indicator to the **3** second mark.

5. Center the Time Scale again (*option*-zoom).

Adding the Cylinder

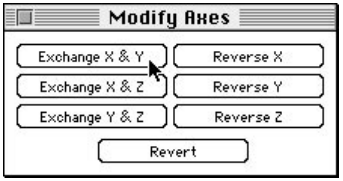
The first object we want to add to the project is a cylinder, which will serve as the pipe.

6. Choose **Add > Model...** from the File menu. You will find the Cylinder model in the Tutorial 3 folder.

7. Rename the **Cylinder** to "Pipe."

Modifying the Cylinder's Axes

Notice that the cylinder was added to the project in an upright position. We'd like to have it lying down, so we need to exchange its X and Y axes.



8. With the Pipe group selected, choose **Modify Axes** from the Tools menu.

   The Modify Axes window, as shown at left, opens.

9. Click the **Exchange X & Y** button, then close the window.

10. Open the Group Info window for the Pipe group and click on the **Surface** button to open the Surface Editor.

11. Set the **Group Color** values as shown at left.

12. Close the Surface Editor and the Group Info window.

Adding the Sphere

Now let's add the ball and configure it.

Choose **Add > Model...** from the file menu, select the Sphere from the Tutorial 3 folder.

The Sphere is added to the project.

13. Rename the **Sphere** to "Ball."

14. Open the Group Info window for the Ball group and set its **Y Position** coordinate to **100.0**.

    This places the ball in the center of the pipe.

Hue	Sat	Val
85	255	128

15. Click on the **Surface** button to open the Surface Editor and set the **Group Color** values as shown at left.

16. Close the Surface Editor and the Group Info window.

Positioning the Camera

Now let's position the Camera.

	Camera	Reference
X:	0.0	0.0
Y:	200.0	150.0
Z:	-500.0	0.0

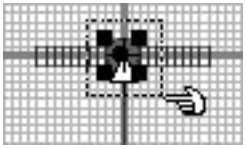
17. Open the Camera Info window, set the **Camera** and **Reference** coordinates as shown at left, then close the window.

We're not concerned with lighting in this tutorial, so we can leave the light in its default position.

Creating the Deformation

It's time now to create a deformation for the pipe. We'll make it bulge out so that it can accommodate the larger diameter of the ball as the ball passes through it.

1. Center the Top View window (*option*-zoom).

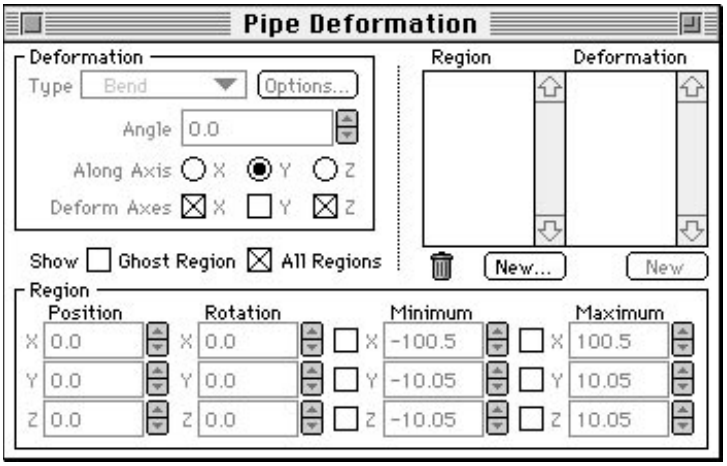


2. *Option*-drag a rectangle around the **Ball** group as shown at left.

   The window zooms in on the Ball group.

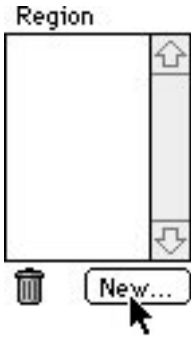
3. Select the **Pipe** group.

4. Click the Group Deformation tool, as shown at left.



The Group Deformation window opens.

Move the window so that the Top View window is visible.



5. Click the **New...** button under the **Region** list.

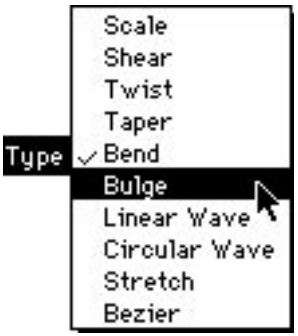
A dialog box asks you to name the region.

6. Click **OK** to use the default name of "Region 1."

The deformation region defines the area to be affected by the deformation. It can be sized and positioned, relative to the center point of the group, by either click-and-drag in the World View windows or by numeric input in the Region section at the bottom of the Group Deformation window. For this tutorial, we'll enter numeric values (so that you can duplicate the tutorial exactly).

7. Set the **X Minimum** value to **-35.5** and the **X Maximum** value to **35.5**.

Note how the region is displayed in the Top View window.



By default, a Bend type deformation is selected There are a number of different deformation types available, and you can choose one based on your needs. Also, multiple deformation types can be applied to the same group and their attributes can be animated. For this tutorial, we want to use a Bulge type deformation.

8. Choose **Bulge** from the **Type** pop-up menu.

9. Configure the bulge as follows:

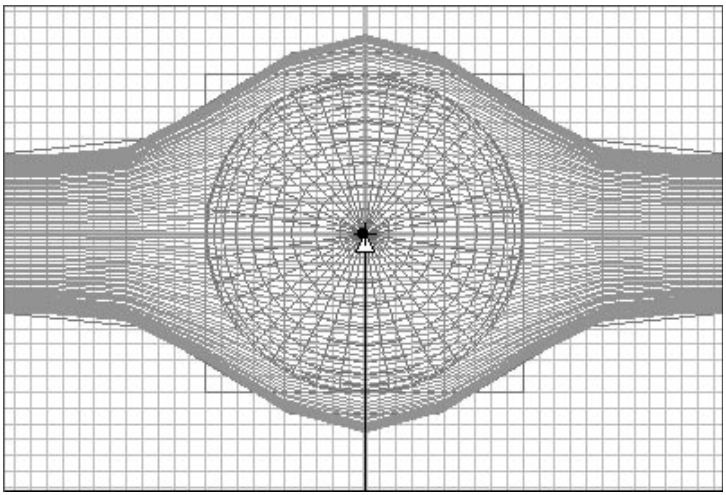
- Set **Bulge %** to **150.0**.
- Set **Along Axis** to **X**.
- Set **Deform Axes** to **Y** and **Z**.

10. We want to create a filleted bulge, which will have more rounded edges, so click the **Options...** button.

A dialog box, as shown below, opens.

11. Click the **Filleted Bulge** check box, then click **OK**.

Notice how the bulge is shown in the Top View and Camera View windows. The pipe has bulged out to enclose the ball.



12. Close the Group Deformation window.

13. Zoom out the Top View window until you can see the entire pipe.

Animating the Ball through the Pipe

Now we can animate the ball to travel through the pipe, and also animate the deformation region so that the bulge will travel down the length of the pipe in synch with the ball.

First we'll animate the ball.

1. Open the Group Info window for the Ball group and set its **X Position** coordinate to **-150.0**.

   Close the Group Info window.

2. In the Project window, drag the Time Selector to the **3.0** second position (at the end of the animation).

3. In the Group Info window, set the Ball group's **X Position** coordinate to **150.0**.

   Close the Group Info window.

Previewing the Animation

Before we go any further, let's preview the animation.

4. Open the preview options pop-up menu by *option*-clicking the camera icon at the lower left of the Camera View window.

5. Make sure that the **Output to Screen**, **Draw Extents** and **Use No Background** options are chosen.

6. Click the camera icon again to start the preview.

   The ball travels from left to right across the screen, through the pipe. However, the bulge in the pipe is still in the center where we created it.

Animating the Deformation Region

Now let's animate the pipe's deformation region so that the bulge will move along with the ball.

7. Set the current time to **0.0** seconds.

8. Open the Group Deformation window for the **Pipe** group (a keyboard shortcut is to hold down the *command* and *control* keys while double-clicking the group.

9. In the Region section at the bottom of the window, set the **X Position** coordinate to **-150** (which is the same coordinate as the Ball group's position at this point in time).

Even though the deformation region is now outside the physical space occupied by the pipe, it can be seen in the Top View window (and should be surrounding the ball).

10. Close the Group Deformation window.

11. Set the current time to **3.0** seconds.

12. Open the Group Deformation window for the **Pipe** group again (*command*-*control*-double-click).

13. In the Region section at the bottom of the window, set the **X Position** coordinate to **150** (which is the same coordinate as the Ball group's position at this point in time).

14. Close the Group Deformation window and preview the animation again.

    The pipe should now be seen to bulge as the ball travels into it, through it and out the other end.

Keeping Our Eyes on the Ball

Now we'll add a couple of eyeballs to watch the action, making use of ElectricImage's "Look at Object" function.

The Look at Object function forces one object to look at another. It is useful for keeping the Camera or a spot light aimed at a moving object or, in this case, to automatically rotate an object so that it is always facing another object.

1. Choose **Add > Model...** from the File menu and add the "Eyeballs Model" from the Tutorial 3 folder.

   The eyeballs are added to the project.

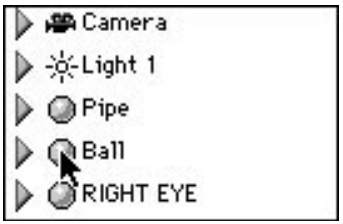
   This model has been pre-configured so that it is automatically placed in the proper position for the tutorial.

2. Set the current time to **0.0**.

3. Select the **RIGHT EYE** group.

4. Click the **Look at Object** tool in the Project window's tool bar, as shown at left.

   In the menu bar, a prompt asks you to select the object to look at.



5. In the Project window, click the **Ball** group to select it.

   A status window opens, indicating the creation of custom frames for the RIGHT EYE group.

6. Now make the **LEFT EYE** group look at the **Ball** group.

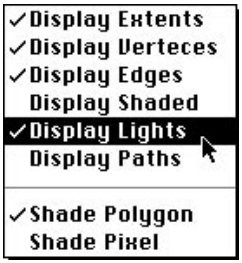
That's all there is to it. You can now view the results of your efforts.

Creating a QuickTime Movie

We're now ready to create a QuickTime movie so that we can see the animation. To do so, we'll use the preview function of the Camera View window.

First let's disable the display of lights in the Camera View window and then select our previewing options.

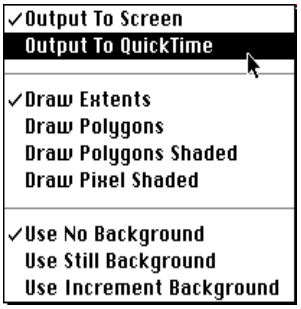
1. Hold down the *option* key and click on the shading icon button in the lower left corner of the Camera View window (shown at left) to drop its menu.



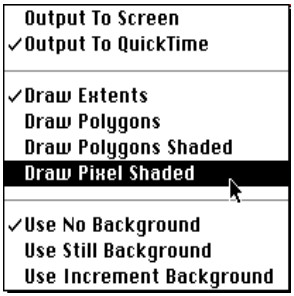
2. Choose **Display Lights** from the menu, as shown at left.

   This will disable the display of lights in the Camera View window.

3. Now hold down the *option* key and click on the camera icon preview button (to the left of the shading icon button) to drop its menu.



4. Choose **Output to QuickTime**, as shown at left.



5. Open the menu again and choose **Draw Pixel Shaded**.

   These settings will create a QuickTime movie with greater rendering detail.

Generating the QuickTime Movie

Now we can generate and play the QuickTime movie.

6. Click the camera icon button again (no *option* key this time).

   A directory dialog box opens for you to save the QuickTime movie.

7. Save it with the default name of "Tutorial QuickTime."

   An Output status window opens while the preview is created.

   If this window is covering all or part of the Camera View window, you may want to drag it out of the way so that you can watch the progress of the preview.

   After the last frame has been completed, a QuickTime display window opens to display your QuickTime movie.

8. Use the window's controls to stop, re-start, etc. When done, close the window.

If the QuickTime movie's display is jerky and/or the animation does not seem to be synchronized with the soundtrack, it could be because you have something operating in the background which is causing additional overhead for your computer. For optimal playback conditions, you should have a fast machine with little or no overhead outside the ElectricImage application.

9. To display the QuickTime movie again, choose **Display...** from the File menu.