

1

Light Rays

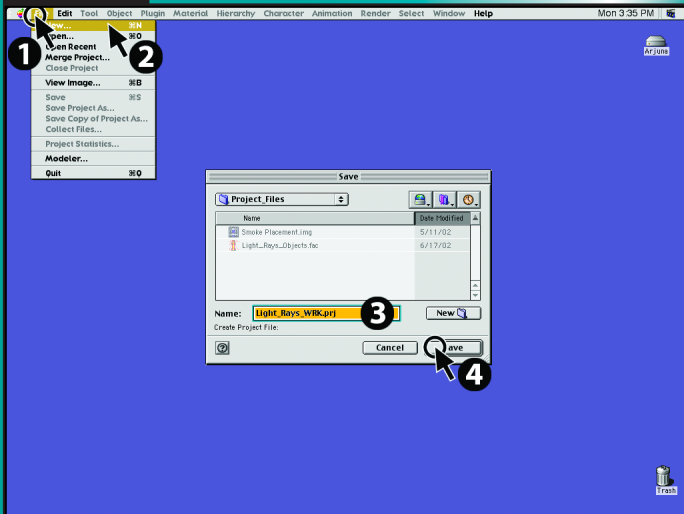


When a light is added to a scene with Glow or Fog enabled, it casts a volumetric area of light.

When objects are placed in front of this type of light source, they will break up the light, creating shafts of light. This break-up is called Light Rays.

This exercise will walk you through creating a volumetric light and adding atmosphere to the volumetric light by using Smoke.





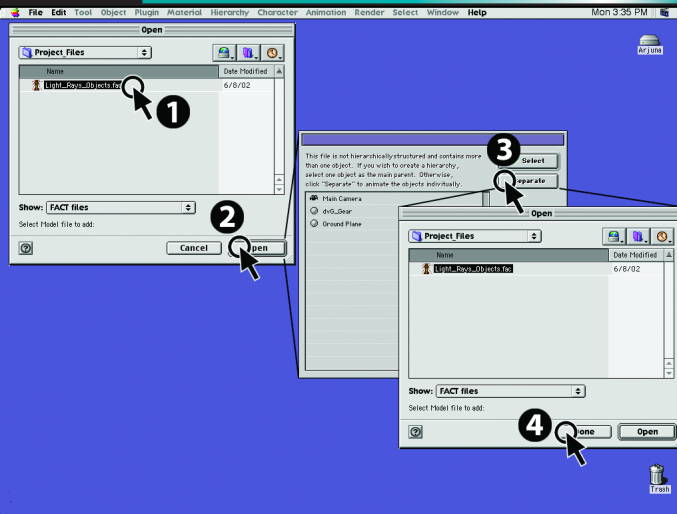
Launch Animator.

Press **[CMD/CTRL+N]** to start a new project.

When Animator prompts you to name and save this new project, name it "Light_Rays_WRK.prj" file, then navigate to the Light_Ray_Tutorial folder and save it in there.

Note: Macintosh keyboard commands are indicated in red. Windows keyboard commands are indicated in blue. Some files may need to be manually located while loading.





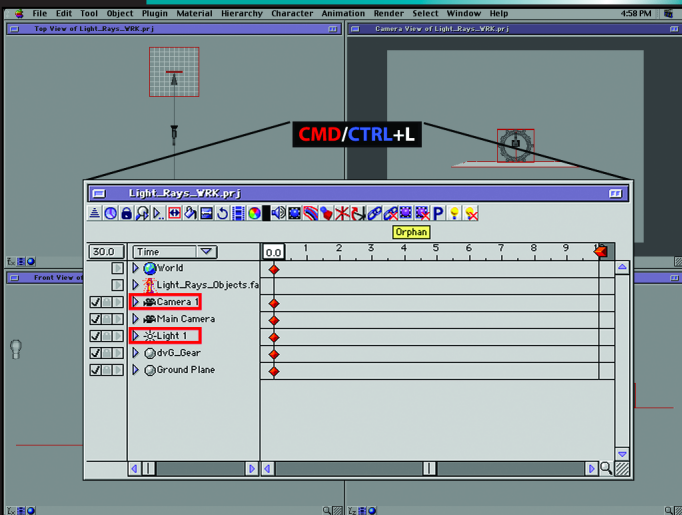
After saving, you will be prompted to load your FACT files into this new project.

Locate the `Light-Ray-Objects.fac` file and **[CLK]** Open.

You will then be asked to create a hierarchy of the objects contained in this FACT file. Since we want them separate, **[CLK]** the Separate button.

If there were any more models to add, you could continue adding them into the project, but in this exercise, there aren't, so **[CLK]** the Done button.





Animator then generates the scene loosely based on the size of the FACT file we loaded.

But before we proceed, we need to remove two unwanted elements - a Camera and a Light.

Open the Project window [**CMD/CTRL+L**].

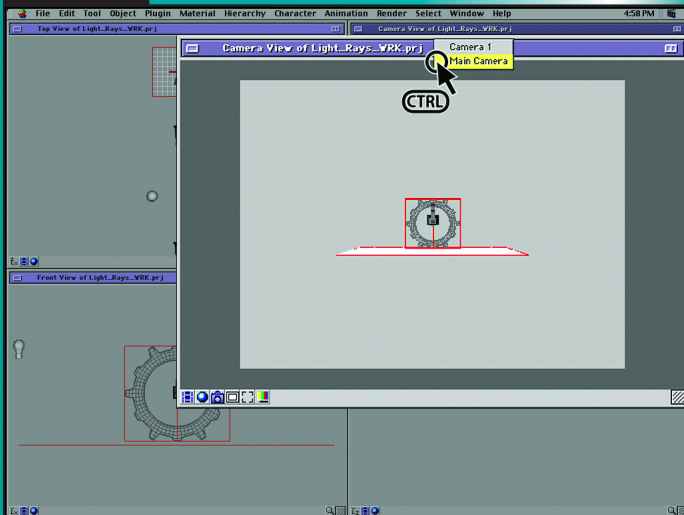
Animator defaults to adding a Light and a camera into every new Project file. Since our FACT file contained a prebuilt Camera and Light, we do not need the default Camera and Light in our scene.

But before we delete the Camera, we need to switch our viewing angle from the default Camera to the Main Camera...



5

Switching the Camera View



In the Camera View window, **[CTRL/RIGHT+CLK]** on the Camera View window header bar.

In the pop-up menu, select Main Camera.

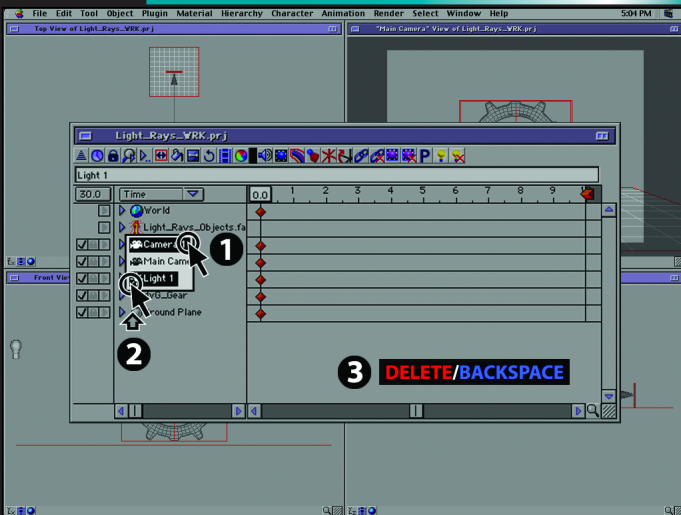
The Camera View window should now be looking at the set from a higher elevation.

Now we can delete the default Camera and Light....



6

Deleting the Default Camera and Light



So, in the Project window, **[CLK]** on Camera 1 and **[SHIFT+CLK]** on Light 1, then press the **[DELETE/BACKSPACE]** button.

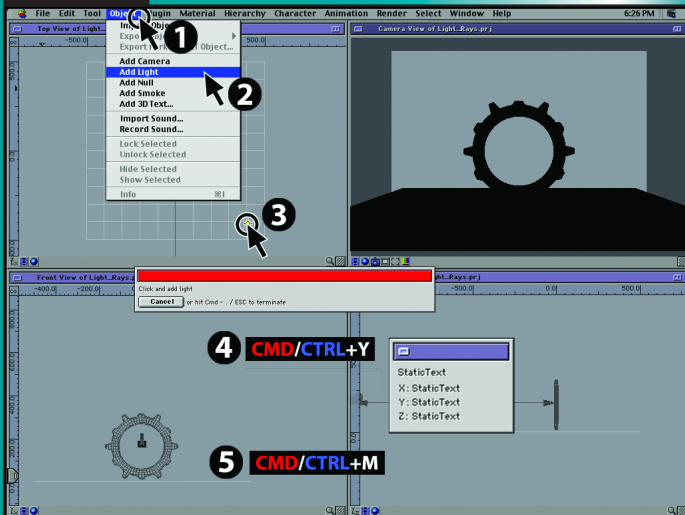
You should only see the following in the Project window : World, Light_Ray_Object.fac, Main Camera, dvG_Gear, and Ground Plane.

Now on to the exercise....



7

Adding a Light



I know, we just deleted a perfectly good light. And now we are adding a light. We want you to get used to adding a light in the scene, since one light usually will not be enough...

In the Main menu, select Object > Add Light.

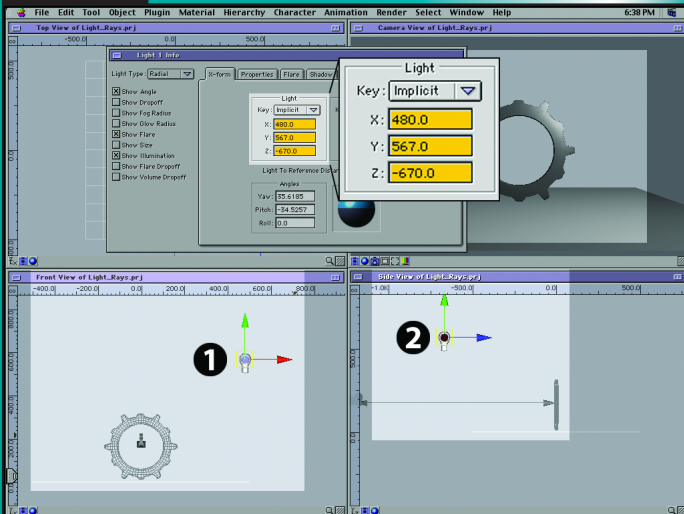
Place this light in the Top View window on the lower right of the Ground Plane.

After placement, open up the location palette [**CMD/CTRL+Y**], which will assist us in manually placing this light, plus turn on the Rulers [**CMD/CTRL+M**].

Both of these will come in handy during the next step when we place the light.

Now is a good time to [**OPT/ALT+CLK**] on the magnifying glass in the lower right of the Top View window.





In the Front View window, position this light above the dvG_Gear object.

In the Side View window, move the light to the left, away from the dvG_Gear object.

Note: This light source should not be visible in the Camera View window, so make sure that it is positioned outside of the Camera View window.

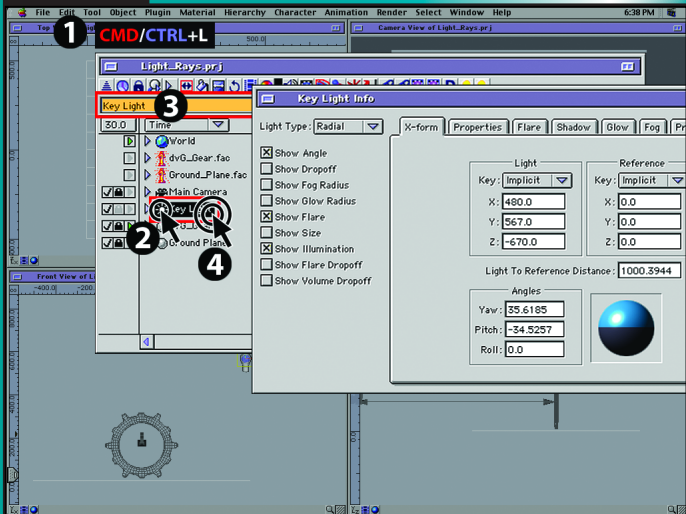
For the numerically inclined, we positioned our light at the following coordinates:

X: 480

Y: 567

Z: -670





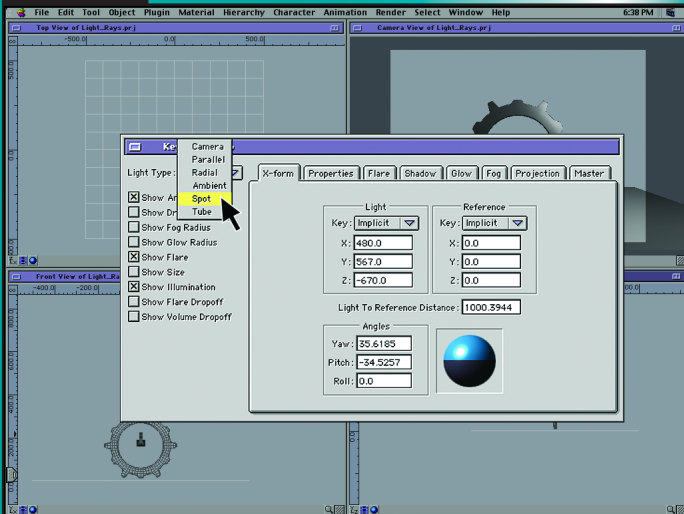
Open the Project window [**CMD/CTRL+L**].

Single [**CLK**] on Light 1 to highlight it.

In the edit box, rename this light 'Key Light' and press [**ENTER**] to commit.

[**DBL+CLK**] on the Key Light name to open the Light Info window.

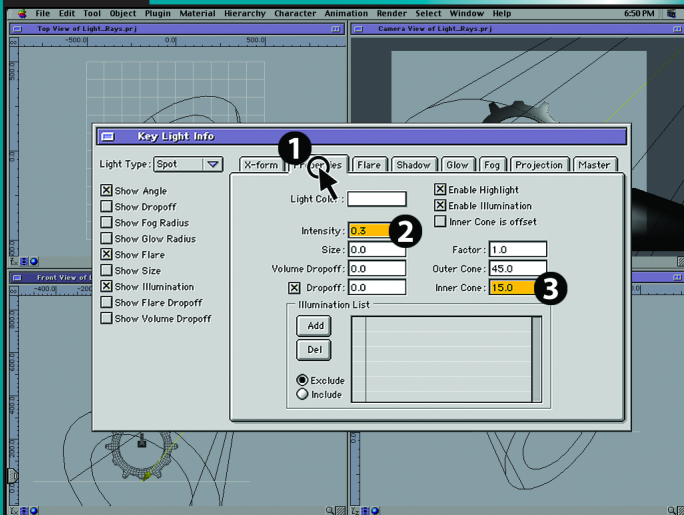




Next to Light Type (in the Light Info window), **[CLK+HLD]** on the Radial option (a pulldown menu will appear) and select Spot to set this light to a Spot Light.

Spot Lights allow us more control over our light source and glow effects than any other light type. Plus it'll look cool, too.





[CLK] on the Properties tab.

Set the Intensity of this light to 0.3.

Leave the Outer Cone set to 45, but change the Inner Cone to 15.

Note: You may need to set your light intensity slightly higher or lower depending on your light placement. The same with the Inner and Outer Cones.

We are going against the norm here... we set the Key Light to a lesser intensity than normal so that our Light Ray effect becomes visible. This will become more apparent later on.





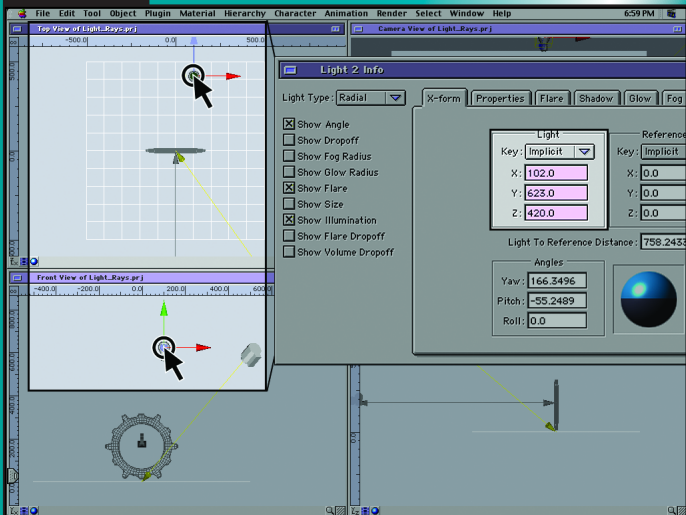
In the Main menu, select Object > Add Light.

In the Top View window, **[CLK]** behind (visually above) the dvG_Gear object to add this light.



13

Positioning the Light



In the Front and Top View windows, position this light so that it is above and slightly behind and to the right of the central axis of the Gear object.

Note: This light source should not be visible in the camera frame, but you should still be able to see part of it in the shaded area of the Camera View window.

Here are the coordinates we used for this light:

X: 102

Y: 623

Z: 420

Note: While this light will illuminate the rear of the dvG_Gear object, it will also be the main light for the effect we are trying to achieve.

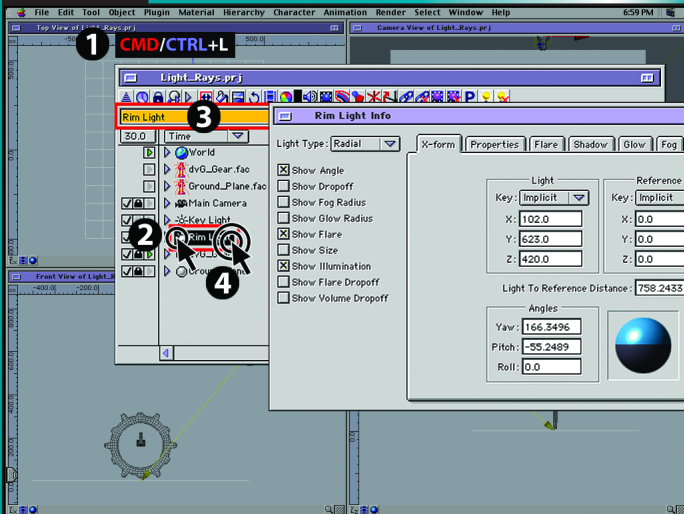


Lighting Tutorial: Light Rays



14

Rename this Light to Rim Light



If you closed it, open the Project window [**CMD/CTRL+L**].

Single **[CLK]** on Light 2 to highlight it.

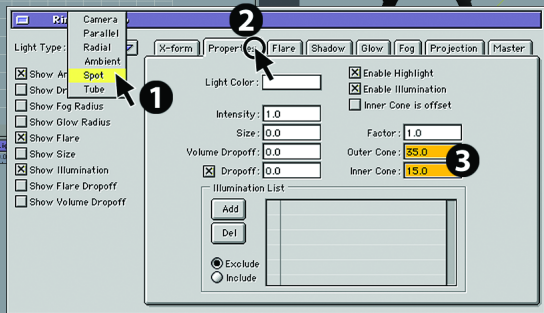
In the edit box, rename this light 'Rim Light' and press **[ENTER]** to commit.

[DBL+CLK] on the Rim Light name to open the Light Info window.



Lighting Tutorial: Light Rays





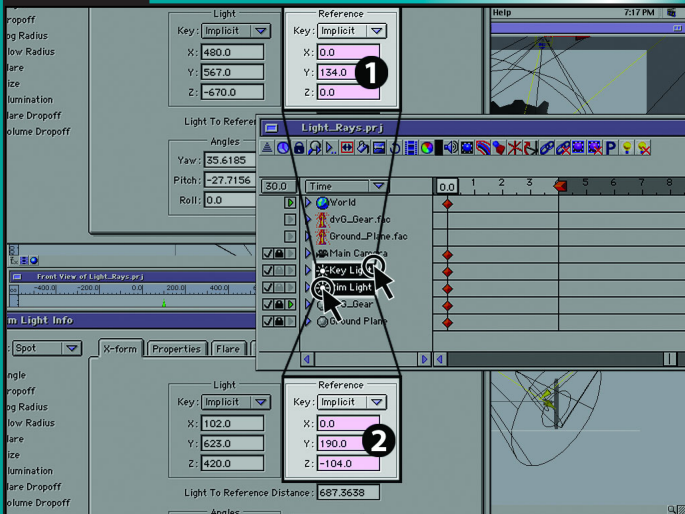
In the Rim Light Info window, change the Light Type to a Spot Light.

In the Properties tab, set the Outer Cone to 35 and the Inner Cone to 15.

Note: You may need to set your light intensity slightly higher or lower depending on your light placement. The same with the Inner and Outer Cones.

If you haven't changed it, notice that we left the intensity alone. That is because this will be our main light, and we will need its full intensity for the effects that we will apply in the next few steps....





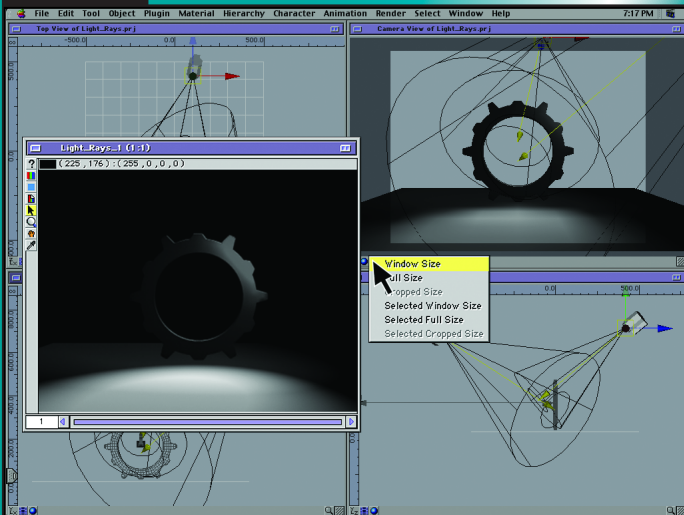
Adjust the reference point (the yellow cone) of the Key Light and the Rim Light so that they are both pointing at the center of the dvG_Gear object.

Again for the numerically inclined, the values we used are as follows:

Key Light, X-Form tab, Reference box:	Rim Light, X-From tab, Reference box:
X: 0	X: 0
Y: 134	Y: 190
Z: 0	Z: -104

Note: Our reference for the Rim Light passes through the top of our model, pointing at the center Z- axis in front of the model.



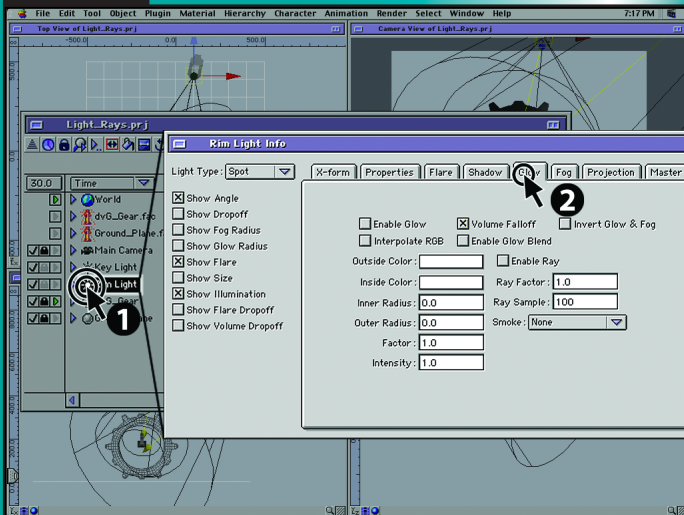


In the lower left of the Camera View window, **[CLK]** on the Snapshot button and select Window Size.

Pretty boring, isn't it? What's missing is the light visibility, or volumetric lighting. As you can tell, our lights are illuminating the objects, but we cannot see the ray of light itself. In order to see our light, we need to tell the light to become visible. This is where the Glow tab comes into play.

Keep this render open so that we can compare future renders to this.

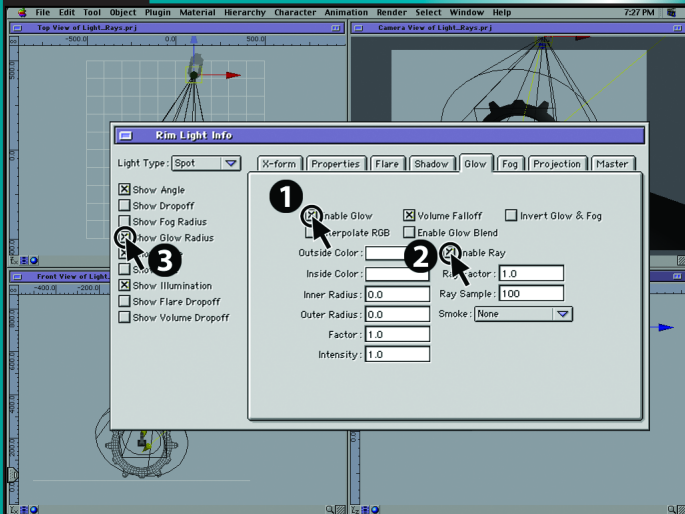




[DBL+CLK] the Rim Light to open its Light Info window.

In the Rim Light Info window, [CLK] on the Glow tab.



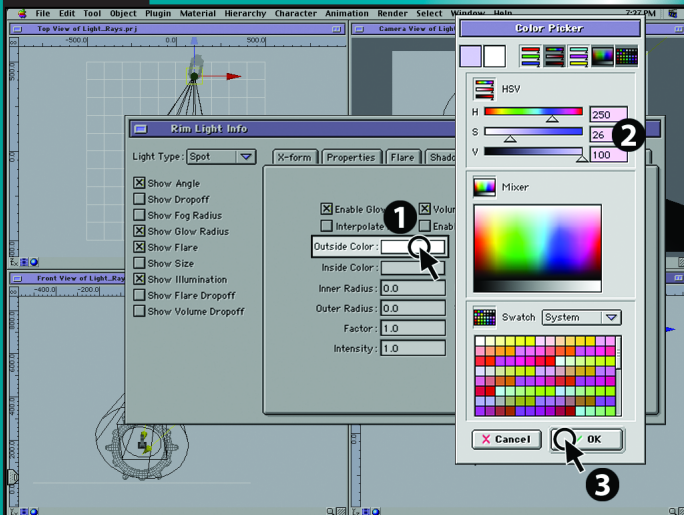


In the Glow tab, check the boxes Enable Glow and Enable Ray. Volume Falloff should already be checked.

In the column of checkboxes to the left (under Light Type), check the Show Glow Radius box.

Note: Enable Glow turned on the Glow effect, and Enable Ray allowed an object that is in the cone of the Light to actually obscure the light by providing Light Rays. Volume Falloff is just a natural looking falloff of the light source as distance comes into play. and Show Glow Radius will become apparent in the next few steps...





Since we are tired of looking at gray scenery, let's add a touch of color to our image...

Still in the Glow Tab, **[CLK]** on the Outside Color color box, and select a light blue color.

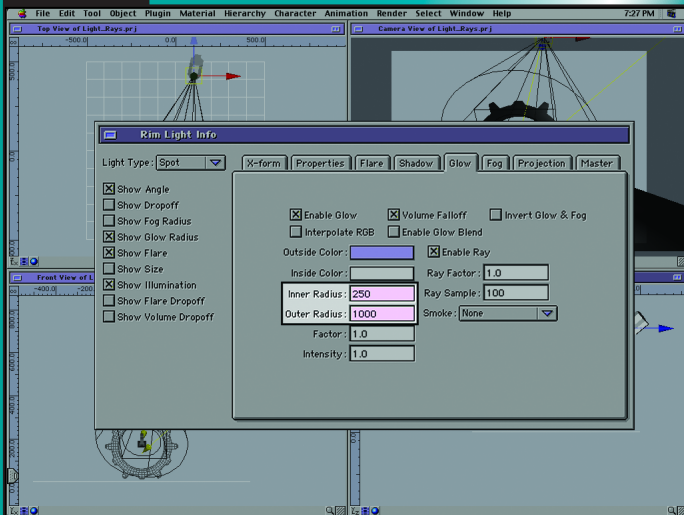
Here is the color that we used:

H: 250

S: 26

V: 100





Now, you would think that turning on the Enable Glow option would enable you to see the glow. Well, that's not the case. Right now the glow emanates from the light source and emanates right back onto itself. In other words, the glow does not go anywhere.

We need to set the distance of the glow, so...

As you enter the following values, watch the windows — specifically, the cone of the Rim Light.*

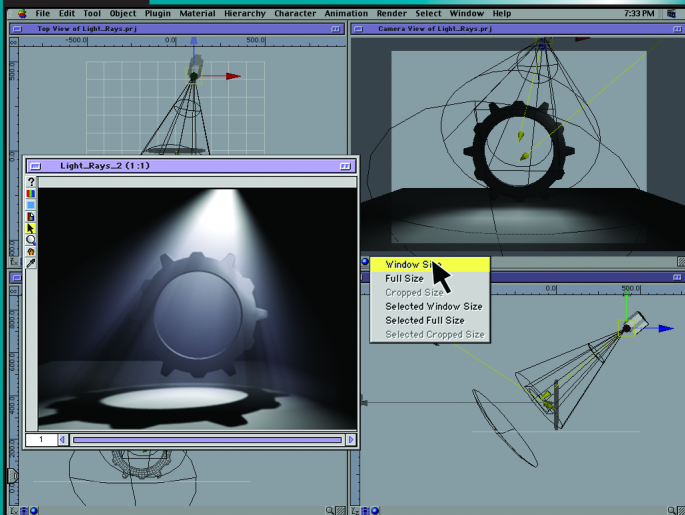
Set the Inner Radius to 250.

Set the Outer Radius to 1000.

Note: You may need to adjust these numbers depending on where your Rim Light is set.

*Enabling the Show Glow Radius in the previous step has allowed you to see where the glow begins and ends.





In the lower left of the Camera View window, **[CLK]** on the Snapshot button and select Window Size.

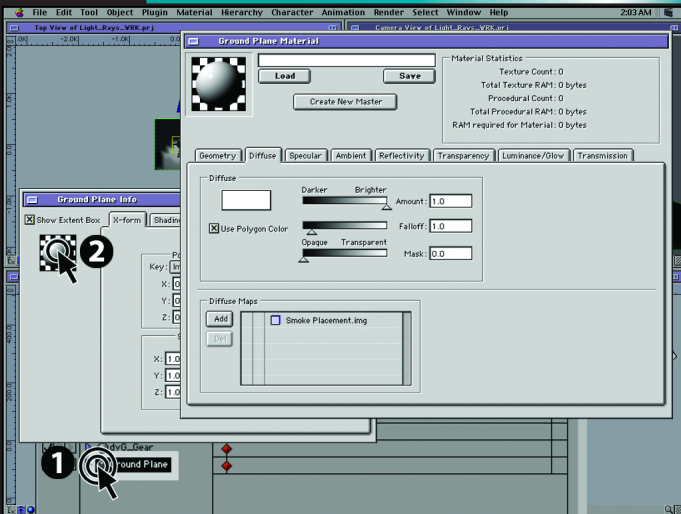
Compare this render with our previous render.

A lot is going on now. We have a light source casting a visible beam of light, plus casting rays as it interacts with the object, plus we have a shadow on the ground.

Now that's weird. We did not even touch the Shadow tab.

The reason (if you look at the Shadow tab now) is that for a Glow or Fog effect to work, Shadows needs to be turned on. Enabling Glow or Fog tells the light that "hey, we need to cast a shadow for this effect to work; if you're not on, you're on now." So now that we have Light Rays, let's take it a bit further and add some atmosphere to the light. How about a little smoke?





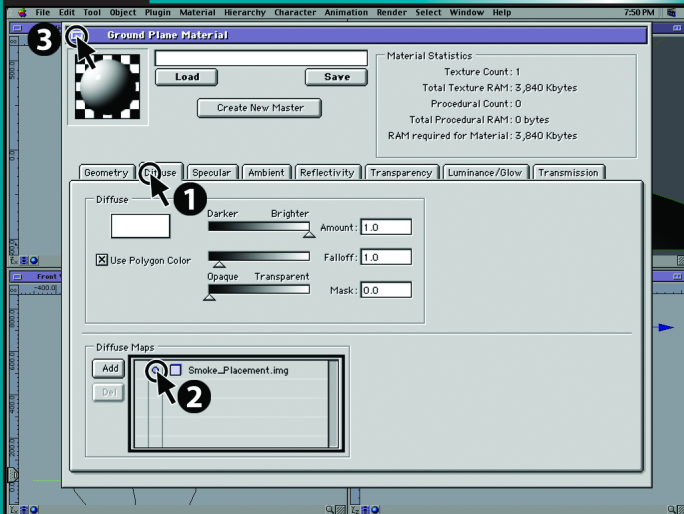
In the Project window, **[DBL+CLK]** on the Ground Plane object.

This opens the Ground Plane Info window.

[CLK] on the Material Ball.

This will bring up the Material Info window.





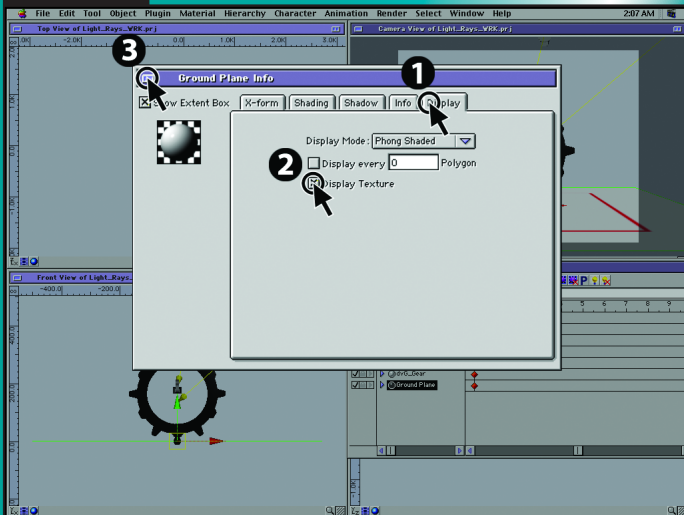
In Diffuse tab of the Material Editor, locate the `Smoke_Placement.img` in the Diffuse Maps setting.

In the column next to the `Smoke_Placement.img`, **[CLK]** to add a blue ball in there.

We just turned on the visibility of this map, which will be used to add our smoker element to the scene.

Close the Material Info window.





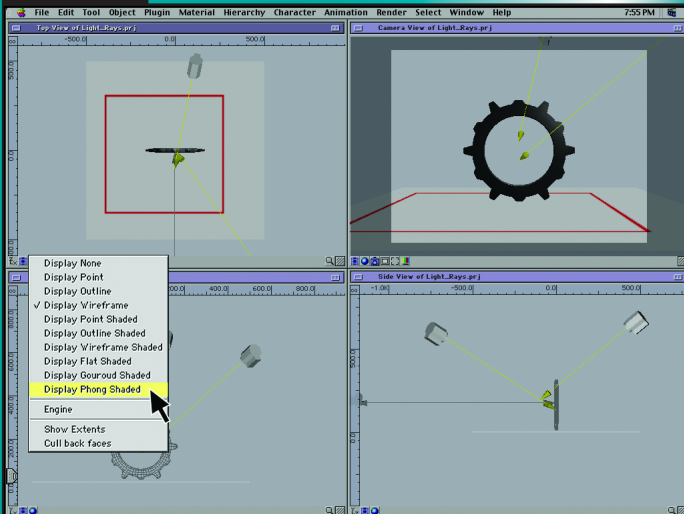
Back in the Ground Plane Info window, **[CLK]** on the Display tab.

[CLK] on the Display Texture checkbox.

This tab controls how the object should be viewed, when displayed, along with its texture maps.

Close the Ground Plane Info window.

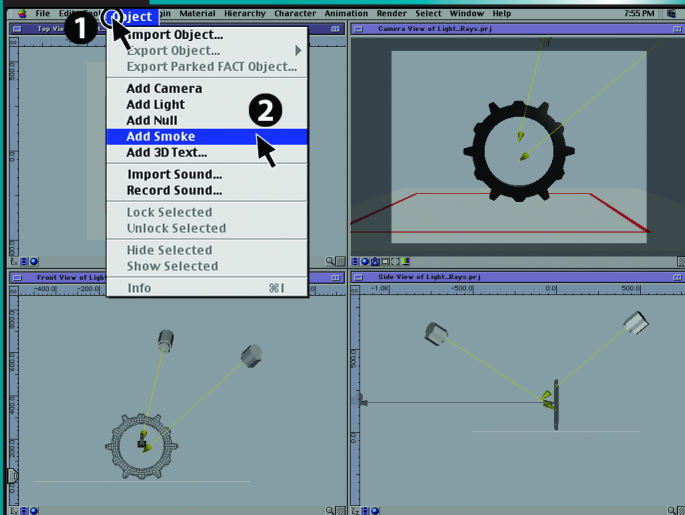




In the Top View window, **[CLK+HLD]** on the Shade Mode button (the blue ball in the lower left corner of the window), and in the pop-up menu, select Phong Shading (if it's not already selected).

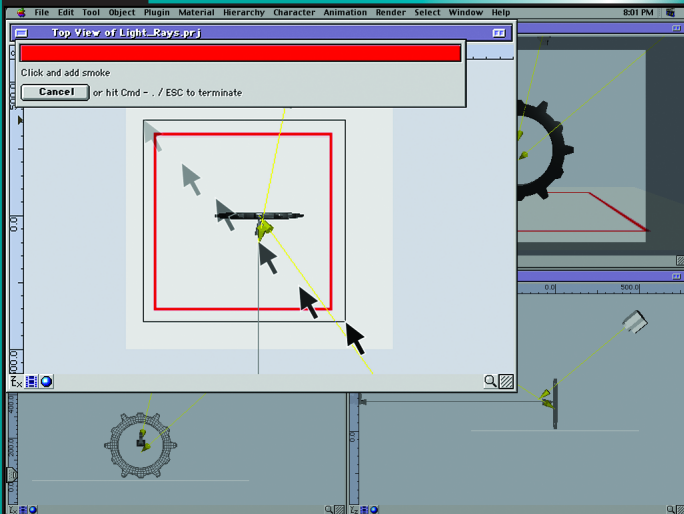
You should now see a red square on a white background. The red square is where we will add our Smoker object.





In the Main menu bar, select Object > Add Smoke.





In the Top View window, **[CLK+DRG]** a box on top of the red rectangle on the Ground Plane.

Note: This creates a volumetric area where the smoke resides.





[DBL+CLK] on the Rim Light to open the Rim Light Info window.

[CLK] on the Glow tab.



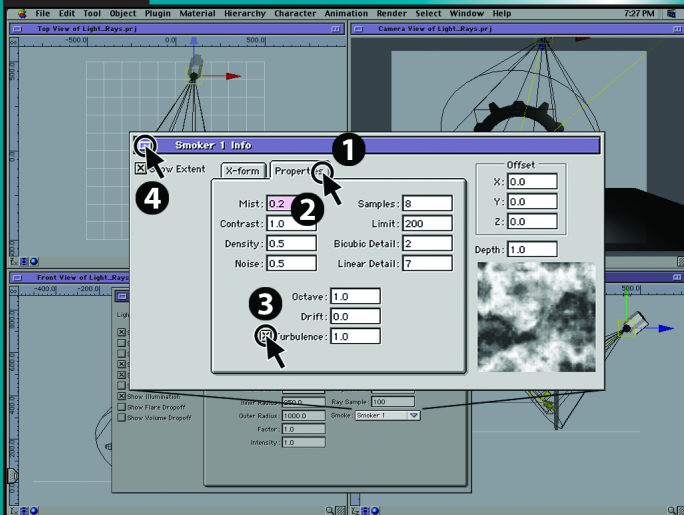


In the Glow tab, locate "Smoke: None" and **[CLK+HLD]** on None.

In the dropdown menu, select the Smoker 1 object.

We just added the Smoker object to this light source.





In the Smoker 1 Info Window, **[CLK]** on the Properties tab.

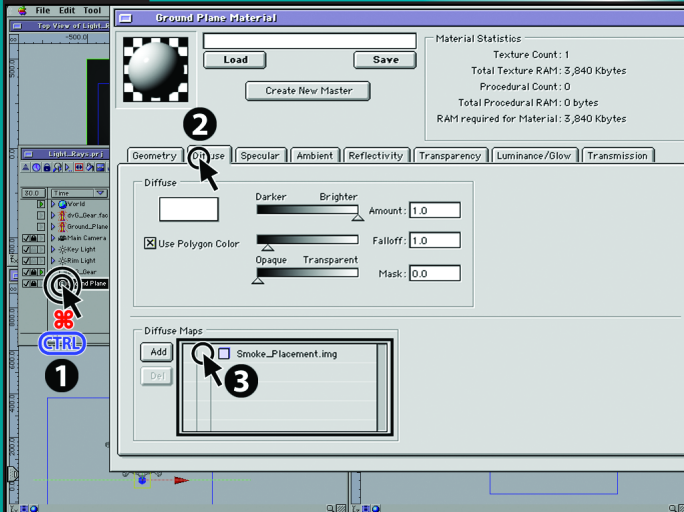
Change the following attributes:

Set the Mist setting to 0.2 and check the checkbox next to the Turbulence setting.

Mist controls the ambient smoke level of the scene, and Turbulence allows the layers of smoke, determined by the Octave value, to interact with one another.

Close the Smoker window.



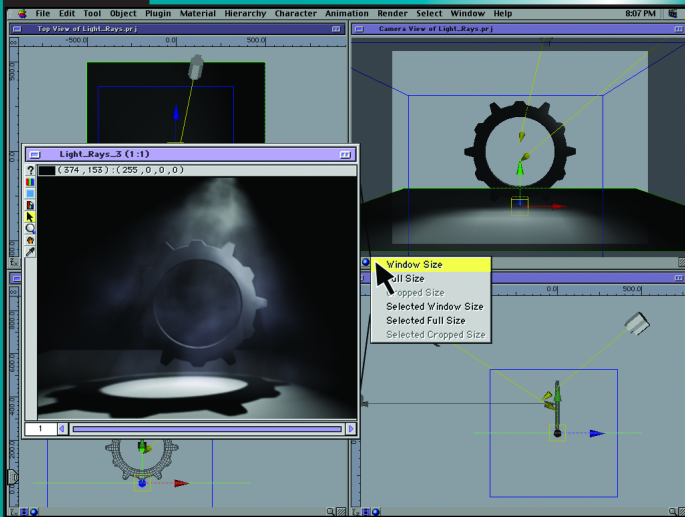


In the Top View window, press **[CMD/CTRL]** and **[DBL+CLK]** on the Ground Plane to open the Ground Plane's Material window.

Turn off the visibility of the `Smoke_Placement.img`. (**[CLK]** on the 3D blue ball.)

Close the Material window.



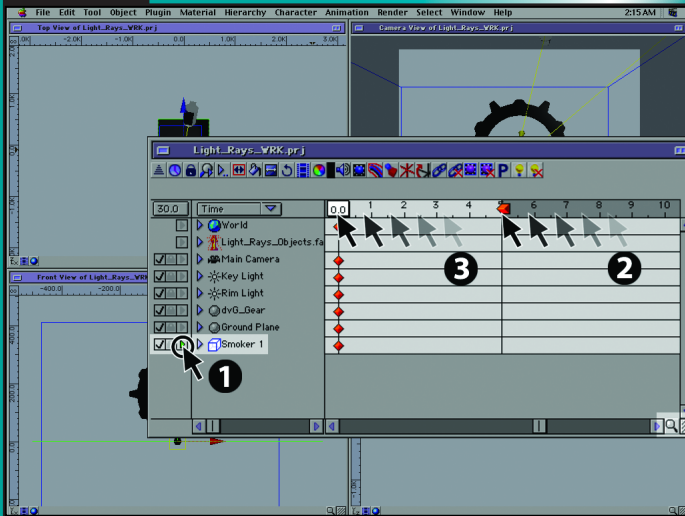


In the lower left of the Camera View window, **[CLK]** on the Snapshot button and select Window Size.

As you can see, our light rays are not only interacting with the object, but they are also interacting with the Smoker object.

Now that we've added some smoke, let's animate it.





Go back into our Light Rays project file and open the Project Window.

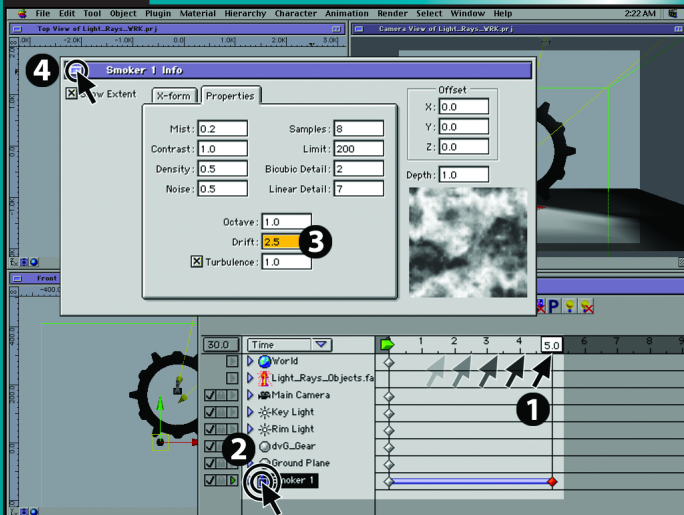
Single **[CLK]** on the animation triangle next to the Smoker 1 object.

We have now enabled the animation for the Smoker 1 object.

Drag the ending Time Marker (the red arrow) to the 5 second mark.

Move the Time Marker back to the beginning of the animation and press **[CMD/CTRL+K]** to set a keyframe.





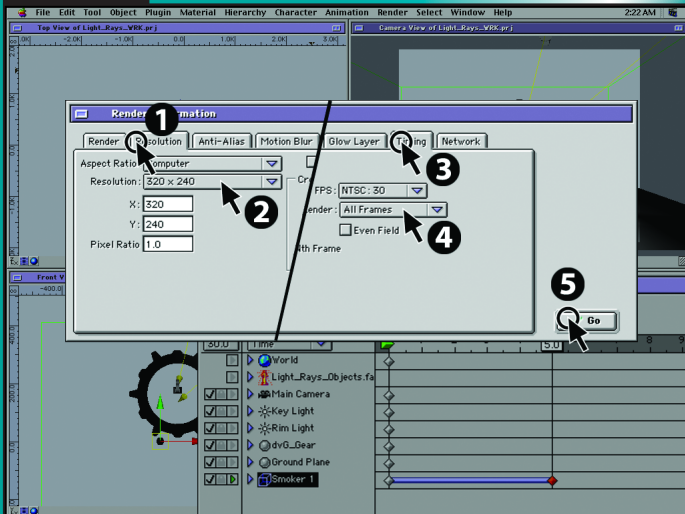
Move the Time Marker to the end of the animation at the 5 second mark, and **[DBL+CLK]** on the Smoker 1 object.

Enter 2.5 for Drift.

Drift controls the rate of motion of the smoke through the turbulence or blending of smoke layers when turbulence is enabled. This function works hand in hand with the octave value.

Close the Smoker 1 info window.





Press [**CMD/CTRL+R**] to bring up the Render setting dialog box. In the Resolution tab, set the animation to 320x240. In the Timing tab, make sure that Render is set to All Frames.

[**CLK**] Go.

You will be asked to Save the render. [**CLK**] OK and you will be prompted to save your file. [**CLK**] OK again to accept.

