

**Autodesk®
3ds Max®**

2009

Tutorials: Lighting and Rendering



Autodesk®

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Lighting and Rendering

The tutorials in this section relate to different lighting features that let you produce outstanding images and animations with 3ds Max. You will learn how to use a variety of lighting methods, how to render still images and animation, and how to use three powerful features in mental ray for achieving global illumination.

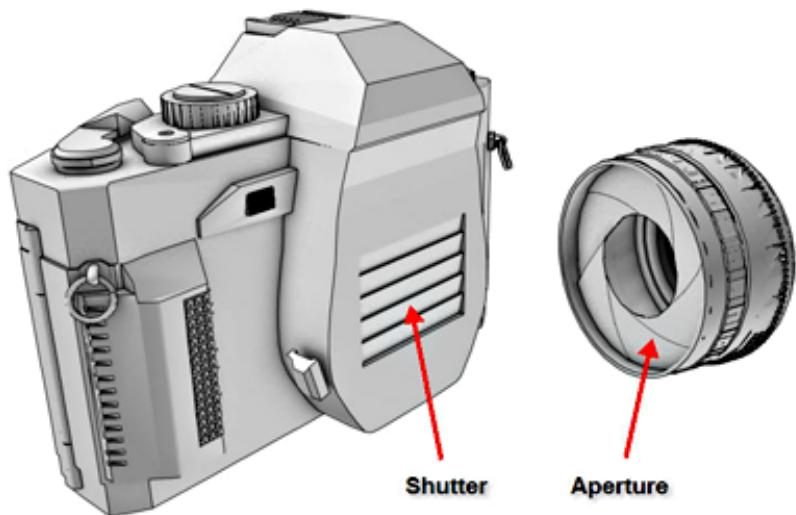
Features Covered in This Section

- Photometric illumination.
- Using daylight systems together with Sky Portal to illuminate a scene.
- Shadow creation and definition.

Photographic Concepts: A Primer

3ds Max uses concepts from the photographic world to help you design proper lighting conditions. Shutter speed and aperture are particularly important concepts to understand. They are used to control the amount of light in a scene. They also control focus effects.

If you are not familiar with how camera shutter speed and aperture can affect scene lighting and focus, read on. Otherwise, skip this section and proceed directly to the first tutorial.



Aperture

In photography, the aperture controls the amount of light passing through a camera lens. Most often, an iris diaphragm is used to control the opening. The various settings are called f-stops. The smaller the f-stop, the larger the opening. Standard f-stop values are f1.8, f2.8, f4, f5.6, f8, f11 and f16.

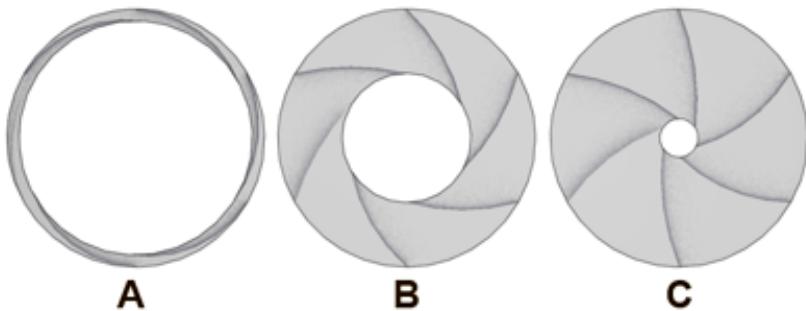


Figure A = f1.8

Figure B = f5.6

Figure C = f11

Aperture can also be used to control depth of field. Depth of field is a technique used to focus on a fixed point in a scene, called a focal plane. The area around the focal plane remains in focus, while the rest of the image is blurred. More blurring occurs when the aperture is wider (set to a smaller f-stop).

The next illustration shows the effect of depth of field in a scene. The focal plane is set short, so that the chair is in focus, leaving the background blurred.



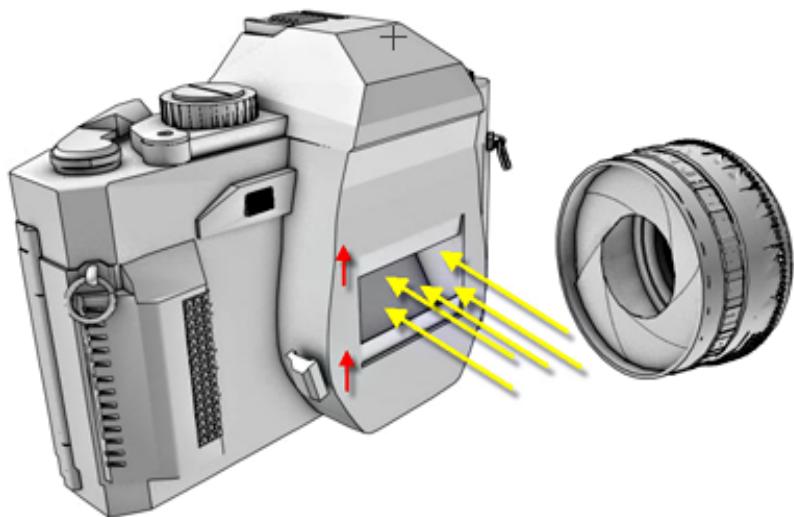
Next

[Shutter Speed Control](#) on page 1171

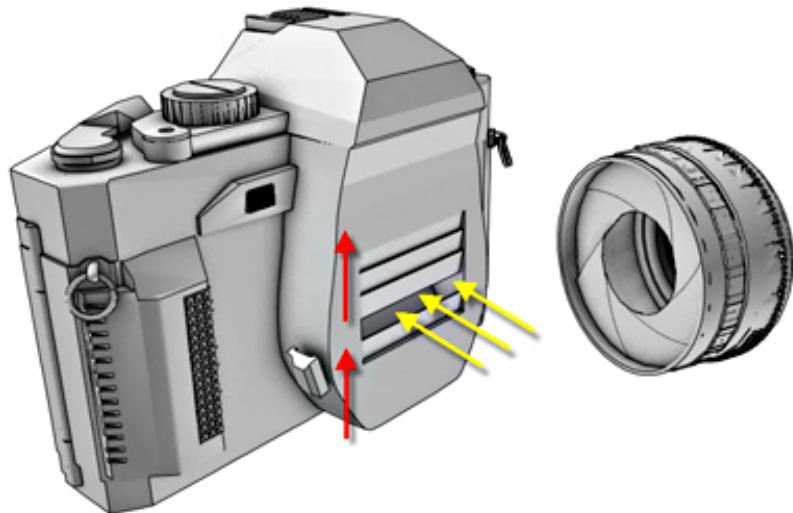
Shutter Speed Control

A camera shutter is set to various speeds, each of which determine the length of time a film is exposed. Shutter mechanisms are commonly blinds-like components that open progressively. Most often, they open up vertically, although they can also open up horizontally. Some devices, especially motion-picture cameras, have rotating shutters.

If the blades move slowly, a bigger slit opens and more light comes in. This is useful for dark environments or ones where there isn't a lot of motion. (Fast-moving objects, like a car racing by, blur when shutter speed is set too low.)



If the blades move fast, the slit is smaller and less light travels through the lens. This is useful for fast-moving action or bright environments with sun, snow, and sand.

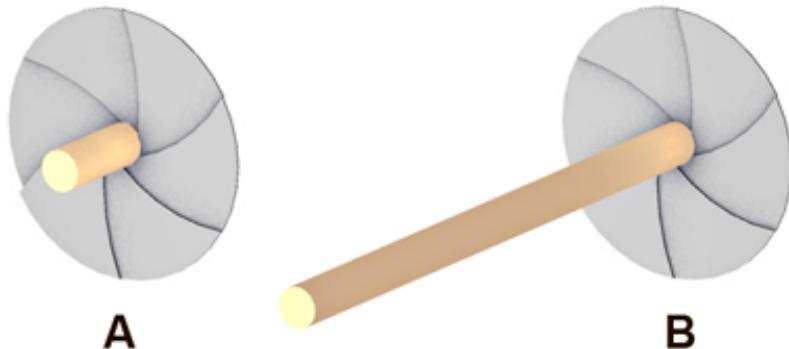


Next

[Aperture and Shutter Speed](#) on page 1173

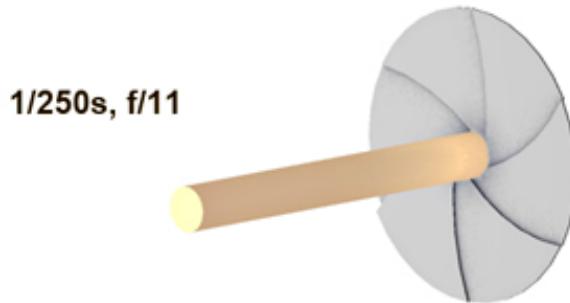
Aperture and Shutter Speed

The following graphic illustrates the amount of light going through a lens set to an aperture opening of f11. In Figure A, shutter speed is fast and only a small amount of light travels through. In Figure B, shutter speed is slow and more light travels through.

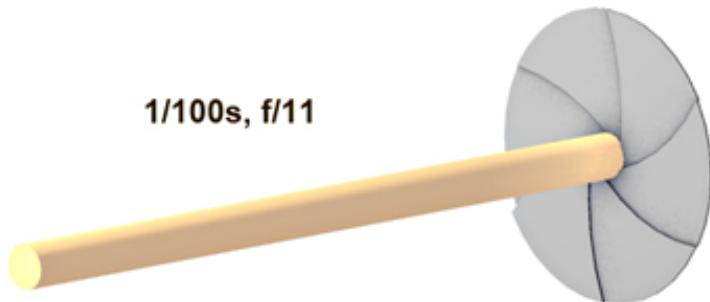


Usually, you need to adjust both the shutter speed and aperture value to ensure that an optimum amount of light enters the camera.

In an exterior setting on a sunny day, for example, you would combine a faster shutter speed with a small aperture to compensate for the bright environment.

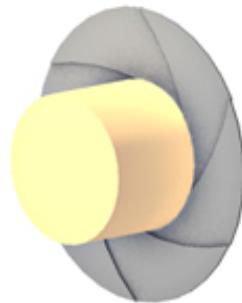


If the day is cloudy, however, you might want to reduce the speed so that more light travels through the lens. Otherwise, your shot will be underexposed and appear too dark.



1/100s, f/11

If your environment includes fast-moving objects, you may choose to use a faster shutter speed to prevent blurring. To compensate for the faster shutter speed, you would also need to open the aperture to let in more light.



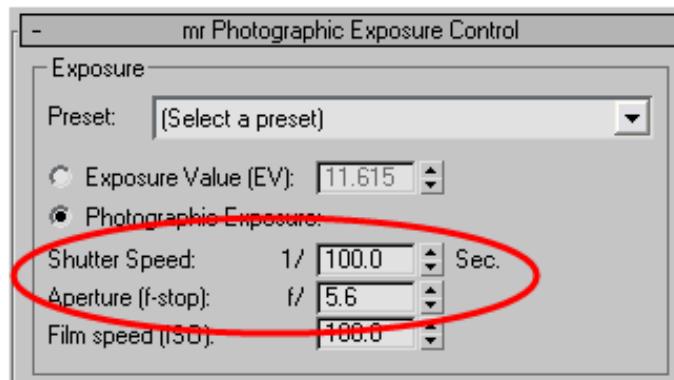
1/500s, f/2.8

The challenge is to strike an effective balance between shutter speed and aperture. A setting that works well in one situation might not necessarily work well in another.

Summary

As you develop your scenes in 3ds Max, you will need to experiment with various aperture and shutter-speed settings to obtain the right lighting condition.

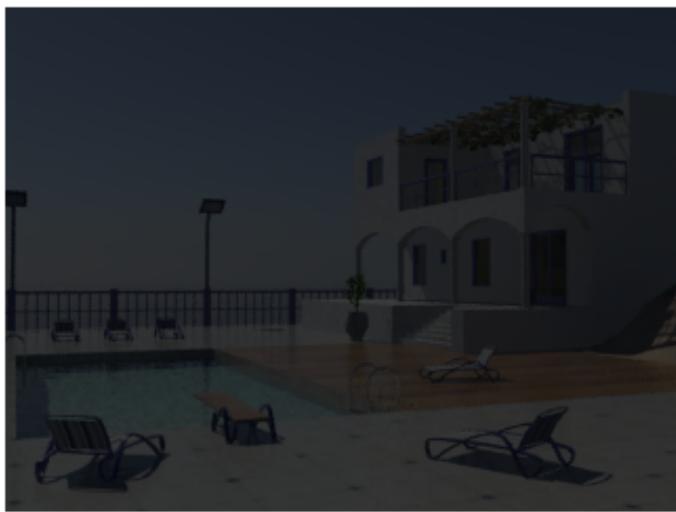
3ds Max provides you with a variety of exposure presets formulated to suit specific environmental conditions. You can then fine-tune your exposure by manually adjusting shutter speed and f-stops as needed.



The next three illustrations show the effects different exposure settings can have on an identical scene.



Properly exposed scene: shutter speeed 1/500s at f8.



Underexposed scene: shutter speeed 1/1000s at f16.



Overexposed scene: shutter speeed 1/100s at f5.6.

Lighting and Rendering a Daylight Scene

In this tutorial, you have the scene of an army compound that requires lighting conditions for early, mid-day and late-day illumination. To accomplish this, you will create a daylight system and customize it to specific scene location and time. Then, you'll set proper scene exposure and combine the daylight system with a Sky Portal object that will cast light into building interiors. You will fine-tune the late-day illumination by adjusting the aperture setting.

After completing these lessons, you will see how easy it is to use mental ray rendering options to create realistic daylight conditions.





In this tutorial, you will learn how to:

- Use daylight systems to illuminate scenes set in the daytime.

- Set up illumination based on the scene's geographic location, orientation, and time of day.
- Use the Sky Portal object to gather skylight and apply it to the interior of buildings.
- Adjust scene exposure.

Skill level: Intermediate

Time to complete: 1 hour

Files for This Tutorial

All the files necessary to do this tutorial can be found on the program disc. Before doing the tutorials, copy the `\tutorials\lighting_and_rendering` directory from the disc to your local program installation.

Adding Daylight Illumination

Start by switching from the default 3ds Max renderer to the mental ray renderer.

Set up the lesson:

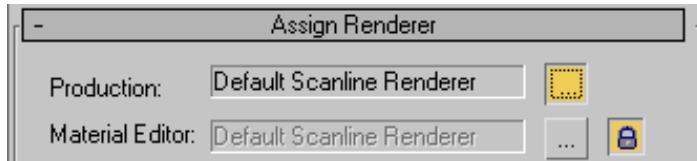
- 1 From the `\tutorials\lighting_and_rendering` folder, open the scene file `army_compound-lighting_start.max`.



- 2 On the main toolbar, click Render Setup to open the Render Setup dialog.



- 3 On the Common tab > Assign Renderer rollout, click the browse button for the Production renderer (at present the label says "Default Scanline Renderer").



A Choose Renderer dialog opens.

- 4 In the Choose Renderer dialog, choose mental ray Renderer, then click OK.
- 5 Close the Render Setup dialog.

- 6  On the main toolbar, click Render.



- 7 Close the rendered frame window.

Default lights provide basic illumination in the scene, with textures and materials applied, but the rendered image appears flat and not very realistic. You need to add daylight to the scene. This will be generated by a daylight system comprising two mental ray photometric light sources:

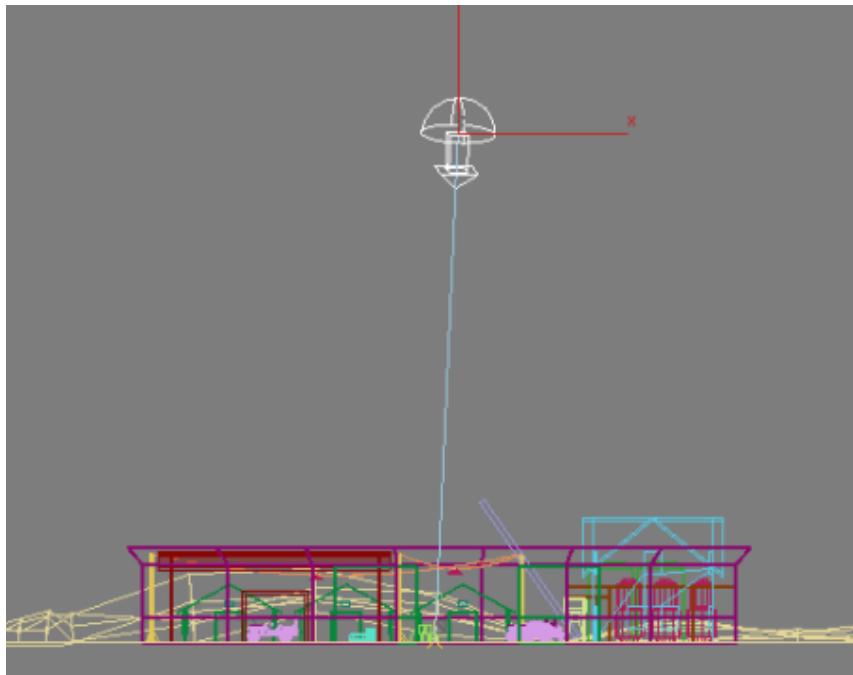
- mr Sun, which simulates direct light from the sun.
- mr Sky, which simulates indirect light created by the scattering of sunlight in the atmosphere.

These two light sources will be accompanied by the mr Physical Sky environment shader, which establishes the physical representation of the sun and sky.

Create the daylight system:



- 1 On the Create panel, turn on Systems.
- 2 On the Object Type rollout, click Daylight to turn it on.
- 3 On the Daylight System Creation dialog box, click Yes to accept the recommended mental ray photographic exposure control value of 15.
- 4 In the Top viewport, click anywhere over the compound and drag slightly in any direction to create a compass rose.
- 5 Release the mouse button.
As soon as the mouse button is released, a Daylight object, or "sun," is created.
- 6 Move the mouse upward to position the daylight object in the sky. You can track the object's position in the Front viewport. The exact height of the daylight object in the sky is not important.



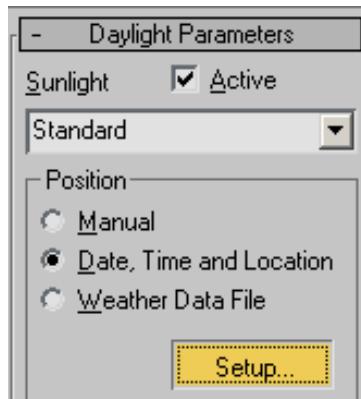
- 7** Click once to set the Daylight object position, then right-click to end Daylight creation.

Set the time and location of the light source:

Now you will reposition the Daylight object, or “sun,” so its position in the sky corresponds to the geographic location of the scene.



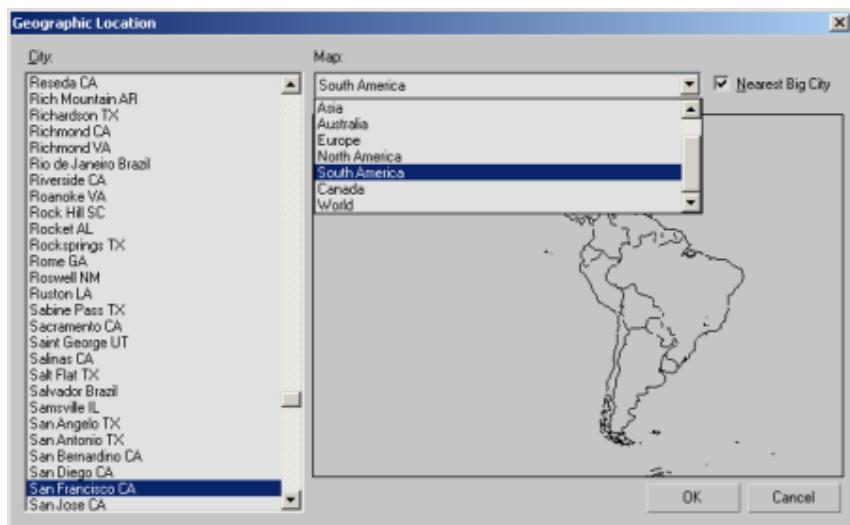
- 1** With the Daylight object selected, on the Modify panel > Daylight Parameters rollout, click Setup.
3ds Max displays the Motion panel.



- 2** On the Motion panel > Control Parameters rollout > Location group, click Get Location.

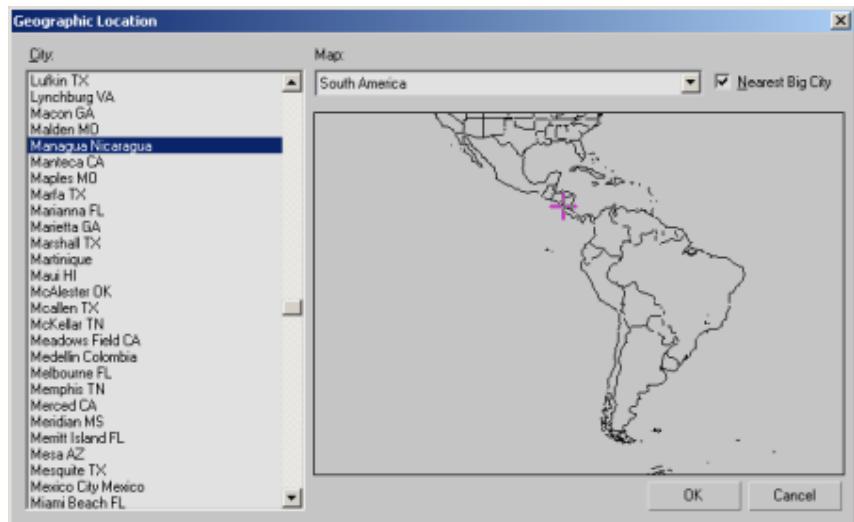


- 3 On the Geographic Location dialog box, Map list box, choose South America.



You will now choose Managua, the capital of Nicaragua, as the physical location of the scene.

- 4 On the map, click on Nicaragua, or choose Managua Nicaragua from the City list displayed to the left.



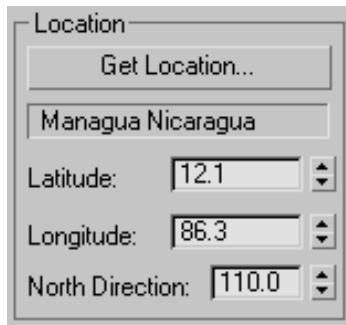
After you click OK, the compass rose and Daylight object are repositioned to scene coordinates that simulate the real-world latitude and longitude of Managua.

The Control Parameters > Time group displays controls that let you modify the date and time of day, which also affects the sun position. The first scene you will illuminate and render is morning at 9 AM.

- 5 In the Time group > Hours spinner box, set the time to **9**.



- 6 In the Location group, set North Direction to **110** degrees.



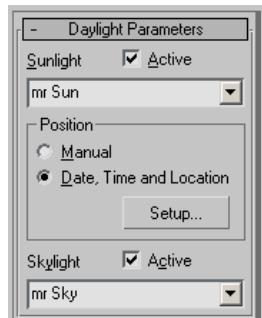
This adjustment will reorient the north-south position of the scene so when you render the late-day version of the scene, the sun disc will appear over the barracks as it prepares to set in the west.

- 7 Right-click the Camera01 viewport and press F9 to render the scene.



The scene looks good, but can be improved.

- 8 With the Daylight object selected, go to the Modify panel.
- 9 On the Daylight Parameters rollout > Sunlight drop-down list, choose mr Sun, and from the Skylight drop-down list, choose mr Sky.



- 10 A dialog box appears, asking if you want to use the mental ray Physical Sky shader. Click Yes to apply the mr Physical Sky shader to the scene.



Note how the regions behind the barracks doorways remain unnaturally dark. You could solve this problem by increasing the number of ray bounces next to the Indirect Lighting control. Alternatively, you could add a Sky Portal. This method is described in the next lesson.

Using Sky Portal and Photographic Exposure Control

Sky Portal is a light object that gathers the sky light (as opposed to direct sunlight) generated by the daylight system. It then directs the light flow to the interior of selected scene objects.

NOTE The Sky Portal generally requires less rendering time than the Global Illumination option. It is an effective alternative to quickly visualize a scene.

Add the Sky Portal:

- 1 Continue working on your own scene file, or from the `\tutorials\lighting_and_rendering` folder, open the scene file `army_compound-lighting_daylight.max`.

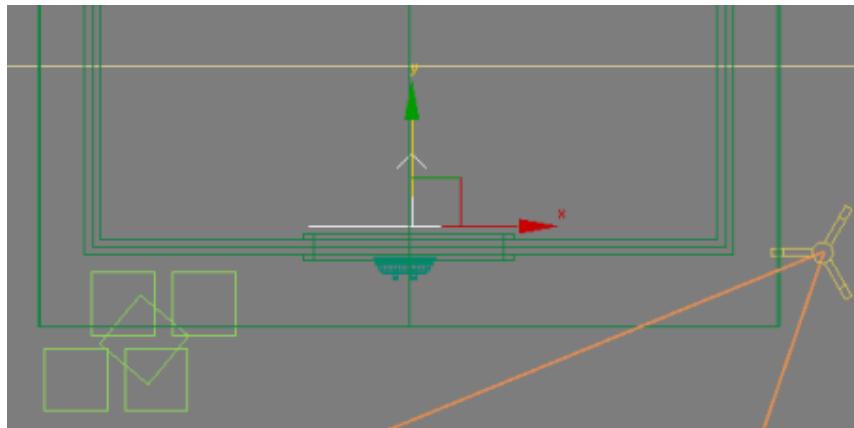


- 2 On the Create panel, click Lights.
Photometric should be chosen on the drop-downlist.
- 3 On the Object Type rollout, click mr Sky Portal, then turn on Autogrid.
- 4 In the Camera01 view, create the Sky Portal by dragging diagonally from the upper-left corner of the far right barracks entrance to the lower-right corner, until the entire opening is covered.



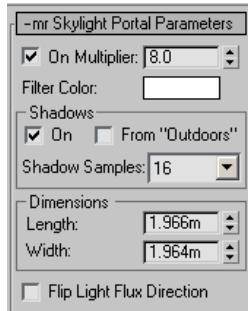
The Sky Portal should not be much larger than the door.

- 5 Right-click to complete creating the Sky Portal.
- 6 Right-click the Top viewport and zoom into the scene until you can clearly see the barracks entrance nearest to the Sky Portal object.
- 7  Reposition the Sky Portal so it lies just inside the barracks entrance.



If the Sky Portal was placed outside the entrance, the sides of the door frame would attract unneeded illumination.

-  8 With the Sky Portal object still selected, go to the Modify panel. On the mr Skylight Portal Parameters rollout, turn on On Multiplier and specify a value of **8**.



You would typically specify a lower multiplier value if Sky Portal objects were added to other doors and windows in the barracks.

- 9 Shift+drag the Sky Portal to the left and create two instances of the Sky Portal for each of the two remaining barracks in the scene. Position the portals at their respective entrances.



- 10 Activate the Camera01 viewport, press F9 to render the scene, and compare the result with the cloned copy of the previous rendering.



The result is much improved. The Sky Portal is now channeling sky light into the barracks.



- 11 Make a clone of the rendered frame and minimize it.

Set illumination for mid and late afternoon:



- 1 Select the Daylight system (select the sun object, not the compass rose). On the Motion panel > Time group > Hour spinner box, set the time to **14** (2pm).
- 2 Make sure you have camera view active and render the scene.



The shadow of the suspended light next to the jeep indicates that the sun is almost directly overhead. One problem exists however: the Sky Portal is transferring too much light into the barracks.



- 3 Select any Sky Portal object, go to the Modify panel, and on the mr Skylight Portal Parameters rollout > On Multiplier field specify a value of **5.0**.

Because you instanced all copies of the Sky Portal, any change you make to one object will be passed on to the others.



- 4 Render the scene and make a clone of the rendered frame.



Compare the latest rendered frame with the one you cloned earlier. The entrance illumination is subtle but more realistic.

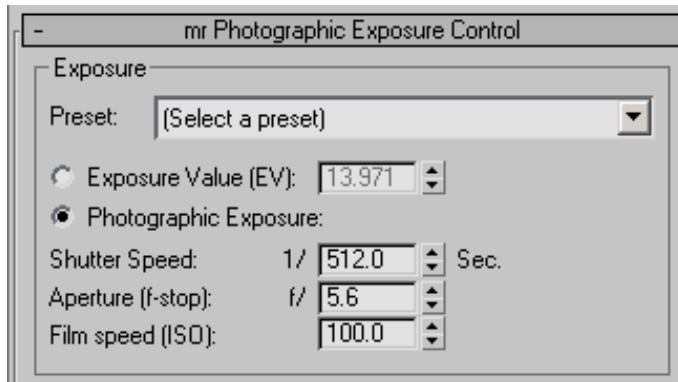
You will now generate a third rendered version of the scene, this one showing late-day illumination.

- 5 Select the Daylight system and in the Motion panel > Time group > Hour spinner box, set the time to **17** (5pm).
- 6 Render the scene.



The army compound is too dark for this time of day. You will use exposure control to adjust scene illumination.

- 7 On the Rendering menu, choose Exposure Control to open the Environment And Effects dialog.
- 8 On the Exposure Control rollout, make sure Photographic Exposure is turned on and set Aperture (f-stop) to **5.6**.



- 9 Render the scene.



The lighting conditions better reflect the time of day. Compare the rendered frame with the other cloned frames to see how you have created three distinct moods based on mental ray lighting techniques.

Summary

You can create a daylight system to simulate real-world outdoor lighting conditions at any time of day, at any location on the planet. mental ray offers a range of presets that define proper exposure settings, which you can adjust manually as needed. A Sky Portal object can be added to channel daylight into doorways and windows of structures, to enhance their interior illumination.

Lighting and Rendering a Nighttime Scene

In this tutorial, you will illuminate a nighttime scene of an army compound. You will create photometric lights that replicate real-world lighting systems, then add a touch of realism using the mental ray Glare effect.



In this tutorial, you will learn how to:

- Place photometric lights in a scene and adjust light color.
- Set shadow parameters so lights cast shadows properly.
- Use render presets to quickly set night scene exposure.
- Use a bitmap image as the scene background and adjust the bitmap exposure, brightness and contrast to compensate for night lighting conditions.

Skill level: Intermediate

Time to complete: 1 hour

Files for This Tutorial

All the files necessary to do this tutorial can be found on the program disc. Before doing the tutorials, copy the `\tutorials\lighting_and_rendering` directory from the disc to your local program installation.

Adding Photometric Lights

Start by switching from the default renderer to the mental ray renderer, if you have not already done so. You will then add photometric lights that will provide illumination to the night scene.

Set up the lesson:

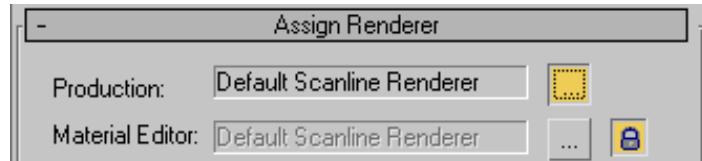
- 1 Choose File > Reset, and accept the prompt dialogs to reset 3ds Max.
- 2 From the `\tutorials\lighting_and_rendering` folder, open the scene file `army_compound-lighting_start.max`.



- 3 On the main toolbar, click Render Setup to open the Render Setup dialog.



- 4 On the Common tab > Assign Renderer rollout, click the browse button for the Production renderer (at present the label says “Default Scanline Renderer”).



A Choose Renderer dialog opens.

- 5 Choose mental ray Renderer and click OK.
- 6 Close the Render Setup dialog.



- 7 Activate the Camera01 viewport, and on the main toolbar, click Render.

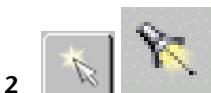
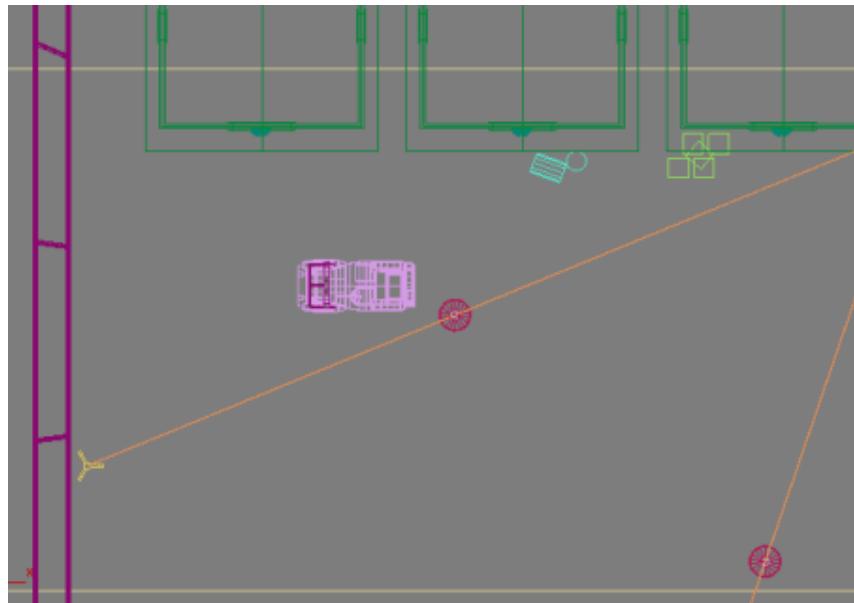


This is the same starting point as the previous tutorial, with default lights providing basic illumination. You will now add photometric light objects to illuminate the scene.

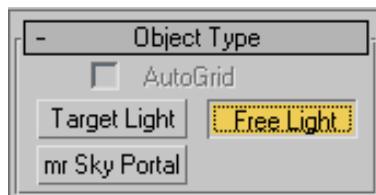
- 8 Close the Rendered Frame Window.

Set up the photometric lights:

- 1 Activate the Top viewport and zoom in to the overhead lamp next to the *jeep01* object.



- 2 On the Create panel, choose Lights.
- 3 If AutoGrid is on, turn it off.
- 4 On the Object Type rollout, click Free Light to turn it on.

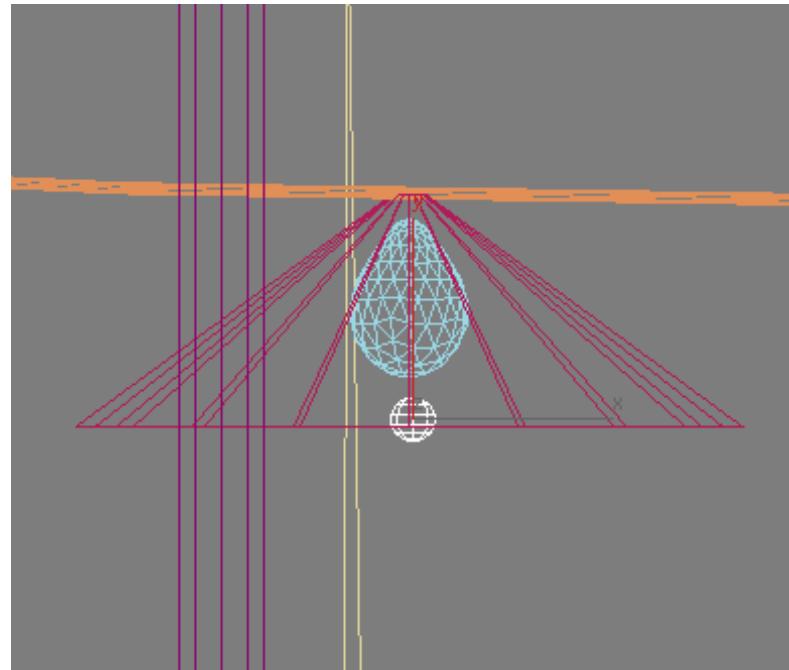


- 5 On the Photometric Light Creation dialog box, click Yes to apply the mr Photographic Exposure Control settings to your scene.
- 6 Click once on the center of the lamp shade to create the light object.



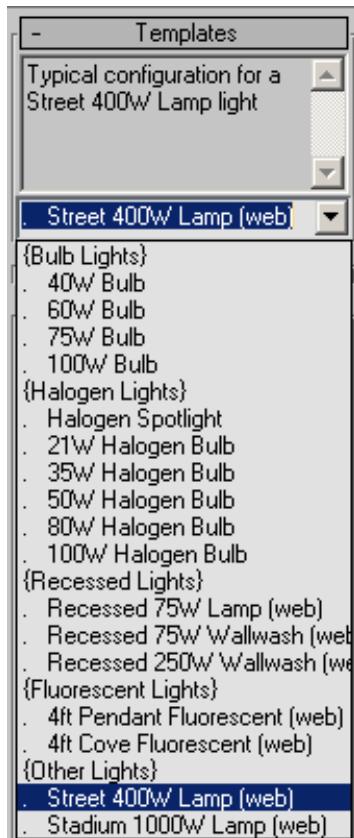
By default, the light object is created on surface plane of the scene.

- 7  Activate the Front viewport and use the Select And Move tool to move the light object on its Y axis until it is just below the lamp light bulb.



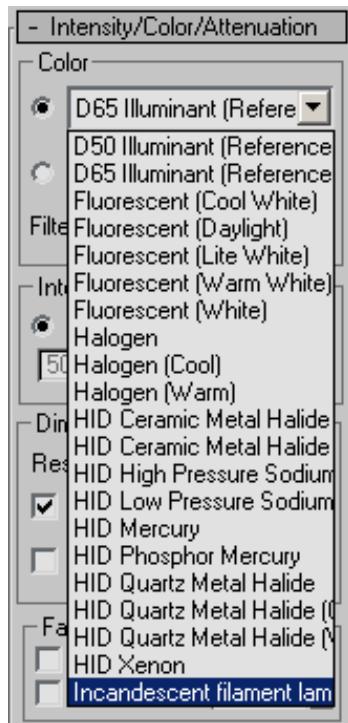
Do not position the light object inside the bulb itself. Otherwise, it will cast unwanted shadows.

- 8 Go to the Modify panel > Templates rollout and choose Street 400W Lamp (Web).



Next, you will choose the color of the light to be cast. You have two ways to do this: you can specify color by the type of object that emits the light, such as an incandescent bulb or fluorescent tube. Or you can specify light color by its temperature, in degrees Kelvin.

- 9 On the Intensity/Color/Attenuation rollout > Color group list box, choose Incandescent Filament Lamp.



The adjacent color chip updates to match the color temperature of your light selection and displays its corresponding value in degrees Kelvin.

- 10 Activate the camera viewport and press F9 to render the scene.



The image is too bright because you have not set the proper exposure for this type of lighting environment.

Set scene exposure:

- 1 On the Rendering menu, choose Exposure Control to open the Environment And Effects dialog.
- 2 On the mr Photographic Exposure Control rollout > Exposure group, make sure Photographic Exposure is turned on, then specify a Shutter Speed of **1/2.0** second, then render the scene.

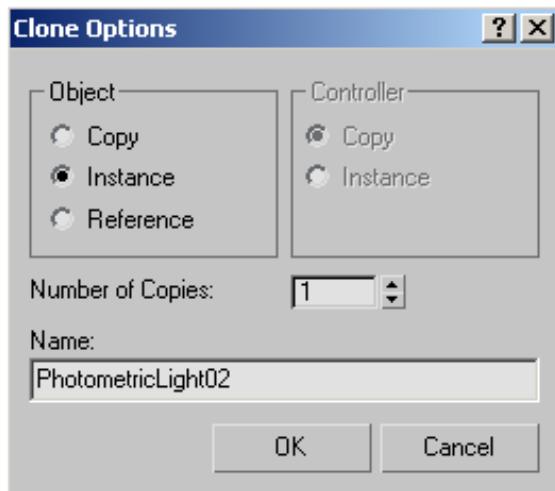


The scene is much improved, but light is only falling on the central part of the compound. You need to add another overhead light.

- 3 Close the Environment And Effects dialog.

Add more lights and introduce shadows:

- 1 Activate the Top viewport and zoom out until you can see the other light fixture, to the lower right.
- 2 Shift+move the light object until it is just below the other light fixture. A Clone Options dialog displays.

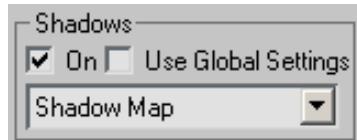


- 3 In the Object group, turn on Instance to create an instance of the light object then click OK.
- 4 Activate the Camera01 viewport and render the scene again.

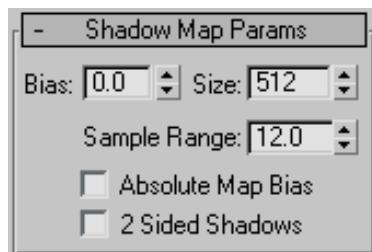


The rear area of the compound is now illuminated, but objects in the scene cast no shadows.

- 5 With either light selected, go to the Modify panel > General Parameters rollout > Shadows group and turn shadows on.



- 6 On the Shadow Map Params rollout, reduce Bias to **0** (to set shadows closer to shadow-casting object) and set Sample Range to **12.0**. Setting Sample Range to a value of greater than 0 generates soft-edged shadows.



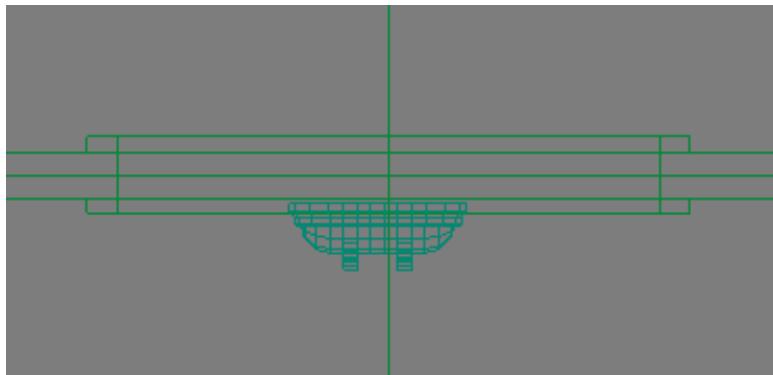
- 7 Render the scene.



Note the improvement that shadow casting has on the rendering of the jeep.

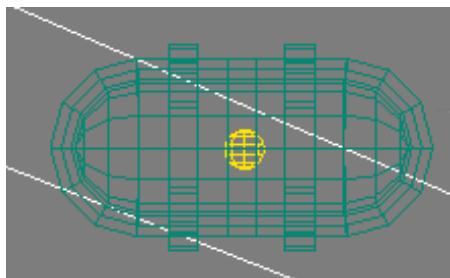
Next, you will add a light object to each barracks light fixture.

- 8 Close the rendered frames, activate the Top viewport, and zoom in to the light fixture above the entrance to the far left barracks.

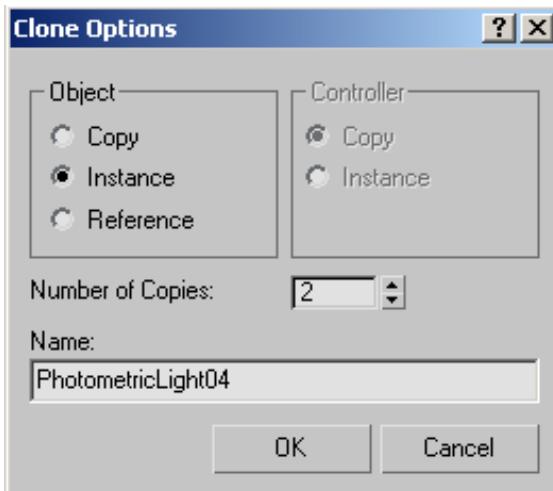


- 9 On the Create panel, choose Lights.
- 10 On the Object Type rollout, click Free Light.
- 11 Click once on the center of the light fixture to create the light object.

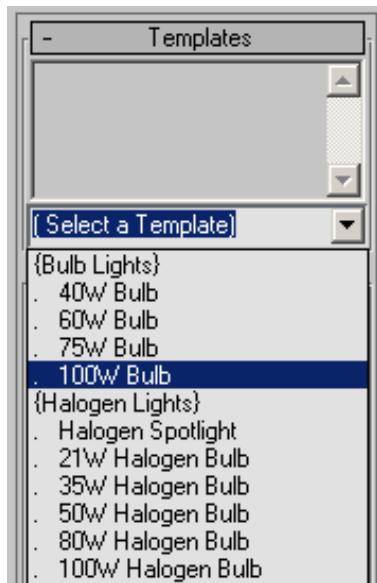
- 12 Activate the Front viewport and use the Move and Select tool to move the light object on its Y axis until it is level with the light fixture.



- 13 In the Top viewport, zoom out until you can see all three doorways, then Shift + drag the light to the right, creating two instances of the light, each positioned above one of the remaining two barracks entrances.



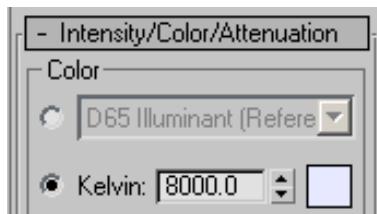
- 14 With any of the barracks doorway lights selected, go to the Modify panel > Templates Rollout, and choose 100W Bulb.



Keep in mind that the light you choose in this list possesses the same properties as real-world lights do. In terms of light attenuation, for example, for every 10 meters distance travelled, light intensity from this bulb will drop off to 1/100th of its initial strength.

- 15 On the Intensity/Color/Attenuation rollout > Color group, assign a Kelvin value to the light cast by the bulb. You want the bulb to project a light blue color, so click to choose Kelvin, and then enter a value of **8000.0**.

In the range of degrees Kelvin, light color varies from 1000 (pink) to 20,000 (blue).



- 16 Activate the Camera01 viewport and render the scene.



All objects in the scene foreground look properly lit.

Next

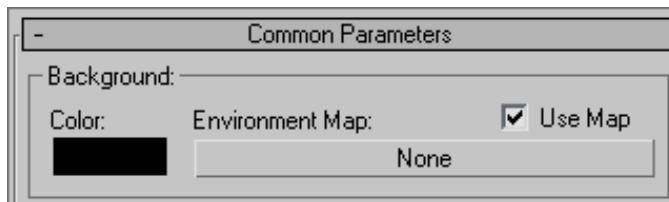
[Adding a Background Image and Lighting Effects on page 1211](#)

Adding a Background Image and Lighting Effects

You will now take a daylight image of a desert panorama, adjust its contrast and exposure to resemble night lighting conditions, then incorporate the result into the scene as a backdrop. You'll introduce a few more photometric lights to illuminate the interior of the barracks, then add a glare effect as a finishing touch.

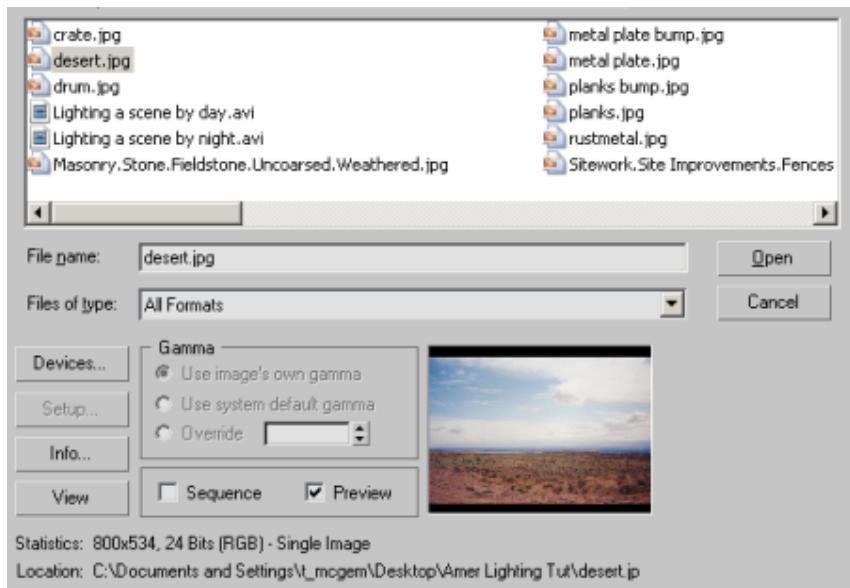
Add background image and set exposure:

- 1 Continue working on your own scene file, or from the `\tutorials\lighting_and_rendering` folder, open the scene file `army_compound-lighting_no_bkrnd.max`.
- 2 From the Rendering menu > Environment > Common Parameters rollout, click the Environment Map button (at present, the text on the button says "None").



3ds Max opens the Material/Map Browser.

- 3 On the Material/Map Browser, double-click the Bitmap map type.
- 4 In the file dialog, navigate to the \tutorials\lighting_and_rendering folder and click *desert.jpg* to highlight it.



- 5 In the file dialog, click View.

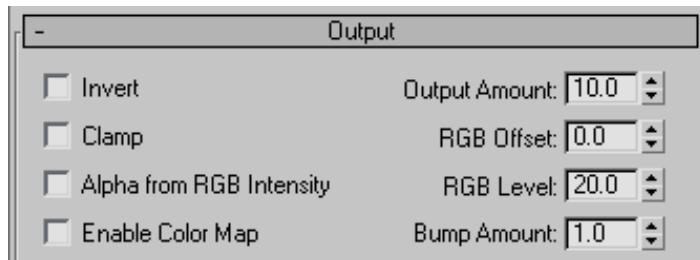
The image is a desert landscape, taken during the day. You will need to adjust image brightness and contrast to make it suit the nighttime scene.

- 6 Close the bitmap view, then click Open to add the image as a background to the scene.
- 7 Make sure no object is selected in the viewports, then right-click to display the quad menu.
- 8 Choose Hide Unselected, then render the scene.

With objects hidden, you are rendering only the background. However, the rendered frame shows nothing but black because mental ray has undercompensated the exposure.



- 9 Press M to open the Material Editor.
- 10 Drag the Environment Map button from the Environment And Effects dialog onto any unused sample slot in the Material Editor.
A prompt asks if this should be an instance or a copy. Make sure Instance is selected, and then click OK.
- 11 Close the Environment And Effects dialog.
You will now use the Material Editor to adjust the color and contrast of the bitmap to compensate for the low-exposure night scene.
- 12 On the Material Editor > Output rollout, increase Output Amount to **10.0** and RGB Level to **20.0**.



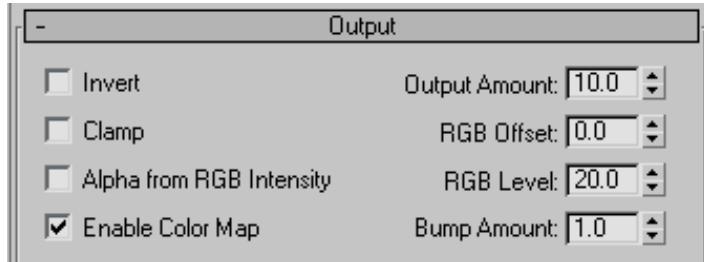
These values will restore the output value of the original bitmap.

- 13 Render the image.

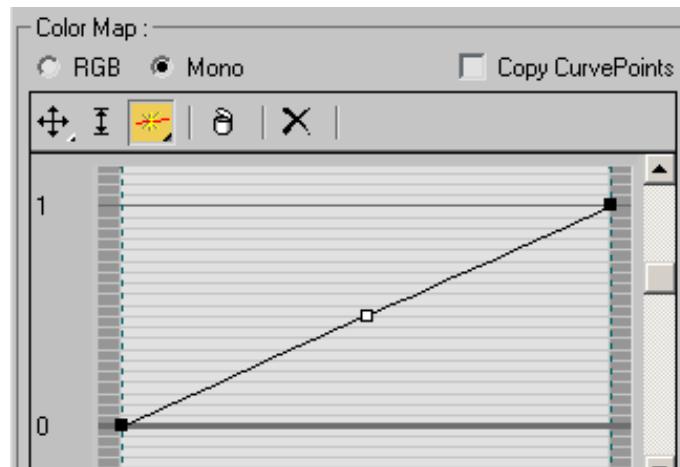


The image appears washed out. Adjusting image contrast should solve this problem.

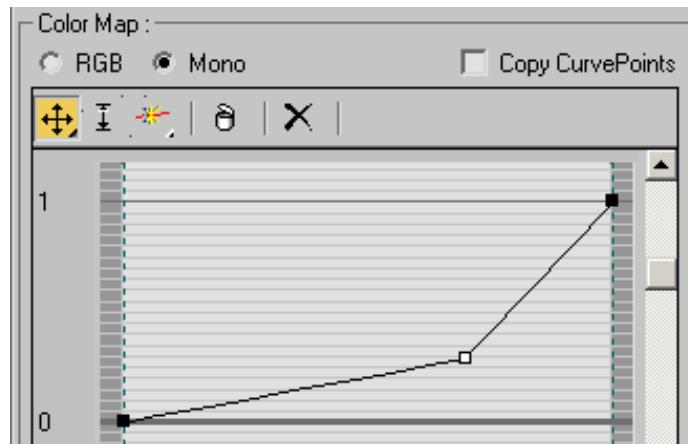
- 14 On the Output rollout, turn on Enable Color Map.



- 15 In the Color Map group, click the Add Point button, then click at the midpoint of the color map graph.



- 16 Click the Move Point button and drag the new point down and to the right as shown in the next illustration.



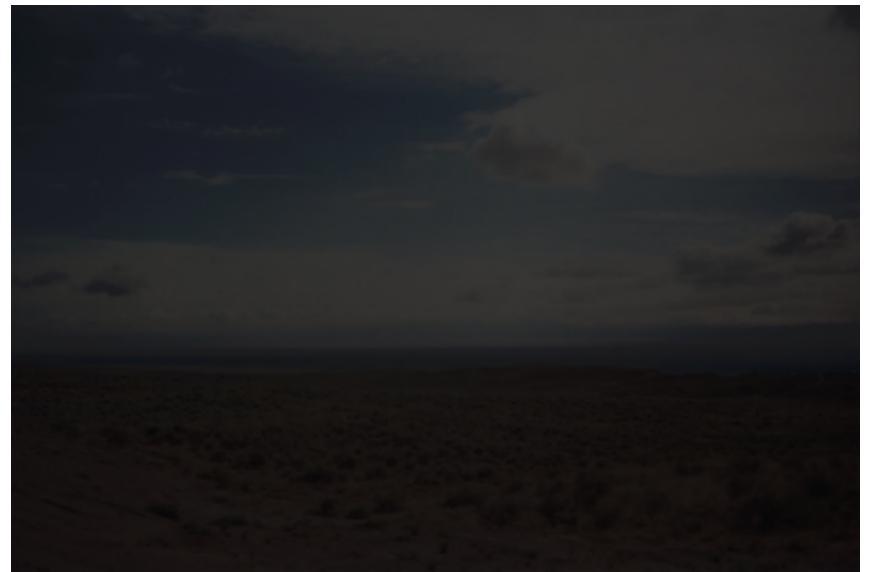
- 17 Render the image again.



The color map has generated more contrast, emphasizing features that will still be visible after you deliberately underexpose the image in the next step.

- 18 On the Output rollout, decrease the Output Amt to **1.0** and RGB Level to **10.0**.

The result is a heavily underexposed scene, resembling a night sky: a digital version of filming “day for night.”



- 19 Right-click any viewport, select Unhide All from the quad menu, then render the scene again.



The background is properly exposed, adding depth and interest to the scene.

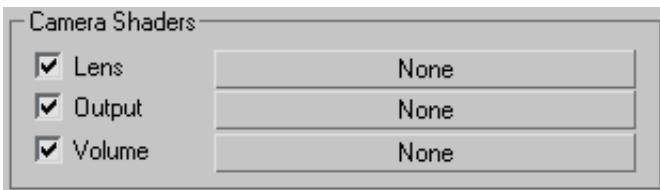
20 Close the Material Editor.

Add glare effects:

mental ray provides a number of special effects designed to give light objects added realism. Here, you will add a glare effect to the army compound lights, to simulate their interaction with dust particles and ambient humidity.



- 1** Click Render Setup, and on the Render Setup dialog > Renderer tab > Camera Effects rollout > Camera Shaders group, turn on the Output shader button.



3ds Max opens a Material/Map Browser.

- 2** Close the Render Setup dialog.



- 3** Make a clone of the existing rendered frame, then render the scene.

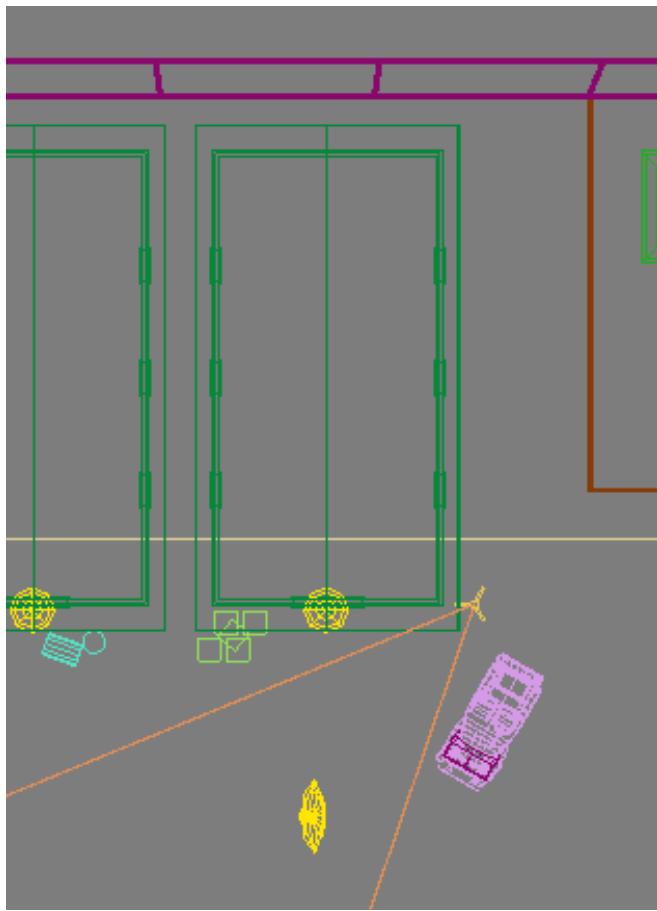


Compare the two rendered frames to see the glare effect. This effect is most pronounced on the suspended lamp over the jeep.

- 4 Close the rendered frames.

Add interior lights:

- 1 Activate the Top viewport, then zoom and pan until the far right barracks comes into view.



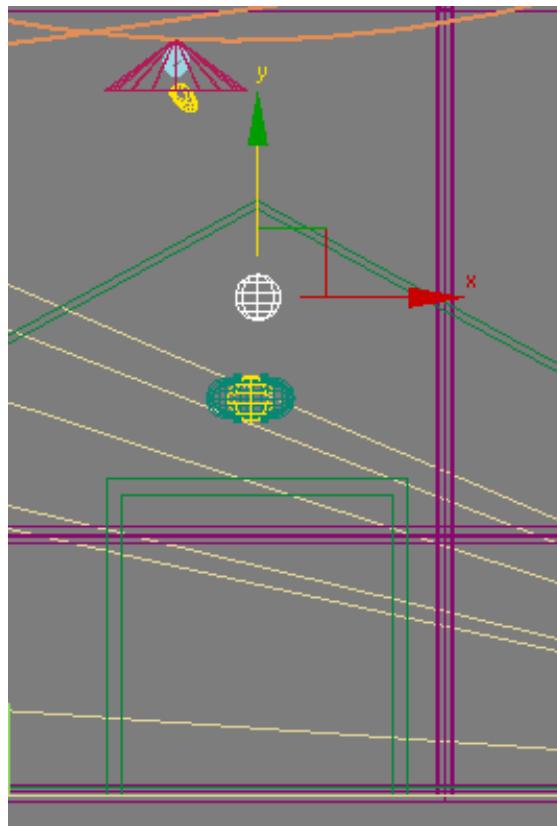
2 On the Create panel, choose Lights.

3 On the Object Type rollout, click Free Light.

4 Click on the apex of the barracks roof, near the entrance.

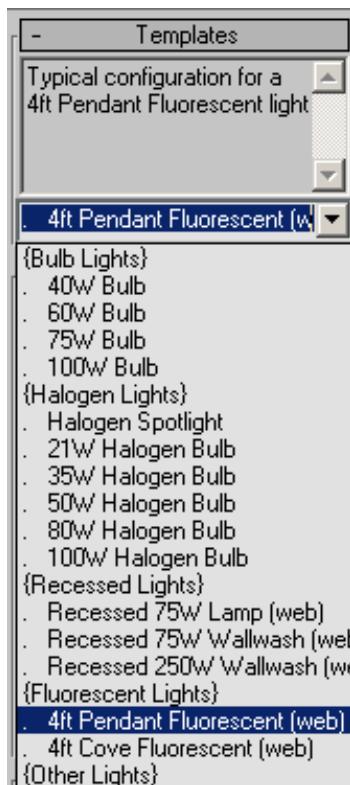


5 Activate the Front viewport and use Select And Move to raise the light object on its Y axis until it is at a suitable height above the floor, as shown below.



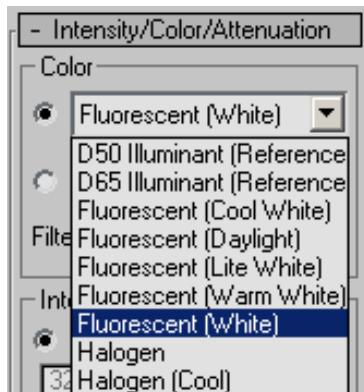
You are about to create a set of fluorescent lights, so the light object should be suspended roughly two feet from the ceiling.

- 6 Go to the Modify panel > Templates rollout and from the drop-down list, choose 4ft Pendant Fluorescent.



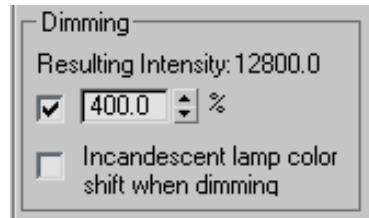
You will now choose the color of the light to be cast.

- 7 On the Intensity/Color/Attenuation rollout, choose Fluorescent (White) from the Color drop-down list.

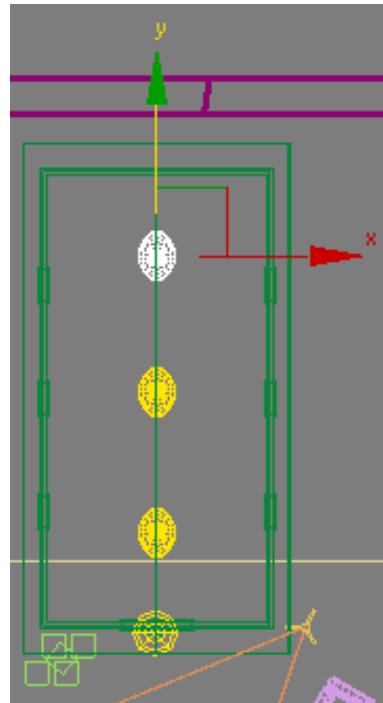


The scene calls for a standard fluorescent fixture consisting of four tubes. Rather than physically re-creating each tube, you can simply bump up the intensity of the single light object by a factor of four.

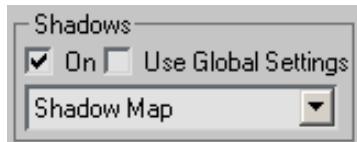
- 8 On the Intensity/Color/Attenuation rollout > Dimming group, update the Intensity spinner box to **400%**.



- 9 Make two more instances of the light object and distribute them evenly along the length of the barracks.



- 10 On the Shadows rollout, turn shadows On to create shadow maps of the ceiling lights.



- 11 Activate the Camera01 viewport and render the scene again.



The inside of the barracks is now illuminated, with light spilling out of the entrance to form a shadow on either side of the door frame.

Summary

In this tutorial, you learned how to use photometric lights to illuminate a night scene. You specified the color of the light source and defined how shadows were cast. You also learned how to take a background image, adjust its exposure, brightness, and contrast, and apply it as a background to the night scene. Finally, you saw how a mental ray special lighting effect can be applied to a light object to produce added realism.

Network Rendering

Included with 3ds Max is functionality that lets you render an animation or a high-resolution image over a computer network, using multiple computers simultaneously. Each computer on the network, if properly set up, can render different frames of the animation or different sections of the image, greatly reducing overall rendering time.

This lesson provides a brief overview of the process of rendering an animation over a local area network. For detailed information, see the section on network rendering in the help, beginning with

ms-its:3dsmax.chm::/WSf742dab0410631334fe17e2d112a1ceaf4d-7f81.htmlIntroduction to Network Rendering. Also see

http://www.visualz.com/free/down_on_the_farm.pdf *Down on the Farm*, an informative online white paper in PDF format by Gary M. Davis.

NOTE *Down on the Farm* is a fairly large document; it might take a little while to download after you click the link.

Set up the rendering network:

- 1 Create a local area network or use an existing one. Each machine, or Server, that you plan to use for rendering should meet or exceed the minimum requirements for running 3ds Max.
- 2 On each Server, install 3ds Max using the Compact installation option. No authorization is required for this option.
- 3 At least one machine on the network should contain a full, licensed version of 3ds Max for creating scenes to be rendered.
- 4 Determine which machine on the network will act as Manager. Typically, this machine is different from the machine on which scenes are created, but it can be any machine on the network. On the Manager machine, run the Manager program as an application or service. You can also use the Manager machine as a Server. Do this only if you won't be using 3ds Max at the same time to create or modify scenes.
- 5 On each Server machine, run the Server program as an application or a service. The Manager assigns tasks to the Server program.

Set up for network rendering:

- 1 Create a scene containing animation that you want to render on the network, and specify where the output image files should go. When

specifying directories for maps and output files, be sure to use the Universal Naming Convention (UNC) so that all machines on the network will be able to find the directories. Also, the directories should be shared.

TIP The easiest way to specify a UNC path is to start with Save In > My Network Places, and then navigate through the network to the machine and directory.

For further information, see

ms-its:3dsmax.chm::/WSf742dab0410631334fe17e2d112a1ceaf4d-7f6c.htmSetting Up Directories.

- 2 Open the Render Scene dialog (press F10), and in the Render Output group, turn on Net Render.
- 3 Click Render.
The Network Job Assignment dialog opens.
- 4 Specify a job name and, optionally, a description of the job.
- 5 Set a priority and options for the job. All of these are explained in the topic
ms-its:3dsmax.chm::/WSf742dab0410631334fe17e2d112a1ceaf4d-7f64.htmNetwork Job Assignment Dialog.
- 6 Click the Connect button to find and register with the Manager.
 Optionally, if you want to connect to a specific manager, first turn off Automatic Search and enter the name of the Manager machine or its IP address.
After you connect, the Network Job Assignment dialog displays a list of servers and current jobs.

Submit and monitor the job:

- 1 To use all available servers, make sure Options > Use All Servers is on, and click Submit. Alternatively, turn off Use All Servers, highlight the servers you wish to use, and click Submit.
Your rendering job enters the queue, and will be undertaken as soon as the designated servers are available, depending on the presence of any existing jobs and their relative priorities.
At this point, you can use the backburner Queue Monitor program to check the progress of your job. For detailed information on the Queue Monitor, see

*ms-its:3dsmax.chm::/WSf742dab0410631334fe17e2d112a1ceaf4d-7f4f.htm*The Queue Monitor Application.

-  **2** Click the Connect button, and then use the Connect To Manager dialog to specify the same manager you connected to from the Network Job Assignment dialog.
- 3** In the Job list, find your job and click it to highlight it.
A job summary appears in the list to the right.
- 4** Use the Queue Monitor tools to edit the job, stop or start it, delete it, and so on.
When the job is finished, you'll find all the rendered frames in the directory you specified with the Render Scene dialog. You can convert these to a movie file using any of several different methods, such as with the 3ds Max RAM Player utility.

Summary

If you have access to multiple networked computers, you can save enormous amounts of time rendering both animations and high-resolution still images on the network. All it takes is a bit of setup and administration, and the payoff makes it well worthwhile.

