

# Texture Mapping in EIAS 2.8

by

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## SECTION 1.

### Texture Map Coordinates

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The first area we'll cover is the different types of mapping coordinates supported - what they mean and when they should be used. EI supports 4 different mapping types: Flat, Cubic, Spherical and Cylindrical.

#### Flat Mapping:

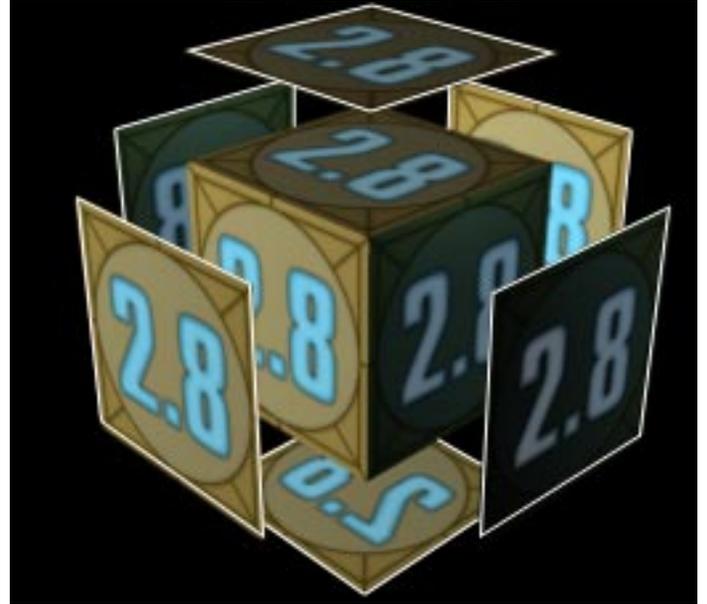
Flat is the default mapping method used in EI. This method works best when the object you wish to texture map is more or less a flat object. In the mapping window you will notice that when flat is selected as your projection type you get a flat plane with 3 arrows on it representing texture map placement or coordinates. One arrow lies on the  $x$ -axis pointing to the left edge of your texture, one on the  $y$ -axis pointing the top of the texture and one along  $z$  representing the direction the texture projects. Flat mapping has a tendency to streak along the sides of objects. One way of avoiding this is by turning off "negative  $z$ " (see Negative  $z$  later in this section). This streaking can also be avoided by setting your tiling to none and making sure your mapping coordinates are a bit smaller than your object.



Flat mapping works great on faces that are perpendicular to the direction of projection. The closer faces get to parallel to the direction of projection, the more streaking will occur.

### Cubic Mapping:

Cubic mapping is quite like flat mapping; the main difference being that instead of projecting your texture from one direction, the texture is projected from all 6 directions. This is without a doubt the most versatile of all mapping methods. When a specific texture or image is required like a decal, sign or picture, flat mapping is the method of choice. But when the object you are creating is more natural and oddly shaped like a pile of stone, scraps of metal, a large wooden object like a shelf or desk, even the walls of a castle or a sculpture made of marble, Cubic mapping is the way to go. All these objects would be very difficult to map any other way showing streaking or pinch points. Cubic is the best way to map odd shaped objects. It is always a good idea to make your texture maps seamless to avoid unsightly seams (see Section 6 Texture Tips).



In this example the cubic mapping coordinates scaled the same as the object, a different scale could be used allowing the texture to tile or crop accordingly.

### Spherical Mapping:

Spherical mapping wraps the texture map around the object using spherical mapping coordinates. This mapping method is not nearly as versatile as Cubic or Flat mapping but powerful nonetheless. Spherical mapping works not only on spherical objects but any object that is generally spherical in shape, a rock for example. EI gives you control over the degree of wrap (how far around the sphere) and the band angle (from top to bottom, or pole to pole). When a spherical map is applied the top and bottom of the map pinch at the poles as you can see in the example here. There are a couple of ways around the pinching problem depending on what type of texture map you are working with.



The wrap angle in this example is set to 180 allowing the texture to wrap around the sphere times. A 2:1 ratio is best used when mapping with spherical, either make your texture map twice as wide as it is high or set your wrap angle to 180.

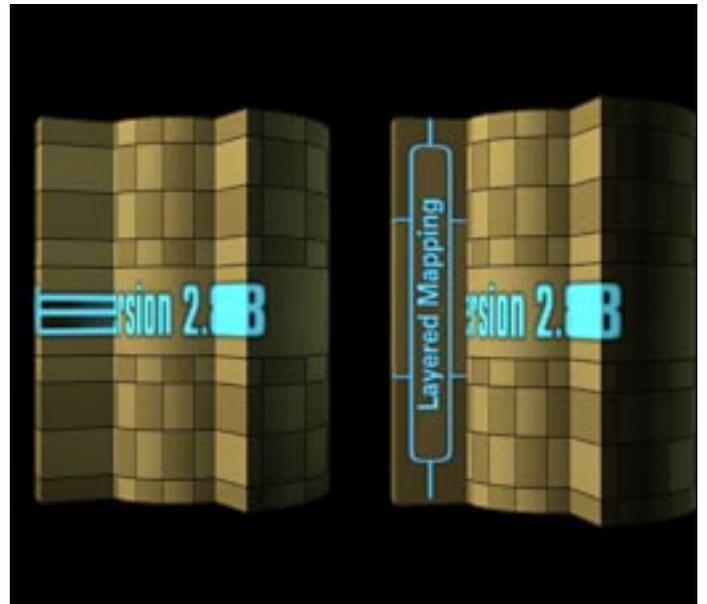
### **Cylindrical Mapping:**

Much like Spherical mapping, the cylindrical mapping method has very specific uses. Cylindrical mapping projects the texture map from the y-axis of the mapping coordinates. The effects is similar to taking a label and wrapping it around a can or bottle. The placement of the y-axis is crucial though as the texture map is projected from that line outward. The diameter of the cylinder does not matter, all that matters is the height and location of the mapping coordinates. Cylindrical mapping can be used on a large variety of objects only it is important to keep in mind the closer any surface gets to parallel to the direction of projection, the more streaking will occur. See example below.



### **Streaking, Cylindrical Mapping:**

In this example we have a cylinder that has a quadrant cut from it. This creates 2 flat faces that are parallel to the projection created with Cylindrical mapping. As you can see the faces show extreme texture streaking. The same holds true with Spherical mapping. One way of remedying the problem was to create your object as separate groups, which works great but is very time consuming. Now with version 2.8 you can simply layer your texture maps to your heart's content. You need to be careful though it may be necessary to turn off "negative z" in some situations.



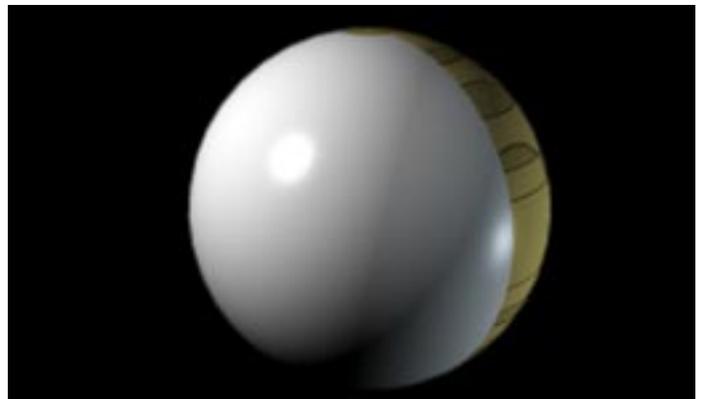
## Negative z

The default mapping method when you open the mapping coordinates window is flat with the texture centered at 0,0,0 in object space. When negative-z is checked, the texture will project both forward into positive-z and backward toward the camera or into negative-z. It is beneficial at times to turn negative-z off and have your texture project only in the positive-z direction. This is very powerful when you want to put text or a label on an object and you do not want it to project through to the other side.

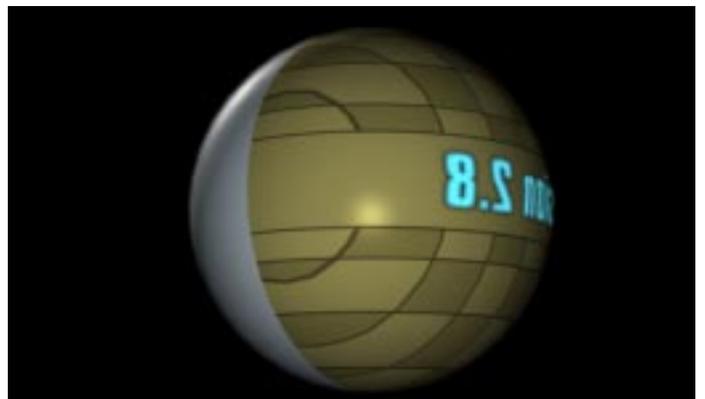
Say for example you have a clear shampoo bottle and you want to put a label on it but you do not want it to project through to the backside. Here is a situation where you would need to turn off negative-z. First you would make your label normally in your paint package of choice and then flip it across the vertical. This yields a label that reads backwards. Flipping your label is required since you will need to project it from the inside of the bottle onto its front face making sure you have negative-z turned off. The label will only project in one direction, the front of your bottle leaving the backside untouched and since you've projected it from the inside the reversed label now reads normally.



In this example the flat projection is centered on the object at 0,0,0 and negative-z is on allowing texture map to project both forward and backw



Here negative-z has been turned off allowing texture to project only in positive-z.



Here is another angle on the object from the backside more clearly showing the texturing on the back half of the object only.

## SECTION 2. Building Complex Materials

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In this tutorial we will develop a material using Diffuse, Specularity and Bump Maps. These 3 are really the minimum that you should ever settle for if trying to create a realistic looking surface. Many issues need to be considered before you start to develop your textures, such as what type of material is this? Is it shiny or dull and if so what parts? Is it going to be seen up close, in which case it will need to be high resolution or is it going to be in the distance. Another and most important thing to consider is the object's history. It may sound a bit funny but in reality everything has a history. The object in question could be in great shape, shiny and new or it could be outdoors exposed to the elements getting rusty and dirty. Quality texture mapping can make all the difference in the world so be sure and plan out every step. Having said that we are ready to build a surface.

I've created all the textures required for this example and labeled them appropriately. They can be found in the "**Textures Folder**". When creating your textures it is a good idea to label them like so: texture map\_RGB or texture map\_SPC. Giving each texture an extension like this is an important part of keeping everything organized.

### The Textures

Below are low resolution versions of the texture maps we will be using for this section.



Diffuse Map



Bump Map

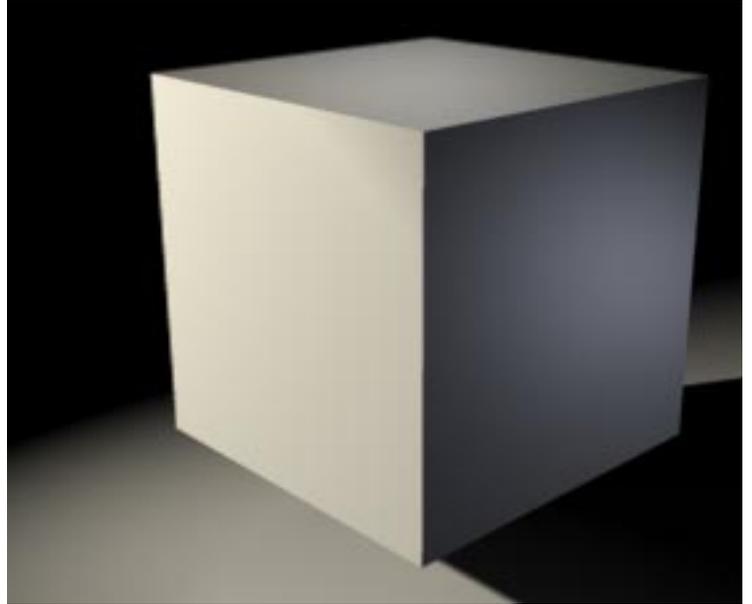


Specular Map

To keep everything simple for this exercise we will use a standard shape, a cube which we will map, you guessed it cubic.

## Open the Project

1. After launching EI locate the project "Complex Material.prj" in the "Projects Folder" and open it. This project contains a floor, a cube, 3 lights and a camera. It is a good idea to use more than one light for any project even one as simple as a cube. Additional lights will help to spotlight some of the features we will be working with. Feel free to render a snapshot of the scene as it stands to get a feel for the lighting. It should look something like this. You will notice that the main light off to the left has a warm feel to it and the fill light off to the right is cool, this is more realistic than using plane white light. White light can be used to balance things out though as is the case with the light pointing toward the camera onto the top of the cube.



## Adjusting the Specular

2. Command clicking on the cube group in the project window brings up the "Cube Info" window. The first thing you should do is click on the "Specular Tab" you'll notice the settings for size and falloff are 30.0 and .75 respectively. These have been changed from the default settings of 200 and 1. Settings of 200 and 1 yield a very specular or shiny object, not what we want for this example and not good settings for a flat object such as a cube. The higher the number for size the tighter or smaller the specular highlight. A setting of 1 for falloff produces a hard edged highlight. Dropping the value down to .75 yields a softer highlight.

### Add the Diffuse Map

3. Next click on the "Diffuse Tab". Here you'll find settings for the amount of diffuse light, the diffuse falloff and a mask slider. The default settings are fine here. Below the sliders is an area for adding texture maps to your material, as many as you like. Click on the add button, go to the textures folder and add the file "2.8 Texture Map\_RGB". Back under the "Diffuse Tab" double click on the texture name, this brings up the mapping window. The default mapping method is flat or planer and centered at 0,0,0 in object space. For this example we want cubic so go to the "Projection Tab" and set the map type to cubic. For this example that's all there is to it but feel free to explore the other tabs as well. Take a snapshot, your rendering should look something like this.



### Render looking soft?

If you find that your renderings look too soft there is a good chance that your render settings could be the fault. Hit Command-R to bring up the render dialog, click on the "Anti-Alias Tab" and make sure your anti-aliasing settings are Adaptive not Oversample. Close the window and the settings will remain.

### Add the Bump Map

4. Now, click on the "Geometry Tab". Here you will find controls for Cel/Outline Shader, Bump and Displacement mapping as well as Clipping Maps (Please reference your users guide for more on these features). For now we will just be adding the bump map. Click on the Add button just under Bump/Displacement Maps. Go to the textures folder and add the file "2.8 Texture Map\_BMP". This file is a greyscale image file. Bump/Displacement requires that you use a greyscale file. Double click the texture name as before and make sure the mapping type is set to cubic to match the diffuse map. Next click on the "Special Tab" and unchecked Enable Displacement and set your bump factor to 8.



## Detail

In the above example I've really cranked the bump map settings. Generally a setting between 1 and 3 is sufficient but due to the size of our render and the fine detail of the map a higher setting is required. The higher resolution detail to the right should give you a better feel for the effect a good bump map can have. Also it is a good idea to blur the map slightly. An extremely high contrast map will not render as nearly as well as a slightly blurred one. Experiment with the bump settings. Crank them up extremely high to find the point at which they break up and become useless. This is a good way to understand what a bump map can and can not be used for.



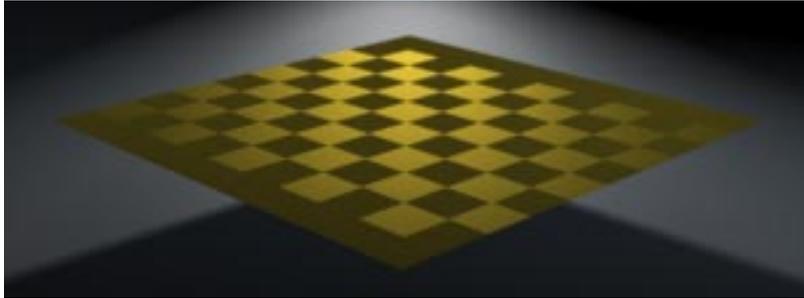
## Add the Specular Map

5. After adding the Specularity Map we might find that our specular settings need adjusting. Until you have your maps and lighting in place it is difficult to know exactly what the settings should be and nothing is written in stone, feel free to experiment with different settings. Click on the add button for Specular maps and load the texture "2.8 Texture Map\_SPC". Double click on the texture name and set the mapping type to cubic. Unlike bump maps specular maps work best when very high contrast. A flat object such as this is not the best model for an example of how powerful a specular map can be, but its effects can be noticed on the areas of scum on the right side of the cube where specularity has been removed.



Below is an additional example of what a Specular map can do. When trying to achieve realism the use of a Specular map is a must especially if animation is involved as the specularity of an object is quite evident as an object moves in and out of different lighting situations. This example uses only a specular map

to create the checker board. In the real world when an object gets dirty that area of the object show less or no specular highlight. Think of tarnished brass.



### **SECTION 3.**

#### **Reflectivity**

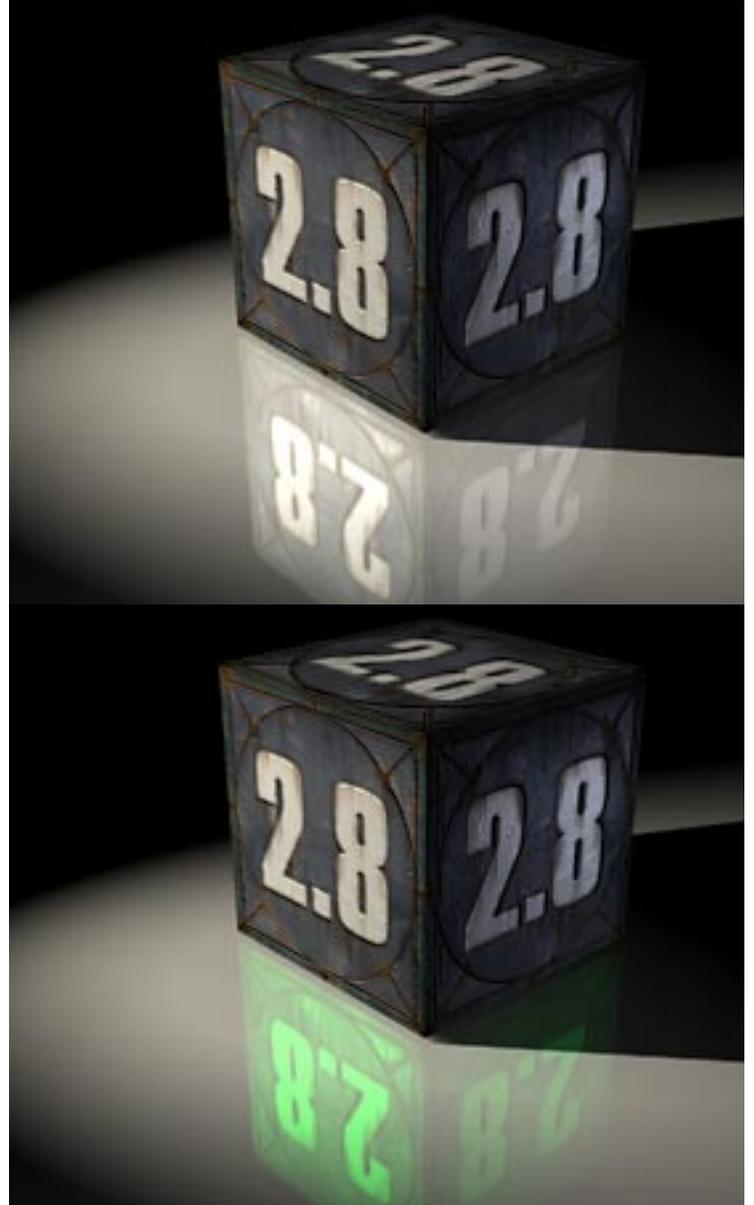
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In this section we will be working with reflectivity — what the different features mean and how to simulate ray tracing without the lengthy render times. As with other texture mapping techniques the use of reflectivity requires close attention to detail, you need to be clear on what you want to be reflective and how much. There are many ways to make an object reflective and you need to know which one is best suited for your needs. There is no need to use a full environment map if a mirror map will do. There are basically two distinct features to the reflectivity section, Reflectivity maps which determine how reflective your objects is and Reflection maps which determine what gets reflected.

#### **Using Mirror**

1. Using Environment Reflection, Mirror is a great and efficient way of simulating ray traced reflections and doing it quickly. Anytime you have a flat face, (3 dimensional surfaces work also though not as well) that needs to be reflective like an actual mirror or the side of an office building or the glass on a monitor, mirror mapping works great.

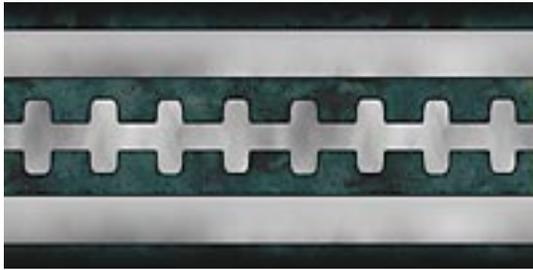
Locate the project "Reflect Mirror.prj" in the "Projects Folder" and open it. Command double click on the Floor in the Project window and click on the "Reflectivity Tab". For this example we are simply going to make the floor reflect the cube. Set your reflectivity amount to .5 and make sure Reflection Bias is checked on. If you unchecked Reflection Bias your reflection will possess the color present in the color swatch. To the right check Use Environment Reflection and select Mirror below. Click on the Configure button. This brings you to the standard mapping window where you can position and scale your mapping coordinates. The projection for Mirror extends infinitely in all directions so there is no control for scaling but it can be moved and rotated to accommodate different situations. The default positioning should be fine, as long as it is parallel to the object you wish to be reflective. Close the mapping and materials windows and take a snapshot. Your render should look something like this. The second render in this example shows what you would get if you unchecked Reflection Bias and set the color to bright green. The reflection takes on the color chosen.



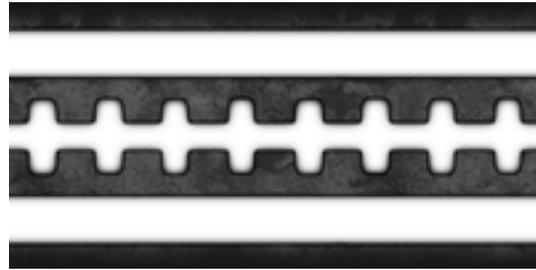
## Using Reflection and Reflectivity Maps

2. The use of both "Reflection and Reflectivity maps allow for great freedom when creating complex surfaces that have areas of reflectivity and areas that are non-reflective. The use of a reflection map allows you to give objects the appearance of being reflective while keeping render times short. Reflection maps are single maps that reflect in an object as opposed to Environment Reflections which render 6 separate maps from the objects point of view and then use those 6 maps as the source of the reflections. The use of Environment Reflections is great in situations where objects that are reflective need to interact with other objects and reflect their surroundings, the drawback being longer render times than if a simple reflection map were to be used.

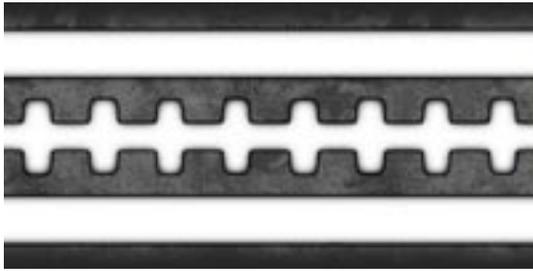
In this example we will use both a Reflectivity map and a Reflection map as well as Diffuse, Bump and Specular maps to create a material that is reflective in areas and non-reflective in others.



Diffuse Map



Bump Map



Specular Map



Reflectivity Map



Reflection Map

First locate the project "Reflect Maps.prj" in the "Projects Folder" and open it. This example uses a sphere and a different lighting arrangement. Bring up the Spheres Group info window so we can add all the texture maps. In the texture folder you will find several maps called "ReflectionExample\_XXX". Add the Diffuse, Specular, and Bump maps just as we did in the previous example only use the Spherical mapping method this time. Don't forget to disable Displacement on the "Special Tab" in the "Mapping window" Make sure the wrap angle is set to 360 and the band angle 180. Also, set the specular values to a size of 50 and a falloff of 1. Take a snapshot, your rendering should look something like the image to the right.



Now we will set the object to be reflective and assign the appropriate maps. Click on the "Reflectivity Tab", add the Reflectivity map "ReflectionExample\_REF1" making sure it has the same projection settings as the Diffuse, Bump etc.... This is the map that will determine what parts of our object are to be reflective. Now add the Reflection map "ReflectionExample\_REF2" making sure you have Use Bitmap Reflection checked. Double click on the texture name to bring up the mapping window. Go to the "Projection Tab" and set the map type to spherical, and the wrap and band angle to 180. All the standard tiling and projection methods work just as they do with other texture types except that Cubic is not available. Take a snapshot. Again, your rendering should look like the one here.

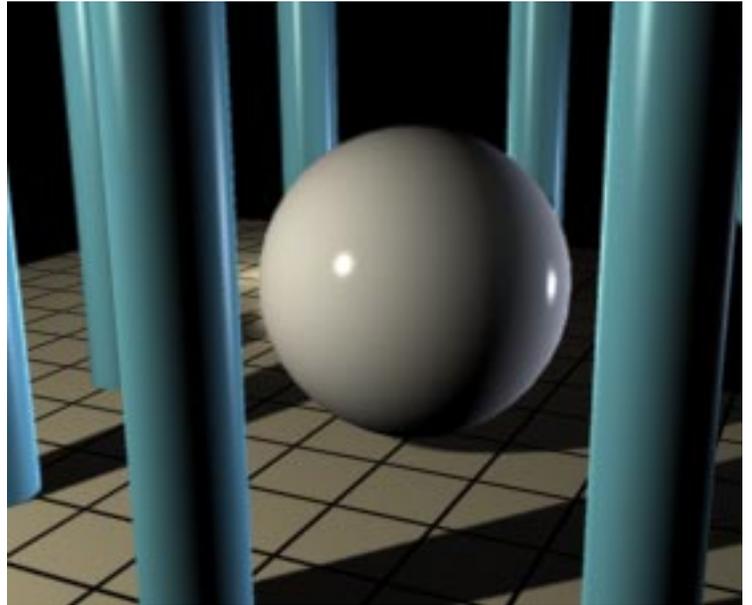


### Using Environment Reflection Maps

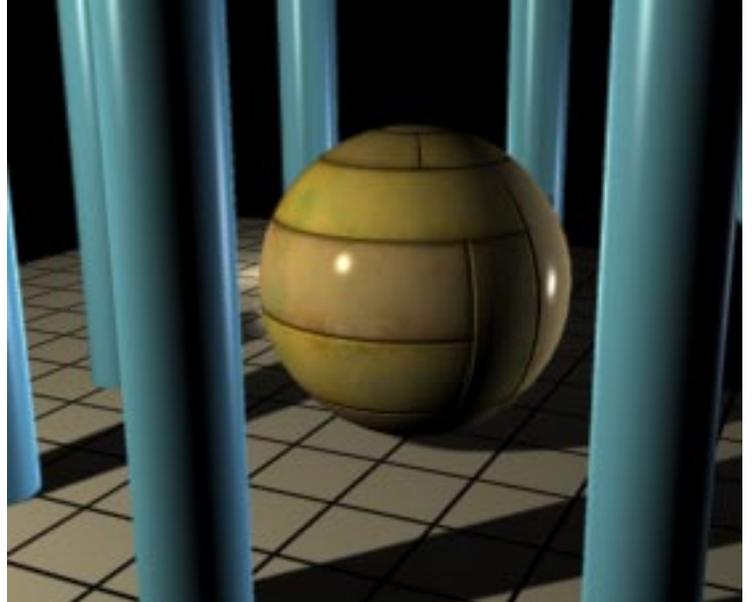
3. As we stated earlier the use of "Environment Reflections" allows an object to reflect everything within a given environment. Instead of using a single image as the reflective source, when environment reflections are used and set to Environment as opposed to Mirror, six images are rendered from the objects

point of view and then used as the source of the reflections. You have the option of calculating those images for each frame of an animation or simply rendering them once. Rendering them once is a major time saver and recommended if the reflective object moves very little. For example, if the objects in your scene are mostly still and the only motion is the camera, you should only calculate the reflective source images one time.

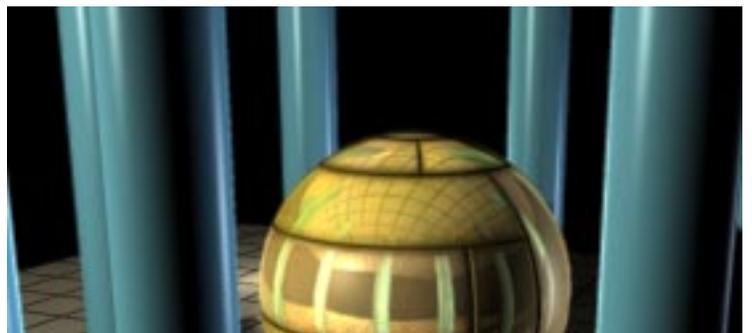
Locate the project "Reflect Env.prj" in the projects folder. In this scene you will notice we have a sphere, 8 cylinders, a ceiling and a floor. The ceiling and the floor have been mapped with a "Procedural" grid (see the section on Procedurals for more on these shaders). The first thing we will do is add a material to the cylinders. Open the "Group Info window" for Cyl-1 click on the "Diffuse Tab" and make it a dull blue grey. Click on the "Specular Tab" and set the size to 40 and the falloff to .5 also uncheck Diffuse Bias. With Diffuse Bias checked the specular highlight takes on the color assigned under diffuse, by unchecking it we allow our highlight to be white. To save some time we will save this material. In the text field at the top of the group window name your material, any name will do and click Save. Your material has now been saved to the folder "EI Material" within your Electric Image application folder. You can call up this material at any time by clicking on load, it's important to note that texture maps *do not* save with the material. Go ahead and set each of the Cylinders to the material you just saved. Take a snapshot your render should look something like this.



Now to add the texture maps. Go to the "Diffuse Tab" for the sphere and add the texture map "ReflectEnv\_RGB" set its mapping to "Spherical" and leave everything else default. Do the same for bump, specular and reflectivity. For reflectivity don't set any value for reflection and for bump be sure to go to the "Special Tab" and uncheck Enable Displacement leave your bump value at 1. Your snapshot should look like this.



Now go to the "Reflectivity Tab" set the reflection amount to 1, check Use Environment Reflection and the Environment button below. Click on Configure and go to the "Projection Tab". Buffer size is the size the reflection source images rendered, the higher this number the longer



## **SECTION 4.**

### **Transparency**

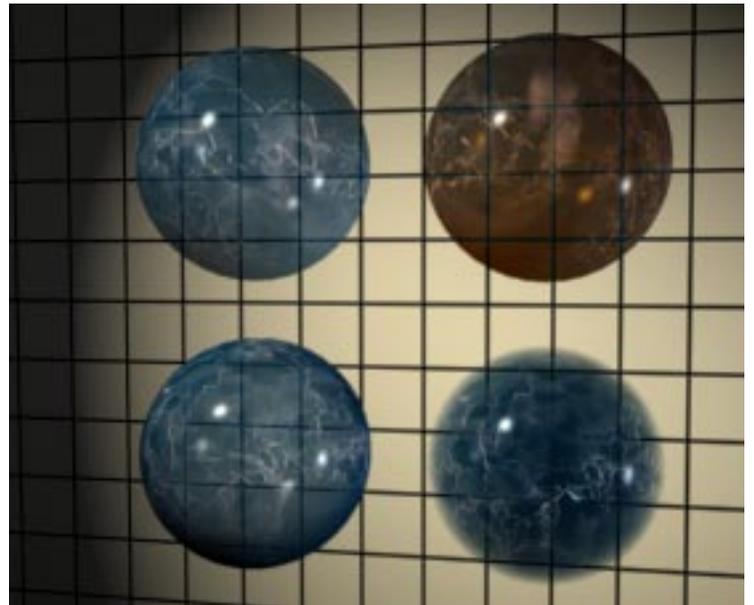
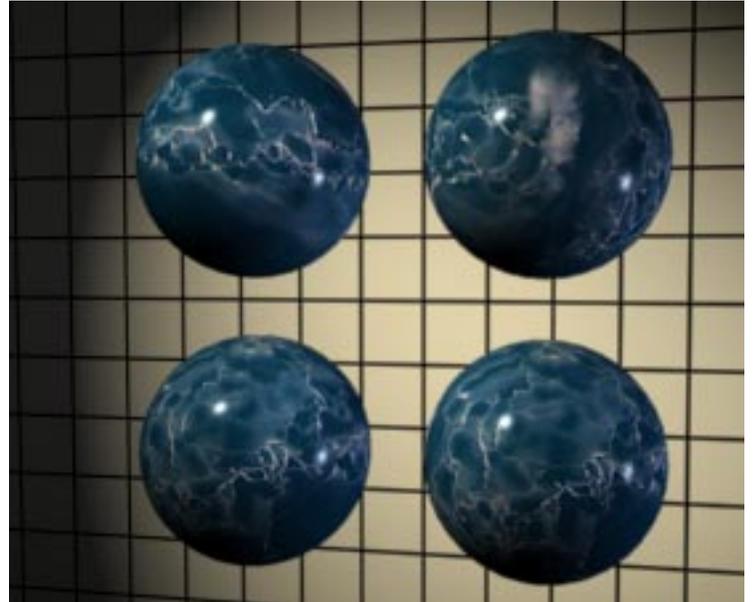
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The controls for Transparency have been simplified a great deal. All of the control you are used to from previous versions is still there it is just easier to get to. For this example I've assigned a marble texture map to the object we will be working with.

## General Settings

1. To cover some of the basic setting for transparency open the project "Transparency1.prj". In this project you will see 4 spheres and a flat plane. We will give each of the spheres different settings and the results should match what you see here. Open the group info window for Sphere 1 and go to the "Transparency Tab", this one we will just set straight transparency, set the value to .5 and make sure the radio button for filter is on. For Sphere 2 click on the Color Filter radio button, select Use Custom Color and select your color of choice. For Sphere 3 select Filter set the transparency value to .5 and then under Edge Characteristic set the amount to 1 and the falloff to .5 and click the Opaque radio button. For Sphere 4 set the transparency to Color Filter and the Filter Color to Use Surface Color. Under Edge Characteristic set the amount to 1 and the falloff to .5 make sure the radio button is set to transparent. Take a snapshot and your render should look like the one to the right.

The proper use of Edge Characteristic can be very helpful in making your rendering work. If for example you were rendering something that was volumetric like a glass figurine or hunk of amber, you should use the transparent edge characteristic as the more of a solid object you look through the more dense it becomes. On the other hand if you were working on say a bottle of colored glass since it is not volumetric looking through the edge of the bottle would be more dense than looking at it straight on therefore you should use the Opaque setting for edge characteristic.



## Using Transparency Maps

2. Transparency maps can be used for a great variety of things. In the following example we will work with text. On the face of the text we will add an interesting Transparency, Diffuse and Luminance map that will make portions

of the face transparent while leaving others opaque. The idea for this example is to show you how to create those magical beams of light that seem to emit from most animated logo's. It is really a very simple process that can be applied to any number of situations.

To start off open the project "Transparency2.prj", this project contains the numbers 2.8 which have been extruded and given a bevel. The materials for the bevel, the back face, and the sides have all ready been applied. The color you see in the reflections was created by uchecking Diffuse Bias and assigning a color. The reflection map for this render has no color in it, this is a great way of breaking up reflections in a scene. Take a snapshot, your rendering should look something like this. Feel free at any time to adjust the camera angle, lighting, or reflection colors of any scene, the more you interact the more you remember.

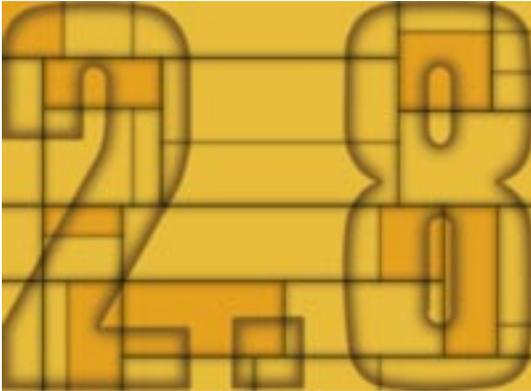


Now we will add the texture maps to the front face of the numbers to give them the appearance you see here, something like stained glass.

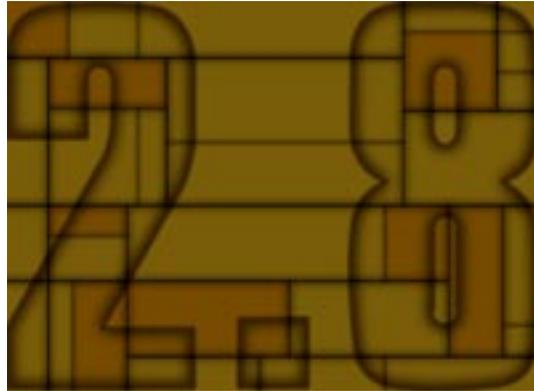
Bring up the group info window for the group FrontFace.Fact and add the Diffuse map "Transparency2\_RGB", the default settings for mapping will work fine. Set the amount for diffuse to .75. Click on the "Specular Tab" and set the amount" to 0. Now go to the "Transparency Tab" and add the map "Transparency2\_TRA" make sure the radio button is set to Filter and Edge Characteristic is set to Normal. Next click on the "LuminanceTab" and add the map Transparency2\_LUM and make sure Use Shading is selected. There is no need to adjust the slider as all of the Luminance will be derived from the map. That should be it. There was no need to adjust any of the mapping coordinates since the default is flat centered on object space, exactly what we wanted. Go ahead and take a snapshot and your images should match what we have here.



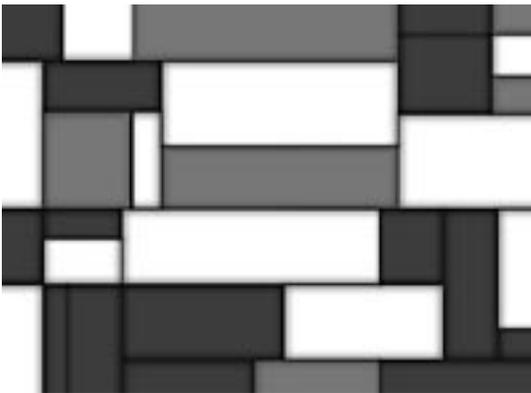
The texture maps we've used to create this effect are as follows:



Diffuse Map



Luminance Map



Transparency Map

## Adding the Light Beams

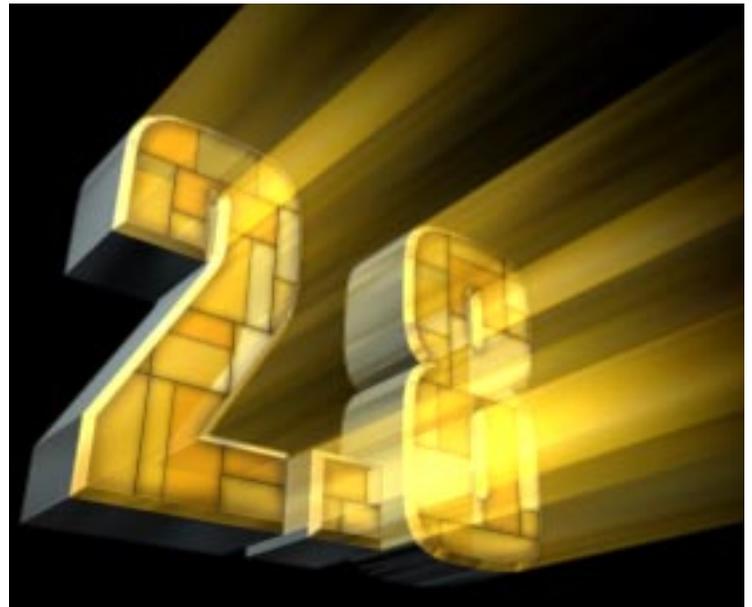
Now to add the light beams. In your project window turn on the group Beams of Light.Fact. This group is simply a duplicate of the numbers sides, it's scaled in z and positioned directly in front of the originals. The development of the light beams requires 2 separate texture maps seen here to the right. You will notice that the values of these maps are quite subtle, this is very important, it is easy to over do it and obscure your object when trying to achieve this effect. Bring up the Group Info window for Light Beams and go to the "Diffuse Tab". Set the color to, in HSV, 46, 86, 63. The color will be a rather drab looking gold. Next set the specular amount to 0. Now go to the "Transparency Tab", load the transparency map "Transparency2\_TRA2" and double click the name. On the "Projection Tab" set the map type to cylindrical, wrap angle 90 height scale 1 and radius 600. Now go to the "Alignment Tab" and set the alignment to bottom, close the window. Back on the "Transparency Tab" make sure that filter is selected, this is very important as the other options will not work here, and set the transparency amount to 1. Now move over to the "Luminance Glow Tab" and load the luminance map "Transparency2\_LUM2" assign it's mapping type just as you did for transparency. Set luminance color to use shading and leave the slider at 0. If everything is set up properly you should see no sphere in the upper left corner of the group window, it should be completely invisible including the specular highlight. Take a snapshot and your render should look like this.



The Luminance Map



The Transparency map



The use of an animated Transparency map in situations like this will greatly improve the dramatic effect of any animation.

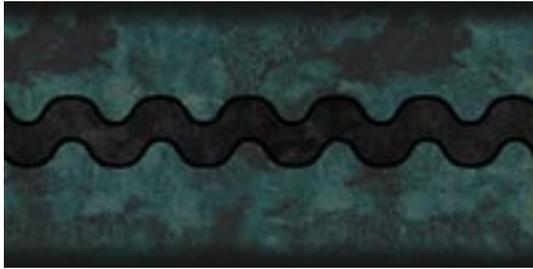
## SECTION 5.

### Luminance and Glow

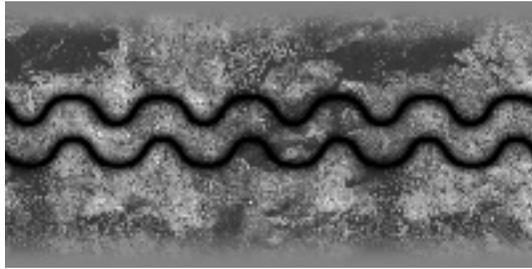
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In this section we will cover the use of Luminance and Glow mapping. First I'll quickly cover the different controls associated with luminance and glow. Clicking on the "Luminance/Glow tab" you'll notice 2 separate sections one for, take a wild guess.... luminance and one for glow. Basically the difference is this, luminance is the effect of having a solid shade or color across the area assigned as luminant depending on the amount set. Think of a light box, same effect. Luminance will not cast light or emit a glow of any kind, that is what glow is for. Glow will not actually cast light but it will be quite visible emitting from the source. Depending on the settings, areas assigned to have glow will have a soft halo of light surrounding them. Use in conjunction with creative lighting the effect is very convincing. With luminance adjusting the slider will affect the entire group, where as if a map is used the value and color of the map determine what is luminant. Use Shading will use the shading of the object as luminant; Use Color will use the chosen color. It is best to build your areas you wish to have luminant against a black background so as to not affect the rest of your object. Just as we will be doing below.

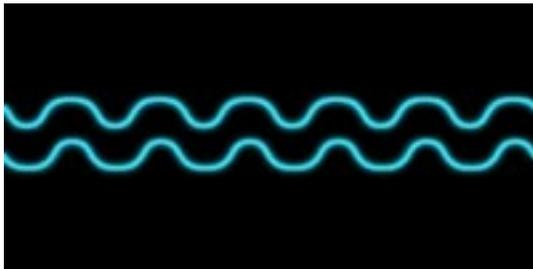
First, the textures we will be using for the Luminance section of this exercise are as follows:



Diffuse Map



Bump Map

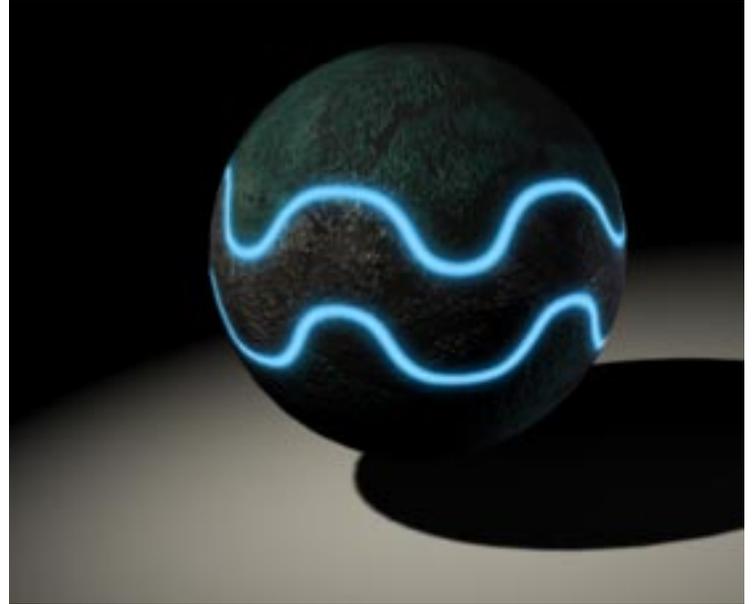


Luminance Map

You'll notice that the areas that will be Luminant have been made black in the Diffuse Map, this is to avoid getting areas that are over-saturated.

## The Use of Luminance Maps

1. Just as in previous examples we will be using diffuse and bump maps. We will also add a luminance map that is mostly black with the luminant lines in bright blue. In the projects folder you will find the project titled "Luminance/Glow.prj". This project contains a sphere, a floor and several other objects that are turned off. Leave them off for now. Bring up the spheres "Group Info Window" and assign the diffuse map Lum/Glow\_RGB, and bump map Lum/Glow\_BMP with a spherical projection set to 360 for wrap angle" and 180 for band angle". Next under the "Luminance/Glow Tab" add the texture map "Lum/Glow\_LUM" for luminance, same settings used for the diffuse and bump maps. Take a snapshot and your render should look something like what you see here.



## Adding the Glow Maps

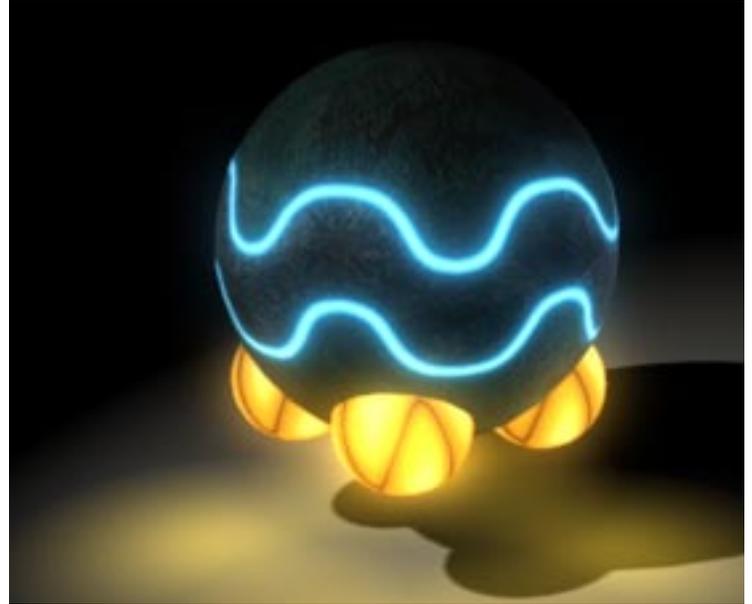
2. Next we will work with the "Glow". For glow to work properly you need to set up Selection Sets. First, in the Luminance/Glow Project expand the groups Pod 1 through Pod 4 (select Pod 1 and hit command h to expand). Each Pod has a light linked to it. Turn on all the Pod's and their lights.

## Selection Sets

To set up a selection set go to Select/By Set/Edit Set click on add and name your set "glow set", leave that window open and in your project window select the objects you want in your selection set or in other words the objects you want to have glow, now click on Add under Members, making sure you have "glow set" highlighted. You've just created a selection set called "glow set". Close the selection sets window. Now you need to, assign that selection set to a glow layer.

Go to the render dialog (command R) and click on the "Glow Layer Tab", you'll see an area called Glow Layer and one called Glow Layer Members. First you are going to create a "glow layer", click on the Add button under Glow Layer and name it "glow layer 1". Now make sure the layer you just created is highlighted and click on the Add button under Glow Layer Members, select your "glow set" and say OK. Next you set your Glow Radius to say 35 and set the Intensity at 1.25 and you're ready to render that is if your maps are in order, which they are not, yet.

3. Getting your maps in order is a simple process. First the sphere, open it's "Group Window" and go to the "Luminance/Glow Tab" under Glow Color Maps add the same file you used for the luminance, "Lum/Glow\_LUM" set it up the same way with spherical mapping wrap angle at 360 band at 180. Back on the "Luminance/Glow Tab" click on the Radiate button. radiate allows the maps assigned to be used, where the Glow button uses the assigned color and slider. The sphere is now set. Next go to "Pod 1" and open it's "Group Window". On the "Diffuse Tab" set the amount to 0, do the same on the "Specular Tab" we don't want any standard shading to get in the way of our glowing pods. At the "Luminance/Glow Tab" assign the map "Lum/Glow\_GLO" to both the Luminance maps and the Glow Color Maps. Use spherical mapping set to 360 for wrap angle and 180 for band angle. Also make sure that you set the radio buttons back on the "Luminance/Glow Tab" to Use Shading for Luminance and Radiate for Glow Color. These steps need to be carried out for each of the 4 Pods.



In this example I've also decreased the intensity of the main light to further exaggerate the glow effect. This is very effective method of achieving a look for a Marquee sign, or a neon bar sign. Coupled with well thought out use of practical lighting it can be very convincing.

## SECTION 6. Texture Tips

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The following tips are based on the use of *Adobe Photoshop*

### Eliminating Seams

An important and often overlooked step in creating textures is making sure they wrap, that is show no seams where they tile. You've no doubt seen them, a beautiful animation is unfolding and as marble cherub comes to life, turns to fire his bow there it is a texture seam running straight up his back, sort of ruins the whole thing doesn't it? Inexcusable and easily avoided. You have a texture that you plan on applying to an object and you know it is going to seam and no camera trickery is going to save you.



Original marbled texture

1. Offset the texture in Photoshop equal to 1/3 the texture size. Our texture here is 500 x 300 so we offset it 160 x 100. The numbers are not all that important just don't divide it half or that could cause problems later. Make sure when you offset that you have wrap turned on.



Offset marbled texture with seam

2. Now use the Rubber Stamp tool in Photoshop to eliminate the seam. In some cases it is a good idea to make odd shaped selections with the lasso tool, select a feather, copy the selection, and finally past it over the seam. The idea is to make it look natural, not like you just painted over a seam.



Seams have been painted over with the Rubber Stamp tool

3. Now hit Command F to perform offset again, chances are you have small seam forming an x someplace on your image, eliminate it as well. That x forms as you rubber-stamp the original seam and paint directly on the edge of the image. It is the reason for not dividing your texture in half when offsetting, you would offset again and never see it because it would like directly on the edge.

You can now texture map with confidence your image tiles.

## **Eliminating Pinch Points**

Oftentimes, depending on the texture map when you apply a map with spherical mapping method you get a noticeable pinch point at both the top and the bottom of the object. One way to get around this is to hide those areas within other object or out of camera view, quite a limiting fix. Another way to fix the problem is to eliminate the pinch points. Here we will show you 2 way in which to do just that.

### **1. The "Remove the detail from the top and bottom method"**

This is the quick and easy way of solving the problem but in many cases quite acceptable. Say you have a texture map you plan on applying with spherical mapping, like the one below. In the case of this simple cloud map this method should be satisfactory.



Original cloud texture

1. Make rectangular selections at the top and bottom of the image a few pixels high by the width of the image, say 15-20 pixels and select feather 10-15 pixels.



Cloud texture with color added both top and bottom

2. Pick a color from your image, blue in this example and fill the selections with that color. I generally do "option delete to delete to the foreground color". It is then a good idea to use your airbrush to make the color areas you just created a bit less symmetrical or else you will end up round disks of color at the top and bottom of you object. And that is all there is to it, I said it was quick and easy, compare the renderings below.



### 1. The "Polar to Rectangular Method"

This method of eliminating pinch points and seams in a few easy steps was developed by John Knoll awhile back and is the method of choice. One drawback to this method though is the fact that the filter used has a tendency to soften the image so it is a good idea to, 1. work with as large a map as you can and 2. slightly sharpen the image as you go along. It is important not to over sharpen though, if too much sharpening occurs toward the top and bottom of the image it can ???.

1. This method uses the filter, Polar Coordinates which takes the rectilinear coordinates of your image map and bends them into polar coordinates. The first thing to do is make a circular selection in the center of your texture as we've done below, hit command c to copy that selection to your clipboard.



Original texture map with selection marquee

2. Now under Filter/Distort, run Polar Coordinates on you texture map, be sure and select rectangular to polar. You image should look something like this.



Rectangular to Polar filter run

3. Now hit command v to paste your selection back down onto your texture, (if you are using Photoshop 4 you also need to flatten your image). You've just covered the pinch point in the center of your texture. Also at this time use the Rubber Stamp tool to eliminate the seam running from the center to the top of your texture.



Pinch point and seam eliminated

4. Run Polar Coordinates again only this time select polar to rectangular, your image should look something like this.



Back to Rectangular coordinates

5. Select all and flip your image in the vertical and perform the same series of steps to affect what is now the top of your image. When you have finished your texture should look something like this.



The image may look strange and blurry as a flat map but when it is mapped on to a spherical object and the pixels that occupy the areas toward the top and bottom are forced to cover a smaller and smaller space until the poles are reached it will map perfectly. This is why it is important not to over sharpen. Compare the renders below.

