

# excerpt from chapter fifteen

# 3D

## multi-pass rendering

**After Effects is used for many different purposes but the area in which it is probably most widely used is in the post-production of footage. For those of you unfamiliar with the term, this is when the produced footage, image and animations are put together and any effects, color treatments or graphics are added.**

Quite often the compositor will have to mix 2D and 3D footage together at this stage, making sure that the 'joins' between these two worlds are seamless.

You'll often find, when talking to artists and designers that they tend to have a preference towards working in either a 2D or 3D environment. I've often overheard individuals complaining that they feel 'uncomfortable' outwith their chosen environment,

Being from a fairly traditional 2D background myself, I have only begun getting into 3D animation quite recently, in fact my interest really started growing since working with some of the 3D concepts introduced in After Effects 5.



Figure a: Here is a frame from a finished QuickTime movie that you will learn to create using a Cinema 4D multi-pass render, Zaxwerks Invigorator and a smattering of special effects!

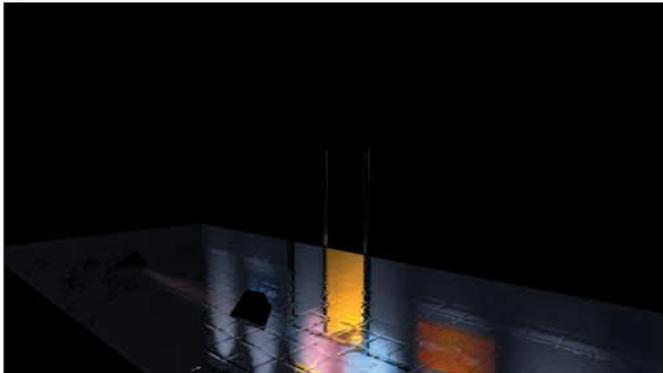
One of the things that, in the past, put me off some 3D animation was the fact that it was too unrealistically 'real', too perfect, shiny and polished. I prefer work that has more of an edge to it, you know, with a slightly 'grungy' quality.

In recent years I've seen some really impressive 3D work, which displays these qualities. After researching the techniques used to produce these works I discovered that the all too important finishing touches were often added in post-production with applications such as After Effects. All the things that make a scene more realistic can be added after the 3D render is complete. To make these 3D renders easier to edit and to make them more flexible you can render the image or movie out as a multi-pass render.

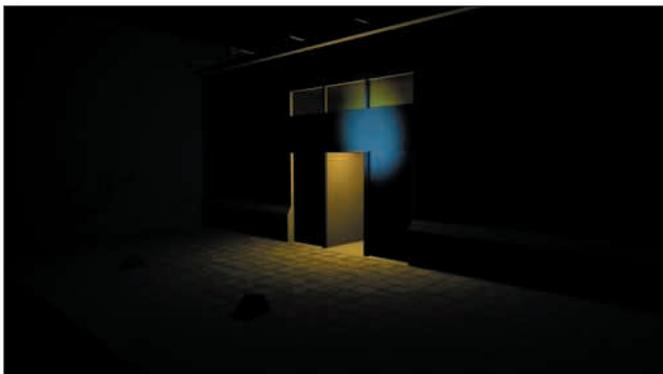
## What is a Multi-pass Render?



A multi-pass renders each element of the scene as a separate pass. For example: Below are some of the individual passes that can be rendered from Cinema 4D: depth, reflection, and diffuse values respectively.



These passes are then composited together in a compositing programme such as After Effects where they can be adjusted using transformations, blending modes and effects.



We're going to take a look at a couple of techniques for re-composing these Cinema 4D multi-pass renders within After Effects.

I have recently become interested in learning more about 3D, in fact I'm currently trying to find time to spend with my two 3D applications of choice: Alias Wavefront Maya and Maxon Cinema 4D XL.

It may seem quite odd to you that I have two favorites but up until fairly recently, Maya's price was out of the reach of most small production houses. It also has a complicated install procedure which makes it difficult to transport the software from one machine to the next and this is something that has to be done at times when freelancing. Whenever I work away from my studio I take my copy of C4D to install on the machine where I work (I also remove it from the same machine when I finish the job!!) Cinema 4D is an excellent, low cost alternative which can pretty much match Maya feature for feature. Its interface is very similar to that of Maya but also has some unique features which we will take a look at in the following tutorials.

Tim Clapham, a very talented designer at Hypa solutions in Brighton, England, and myself, designed these tutorials. Tim concentrated more on the Cinema 4D aspects whilst I concentrated on the After Effects side of things. In a way, this echoes the way that many real world studios work: one designer passing the 3D materials onto the post artist for effects and finishing touches.

There are two main sections to this tutorial. The first part showed you how to set up a scene in Cinema 4D. This is the second main section; it shows you how to adjust elements of the 3D scene in After Effects.

# 1 importing multi-pass renders

We're now going to take a look at how you can import a Cinema 4D multi-pass render along with all associated cameras and lights directly into the After Effects Timeline. You'll learn how to adjust elements of the scene in post-production, animate the lights and even composite new 3D elements within the rendered 3D scene.

Later we'll take a look at how After Effects deals with multi-pass renders from other 3D applications. I'll also show you how to extract camera data from 3D rendered RPF sequences (and use that data within AE). We'll also look at some third party filters that can be useful when working in 3D.

## Cinema 4D AE plug-in

Maxon Cinema 4D has a special After Effects Composition export feature which allows you to export a multi-pass render automatically to the After Effects Timeline. In order to import this special file, you'll need a copy of the free CINEMA4DAE plug-in for After Effects from Maxon. This is freely downloadable from the Maxon website at: [http://www.maxon.de/pages/download/download\\_updates\\_e.html](http://www.maxon.de/pages/download/download_updates_e.html)

If you have not already done so, install the CINEMA4DAE plug-in now and restart After Effects. If you do not have this plug-in installed on your system you can skip ahead to the step number 8 (page 4) where a pre-built project awaits you!

## Zaxwerks Invigorator plug-in

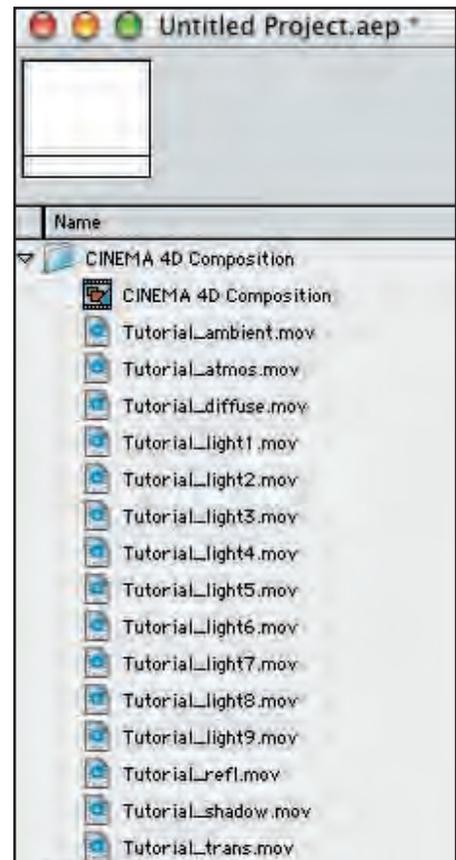
Later in this section we'll be using the Classic version of the Zaxwerks Invigorator plug-in for After Effects. This plug-in allows you to create 3D models directly in After Effects. You will need this to go through the final parts of this tutorial. A fully working demo version is free for download at the following website: <http://www.zaxwerks.com>



Before proceeding remember to check the Readme file that is included in this download, it contains important information about system requirements for the following tutorials.

- 1 Open After Effects if it is not already open.
- 2 Go to File>New>New Project to open up a new Project Window.
- 3 Double-click on the empty space within the Project Window; this will open the Import As dialog box.
- 4 Go to the **Multipass tutorial** folder and import the file named, **clubFront\_FINAL.aec**.

You'll notice a short delay as After Effects imports the After Effects composition which was created in Cinema 4D. Once AE has stopped importing you will see that two new folders have appeared in the Project Window, these folders contain all the passes you exported from Cinema 4D. (See diagram below)



- 5 In the Project Window, open up the folder named, CINEMA 4D Composition. Within this folder you will see several QuickTime movies and a composition, also named, CINEMA 4D Composition.
- 6 Double-click the QuickTime movies one-by-one and play them so that you can see what the individual passes look like. Notice that each pass contains a single element from the render, e.g. the reflection pass contains only reflection information. Close the movies once you have looked at them. (Fig.1)
- 7 In the Project Window, double-click on the CINEMA 4D composition icon to open up its Timeline and Composition Window. Notice that all of the layers that were rendered out from Cinema 4D have been placed into a new Timeline in the correct order, with blending modes applied. (Fig.2)
- 8 Go to the File menu>Open Project, open up the project named **Multipass.aep** from the Multipass>AE projects folder. This is a ready-made replica project full of comps which will open even without the Cinema4D import plug-in installed.

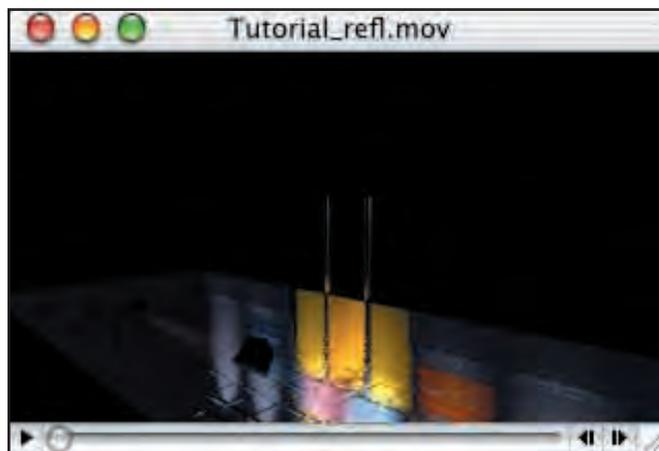


Figure 1: Multiple passes enable you to be more flexible with your 3D renders. By rendering each element to a separate layer it makes it easier to isolate elements in order to make changes in post-production.



If you don't have a copy of Zaxwerks Invigorator installed, or if you are using the Standard version of After Effects you will get a message telling you that certain effects are not present, if you get a message like this, please click OK and continue with the tutorial.



Inset 1: The Solo switches in the A/V Features panel along with the Video switches.

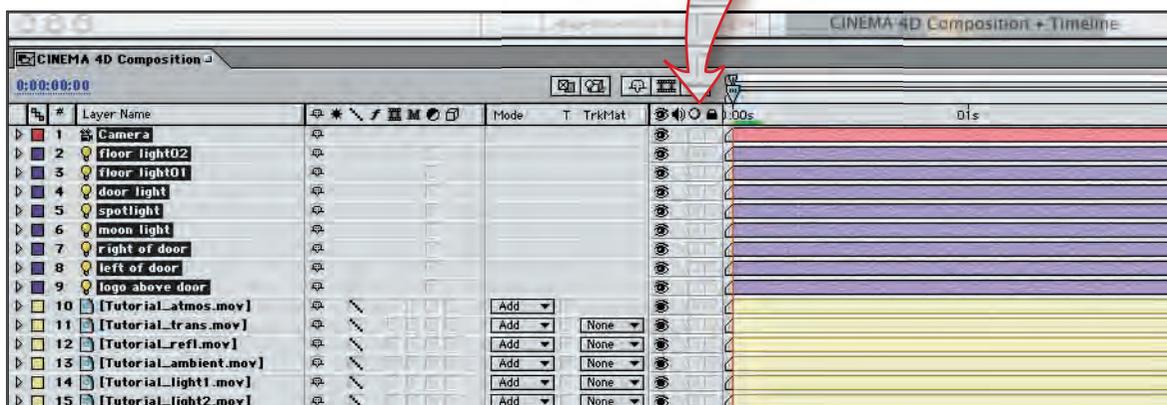


Figure 2: When working with multi-passes from other 3D programs, you have to figure out the correct order and blending modes for yourself using trial and error. Later I'll show you how this is done. You'll also notice that there is a camera and several lights within your comp, these have been imported directly from Cinema 4D along with all original settings and animation keyframes. This makes it very easy to composite new elements into our 3D scene; we'll do exactly that a little later.



Figure 3: You may have noticed that the After Effects cameras and lights at the top of the screen don't appear to have any effect on the other layers. This is because none of the layers are 3D yet so cannot react to the lights and cameras. But never fear! I'll show you how we can use them later.

- 9 In the Timeline, toggle the Solo switches on and off for each layer to see the passes and how they interact with each other. Do this by clicking in the checkboxes under Solo (Inset 1).
- 10 In the Modes column, notice that the correct blending modes are already applied to the layers for you. We'll look at this in more detail later
- 11 Select layer 14, `tutorial_light1.mov` and Toggle its Video switch on  and off to see its effect on the scene. Do the same for the other light layers.

These are the light render passes from cinema 4D and are just 2D QuickTime movies. Notice that as well as these light layers, there are real After Effects cameras and lights in the composition (Fig.3)

## 2 flashing lights and expressions

The first thing we are going to do to our scene is to animate the lights flashing on and off. We'll use the wiggle expression that we learnt about in Chapter Fourteen of the book, 'Expressions'. This time we'll use a new technique to adjust the timing of the resulting values.



Figure 4: We can animate the lightbeams easily in After Effects



If you haven't already completed the expressions chapter of the Creative After Effects 5.0 book, I recommend that you do so before continuing with this tutorial; it will give you a good basic understanding of expressions. If you continue without a good basic understanding you may find the remainder of this section quite challenging but please feel free to continue if you feel confident. If you would prefer to skip this section, and come back to it later move straight ahead to the next section, 'Colored Lights' where we will add some color animation to the lighting.

- 1 With layer 14, `tutorial_light1.mov` still selected, hit the T key to bring up the Opacity value. (Fig.5)
- 2 Option/Alt-click on the stopwatch  to add an expression and then type in the following text; `wiggle(5,200)`

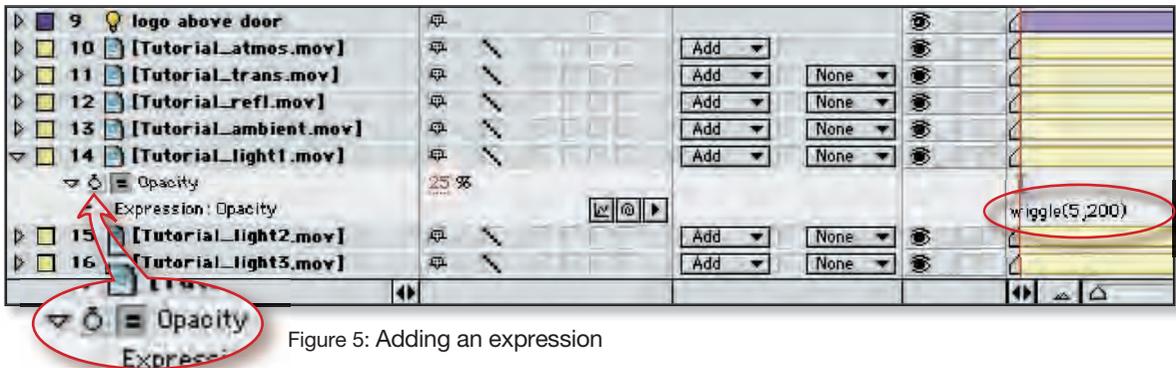
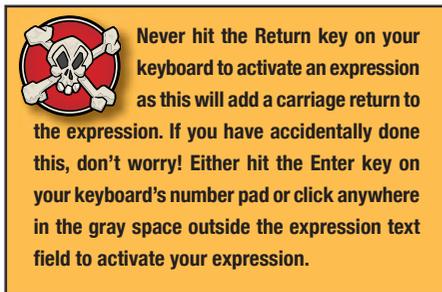


Figure 5: Adding an expression

- 3 Hit the Enter key on the number pad or click away from the text field to activate the expression. This will wiggle the value five times every second of the animation by a maximum range of 200 from the original setting (Fig.5).



- 4 RAM preview the animation to see the light flashing on and off.

I have only selected to render one pass for each light in this instance but you can choose to render up to three separate passes for each light, diffuse, specular and shadow. If you had rendered all three passes, they would be nested together in pre-comps where you could adjust the passes individually. In this case, to save on disk space we are only working with the light beams themselves.

OK, we used a pretty basic expression to make the lights flash on and off repeatedly; but we only have one light flashing. How can we make all of the lights flash on and off at roughly the same speed? The logical way would be to link the other layers to the wiggled layer; this way we could control the speed of the flashing lights by simply adjusting one single layer. The concept is good and so if you came up with this solution, you're on the right track, well done, but, there is a slight problem that I'll now demonstrate to you.

- 5 In the Timeline, select the **tutorial\_light2.mov** layer and then hit the T key to bring up the Opacity property.
- 6 Alt-click on the Opacity stopwatch to add an expression.
- 7 Drag the Pickwhip from the **tutorial\_light2.mov** layer's Opacity value to link to the **tutorial\_light1.mov** layer's Opacity value (Fig.6). The expression should now read; `this_comp.layer("Tutorial_light1.mov").opacity`

As I mentioned in the Expressions chapter it helps to break down the expression as you would a file path on your computer's hard drive. This would mean that the Opacity value of this layer is now being taken from;

`This composition/ Layer, Tutorial_light1.mov/ Opacity value`

- 8 Hit the Enter key and then RAM preview the result. Both layers should be flashing with exactly the same timing. If they are not, you have perhaps missed a step. No problem, simply undo your steps in the Edit>Undo menu till you have undone the previous 'Add Expression', then repeat steps 7 and 8.

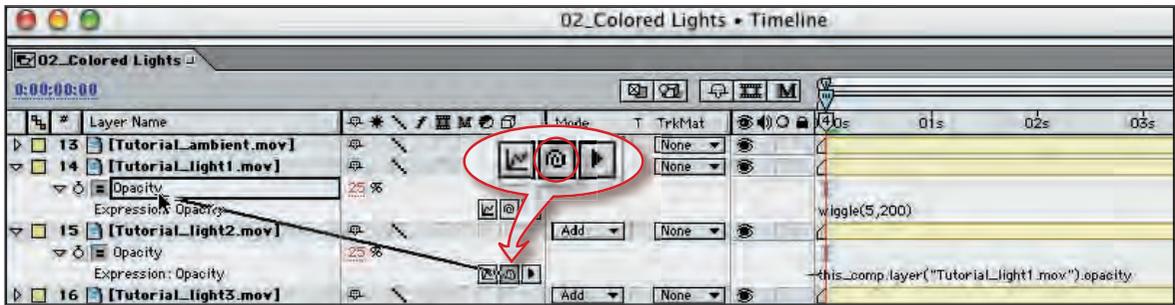


Figure 6: Dragging the Pickwhip to link Opacity values between layers

## time expressions

Notice that both layers are flashing with exactly the same timing; this is not the effect we want. We want the layers to be flashing at the same speed but it would be preferable if the lights flashed randomly. There are several ways of achieving this but the easiest way is to simply offset the timing a little. We can do this easily by using the Value at Time expression.

The Value at Time expression is useful if you want to offset the timing of an animation, whether it is a keyframed animation or the result of an expression. To offset the timing of a keyframed animation the Value at Time expression would be added directly after the property. For example, adding to the `opacity` expression so that it reads;

```
opacity.value_at_time(time+1)
```

would move the whole animation forward by one second.

In this case, we want to offset the result we have obtained by pickwhipping to another layer. This makes this expression slightly more complicated, but you can still cope with it I'm sure! The expression should currently read;

```
this_comp.layer("Tutorial_light1.mov").opacity
```

- To offset the animation by one second simply place the cursor at the end of the expression text and add to it so that it finally reads;

```
this_comp.layer("Tutorial_light1.mov").opacity.value_at_time(time+1)
```

This just takes the result of the original expression and offsets in time by one second, moving it forward.

## variables

As I mentioned in the Expressions chapter of Creative After Effects 5.0, it's good to break expressions down into sections so that they are easier to understand. One way of doing this is to use variables. You can achieve exactly the same result as the previous example by using the following expression which I think is much more elegant:

- Select the **tutorial\_light3.mov** and add an expression to its Opacity value.

- Type in the following expression;

```
a=this_comp.layer("Tutorial_light1.mov").opacity;
```

```
a.value_at_time(time+1)
```

In the first line we set up the letter 'a' as our variable. The second line is the actual expression, using the variable 'a' in place of: `this_comp.layer("tutorial_light1.mov").opacity`

OK, so we have exactly the same expression, just in a different format. The only problem is that the last two layers will have the same values (Fig.7).

- 12** Check this by clicking on the expression graph buttons  for the last two layers; they will be identical. Make doubly sure by RAM previewing the comp. Notice that lights 2 and 3 are flashing with exactly the same timing, not what we are after!

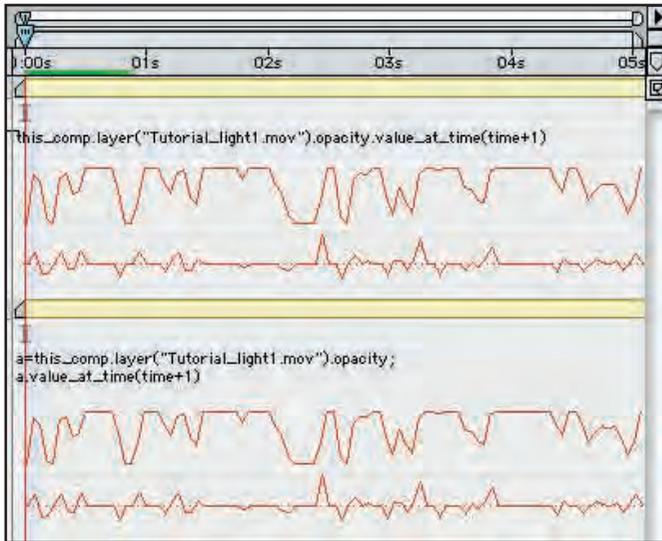


Figure 7: Both expressions return exactly the same values.

What we need is for each layer to be offset by a different number. When you use the **index** attribute in an expression it returns a value based on the layer's number in the Timeline. So, if my layer is number 14, it will return a value of 14.

- 13** Change the expression on the **tutorial\_light2.mov** layer so that it reads;  
`a=this_comp.layer`  
`(“Tutorial_light1.mov”).opacity;`  
`a.value_at_time(time+index)`

- 14** Add the same expression to each of the other **tutorial\_light** layers' Opacity values. By using the layer's number as the offset value we can offset each layer's Opacity value by a different amount.

There's no need to save your project as the steps have been saved into pre-built compositions for you. However, if you really want to you can save your project into a new folder on your hard drive.

## 3 Colored lights



**Now we have all the lights flashing we'll use a pre-saved favorite effect to apply a color effect to all the light layers.**

- 1** In the Project Window double-click the **02\_Colored Lights** composition to open its Comp Window and Timeline. This contains a composition that is almost identical to the one you have been working on.
- 2** Select **tutorial\_light1.mov** in the Timeline window and go to Effect>Apply Favorite.
- 3** Navigate to the Multipass>Favorite FX folder; choose the **Wiggle\_Hue.ffx** favorite effect to apply to your footage.

This is a Favorite Effect, which I saved earlier. As well as being able to save the actual effect and its settings, Favorite Effects also save any keyframe or expression information associated with the effects. This particular Favorite Effect has the Hue/Saturation effect applied, which has a wiggle expression attached to it.

- 4 RAM preview the comp to see the Hue value of light 1 animating over time.
- 5 Select the **tutorial\_light1.mov** in the Timeline and then double-hit the 'E' key to open up any expressions applied to the layer.

Notice that this Hue property has a wiggle expression, similar to the one used to wiggle the lights opacity in the previous section. The saturation of the lighting color is a little bit too high at the moment, making the light a very bright, unreal color.

- 6 Open the Effect Control Palette if it is not already open.  
(Command/Control+Shift+T)
- 7 Go to the bottom of the Effect Control Palette to find the Colorize Saturation value, change this value to 60 to reduce the saturation of the light color (Fig. 8)

Another new feature of After Effects 5.5 is the Effects Palette, which is a completely separate entity from the Effect Controls Palette. You can find the Effects Palette in the same group as the Time Controls Palette and the Audio Palette.

- 8 Click on the Effects Palette tab in the palette group, or, if it is not currently visible, go to Window>Effects to open it up (Fig.9)

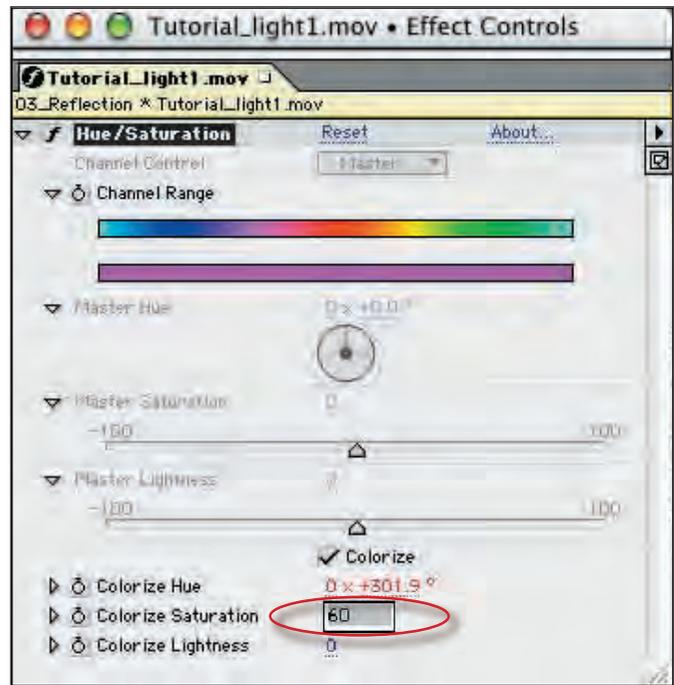


Figure 8: the Hue/Saturation Effect Control Palette

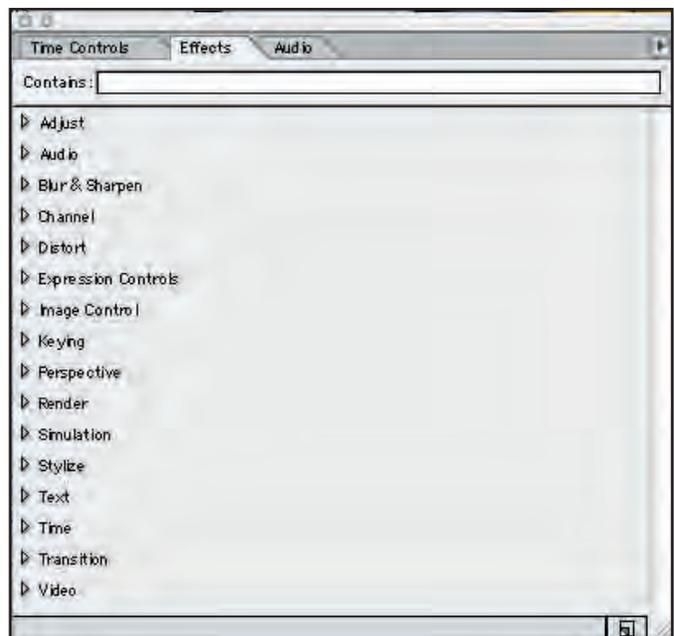


Figure 9: After Effects 5.5's new Effects Palette



The Effects Palette has several uses, the most important being an effects management system. In here you can choose to view all available effects in several new ways:  
**By Category** – as they normally appear in the Effect menu;  
**In Finder Folders** – as they appear on the hard disk (useful for viewing effects in package groups); or as an **Alphabetical List**.

- 9** In the Effects Palette, click on the wing menu to reveal the choices available to you. Toggle between the first three options in the menu (Category; Finder Folders or Alphabetical) to see how the effects are listed using the different methods. Finish with them displayed in their Finder Folders. (NB: If you only have one folder within your plug-in folder, you will not see any folders, only the effects as they are listed alphabetically).

Another way of making the light a little bit more realistic is to add a bit of noise to break it up a little. In the Effects Palette, you will see a *Contains* text box at the top of the palette; this allows you to search quickly for effects by their name.

- 10** In the Contains text box, type the word *noise*. All effects containing the word noise should now appear in the folders that are contained within the finder. Effects can be dragged and dropped from the Effects Palette directly onto layers in the Timeline; the Effect Controls Palette or the Comp Window, a very flexible way of working.

The next two steps can be followed in two different ways depending on which version of After Effects you are using. Please follow PB if you are running the Production Bundle or SV if you are running the Standard Version.



**11** (PB) If you have the Production Bundle of After Effects, you will see the Fractal Noise filter listed. If so, click and drag this effect from the Effects Palette onto your **tutorial\_light1.mov** in the Timeline.

- 12** (PB) In the Effect Controls Palette change the Contrast to 125% and the Transfer Mode menu to Multiply. This will give your light a smoky effect. (Fig. 11)



**11** (SV) If you have the standard version of After Effects, the Fractal Noise effect will not appear in the list. If this is the case, drag the Noise effect onto your tutorial\_light1.mov layer in the Timeline.

- 12** (SV) Change the Amount of noise value to 2%. This will give you a different result from the Fractal noise filter, more like the light being shone through particles of dust. (Fig. 12)

Before we preview the effect we'll use the same effect on all the other light layers. You can continue with the next step whichever version of After Effects you are using.

- 13** Another really nice new feature of the Effects Palette is the ability to save favorite effects by dragging them onto it. Before continuing with the next step, make sure that you can see both the Effect Controls Palette and the Effects Palette, side by side (Fig. 10).

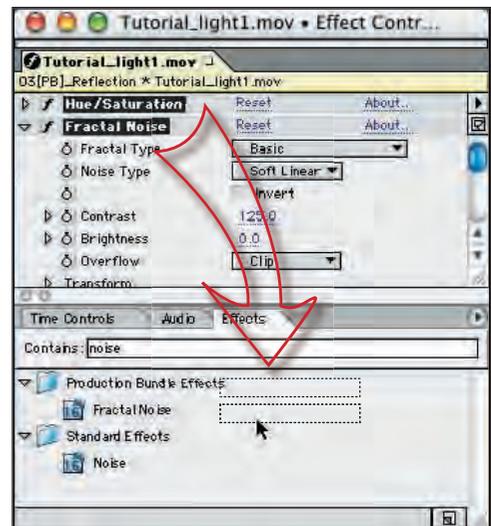


Figure 10: Drag multiple effects to save as favorites

- 14** In the Effect Controls Palette, select both of the effects and then drag them onto the Effects Palette (Fig. 10).
- 15** You will then be given the opportunity to save these. Navigate to the desktop to save your new favorite effect.



- 16** If you are working in the Production Bundle, name your new favorite effect **Fractal\_noise\_Hue.ffx** and save it to the desktop.
- 17** Deselect the tutorial\_light1.mov layer and then select all the other **tutorial\_light** layers.
- 18** Go to the Effect menu>Recent Favorites and apply your new favorite Effect, **Fractal\_noise\_Hue**, to all the selected layers.



- 16** If you are working in the Standard version, name your new Favorite Effect **Noise\_Hue.ffx** and save it to the desktop.
- 17** Deselect the tutorial\_light1.mov layer and then select all of the other **tutorial\_light** layers.
- 18** Go to the Effect menu>Recent Favorites and then apply your new **Noise\_hue** effect to all of the selected layers.

- 19** All the selected layers will now have the favorite effects and expressions added to them. RAM preview to see the results.

In the Project Window you will see two comps named, **03[PB]\_Reflection** and **03[SV]\_Reflection**. These are pre-saved versions of the comps you have just finished working on. In the PB version I have taken the extra step of animating the Evolution property of the Fractal Noise effect. In the Standard Version I have removed the effects from Tutorial\_light4.mov to make the effect more subtle.

- 20** RAM preview the appropriate comps to see the effect. Remember that you will not be able to see the animating fractal noise if you are working in the Standard version ( Figs. 11 & 12).



Figure 11: The Production Bundle's Fractal Noise effect applied

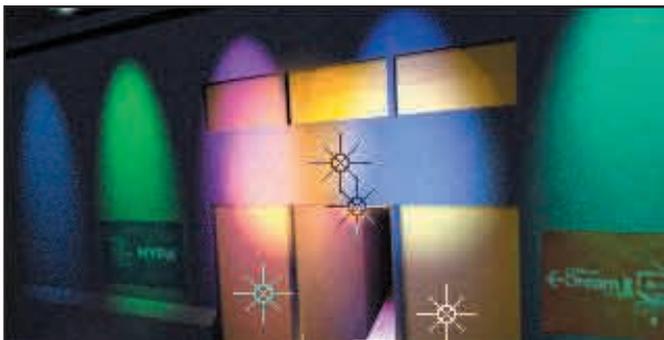


Figure 12: The Standard version's Noise effect applied

These are just two very simple examples of how you can change the property of your light in post-production. In this example you may have noticed that only some of the lights are reflecting onto the floor. To save disk space we have only rendered out a single pass for each light. You can have a much higher level of control by rendering out individual passes for each property of the light. In this way you can control the light beam, the light reflection and its diffuse qualities separately.



You could try the same technique substituting the Hue/Saturation effect with one of my favorites, Colorama. This way you could try a multitude of color combinations very quickly and easily. But remember that Colorama is not (at the time of writing) a 16-bit effect. Hopefully it will be by the time you read this!

## 4 reflection deflection

OK, so imagine that the producer looks at the render and says, “I love it! But there’s too much reflection on the ground; it just looks too shiny”. Well, with a regular 3D render we would have to go back to the 3D program, adjust the settings and render again. Not so with a multi-pass render, it’s very easy to adjust the amount of reflection. There are several ways of doing this, and I’m going to show you the quickest and easiest way to do it.

- 1 Open the 03b\_Reflection SV comp by double-clicking its icon in the Project Window. We’ll continue to work on this project as it will work correctly on both versions of AE.
- 2 Select the tutorial\_refl.mov layer and then hit the “T” key to open up its Opacity property.
- 3 Move your cursor over the Opacity value (which currently reads 100%) till it changes to a hand with a finger pointing. You can now scrub the Opacity value to the left till it reads 60%. You will see the opacity of the layer change in the Comp Window as you scrub (Fig.13).

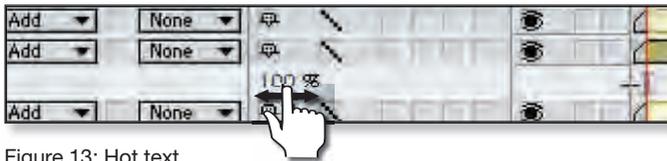


Figure 13: Hot text

That’s how easy it is to reduce the amount of reflection in post when working on a multi-pass render! We could also use blurs and/or displacement maps to alter the perceived texture of the surface; here we’ll use a simple blur effect.

- 4 In the Effects Palette (Window>Effects) type in the word blur to isolate all the available blur effects.
- 5 Drag and drop the Directional Blur effect onto the tutorial\_refl.mov layer in the Timeline. This allows us to alter the angle of the blur to fit in with the angle of the floor.
- 6 Change the blur Length value to about 3 and the blur Direction value to -118 degrees so that it is blurring in the same direction as the floor tiles.

## 5 matching camera moves

Up until now, we’ve adjusted our scene by applying effects and expressions to existing elements but what if we wanted to introduce a new element into the scene? You would think that this would be impossible; surely once the scene has been rendered it would be too late to introduce new elements?

With the Cinema 4D import you can, because as well as exporting all of the passes as 2D QuickTime movies, Cinema 4D exports all of the lights and cameras used in your scene, along with any keyframes associated with them, making it very easy to match up camera moves.

- 1 Open the 04\_Composite comp by double-clicking it in the Project Window. Notice that there is a new layer, 60Dance.mov which is bigger than the composition and currently obscuring the other layers (Fig.14).
- 2 RAM preview to see the dancer dance.



Figure 14: Boogie woogie!

We are going to composite this footage into the window areas at either side of the door in our scene so that it appears to be a silhouette of a dancer inside the nightclub. This layer is very obviously a 2D layer – like all the other QuickTime movie layers within this composition.

You may be a little confused at this point. Because the multiple passes were imported along with real After Effects cameras and lights you may be thinking this scene is three dimensional but remember that the passes are all 2D QuickTime movies composited together. It's important to understand that at this point.

- 3 Switch off the Video Switch for the  **60Dance.mov** in the Timeline.
- 4 Select the tutorial\_diffuse.mov layer in the Timeline and then, in the Comp Window, drag it around the screen to see what happens. The layer will move around the screen demonstrating clearly that it is a 2D layer.
- 5 Hit Command/Control + Z to undo the last step.
- 6 Switch the Video Switch back on for the 60Dance.mov layer.
- 7 Switch on the 3D Switch for the  60Dance.mov layer and notice that it appears to shrink as it jumps into the 3D scene (Figs. 15 & 16).

The layer has not really shrunk, it is simply reacting to the camera that was imported from Cinema 4D, which happens to have different coordinates than the default After Effects camera.



Figure 16: The layer jumps into 3D space



If you want your animation to begin with the same point of view as the default After Effects camera (so that your layer will be seen at its original size within the comp) you should create a new camera in AE with the default 50mm settings. Then, take down a note of all the coordinates, then transfer them to Cinema 4D camera to achieve the correct starting position. Remember that we also used nulls to control the camera in Cinema 4D so their coordinates also have to be taken into consideration.



Notice that the two Camera layer's values are very different from each other, hence the difference in views between them. Remember that the layer has not really shrunk, it is only the camera from C4D that makes it appear that way. It's important to keep this in mind when planning your comps. You want to avoid stretching your layers, particularly when working with bitmap images or movies.



If you are creating a new image that you wish to fill the screen, set up a test composition with the camera as you want it. Place a 3D layer in the desired position and then stretch it to its required size. Take a note of the pixel measurements, and use this information to format the new file at the required resolution before importing into After Effects.



Figure 15: Click inside the little checkbox under the 3D switch to make your layer 3D and watch it react to the After effects cameras and lights.



If you have an existing file that you will be zooming into, or if you need a layer to appear bigger than it's default size, make sure that you resize it to the maximum size required in the application where it originated before importing it into After Effects. If this is not possible you can plan the whole 3D scene around the size of the original footage by placing a copy of the image you want to work with into your 3D application as a guide.

- 8 Go to Layer>New>Camera to bring up the Camera Settings box (Fig.17).
- 9 Name the camera 'Test Camera', choose 50mm in the Preset menu and then click OK. As you do this, the 60Dance.mov layer will appear to jump back to its default position. This demonstrates that the default After Effects camera's 3D view will match up with the comp's 2D appearance. Just as with regular layers, the view of the camera layer highest in the Timeline will override any other camera views below it.

- 10 Select both camera layers and hit the 'P' key to open up their Position properties. Notice the difference between the two camera's coordinates, resulting in different views for each.
- 11 Select only the 'Test camera' and then hit Backspace to delete it. Close up any open layers.
- 12 RAM preview the composition. Notice that the new layer now reacts to the After Effects cameras and lights making the layer appear to be positioned in the original 3D scene.

Because these cameras and lights match up exactly with the cameras and lights used in the Cinema 4D render, it appears as though the layer is now within the 3D scene. This is an optical illusion but it works very well!

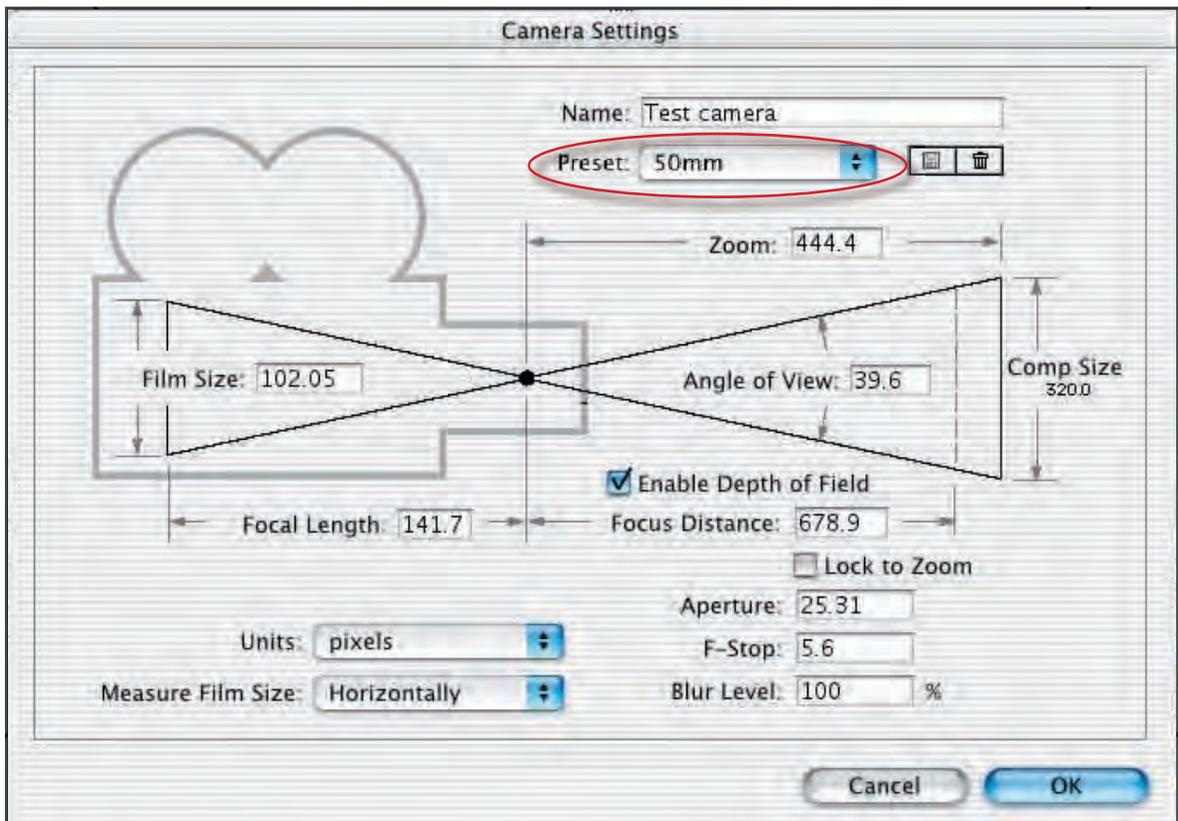


Figure 17: The Camera Settings dialog box

The one thing that it is not yet supported in the Cinema 4D export is nulls. I'm not exactly sure why this is; both applications support nulls so why can't the twain meet? The honest answer is that I don't know, you would have to ask the programmers. I have a suspicion that it must be something to do with the way the coordinates of nulls are measured in the two applications. After Effects places the anchor point of a null on the top left corner of the layer whereas Cinema 4D nulls are measured from the centre point of their 3D world.

It really would be great if nulls were also exported, and if their parenting relationships could also be maintained. That way, we could use nulls to easily match up the coordinates between the two applications. Meanwhile, I can tell you how to get around this oversight by using dummy lights as nulls.

If you followed the Cinema 4D tutorials you may remember that there were some extra lights in our scene, which were switched off. Those lights were placed into the scene for one reason only; to give us coordinates to copy to our new elements in After Effects. If you know in advance that you will be compositing new elements into a scene, simply place lights (with no properties) in the position that you want the new element to appear. I'll show you how you can use this information in After Effects.

**13** Move to the three-second mark.

**14** Select the **Right of door** light layer and hit the 'P' key to open up its Position property.



Figure 18: Using the light layer as a null

**15** Click on the word *Position* in the Timeline to make this property active and then hit Command/Control-C to copy the position value.

**16** Select the **60Dance.mov** and then hit command/Control-V to paste the position values into the layer. The dancer should now jump to the same position as the light layer. (Fig.18)

**17** Select the right of door light layer and hit backspace to delete it.

OK, so we have one dancer roughly in position but she's white on black, we want a black silhouette on a white background. It's very easy to reverse this image by using one of the Channel effects.

**18** In the Effects Palette, type in the word *Invert* to isolate any effects containing this text.

**19** Drag and drop the Invert effect onto the **60Dance.mov** layer in the Comp Window. This effect will invert the color channels, making our dancer black on white. You can clearly see the lights now reacting with the layer's white background.

**20** In the Comp Window, scale the **60Dance.mov** layer down to 85%.



Remember to use the Info palette as a guide to tell you how much you are scaling by. The Info palette is also extremely useful for displaying position coordinates and color values (Window>Info [Command/Control+2]).

- 21** To make the background disappear, in the Modes panel of the Timeline, change the blending mode of the dancer layer to Multiply.

Notice that there is still a slight edge left where the lights were shining onto our layer. To get rid of this we'll use a mask as a *garbage matte*. A garbage matte is a hand drawn matte which gets rid of unwanted areas of your image. The easiest way to do this in After Effects is to use masks. As a rule I tend to prefer to draw my masks in the Layer window as I can see my layer in its original state without effects applied (See Masks chapter) but in this instance the ability to draw masks directly into the Composition Window really comes in useful as I can see the layer in its final position and use the background as a guide for my mask.

- 22** Click the Title bar of the Comp Window to make sure that it's active and then change the magnification to 200% by hitting the Period key on the keyboard (the Comma key will scale down).
- 23** Hold down the spacebar to change temporarily to the hand tool; with this drag inside the Comp Window to move the image within the frame so that you can see the dancer and the panel behind her
- 24** Select the Rectangular marquee tool from the Tool Palette and draw a mask around the edges of the panel, don't worry if you are masking off part of the dancer's arm, we can fix this later (Fig.19).



Figure 19: Using a mask to create a grabage matte

The *Pan Behind* tool has several uses, as we learnt in previous chapters. It can be used to move the anchor point of a layer without affecting the layer's placement in the Comp Window. It can also be used to move (or pan) a layer behind its mask; doing this will adjust the Position and Mask shape values in one easy action.

- 25** Select the Pan Behind tool (Y)  from the Tool Palette.
- 26** Click on the **60Dance.mov** layer in the Comp Window (avoid the anchor point of the layer as this will move the anchor point instead) and drag the layer to the right till her arm is lying just inside the mask boundaries.
- 27** Reselect the Selection tool by  hitting the 'V' key. We'll now create a second dancer to go in the opposite panel.
- 28** With the **60Dance.mov** layer still selected, hit Command/Control+D to duplicate it.



If your layer does not appear to have duplicated it could be that you still had the mask selected when you hit Command/Control+D. A new feature of After Effects 5 was the ability to duplicate masks. This is one of the rare cases where I don't particularly like a new feature, it's too easy to accidentally duplicate a mask instead of a layer which can cause confusion. If this has happened to you, select your layer and hit the 'M' key to open up any masks applied to the layer. If you have more than one mask, delete all but one of them and then make sure that the remaining mask is not selected before hitting Command/Control+D again to duplicate the layer. Watch out for this one, it's caught me out on several occasions.

- 29 Copy and Paste the Position value from the **Left of door** light layer into the new **60Dance.mov** layer as you did in steps number 14–17.
- 30 Remember to delete the **Left of door** light layer when you are finished with it.
- 31 Nudge the new layer into place if need be, using the arrow keys on your keyboard.
- 32 To make the dancer move in the opposite direction to the first dancer, hit the ‘S’ key to open up the Scale property and then click on the Aspect Ratio Unlock key (Fig.20) to the left of the three scale values.

This feature enables you to adjust each value independently without constraining the aspect ratio, a very welcome new feature to version 5.5.

- 33 Reverse the Scale on the X-axis only, making it –85% (Fig.20).
- 34 RAM preview the comp so far. In the finished movie I’ve also added a blur to the dancers to make them look more shadowy.

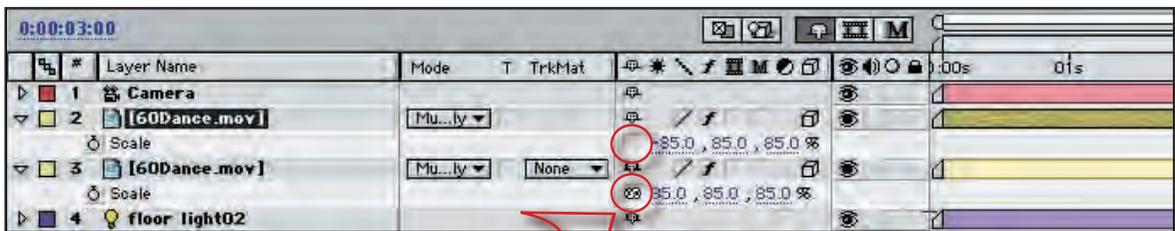
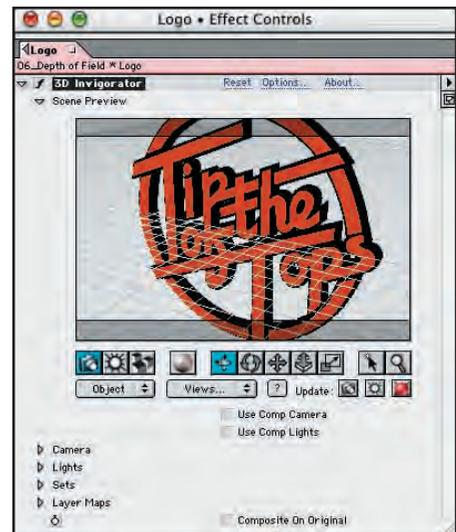


Figure 20: The Aspect Ratio Unlock keys

## 6 zaxwerks invigorator

If you bought the complete After Effects 5.5 Production Bundle you will have received a free copy of Zaxwerks Invigorator Classic with the package (this was not included in the upgrade package). If you didn't receive Invigorator as part of the package, you may want to consider investing in it as it really is worth the investment, as you will see. Invigorator is a plug-in which allows you to create true 3D objects within After Effects. The plug-in comes in two 'flavors': the Classic version which allows you to extrude your vector artwork into 3D objects (amongst other things which we'll take a look at later); and the Pro version which offers a whole lot more including the ability to import 3D objects from other applications. We'll take a look at some features of the classic version today but if you want to find out more (or if you want to download the demo version to continue with this tutorial) please visit the website at; <http://www.zaxwerks.com>



If you want to skip this part of the tutorial and cover it later, when you have installed the Invigorator software, please go to the next section, Adjusting Depth of Field.

We're now going to make a sign from a logo to sit over the doorway of the nightclub. The nice thing about this is that we can make changes to the sign in post production, so, for example if the client decided to add a subtitle, it could be easily changed without having to re-render the whole lot in a 3D program. In the following exercise we will take a look at some of the features of Invigorator but there's a whole lot more to this plug-in than we'll have time to look at here so please do explore it more for yourself afterwards, it comes with an excellent manual as well as a great QuickTime Introduction movie.

- 1 Open **05\_Invigorator** comp from the Project Window.
- 2 Hit Command/Control+Y or go to Layer menu>New>Solid to open up the Solid Settings box. In order to use Invigorator you firstly need to create a layer to apply the plug-in to.
- 3 Name the new layer 'Logo', click the *Make Comp Size* button to make the layer the same size as the composition and then click OK.
- 4 With the layer selected, go to Effect>Zaxwerks>Invigorator (or use the Effects Palette to drag and drop the effect onto your layer.
- 5 If you are using **Invigorator Classic**, the Select Artwork box will appear where you can locate the **tott.ai** file from within the Multipass>Footage folder, click once to select it (Fig.21).
- 6 If you are using **Invigorator Pro**, a dialog box will appear giving you a choice of four options, choose *Create a shape Object*. This will take you to the same select Artwork box where you can click once on the **tott.ai** file to select it.

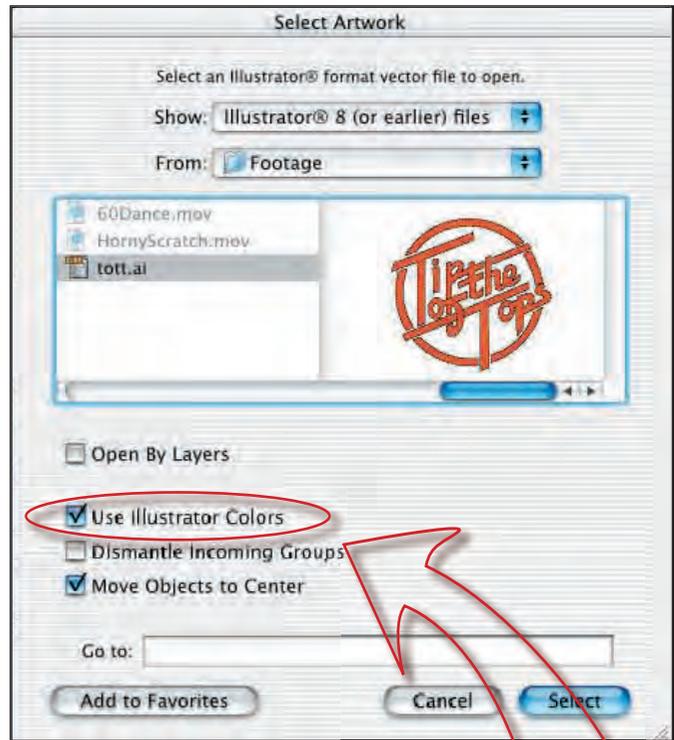


Figure 21: The Invigorator Select Artwork box

- 7 At the bottom of this box, check the Use Illustrator Colors box; this way the colors you chose in Illustrator for your logo will be matched exactly in Invigorator, very handy for matching up corporate color schemes.
- 8 Make sure the *Move Object to Center* button is checked and then hit the *Select* button. Your logo will be taken into Invigorator and extruded to make a 3D object. (Fig.22)
- 9 You may need to rearrange your windows before continuing. Make sure that the Effect Control Palette is big enough so that you can see all of the Invigorator controls easily. Also make sure that both the Effect Controls Palette and the Comp Window are situated so that you can see both simultaneously.
- 10 Once you are happy with the screen layout go to Window menu>Workspace>Save Workspace. In the Choose Name box, type in 'Invigorator'. This window layout will be saved so that you can easily change it back at any time.

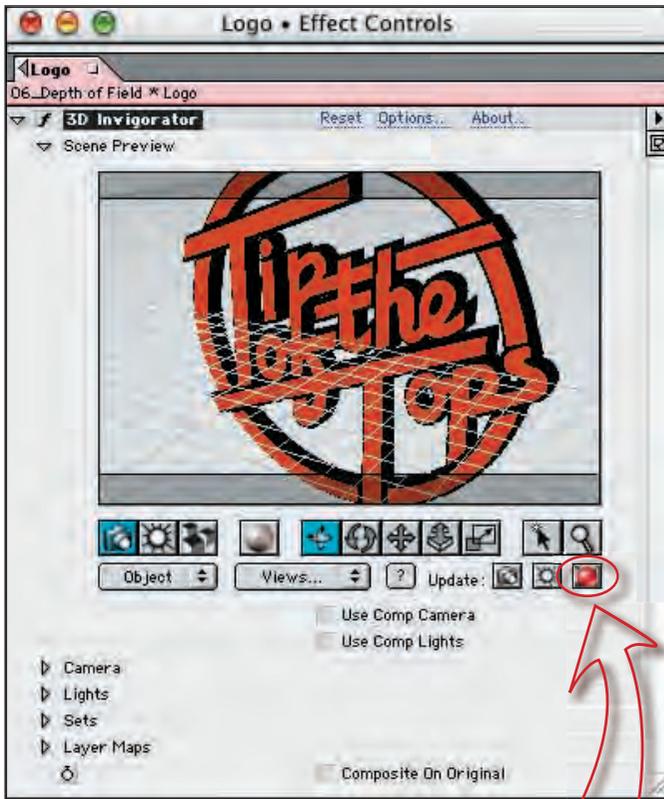


Figure 22: The Invigorator window and the Setup window button

**11** Back in the Effect Controls Palette,  click on the button with the red sphere on it, to the right of the palette; this is the Set-Up Window button. As you click, a new Set-Up window will open up; this is where you can change the non-animatable properties of your objects such as shape, bevel, color, textures and rendering options (Fig.23).

NOTE! You can also access the same setup area by clicking on the word Options at the top of the Effect Controls Palette.

**12** Notice that there is a toolbar with several square buttons underneath the Scene Preview window. The buttons on the left are the Mode buttons; these are for switching between Camera, Light or Object mode. At the moment we are in Camera Mode so any changes we make using the Manipulator buttons on the right will affect the camera.



Figure 23: The Invigorator Setup window

**13** Using the Camera  Tumble tool, adjust your view any way you want by clicking and dragging within the Scene Preview window.

**14** On the Left of the palette you will see the *Views* drop-down menu; change the view to *Front*. Your view will change so that you are seeing your object from the front.

This is a fixed view, and, although the view can be adjusted by using the camera manipulation tools, you can quickly reset your view by selecting the presets in this menu. You can also save any of your own custom views as presets in this menu.

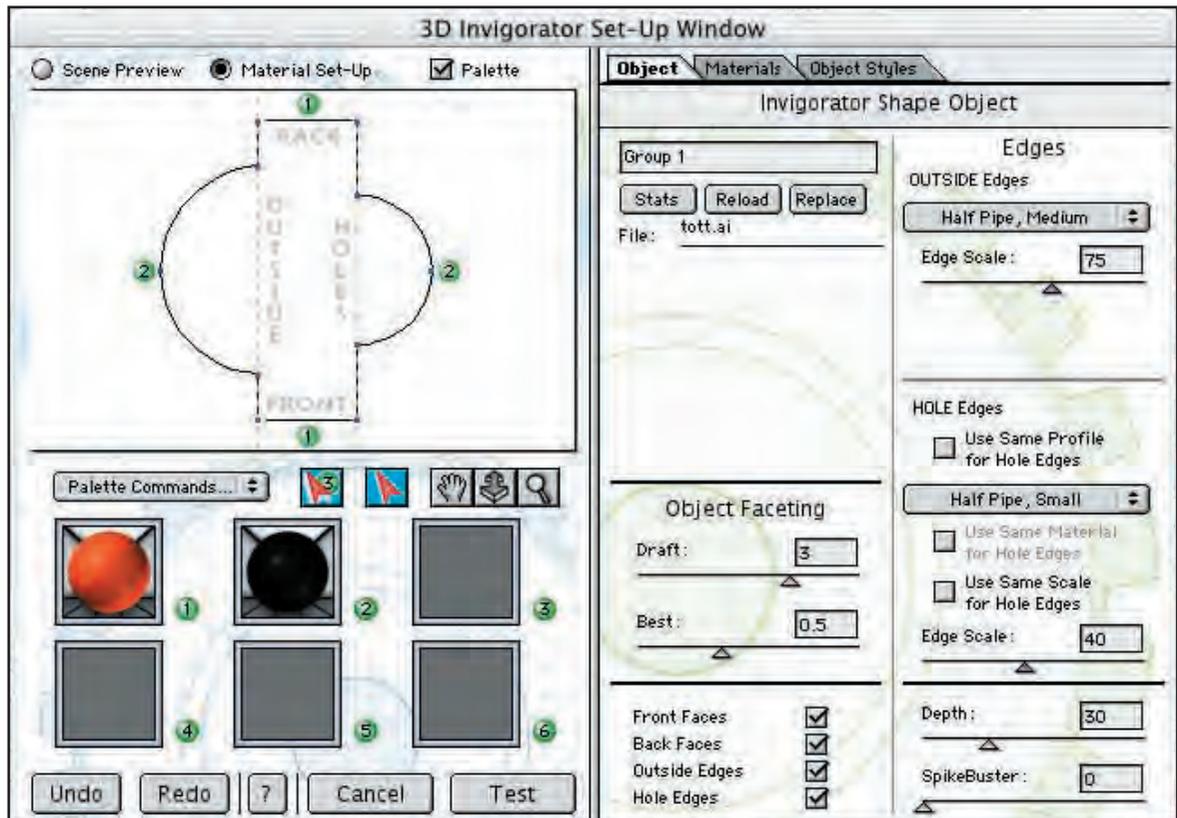
**15** Click on the Object Mode button  to enter Object mode. Look underneath the Toolbar, and to the right slightly; you will see a menu that currently reads 'None Selected'. Click on this menu and choose 'Select All' to make sure that all objects which make up the group are selected.



The logo that we are using is quite a complex one but you can create your own perfectly round neon tube much more easily using Illustrator and Invigorator Classic, here's how. Draw the neon sign text in Illustrator as a single, open path shape (try using your name for this). Give the tube path a stroke weight and then use the Outline Stroke command to give yourself a path that is now a filled object. Save this as 'Neon.ai'. In After Effects apply Invigorator to a layer and choose the 'Neon.ai' Illustrator file. Use the Half Pipe edge profile on this two-sided path to get a perfectly round tube! One of the cool things about doing it this way is that the diameter of the tube can be changed on the fly by simply changing the Depth of the tube object.

**16** Look to the right hand pane of the Set-Up window and notice that there are three tabs; we currently have the Object tab open. In here you can do various things to adjust the appearance of your object. Let's take a look at the Bevel options (right hand panel of Fig.24).

Figure 24: The Material Setup window



- 17** In the Edges section you will see a drop-down menu that currently reads, *Bevel, Medium*. Click on this menu and choose *Pipes and Half Pipes > Half Pipe, Double* from the list. Now that you have chosen a bevel, you can cycle through the remaining choices.
- 18** Use the Up and Down arrow keys on your keyboard to preview some of the other shapes you can choose for your bevel. When you've finished looking, choose *Pipes and Half Pipes > Half Pipe*. This will give our extruded shape a rounded edge. Although this is not a perfectly round edge, we can work on it some more to round it off.
- 19** Notice that the holes inside the letter forms have disappeared because of the deep bevel. To bring them back, start by changing the Edge Scale slider to 75.
- 20** Beneath this slider you will see the Hole Edges section. This enables you to specify a different bevel value for the holes in your letter forms. Uncheck the *Use Same Profile for Hole Edges* checkbox and choose *Pipes and Half Pipes > Half Pipe, Small* from the menu.
- 21** Click on the *Use Same Scale for Hole Edges* box to uncheck it and then change the Edge Scale value to 35. Now you should really be able to see the holes properly.
- 22** At the top-left of the Set-up window you will see two radio buttons, one is the Scene Preview button, the other is the Material Set-Up button. Click on the Material Set-Up button (Fig.24).

This is where you can customize the colors used on the surfaces of your objects. At the top left of the window you will see a cross-section of your object, showing you the different bevels on the inside and outside. Underneath this diagram you will see the Materials Palette, this contains all of the materials that are currently used in your object. Because we chose to keep the colors that we used in Illustrator, we have two surfaces, orange for the fill color, and black for the outline color. Notice that each color has a number and that corresponding green number chips are labeling the facets of the cross section above.

- 23** In the right hand pane, click on the Materials tab to see a selection of available preset materials that you can apply to your objects. We will customize the surface of our object with new materials (Fig.25).



Figure 25: The Materials tab

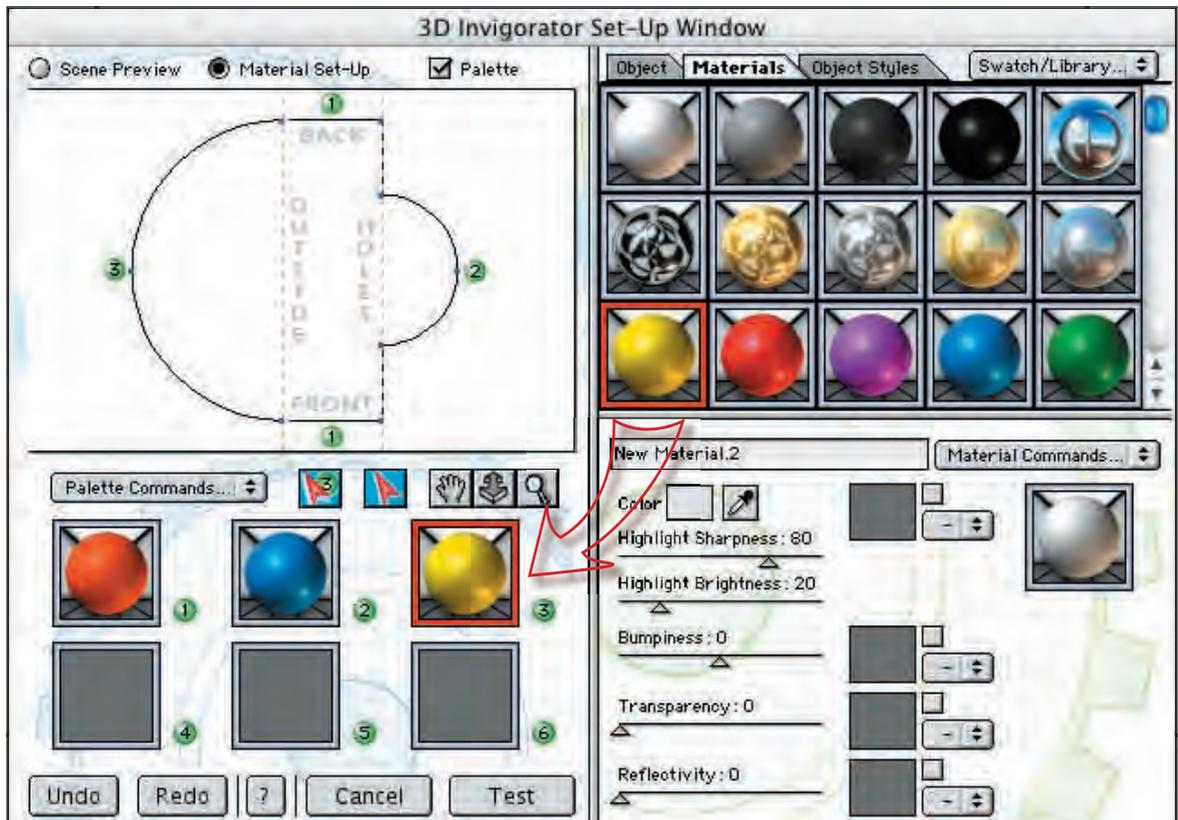


Figure 26: Dragging the Materials onto the docks

**24** Click and drag the blue material from the Materials swatch library onto the black material dock to replace it. You'll be asked if you want to save the black material; choose No (Fig.25).

**25** Drag the yellow material into dock number three (Fig.26).

Notice that the cross-section diagram has little green material chips next to each split section; you can actually add more splits to subdivide your sections using the Split tool but for now we'll just work on the existing sections.

**26** Click and drag the orange material from dock number one onto the green material chip next to the front section (Fig.25). The section will highlight in red. At this point release the mouse button to apply the new material to that section. Repeat this process to apply the orange material to the Back section, the yellow material to the Outside and the blue material to the Holes (As in Figure 26).

**27** Click on the Scene Preview button to see the result of your customization. OK, so you've had a little taster of how to customize surfaces. To make our sign look similar to a neon sign we only want a glassy surface over the entire object .

**28** In the Materials tab Swatch library, scroll down till you see the Blue Glass swatch, double-click it to make it active. Notice its name and settings appear in the section below (Fig.27).

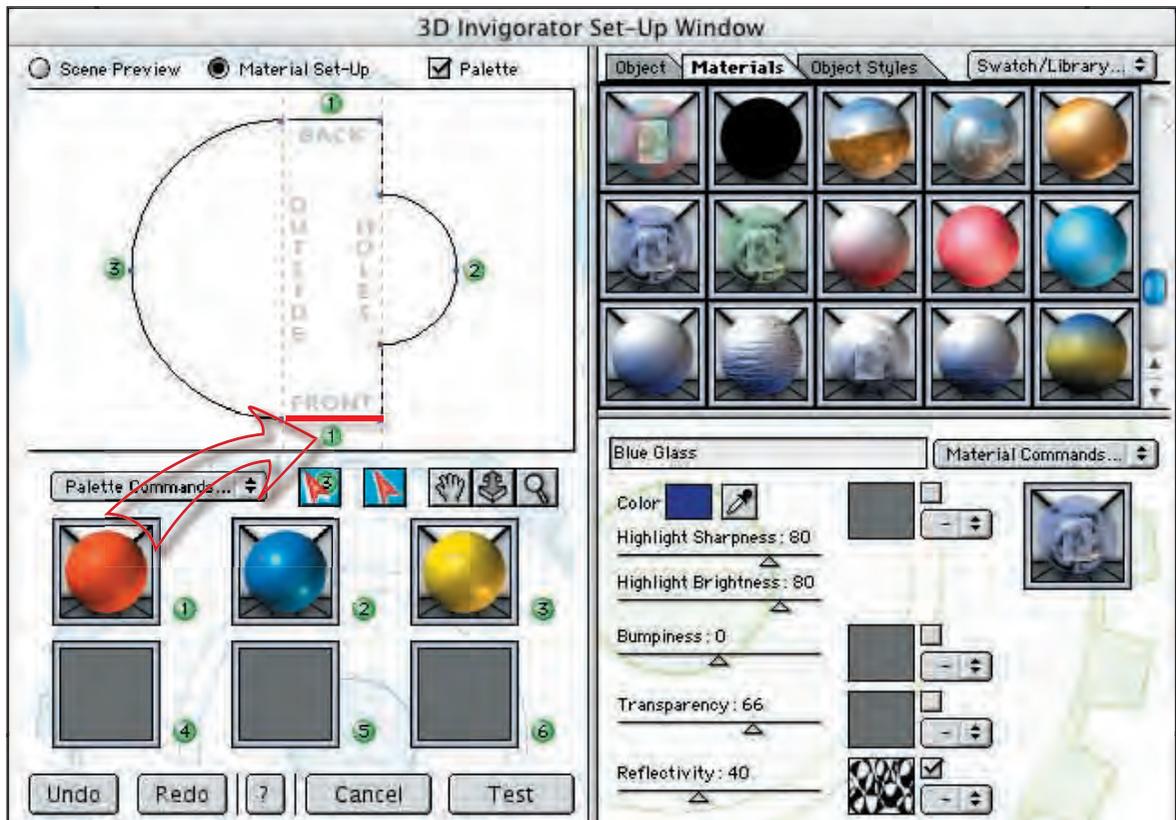


Figure 27: Dragging the Materials onto the material chips

- 29** Go to the Material Command menu below and select Duplicate Material.
- 30** Change the name of the material to *Yellow Glass* and then click on the Color Swatch to select a bright yellow color from the system Color Picker.
- 31** Change transparency value to 50, this will make it appear to be a more opaque glass, similar to the sort of colored glass used for neon signs. Change the Reflectivity value to 10.
- 32** Drag the new material from the preview swatch at the bottom of the window into one of the empty swatches in the Swatch library at the top of the window. This will save it as a new preset swatch (Fig.28).
- 33** Duplicate this material again and then adjust the color so that it is a dark red color. Name it *Red Glass* and drag it into the swatch library.

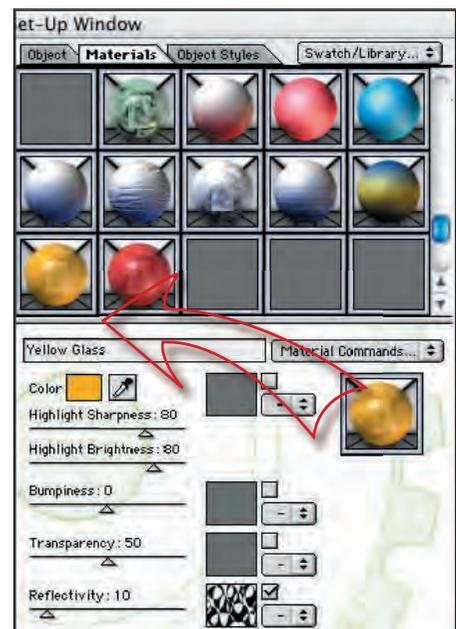


Figure 28: Saving Material presets

- 34** Go back to the Material Set-Up window and replace the Dock number one color with the *Yellow glass* (don't save any of the materials if asked). Replace docks two and three with the Red glass. If asked if you want to replace the material for all selected objects choose *Yes*.
- 35** Click OK to return to the main After Effects interface to see your object complete with its new surfaces.

You may have noticed that the material looks nothing like glass at the moment. That's because Invigorator uses Open GL to render your image in draft mode. Until it is rendered in Best quality mode it will have no anti-aliasing, and no transparency, shadows or reflections etc.

- 36** Switch your layer on to Best quality to see its glass-like qualities (Fig.29).



Figure 29: Best quality render



**NOTE!!** You may have to wait a little while whilst Invigorator calculates all the shadows, transparency and reflections of the glass however, keep in mind that a glass surface will be one of the slowest surfaces to render, plain colored surfaces will render much quicker than this.

- 37** Once you have seen the glass qualities of your object, switch back to Draft Quality to speed up your workflow before proceeding.
- 38** In the Effect Controls Palette, change the Views menu to *Front* and notice that the image in the Comp Window updates to echo the changes made in the Effect Controls Palette.

- 39** RAM preview the animation. Notice that the Logo layer is not reacting to the After Effects camera and lights. This is because, although this layer contains a 3D object, it is still a 2D layer within this composition.

The Invigorator plug-in has its own camera and lighting system that you can use to animate the object within the Invigorator world. Invigorator also has an option for using the After Effects cameras and lights which makes it easier to composite the new elements alongside existing 3D animations and camera moves.

- 40** In the Effect Controls Palette, check the *Use Comp Camera* and *Use Comp lights* buttons. As soon as you do this you will see the Invigorator logo appear to jump into 3D space in the same way as the dancer did in the Composite section. It also begins to react nicely with the composition lighting.

The logo has been designed to sit above the doorway of the nightclub. Now, you may think that you can simply copy and paste the coordinates from the **Logo above Door** layer's Position property to the Invigorator layer's Position property. In theory this sounds fine but the trouble is that the Invigorator layer is still a 2D layer; it just *contains* a 3D object.

In order to change the coordinates of the object within Invigorator you need to adjust the *Sets* values that lie within the Invigorator effect controls. But because we can't copy and paste values between different properties (i.e. between Position property and effect properties), we'll use expressions to link the values together.

- 41 In the Timeline, select the **Logo above door** light layer and hit the P key to open up its Position property.
- 42 Select the Invigorator **Logo** layer and hit the E key to open up its effect controls in the Timeline.
- 43 Click on the disclosure triangles next to *3D Invigorator, Sets and Set 1* till you can see the X, Y, and Z position coordinates for Set 1 (Fig.30).
- 44 Option/Alt-click on the stopwatches for *Set 1 X Position; Set 1 Y Position* and *Set 1 Z Position*.

- 45 One by one, drag from the expression Pickwhips to the corresponding values in the Position property of the **Logo above door** light layer (i.e. from Set 1 X Position to **Logo above door** light layer's X position). Hit the Enter key on the number pad to activate the expressions.

Just when you thought it was safe to go back into the Effect Controls Palette, another nasty shock emerges, the layer does not jump to the expected position above the doorway, there is a slight problem matching up coordinates between After Effects and Invigorator. This problem stems from the fact that After Effects has a unique way of measuring 3D coordinates.

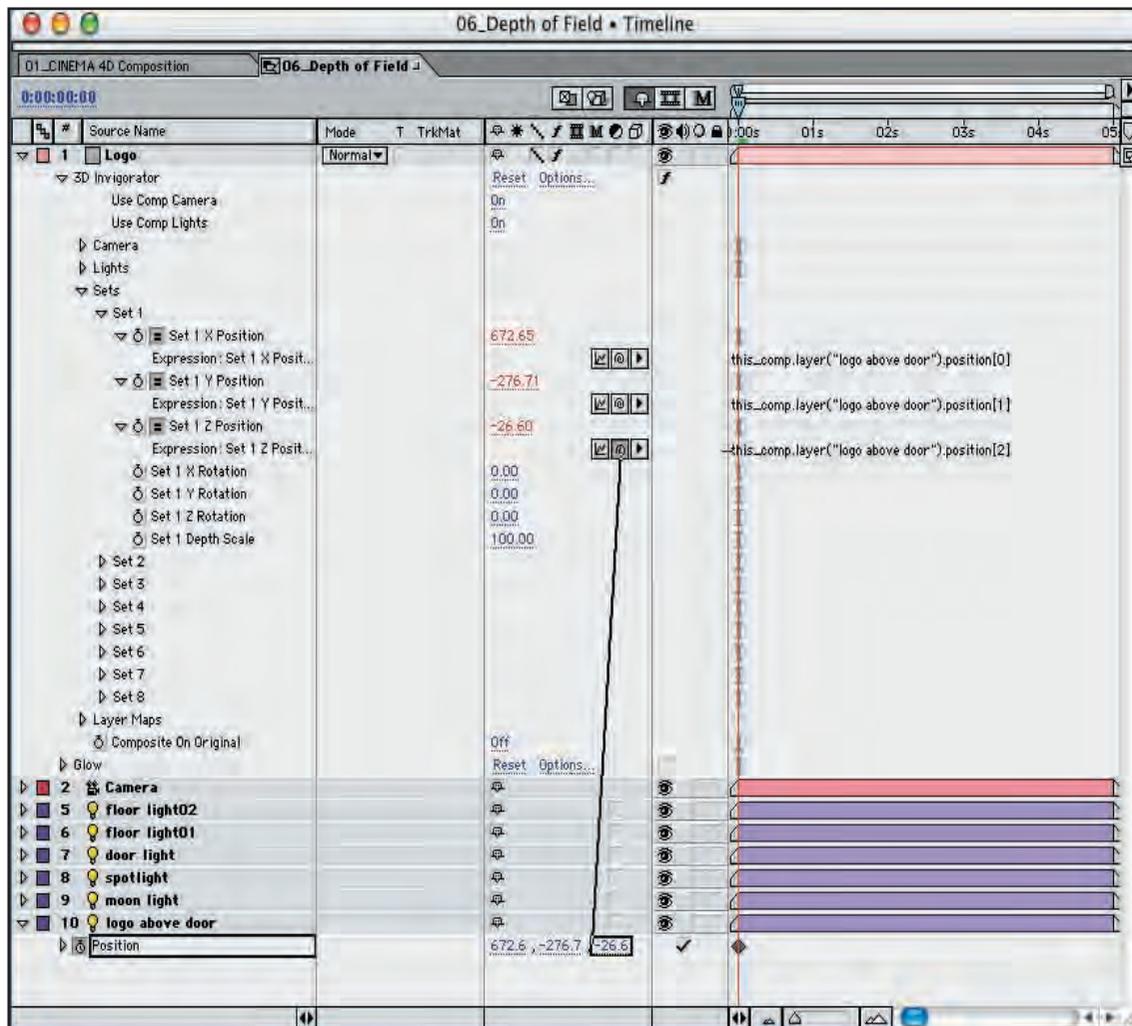


Figure 30: Linking values using the Expression Pickwhip

Most 3D applications (including Invigorator and Cinema 4D) use a Cartesian coordinate system which has an X and Y axis that meets at the origin or (0,0) point. Coordinates are measured from the center of the screen (i.e. 0,0 is the center coordinate). Positive X starts at the origin and goes to the right. Positive Y starts at the origin and goes up (Fig.31).

After Effects is different, the top left corner of the Comp Window is the origin and is measured 0,0. As with the Cartesian system, the positive X direction extends to the right of the origin, however the positive Y direction goes DOWN from the origin instead of up (Fig.32). This may seem strange, but the reason why AE does this is to keep the numbers positive. Just to confuse us even more, Z is reversed positive for negative.

If you want to see how this relates to a real composition, open **07\_Coordinates** comp. I've added a New Solid to the center of a 320 x 180 comp. You will see that its position coordinates are not (0,0) as you might expect something in the center of the screen to be. Rather the location will be (160, 90) which is half of the width and half of the height of the comp. Using a standard Cartesian system the Y value would normally be negative, (160, -90), so by flipping the Y axis the numbers look more normal for the regular AE user. Close the **07\_Coordinates** comp when you have finished looking at it.

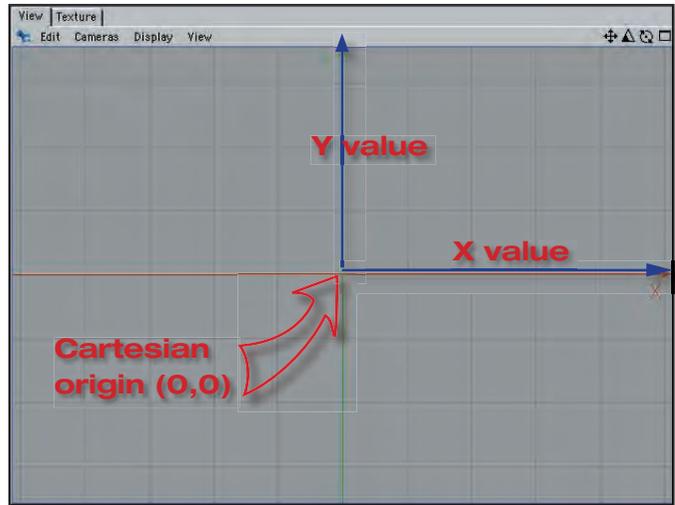


Figure 31: The Cartesian system: Positive X is measured from the origin (centre) to the right. Positive Y is measured from the origin upwards.

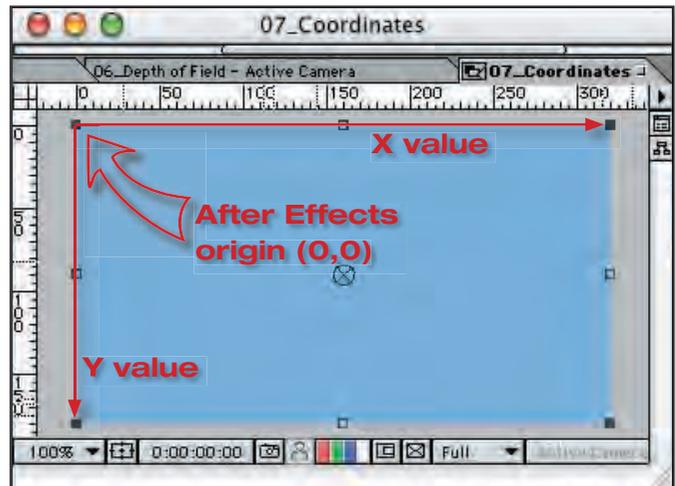


Figure 32: The After Effects system: Positive X is measured from the origin (top-left) to the right. Positive Y is measured from the origin downwards. The X value is reversed positive for negative.

So what does this all mean to the Invigorator? Well, since the origin is offset away from the center of the screen and the Y axis is flipped, we have to compensate for this when we link AE's 3D layers and Invigorator objects. The easiest way to do this is to use expressions to offset the values. I've written a formula for you which will work in any sized composition to correct the offset.

- 46** First of all, make sure that you have the 05\_Invigorator comp open.
- 47** Select the Logo layer and then double-hit the 'E' key to open up any expressions attached to the layer.
- 48** Click at the end of the *Set 1 X Position* expression and then add: `-[width/2]` after the expression so that it reads:

```
this_comp.layer("logo above door").position[0]-[width/2]
```

This will subtract half the comp width from the result of the expressed value (`-[width/2]`).

- 49** Click at the end of the *Set 1 Y Position* expression and then add: `*-1+[height/2]` after the expression so that it reads:

```
this_comp.layer("logo above door").position[1]*-1+[height/2]
```

This will multiply the expressed value by -1 (`*-1`), which will make it a positive value. It will then add half of the comp height to the result (`+ [height/2]`).

- 50** Finally, click at the end of the *Set 1 Z Position* expression and then add: `*-1` after expression so that it reads:

```
this_comp.layer("logo above door").position[2]*-1
```

This will multiply the expressed value by -1 (`*-1`), which will make it a positive value.

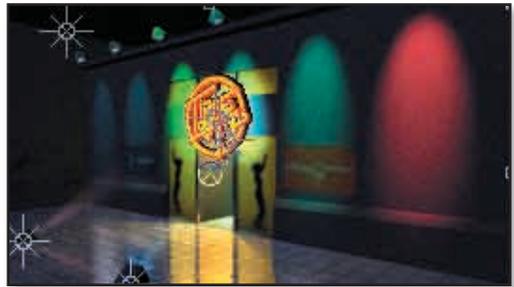


Figure 32: Your logo should look like this



The logo should now be in position above the doorway of the nightclub. If your comp window does not look like the one in figure 32 please check your Timeline. The expressions should be exactly the same as in figure 31. If they are not then please retrace your steps carefully back to step 45 and follow the instructions again.



If you have the Production Bundle of After Effects you can use the Glow effect to make it appear as if there is light emitting from the sign

- 51** Go to the Stylize menu>Glow; change Glow Threshold to 70; Glow Radius to 5 and Glow Intensity to 0.5

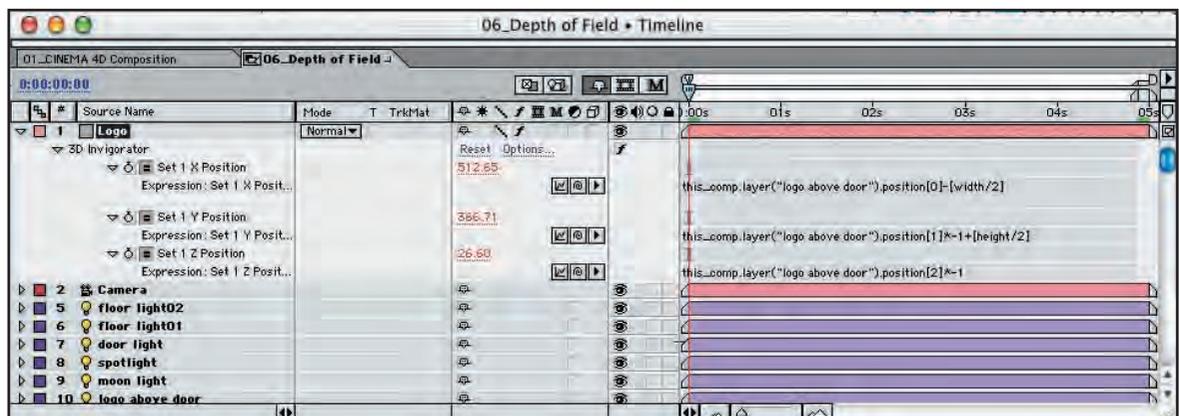


Figure 31: Use my formula to convert Cartesian values to After Effects values

# 7 Depth of Field

As well as rendering out the passes that are included in the Composition, Cinema 4D also renders out various Special Passes, including a color pass; illumination pass and a depth pass. These special passes can be used to further enhance your footage, let's take a look at how we can use the Depth pass.

Try looking at any panoramic scene where you can see far into the distance; if you look at objects close to you they appear sharp and defined; objects which are in the distance will be more blurry and have less detail, this is a natural phenomenon occurring because the lens in your eye is set to focus sharply on a specific range of depths; anything outside this range will gradually blur into the distance. Cameras have an even more restricted focus range which is known as the **depth of field**. The human eye can automatically adjust its depth of field but a camera's depth of field is determined, most importantly by the Aperture setting and the Focal Length of the Lens.

Adding a depth of field blur to your 3D scene can really enhance it and make it more convincing. You can add realistic Depth of Field effects in post-production using the information contained in the depth pass of your multi-pass render.

- 1 In the Project Window, double-click the **06\_depth comp** to open up its Timeline and Composition Windows.
- 2 Still in the Project Window, open up the **Special Passes** folder to see its contents. Notice there are three special passes within it.
- 3 Drag the **tutorial\_depth.mov** from the Special Passes folder on to the Timeline and then RAM preview the Composition.

Notice that this pass contains only grayscale information. The white areas represent areas which need to be blurred 100%; the black areas are where no blurring should occur; any gray areas will be partially blurred according to their luminance. Notice that the furthest surfaces from the camera will be pure white.

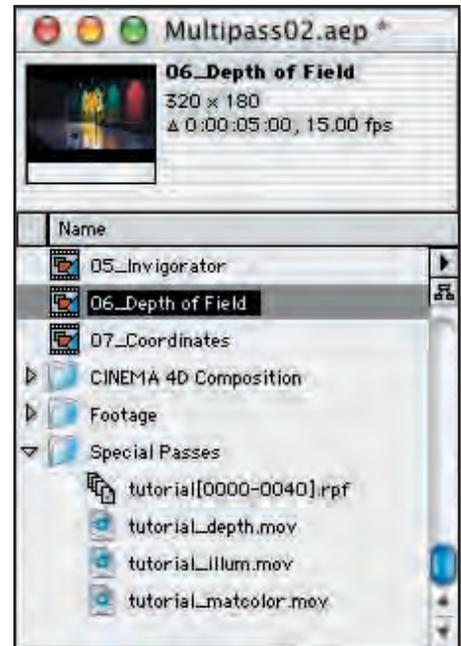


Figure 33: The Special Passes folder

- 4 Switch off visibility for the **tutorial\_depth.mov** layer by clicking on its Video Switch in the Timeline.
- 5 Click on the Timeline to make it active and then go to Layer menu>New>Adjustment Layer. By applying our blur to an Adjustment Layer we can control which layers are to be affected by the blur. (For more information regarding Adjustment Layers see page 68 of Creative After Effects 5.0).
- 6 With the Adjustment Layer selected, go to Effect>Blur & Sharpen>Compound Blur. The Adjustment layer applies its effects to all layers lying beneath it in the Timeline. This saves us from having to apply the effect to each layer individually.

The Compound Blur effect blurs pixels in the layer to which it is applied, based on the luminance values of a selected Blur layer. This Blur layer can be any layer within the comp, visible or otherwise.

- 7 In the Effect Controls Palette, choose the **tutorial\_depth.mov** layer from the Blur Layer menu to use its luminance values to blur the Adjustment Layer.
- 8 Change Max blur to 1.5 to achieve a more subtle result (see Fig. 34).
- 9 RAM preview the comp to see the depth of field blur applied to your movie.
- 10 Move to the four-second mark and notice that the blur extends over the edge of the logo.
- 11 To remove the blur effect from the **logo** layer, simply drag the **Adjustment Layer** so that it sits below the **Logo** layer. Remember that Adjustment layers only affect layers below them in the Timeline.
- 12 Open **08\_FINAL COMP** if you want to compare your final results with mine.
- 13 Feel free to add some new effects. In my final movie, for example, I added a wiggle expression to the glow settings to make the sign flicker. I also experimented with some other material and bevel settings in Invigorator to make the logo seen in **Figure a** on page one of this tutorial.
- 14 RAM preview the comp to see the finished result in real time.

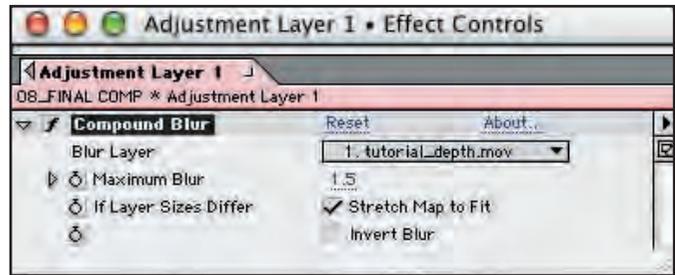


Figure 34: Compound Blur settings

## 8 manual multipass

**Let's now take a look at how you would use multiple passes if they came from another 3D program, which didn't export, directly to the After Effects Timeline. In these cases the multipass composite has to be constructed manually.**

Most of the mid to high-end 3D applications are capable of outputting multiple passes, this usually appears as an output option in the render settings of the application. Software programs that supports multi-pass rendering include; Maya; Lightwave and 3D Studio Max but there are several others. The content and naming structures of the passes will vary from application to application but the basic techniques are the same across the board.

If you are using any of the aforementioned programs to create your passes, you will need to go through the following process in order to composite your passes correctly in After Effects.

- 1 Open project named, **Multipass\_02.aep**.
- 2 Select all of the QuickTime movies in the Project Window and drag them onto the New Comp button  in the Project Window. This will open up the New Composition from Selection dialog box (See Fig.35).

This is a new feature of After Effects 5.5; it gives you more control over the way that your selected layers are placed into new compositions.

3 From the Create section, choose Single composition, this will ask AE to make a single composition containing all of the files you have selected (Fig. 35).

Notice that there are other options to allow you to make individual comps from each file, adjust the dimensions and timing of the files and even sequence your files with or without cross-fades.

4 Click OK to leave the dialog box and notice that all your layers have been placed into a brand new Timeline.

If you preview the Timeline you will notice that the layers are simply placed one on top of the other in the order in which they were selected, the top layer is obscuring all the layers beneath it. In order to combine the layers into their correct order, we will need to do a fair bit of re-ordering and a lot of experimentation with our blending modes, let's have a go!

5 First of all, select the **Tutorial\_light1.mov** layer and drag it to the top of the Timeline, so that it obscures all other layers.

Notice that this light is a spotlight, it is a directional light, and the light from it only falls on surfaces that lie within the direction and cone angle of the light. The white areas represent surfaces that are affected by the light; any black areas are not affected.

In order to re-composite our multi-pass layers back together again we can use the After Effects blending modes.



Figure 36: Using Blending Modes to combine layers

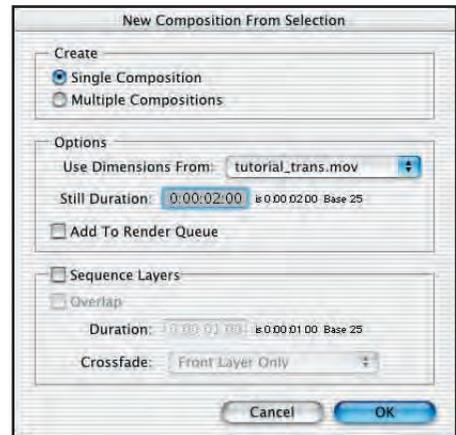


Figure 35: The Composition from Selection box

- 6 Make sure that the modes panel is visible. If not, context-click on the Switches panel heading and choose Panels>Modes from the context-sensitive menu.
- 7 For the **Tutorial\_light1.mov** layer, choose the Add mode from the Blending Mode menu. Notice how the add mode combines the two layers together by adding the top layers numeric color value to the bottom layers numeric color value and displaying the resulting color value.
- 8 OK, in the Switches column, click on the Solo button for layer number  7, **tutorial\_light4.mov**, notice that this light is an ambient light. In other words, it is an evenly distributed light with no direction, it affects all of the surfaces in the scene, unlike the spotlight which was directional light, only affecting certain areas within its cone angle.
- 9 Switch the solo button off again and then drag the layer underneath **tutorial\_light1.mov**
- 10 Change its mode also to Add mode. It, too now combines with the layer directly beneath it (Fig. 36).



You can find out more about Blending Modes in the Technical.PDF which is included on the Creative After Effects 5.0 CD ROM.

Notice how the layers are combining with each other to create a seemingly complete environment, let's expand on this.

- 11** Select all the remaining **tutorial\_light** layers and drag them so that they lie directly beneath the **tutorial\_light4.mov**.
- 12** With all the layers still selected choose Add mode from any of the layers Blending mode menus to change the modes of all selected layers simultaneously.

You should now have all of the lights on in your composition lighting up your scene quite nicely. Let's now add a bit more detail to the scene by combining some of the other passes.

- 13** Drag the **tutorial\_atmos.mov** movie to the top of the Timeline and switch it's mode to Add. This will add realistic highlights to the spotlights and some light rays which emit from the floor lights.
- 14** Repeat the last step, bringing the **tutorial\_ambient.mov** to the top and changing it's mode to Add.
- 15** Repeat again, this time with the **tutorial\_refl.mov**. This pass adds some lovely reflection to the scene adding a touch of realism.
- 16** Finally, drag the **tutorial\_shadow.mov** layer so that it lies just above the **tutorial\_diffuse.mov** and switch it's mode to Multiply. This will combine all the shadowy areas to the scene.



Figure 37: The finished composite

OK, so eventually we have our scene looking just as it did in Cinema 4D (Fig. 37). It took us quite a bit of time to get the layers in the correct places, without this tutorial to guide you it would have taken a fair bit of trial and error before getting the layer order and modes correct but you can see that the technique works. Try outputting some multipass files from your own 3D application of choice, then experiment with the techniques used in this tutorial. Happy Keyframing!

Main Maxon site

<http://www.maxon.de>

Download link for the AE5.x import plugin

[http://www.maxon.de/pages/download/download\\_updates\\_e.html](http://www.maxon.de/pages/download/download_updates_e.html)

Makers of SLA

<http://www.bhodinut.com>

Cinema4D & AE forum

<http://www.postforum.com>

Cinema4D & AE forum

<http://www.creativecow.com>

Watch this space for forthcoming tutorials on working with RPF files from Maya; Smart Mask Interpolation; Character animation and more!