

Atmospheric Cameras for DAZ Studio

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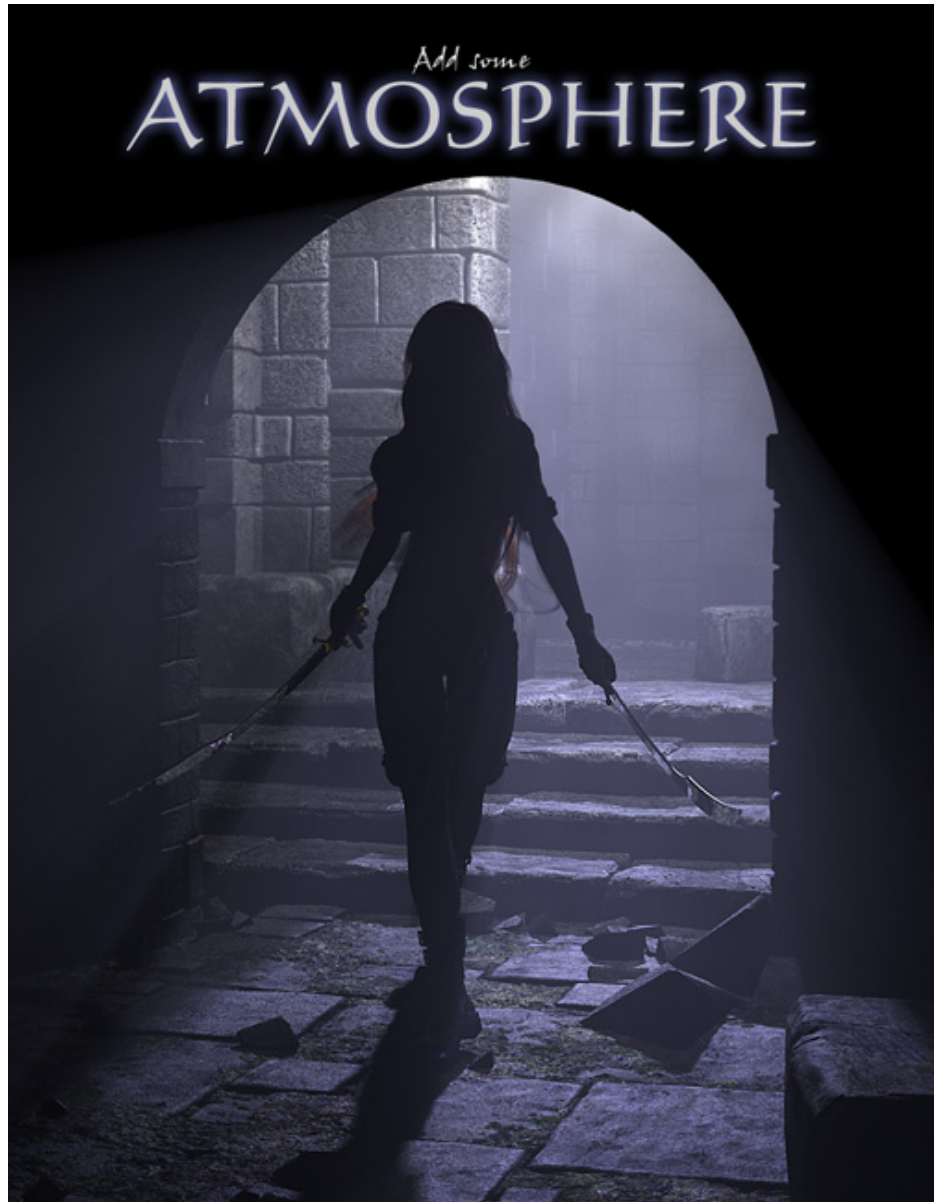
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Introduction



The AoA Atmospheric Effects Cameras now include five, completely procedural, shader based cameras for DAZ Studio. While the primary purpose of these are to produce fog and light reacting volumetric atmospheres they also include fun extras such as vignette, color correction and contrast adjustment. All effects appear right in the render and do not require any post work.

Common Settings

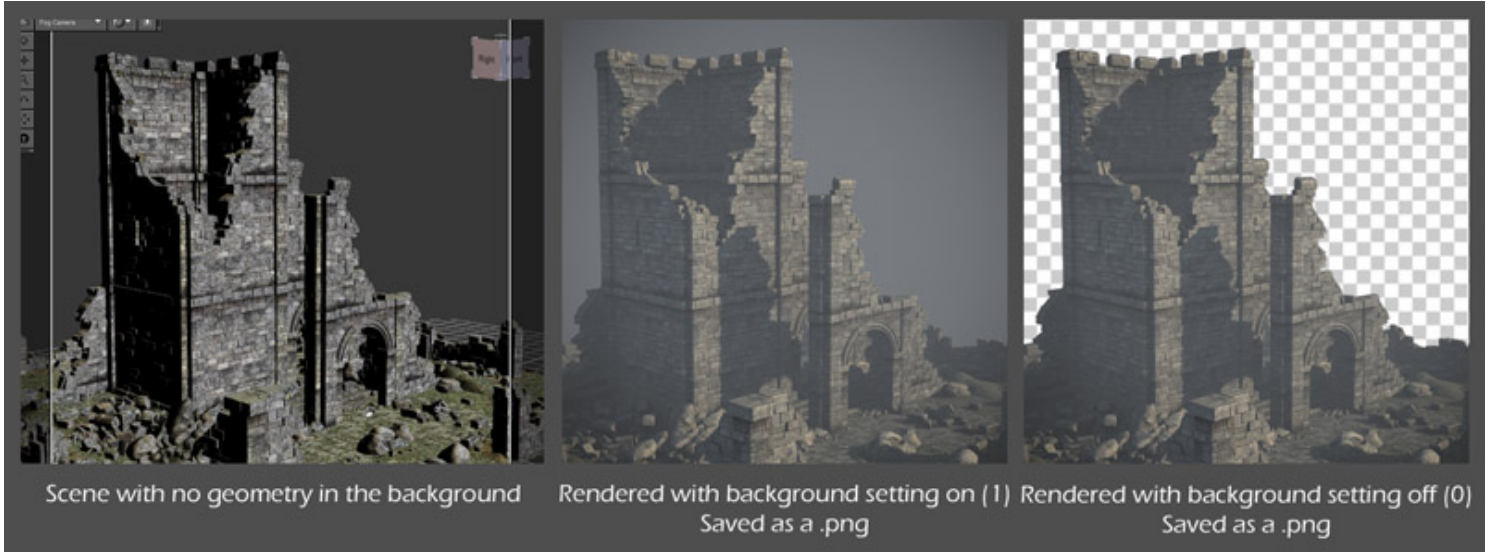


The four original cameras have sliders to adjust color, contrast and vignette as well as a background transparency switch. These features add little or no time to the render process.

Note: The new, Easy Volume Camera does not include these common settings because it was designed to be as fast and as easy to use as possible. Having only the most necessary settings for volumetric light rays makes for a less cluttered user interface and the fastest running code.

Background

The background setting controls whether or not the scene's background is transparent when the final render is saved as a PNG or TIFF file. This should be set to 1 (on) if the scene has areas of no geometry and you are using a vignette or simple fog. This setting does not effect true volumetric effects which require the scene have some sort of geometry fill the frame. See volume camera notes.



Color

In general, color and contrast are best done as a post process rather than at render time as it is usually faster to make adjustments. These features have been included because some users may not have access to an image editor or may prefer not to do any post work.

Settings

- **Contrast** - Controls the overall contrast of the render. Settings less than 0 decrease the contrast. Settings above 0 increase the contrast. A value of 0 will produce the same result as default DAZ Studio camera.
- **Saturation** - Adjusts the amount of color in the render before colorize is calculated. A setting of 0 renders a black and white image. 100% renders as a DS default camera would.
- **Colorize** - Changes the overall Tint of the render. Note that this works like a colored filter on a camera in that it blocks other colors of light from reaching the film (render) so some colors may appear darker in the render. For example, if we have a red ball in our scene and use a colorize setting of 100% cyan (The opposite of red) the ball will appear black.

Vignette

Vignette emulates the darkening near the corners of a photograph caused by inexpensive or wide angle lenses and cameras using long lens hoods. Vignettes can be used to add realism to a render, giving the feel of an actual photograph, or artistically to draw more attention to a subject in the "hot spot" near the center of the frame.

Settings

- **Strength** - Sets the overall strength of the vignette effect
- **Softness** - Controls how blurred the vignette will be. Low values produce a more defined ring and may work well to emulate the look through a telescope or pinhole camera.
- **Width** - How far the vignette encroaches inward from the left and right sides of the frame.
- **Height** - How far the vignette encroaches inward from the top and bottom edges of the frame.
- **Threshold** - A subtle effect which controls the amount a vignette darkens darker areas verses lighter areas of the frame. In real photographs vignetting tends to affect bright areas slightly less than dark areas. Higher values produce a darker and higher contrast vignette. Lower values create a vignette that is lighter and more evenly effect various light levels

Create an old time photograph effect without postwork.



Default DAZ Studio camera



Fog Camera with Vignette, Depth of field, Contrast, Saturation and Colorize adjustments

Easy Volume Camera - NEW!



Easy Volume is a completely new, faster rendering and easier to use camera. It has completely new code, written in RSL, and can recognize certain settings in lights. This allows the camera to selectively add volume only to the lights you choose!

There are only 5 volume dials on the camera. The first three are Volume Color, Strength and Quality. These are fairly self explanatory.

The other two parameters allow you to decide which lights produce "God rays". This is achieved by telling the camera to look at the settings of all the lights in the scene and only use those which either have a certain Intensity setting or those labeled with a category of "foglight".

By flagging only certain lights, you can easily avoid any unwanted flooding of light from distant, ambient or environment lights and obtain rays only from the lights you want.

The AoA Advanced lights, available at DAZ3d, were specifically coded to work with the Easy Volume Camera. Volumetric effects render much faster when used with the AoA Advanced Lights and their `__category` label.



Settings

- **Volume Color** - This sets the base, overall tint of the volume.

The volume color will be effected by the color of lights also. So a blue light will create a blue volumetric effect. Because of this, using a volume color in shades of gray, and allowing the lights to provide the tint instead, generally gives the most realistic results.

- **Volume Strength** - Adjusts the overall strength of the volume effect. A setting of 0% disables volume calculation.

Because the DS default headlamp, distant lights and ambient lights flood the scene with light, you may need to use a very low volume strength with such lights or the image may be very washed out or even completely white.

The strength may need to be turned up when using spotlights or point lights to clearly see the effect.

- **Volume Quality** - This setting determines how frequently the camera samples the volume to see what areas are either in light or in shadow.

The higher the quality, the more accurate and less grainy the volume effect will appear but at a cost of exponentially longer render times. For instance, a setting of 50% may only take a few seconds longer than a setting of 10, but 100% may take several times longer to render than 95%.

In most scenes I use a setting between 10% and 50% while setting up and adjusting the volume and lights. When it is time to do the final render I will generally first try 80% quality and increase in 5% increments if more quality is needed to remove grain.

Using the DS Spot Render tool can be convenient for testing the volume quality in complex, slow rendering scenes. It is often good to spot render areas near the origin of point or spot lights since the source point of a light is usually the area with the most grain.

- **Accept Light Types** - A drop-down menu, with several options, which allows you to determine which scene lights will contribute to the volume effect.

All lights - This option will tell the camera to calculate the volume illumination and shadowing from every light in the scene. This includes environment, distant and ambient lights. This is slow and usually not the desired effect but may be useful when a very foggy scene is needed or when there are only a few spot or point lights in a scene.

Only __category foglight - This is, by far, the fastest rendering option. With this setting enabled, volume will only be calculated for lights which have the text "***foglight***" (without quotes) typed into the __category parameter. Any light which does not have the category foglight will be ignored by the volume calculation.

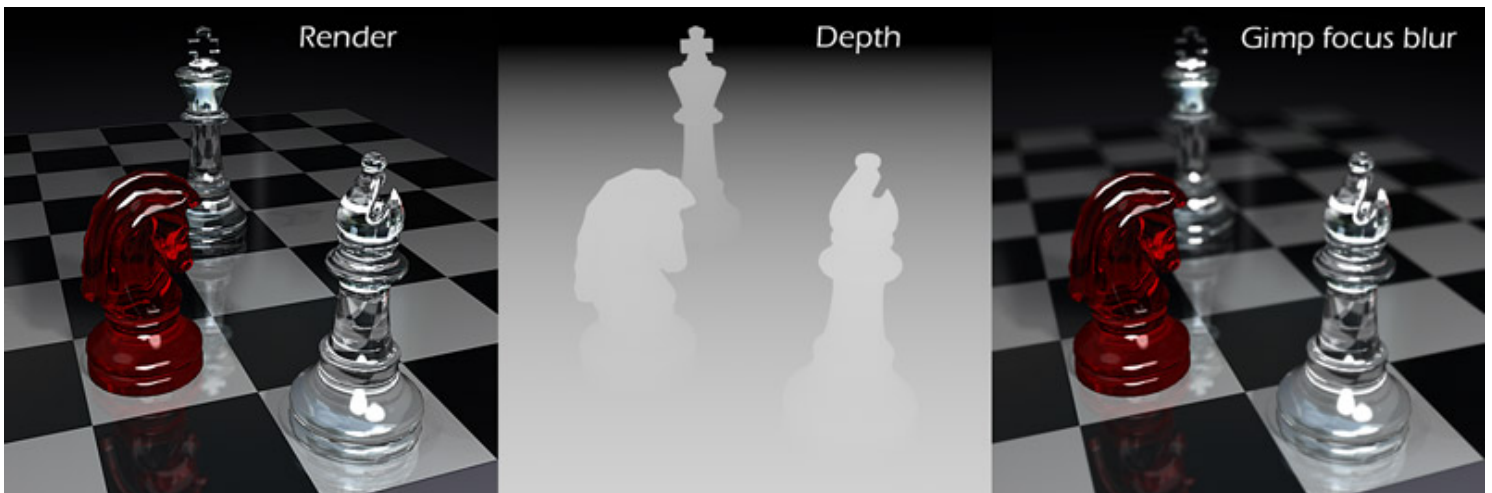
Only Flagged Lights - Using this option tells the camera to only illuminate the volume from lights which match the Intensity slider directly below. The visual effect is similar to using __category foglight but, does not have the speed benefit.

- **Flag lights with intensity of** - The camera will read the Intensity slider of each light to see if it matches the value in this slider. Use this setting in conjunction with the ***Only Flagged Lights*** option above to tell the volume which lights should contribute to the volume's illumination.

For instance, if you had an interior scene with a 125% Intensity distant sunlight shining in through a window and you wanted "God rays" from only this one light, then you would Set ***Accept Light Types*** to ***Only Flagged Lights*** and ***Flag lights with intensity of*** to 125%.



Depth Camera



The depth camera is a utility for creating what is often called a Z-Depth mask. It produces a black and white render where nearer objects are brighter than further objects. The resulting image can be used as a mask for creating various fog or depth of field adjustments in an image editor such as Photoshop or Gimp.

Coin displacement map created using a depth mask render.



Rendering depth masks can also be a handy method of creating displacement maps from geometry.

Settings

- **Off - On** - A setting of 1 enables depth mask rendering.
- **Minimum Distance** - The distance from the camera where white begins to fall off to black (in meters). A setting of 0 is best in most cases but can be increased to provide more contrast.
- **Maximum Distance** - The distance in meters where the depth mask becomes pure black. Limits can be safely adjusted if a greater value is needed for very large scenes.

Tip: This camera needs no lighting to produce a depth mask so all lights should be turned off for faster rendering.

NOTES: The depth mask does not take opacity into account. If it were to render the depth value behind transparent objects then items such as the chess pieces pictured below would not blur properly in post while using this mask. An unfortunate drawback is that transparency mapped items, such as hair, render as solid objects in the depth mask. See Quick Tips for a solution using the fog camera.

Fog Camera



A sense of scale and atmosphere can be produced quickly using the fog camera. This camera adds color over distance to create a haze effect or can darken the scene to give the look of overcast or smoke filled skies. This camera renders very quickly. There should be little noticeable increase in render times using this effect.

Presets are included for various atmospheric settings. These were made with large scenes in mind and may need some adjustment to the visibility setting to better suit your scene.

Settings

- **Off - On** - A setting of 1 enables fog rendering.
- **Visibility - Meters** - Controls the strength of the effect over distance. The value is the approximate distance where objects disappear completely into the fog.
- **Color** - The overall color of the fog.

Tip: In nature, overcast skies generally produce softer shadows than clear skies. To make the effect more convincing I find using a pale blue ambient light with occlusion and a white distant light with soft shadows, both set to around 50% intensity, works fairly well for foggy daytime lighting. The foggier the scene the higher I set the ambient strength and lower the distant light.

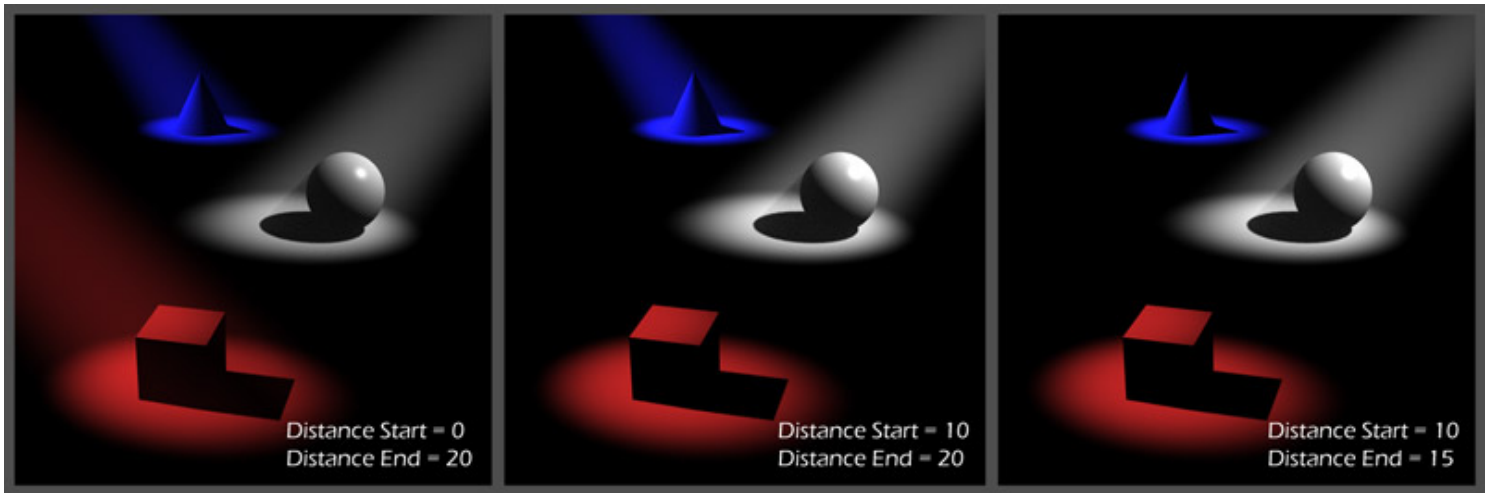
Volume Camera



A true volume camera, this atmosphere is automatically effected by light and shadows. It has two key components, opacity density which absorbs light over distance and a light density which brightens and scatters light. The opacity setting is like the darkening from smoke or thick fog. The light density produces light cones and "God rays." While these effects on high settings can increase render times quite a bit the end result is quite remarkable.

Settings

- **Off - On** - A setting of 1 enables volumetric rendering.
- **Distance start** - This sets how far from the camera the fog begins. This is particularly useful if you want a clear subject standing in front of very thick fog.
- **Distance End** - Sets the furthest distance from the camera that the fog will be calculated. In some cases this may remove essentially unseen fog and speed up rendering.
- **Quality** - Render speed vs quality adjustment. Lower settings render much faster but may produce more noise.
- **Volume Color** - The fog's color primarily effecting the color of the Opacity fog. Light density color is affected much more by the color of the lights in the scene.
- **Volume Density** - Controls how much light is absorbed with distance. This component is affected by the scatter color.
- **Light Density** - Controls how strongly the fog is affected by lights. If you only desire "God rays", light cones like those produced by stage lights or glare around bright lights then this setting can be used by itself, turning down or off the Opacity Density setting.
- **Turbulence Frequency** - Scales the size of the fog variation. Smaller values produce larger "puffs" of smoke.
- **Turbulence Variance** - The contrast of the turbulence variation. Smaller values produce a smoother appearance.



NOTES: Volume cameras must have some form of geometry in the background in order to be properly calculated. The geometry can be anything, a sky dome or simply a plane primitive so long as there are no blank areas in the frame. For instance, if you place a point light in a blank scene and render nothing will show. Place a plane primitive anywhere behind the point light and the render should show the volumetric glow from the light.

These effects react to all light sources in the scene including the default "Headlamp" DAZ Studio provides when no other lights are in the scene. I highly recommend setting up some lights for your scene before turning on these volumetric effects.

Use low render and volume settings while making adjustments to speed up test renders. Things to watch out for are high shadow or ambient occlusion samples, low shading rates and high quality settings on the volume camera. Light shining through transparent items may also increase render times.

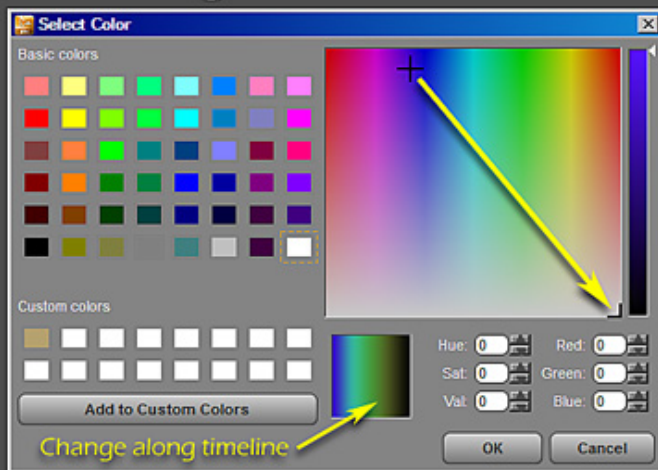
Animating Parameters

All settings are key framable so can be animated. This allows for color, fog density, turbulence, depth of field or whatnot to be changed throughout your animation.

Off-On sliders are absolute so they would not be good candidates for animation. If one were to set Fog off at frame 1 and fog on at frame 48 the animation would show no fog for the first 24 frames then suddenly turn on for frames 25-48.

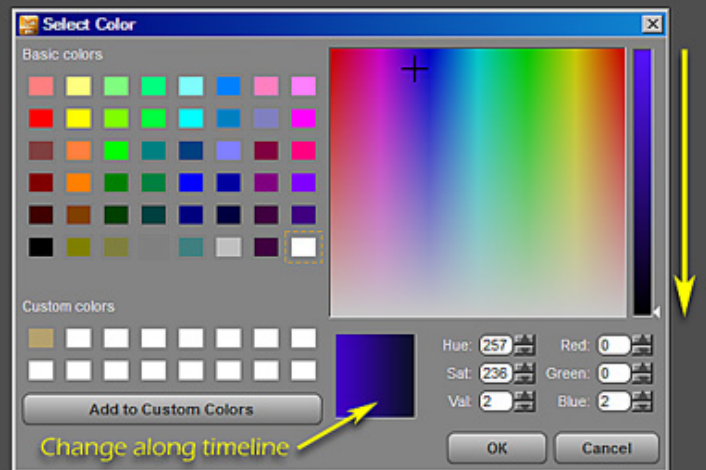
Because of how DAZ Studio treats 100% black or white some care should be taken when animating color values to or from black or white. To get an animated fade from, say, bright blue to black it is best to set the final frame to 0,0,1 (a very dark blue) than to use 0,0,0. This insures a smooth transition from blue to 99% black. The image below illustrates why this works best.

Animating colors



When absolute black or white is used, the hue is not retained and the marker moves to the bottom right corner.

The marker will translate linearly between the two points and your animation will change hues as it progresses.



Setting the value to almost black or white causes DS to retain the hue value. The color will darken or lighten as the animation progresses maintaining the same hue.

Quick Tips

General

- Contrast should be used only for minor adjustments. Extremes may cause render artifacts.
- Colorize is fairly sensitive. Pastel tints near white tend to work best.
- Most parameter limits can safely be turned off or increased if needed. A few settings should **not** have their limits changed: Off - On switches and the quality slider of the volume cameras.

Easy Volume Camera

- The Easy Volume Camera was designed along side the [AoA Advanced Lights](#). The and Camera are complementary and you should find volume render times significantly faster when using the Advanced Lights, especially by using Primitive Hitmode on lights which contribute to the volume.
- Using category foglight to flag only certain lights for volumetric effects renders much faster then using the flag by intensity method.
- The Easy Volume Camera is more intended for creating rays from directional lights rather than large scenes full of dense fog. If a very heavy depth fog scene is desired you may find the Fog Camera or regular Volume Camera give better results.

Depth Camera

- Depth masks can be useful for creating displacement maps from complex geometry.
- This camera does not need any lights to create a depth mask. Turn all scene lights off for faster rendering.
- Several presets are included to change the Distance End limit. This helps make fine tuning the settings easier depending on your scene size.
- If a mask is needed that shows depth through transparency, such as a render with transmapped hair, the Fog camera may be used as an alternative. See fog Camera notes.

Fog Camera

- Generally speaking, scenes with heavy fog or smoke tend to look more realistic with very soft shadows. Ambient occlusion lighting such as the ahEnvironment light (DS 3 only) or the UberEnvironment light (included with DS Advanced or higher) tend to work well.
- Fog can be rendered right in the camera but if you prefer to adjust it separately in an image editor you can render 2 passes and composite them. To get two separate passed simply render one with fog set to off then turn off all scene lights and render with the fog on.
- To render a depth mask using this camera set the fog color to white, adjust visibility to best suit your scene then render with all scene lights turned off. The result will need to be turned to a negative image to work properly with most image editor depth of field filters.

Volume Camera

- Start with low volume quality and render settings while setting up your scene.
- The camera's volumetric lighting detects both mapped or raytraced shadows.
- Gel lights can create some spectacular effects when used with the volume camera.
- Volume camera renders using DS4 Linear fall off point lights can be improved by setting the light's Falloff Start to 0.00.
- Lights with a squared distance fall off, such as the default DS point light and some add on products, are physically correct and tend to add realism when using the volumetric camera.
- Spot lights usually look cleaner and render faster than other types of lights at lower volume quality settings.
- Distant lights tend to flood too much light into the scene when using the light density feature. Far off spotlights are usually a better alternative.
- Lights passing through gaps in complex geometry render faster than through a simple object with a complex transparency map.
- If rendering a forest scene with rays of light passing through the tree canopy, especially if the leaves are transmapped, you may find using a gel light with cast shadows turned off and a gel that breaks up the rays to render much faster than using a normal spot light with shadows turned on.
- Volume camera renders can slow down when using raytraced reflections. Raytrace depth can be turned down to 1 in the render settings or turned off to increase render speed.

Known Issues

Update - March 2014 An update was issued to add the bonus Easy Volume Camera and fix an issue which caused the Contrast feature to have artifacts in DS 4.6 renders.

If, after loading and selecting the Easy Volume Camera, you notice no Volume Settings available in the parameters tab then the camera may not have installed correctly. Please see the [Atmosphere Cameras Update thread in the DAZ3d forums](#) for solutions.

In DS 4.6.0.18 the Volume Cameras may render with square artifacts around objects which are flagged by any Advanced Light to not be illuminated. These artifacts did not appear in tests with a later version of DAZ Studio.

You may see an error in the render message window similar to *"3Delight message #145 (Severity 1): S2073: 'SceneMin' is not a parameter of shader 'brickyard/{ba652b84..."* I believe it to be a minor DS/Shader Mixer internal token error which I have no control over. This should not cause any problems.

Do not use the Volume Camera with Shader Mixer created mesh lights in DS4.5 or earlier. A bug could cause DAZ Studio to crash when Shader Mixer created mesh lights are used with the Volume Camera.