

HDRI AND RADIOSTY IN POV-RAY

Starting with version 3.7, POV-Ray supports HDRI lighting. Following Friedrich A. Lohmüller *How to create Realistic Skies with POV-Ray*, POV-Wiki *Radiosity without conventional lighting tutorial* and Jaime Vives Piqueres *Experiments with Eagle3D* the following code should be added in the *.pov* file before the line *#include "e3d_tools.inc"*.

```
#declare hdrprobe = "sun.hdr"

#declare table = "wood_painting_texture.jpg"

// Radiosity

global_settings {

    radiosity {

        pretrace_start 0.05

        pretrace_end 0.005

        count 150

        nearest_count 10

        error_bound 0.5

        recursion_limit 1

        low_error_factor 0.5

        gray_threshold 0.5

        minimum_reuse 0.005
```

```
maximum_reuse 0.2

brightness 1

adc_bailout 0.01

}

}

// default finish for all textures:

#default{texture{finish{emission 0 diffuse 1 }}}

// hdr environment

sky_sphere{

pigment{

image_map{ hdr hdrprobe

    gamma 1

    map_type 1 interpolate 2}

}

rotate <0,90,0>

}

// wood table

plane{y,-3

texture{

pigment{image_map{jpeg table}}

normal{bump_map{jpeg table}}

finish{reflection{0,.1}}
```

```
translate -.5 rotate <90,90,0> scale <10,10,5>*30  
  
}  
  
}
```

Replace the *table* and *hdrprobe* declarations with your own filenames. You'll need two files:

- a HDR light probe. See the **Resources** section.
- a texture. You can use Creative Commons Search to find those on the web. I used a file By M0tty (Own work) [CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0>)], via Wikimedia Commons.

Replace *texture.jpg* with the name of that texture.

Put these files in Eagle3D - *povray* subdirectory (the above *Eagle3D_povray_folder*).

The result is the first image in this post. To get that, some textures were also modified. The PCB (defined in *e3d_tools.inc* as *col_brd*) got a bit of reflection (as seen on ignorancia.org) and a lower *diffuse* (0.4) than the default. Also the Gold and Silver textures defined in *e3d_tex.inc* were added an *emission* of 0.1 (when using radiosity, these textures emit light).

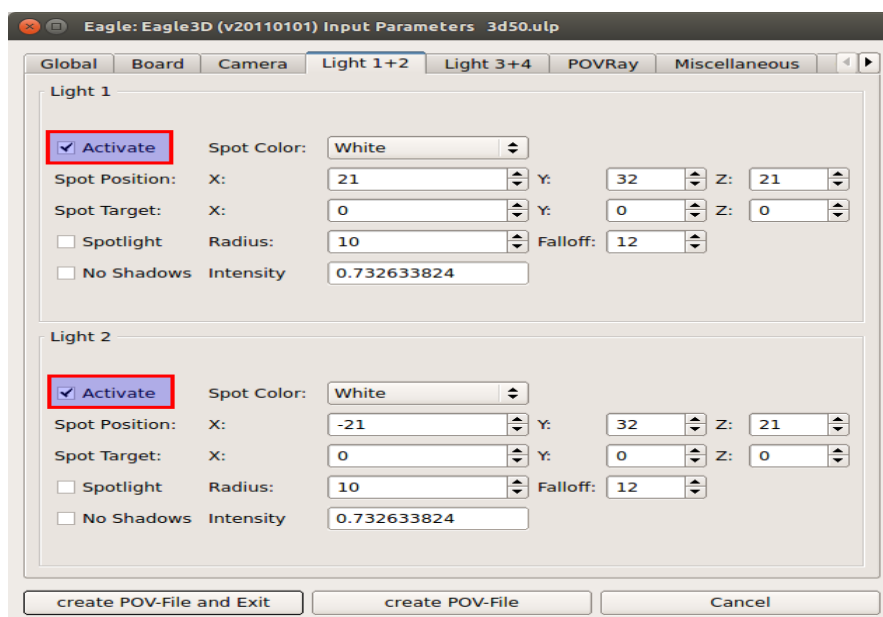
Don't forget to change the **version** declaration from 3.5 to 3.7 (at the beginning of the *.pov* file). And of course, remove all four *light_source* definitions.

Automating things

There are 3 steps you need to do every time:

1. Change file version to 3.7
2. Paste the above contents in the file
3. Remove light definitions

To make things easier, first of all save the above code into a file *e3d_hdr.inc*. Put this file into the *Eagle3D_povray_folder*. Now, the *3d50.ulp* must be edited. Go to Eagle3D - *ulp* folder and open that file in any text editor. Now edit the *usrinc* string and change `"#version 3.5;\n\n"` to `"#version 3.7;\n\n"` (it is on line 35). Edit also the *incfiles* string and add on line 64 `"#include`
`\"e3d_hdr.inc\""\n"`. All that's left now is to remove light definitions. There is no need to remove them as the *Activate* checkbox can be unchecked by default.



The value is stored in *lgtx_inf[10]*, where x ranges from 1 to 4. They can be found on lines 556 - 559. Change the value to 0 like this: *lgt1_inf[10] = 0;* for all four lights.

If you change often the texture and the HDR, you can remove those definitions (the first two lines with *#declare*) from *e3d_hdr.inc* and put them in *3d50.ulp* to be added in the main *.pov* file.

Source: <http://onetransistor.blogspot.in/2014/07/render-3d-realistic-images-of-pcbs.html>