

1. Plugin specs

	explanation	input	output	options	
box	Develop a box	equirectangular	plain image	-b x,y,z -e x,y,z	aspect ratio of the box eye position
cone	Develop a cone	equirectangular	plain image	-r 0.3 -e 0.2	radius of the base eye height to cone height
equirectangular	Mercator to equirect	Mercator	equirectangular	No option	
exponential	exponential	complex (plain image)	complex (plain image)	No option	
invert	invert	complex (plain image)	complex (plain image)	No option	
log	log	complex (plain image)	complex (plain image)	No option	
mercator	Equirect to Mercator	equirectangular	Mercator	No option	
power	power	complex (plain image)	complex (plain image)	-n 2	Power of n
prism	Develop a prism	equirectangular	plain image	-e 0.5 -h 0.5 -s 6 -z 2 -n 2	Eye height. Height of the prism. Number of sides. Specify where to attach the zenith cap. Specify where to attach the nadir cap.
ribbon	Convert a long image to a ribbon	plain image	plain image	-a 0.5 or -a 200/500	Aspect ratio of the input image.
rotate	Rotate an image	plain image	plain image	-a 0	Specify angle in degree.
scale	Scale an image	plain image	plain image	-x 1 -y 1 -xy 1 -p	Specify amounts
slide	Slide an image	plain image	plain image	-x 0 -y 0	Specify amounts (in image coordinate)
stereographic	Equirect to stereographic	equirectangular	plain image	-a 90	Field of view.
swap	Swap xyz axes	equirectangular	equirectangular	-n 1	Swap xyz axes multiple times.
tile	Slanted tiling of a long image. (incommensurate)	plain image	plain image (Mercator)	-a 0.5 or -a 200/500 -s 8	Aspect ratio of the input image. Number of stories
tile2	Slanted tiling of a long image. (commensurate)	plain image	plain image (Mercator)	-a 0.5 or -a 200/500	Aspect ratio of the input image.
tilt	Tilt an equirectangular image around the x axis.	equirectangular	equirectangular	-a 0	Specify angle in degree.
tumblerfan	Create your own tumbler	Mercator	plain image	-s wtop,wbot,height	Size of the fan. Wtop and wbot specifies the top and bottom width of the developed fan, and height specifies the fan height.

2. Panojector

Panojector command accepts a few options.

Usage: panojector [-s size] [list of plugins.....]

Options:

-s n Set image size to n x n.

3. Notes

Plugin describes how to project the $(-1..+1) \times (-1..+1)$ plane onto another $(-1..+1) \times (-1..+1)$ plane. You can apply these projection plugins to the original image by giving plugin(s) as an argument(s) of the panojector command. For example,

```
prompt% panojector -s 400 original.jpg mercator
```

converts the equirectangular image into mercator projection and output as a 400x400 image named original.jpg_proj.jpg

```
prompt% panojector -s 600 original.jpg box equirectangular
```

converts an Mercator panorama into equirectangular panorama and then develops as a box.

Each plugin accepts options as its argument.

Note that x coordinate points to the right, while y coordinate directs downwards. For complex coordinate, real points to the right, and imaginary directs downwards.

4. Other Examples

This converts the sample rectangular image to a swirl:

```
prompt% ./panojector -s 600 sample.jpg stereographic equirectangular tile2 -a 706/881
```



The first plugin “tile2” tiles the original image, second plugin “equirectangular” regards the image as a Mercator (conformal) panorama and convert it into equirectangular panorama image, and the last plugin “stereographic” converts the equirectangular panorama into stereographic (conformal) image.
¹

This converts the inverted little planet image back to equirectangular panorama:

```
prompt% ./panojector -s 1000 sample2.jpg slide -x 1.25 equirectangular rotate -a 90 slide  
-x -0.25 exponential
```



¹ Sample image is provided by Pedro Moura Pinheiro at <http://www.flickr.com/photos/pedromourapinheiro/4929306871> under Creative Commons (CC BY-NC-SA 2.0) License.

This converts a long train image to 6-story ribbon:

```
prompt% ./panojector -s 1000 sample3.jpg ribbon -a 826/29999 -s 6
```



This converts the same image into a swirl:

```
prompt% ./panojector -s 1000 sample3.jpg stereographic equirectangular tile -a 826/29999 -s 8
```

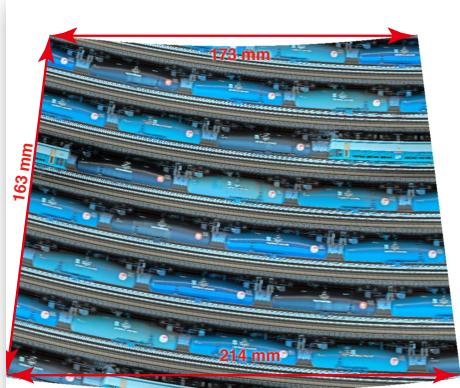
and a tilted swirl:

```
prompt% ./panojector -s 1000 sample3.jpg rotate -a 45 stereographic -a 300 tilt -a 30 equirectangular tile -a 826/29999 -s 8
```



You can even “Create Your Own Starbucks Tumbler.”

```
prompt% ./panojector -s 1000 sample3.jpg tumblerfan -s 214,173,163 tile -a 826/29999 -s 8
```



A small utility `boxsize.py` calculates the proper dimension of the box for your equirectangular panorama image. Here is an example image of a Japanese room:²

1. Measure the dimensions of the images:

picture width, positions of four corners, and ceiling and floor positions at the first corner.

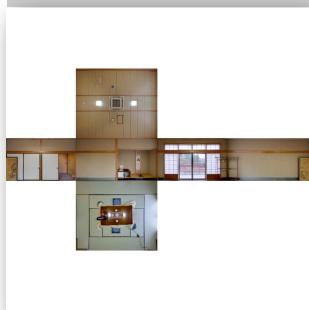


2. Put them as arguments of the `boxsize.py` program and run it. The program estimates the eye position in the box.

```
prompt% ./boxsize.py 4000 538 1432 2541 3445 772 1247
```

3. You get the optimal parameters to convert the image into a box development. Modify as you like, and run it.

```
prompt% ./panojector -s 2000 sample4.jpg box -b 1,1.1724609375,0.609415798286 -e 0.5064453125,0.504081292687,0.521980455925 slide -x 0.269
```



Currently, we provide only one rotation plugin, “tilt”, to give a rotation angle around the X axis to an equirectangular image. In order to rotate the equirectangular image with YAW, PITCH, and ROLL angles in PTgui and Hugin way, use the following parameters: (YAW, PITCH, and ROLL should be replaced by the values.)

```
prompt% ./panojector -s 1000 sample4.jpg swap tilt -a -YAW swap tilt -a PITCH swap tilt -a ROLL
```

² Sample image is provided in a courtesy of Simon Sherwin.