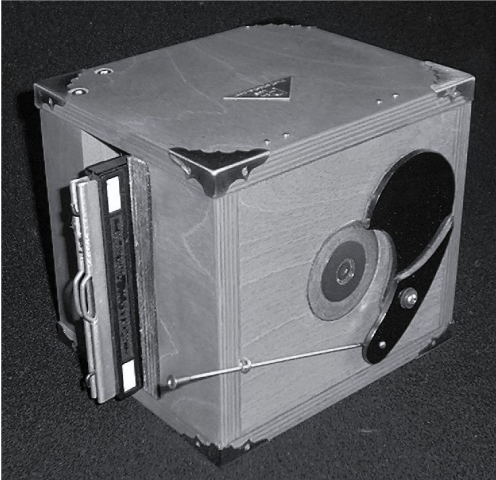


## Hue Candela's PinPLUS 64 mm Camera



**64 mm /  
2.5 inch  
100 degree  
Wide-angle  
Camera**

**Hue Candela's  
PinPLUS** cameras have  
maximized the basic  
pinhole camera design.

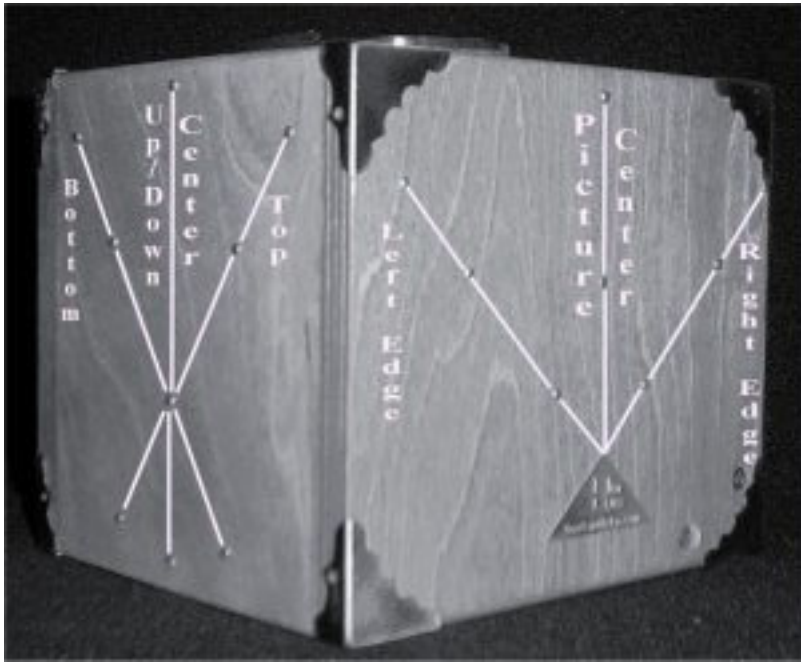
View cameras with different focal lengths for 4x5 films are available. Custom focal length cameras are also available from Hue Candela. There are more than 10 sizes of pinholes for 128 mm to 768 mm cameras and laser-burned pinholes for PinPLUS 64 mm wide-angle camera.

**Pinhole cameras** do not use a conventional lens. This type of camera uses a very small round hole [a pinhole] in a thin piece of metal to control each point source of light from the subject through the pinhole to the film surface within a light proof chamber. The discovery that a small hole can project an inverted image is over 5,000 years old. Pinhole cameras have no linear distortion, and it is an easy task to have a depth of field from one centimeter to infinity in front of the “lens”. Pinhole cameras have and use very high f-stop values, f/180 to f/750 and higher. Pinhole cameras have all over soft focus, as compared to a focused glass lens. Film or print paper is the normal media of image storage. Pinhole camera’s high f-stop requires film to be used in Reciprocity Failure mode, therefore black & white film or print paper is preferred.

**Hue Candela** has looked at the current pinhole cameras for sale. Many have features PinPLUS cameras have, but only PinPLUS has all the features in one camera at a reasonable price. Hue Candela is a supplier of custom pinhole cameras and electronics for single frame photography. See **HueCandela.com** for tables of pinhole information for black & white film reciprocity failure, high-speed flash unit, portable high-powered flash units, flash delay timers, and flash slave receivers.

**PinPLUS** has a self-adjusting film back holder. Each spring assembly has a nylon roller that rides on the outer edge of the film holder. There are no hard pressure points to break the film holders. The spring assembly accommodates 0.4 inch [4x5 film holder] to 0.7 inch [Polaroid, Kodak Readyload and Fuji Quickload] film holders. Therefore no setup time is required for the film holder loading in a PinPLUS camera.

**PinPLUS** has included in the camera's body design two viewfinders for 4x5 film. Horizontal viewfinder [left and right edge] is on the top of the camera and the vertical viewfinder [top and bottom edge] is on one side of the camera. Also center of "lens" markers are on the camera's top and one side. See next page for pictures of PinPLUS camera viewfinders.



PinPlus View Finders for negative framing.

**PinPLUS** shutter has a side-operated shutter control. Timings of  $\frac{1}{4}$  second are possible.



**PinPLUS** shutter's position over the "lens" can be determined, from the backside of the camera because of the visibility of the shutter control rod.

**PinPLUS** has a handle built into the back the camera for ease of carrying.



**PinPLUS** cameras have a  $\frac{1}{4}$ -20 threaded tripod mount

**PinPLUS** camera is designed for horizontal tripod mounting.

**PinPLUS** are made of nine-layer Baltic birch, hand assembled, hand stained, have three layers of spar urethane, and are finished to match late 1800s view cameras.

**PinPLUS 64 mm** is a wide-angle 4x5 view camera, with a 100-degree diagonally field-of-view [90 degrees horizontal and 76 degrees vertical].

**PinPLUS 64 mm** is  $6\frac{3}{4}$  W x 6 H x  $5\frac{3}{4}$  L, with a focal distance of 64 millimeters or  $2\frac{1}{2}$  inches from the pinhole to the film surface.

**inPLUS 64 mm** is supplied with a 250-micron laser drilled pinhole. **Lenox LASER** manufactures the laser holes in 0.0005 inch 300-series stainless steel that Hue Candela uses for PinPLUS 64 mm camera's pinhole assembly. With 5/10,000 metal thickness, the pinhole has no appreciable barrel affect to add to the film edge roll off at 50 degrees from center of pinhole.

**PinPLUS 64 mm** laser drilled **Lenox LASER** pinhole of **0.010 inch / 0.25 mm / 250 microns**, [with circularity tolerance of 1 micron] gives the camera an **f/250** stop rating. Pinhole assemblies with 0.014 [**f/180**] and 0.007 [**f/360**] laser holes are available from HueCandela.com

**PinPLUS 64 mm Lenox LASER** pinholes have an ultra clean edge pinhole, which gives the sharpest focusing "lens" possible for pinhole photography.

The way the reciprocity failure performs can be different for **shutter open times**, chemicals, development times, and personal negative contrast for printing. These can change the **PinPLUS camera 64 mm** with 0.010 inch pinhole f/250 by -1.5 to + 2 f-stops. Therefore in the next pages are tables for f/180, f/250, and f/360. Please use f/250 table for initial pictures. If many prints are dark after reciprocity failure correction was used, try f/360 table. To lighten the contrast, try f/180 table. Process the film in the same way as the last test. At this point you should have the best f-stop for the film, camera, processing, and hardness of paper.

For corrected processing times under your control, the following times are suggested by most film manufactures:

- 10% less devolvement time for 1-10 seconds shutter time
- 20% less devolvement time for 10-60 seconds shutter time
- 30% less devolvement time for 1-20 minutes shutter time



**Reciprocity Failure** starts when a change of 70% [0.3 neutral density filter] less light to the film fails to equal one f-stop of change on the film emulsion. The shutter time increase is by metered read f/stop corrected for time [seconds] required at PinPLUS camera's f-stop value. This corrected seconds raised to an exponents of simple best-fit curve corrects the timing [seconds] for the film's reciprocity failure.

For 2 to 120 seconds are:

Kodak T-Max PRO 100      seconds <sup>^1.16</sup>

Kodak T-Max PRO 400      seconds <sup>^ 1.24</sup>

Kodak T-Max PRO 3200      seconds <sup>^ 1.30</sup>

Ilford B&W negative film      seconds <sup>^ 1.48</sup>

Agfa Pan APX 25      seconds <sup>^ 1.60</sup>

Agfa Pan APX 100 & 400      seconds <sup>^ 1.30</sup>

Kodak Tri-X 400 and Plus X have a different slope curve

The Tables at the back of this book have been derived from manufactures tables and curves for the film type.

**PinPLUS Picture Taking** is a simple task.

**One** Set the light meter at the ASA of the film.

**Two** Take a light meter reading at 1/125 of a second.

**Three** Use f/250 table or the f/stop table that meets your final print requirements.

**Four** Find the f-stop value on the table. Below the f-stop is the uncorrected time for the picture.

**Five** On the reciprocity failure tables, find the table that includes the uncorrected seconds and film type. The value below the uncorrected time is the corrected **seconds** required for the **shutter open time**, with film's reciprocity failure included.

**Six** Is the **shutter open time** acceptable?  
Is the landscape moving acceptable?  
Is the subject moving acceptable?  
Is the lighting source equal through the picture?  
Can the camera be stable for the  
**shutter open time**?

**Seven** If the answers to the previous questions are yes, then lighting conditions are compatible for your PinPLUS camera picture. Note! Equal lighting source gives best negative contrast and sharpness, especially when film is in reciprocity failure.

**Eight** Camera operations:

- a. Set up the tripod with camera
- b. Point camera at subject [Due to the pinhole no glass focusing is available. **PinPLUS** viewfinders can assist in finding the field of view]
- c. Close shutter.
- d. Load film holder into camera.
- e. Pull out film slide.
- f. Open shutter for **shutter open time**.
- g. Return film slide.

## PinPLUS 64mm camera with 0.014 pinhole

No color dot on pinhole assembly indicates a 0.014 pinhole in assembly.

To find the corrected exposure time: set the light meter to **1/125 second shutter time** and to the **ASA of the film** being used, take light meter reading, find reading value in the table below in **f-stop** row, beneath in the **seconds** row is the uncorrected time for **f-180** lens, use uncorrected time with the **Reciprocity Failure Tables** for film's reciprocity failure correction, and use this new corrected timing value for **shutter open time** for the picture.

f-stop	2.0	2.05	2.8	2.85	4.0	4.05	5.6
<b>seconds</b>	<b>32</b>	<b>24</b>	<b>16</b>	<b>12</b>	<b>8.0</b>	<b>6.0</b>	<b>4.0</b>

f-stop	5.65	8.0	8.05	11	11.5	16	22	32
<b>seconds</b>	<b>3.0</b>	<b>2.0</b>	<b>1.5</b>	<b>1.0</b>	<b>0.7</b>	<b>0.5</b>	<b>0.25</b>	<b>0.125</b>

## PinPLUS 64mm camera with 0.010 pinhole

Gold color dot on pinhole assembly indicates a 0.010 pinhole in assembly.

To find the corrected exposure time: set the light meter to **1/125 second shutter time** and to the **ASA of the film** being used, take light meter reading, find reading value in the table below in **f-stop** row, beneath in the **seconds** row is the uncorrected time for **f-250** lens, use uncorrected time with the **Reciprocity Failure Tables** for film's reciprocity failure correction, and use this new corrected timing value for **shutter open time** for the picture.

f-stop	2.0	2.05	2.8	2.85	4.0	4.05	5.6
<b>seconds</b>	<b>64</b>	<b>48</b>	<b>32</b>	<b>24</b>	<b>16</b>	<b>12</b>	<b>8.0</b>

f-stop	5.65	8.0	8.05	11	11.5	16	22	32
<b>seconds</b>	<b>6.0</b>	<b>4.0</b>	<b>3.0</b>	<b>2.0</b>	<b>1.5</b>	<b>1.0</b>	<b>0.5</b>	<b>0.25</b>

## PinPLUS 64mm camera with 0.007 pinhole

Violet color dot on pinhole assembly indicates a 0.007 pinhole in assembly.

To find the corrected exposure time: set the light meter to **1/125 second shutter time** and to the **ASA of the film** being used, take light meter reading, find reading value in the table below in **f-stop** row, beneath in the **seconds** row is the uncorrected time for **f-360** lens, use uncorrected time with the **Reciprocity Failure Tables** for film's reciprocity failure correction, and use this new corrected timing value for **shutter open time** for the picture.

f-stop	2.0	2.05	2.8	2.85	4.0	4.05	5.6
<b>seconds</b>	<b>128</b>	<b>96</b>	<b>64</b>	<b>48</b>	<b>32</b>	<b>24</b>	<b>16</b>

f-stop	5.65	8.0	8.05	11	115	16	22	32
<b>seconds</b>	<b>12</b>	<b>8.0</b>	<b>6.0</b>	<b>4.0</b>	<b>3.0</b>	<b>2.0</b>	<b>1.0</b>	<b>0.5</b>

## Reciprocity Failure 1 – 4 seconds

Film	1sec	1.5s	2sec	3sec	4sec
Kodak Plus-X, Tri-X Agfa Pan APX 100 Agfa Pan APX 400	2.0	2.2	3.7	8.1	13.9
Kodak T-Max Pro 100	1.1	1.6	2.2	3.6	5.6
Kodak T-Max Pro 400 Agfa Pan APX 25 Agfa Scala 200X	1.2	1.7	2.4	3.9	5.6
Kodak T-Max Pro 3200	1.2	1.7	2.5	4.2	6.1
Iford all B&W Negative films	1.4	1.8	2.8	5.1	7.8



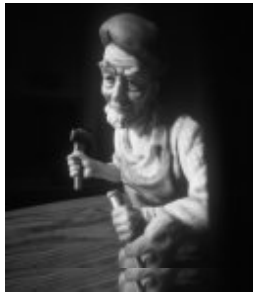
## Reciprocity Failure 6 – 24 seconds

Film	6sec	8sec	12sec	16sec	24sec
Kodak Plus-X, Tri-X Agfa Pan APX 100 Agfa Pan APX 400	25.0	38.5	52.0	1m15	2m14
Kodak T-Max Pro 100	8.0	11.2	17.9	24.9	39.9
Kodak T-Max Pro 400 Agfa Pan APX 25 Agfa Scala 200X	9.2	13.2	21.8	31.1	51.5
Kodak T-Max Pro 3200	10.3	15.0	25.3	36.8	1m02
Iford all B&W negative films	14.2	21.7	39.5	60.0	1m50

## Reciprocity Failure 32 - 128 seconds

Film	32sec	48sec	64sec	96sec	128 sec
Kodak Plus-X, Tri-X Agfa Pan APX 100 Agfa Pan APX 400	3m20	6m39	10m05	18m19	29m19
Kodak T-Max Pro 100	55.7	1m30	2m05	3m19	4m39
Kodak T-Max Pro 400 Agfa Pan APX 25 Agfa Scala 200X	1m14	2m18	2m53	4m46	6m50
Kodak T-Max Pro 3200	1m31	2m34	3m42	6m17	9m09
Ilford all B&W negative films	2m49	5m08	7m51	14m19	21m54

**Hue Candela products for single frame photography** Lighting Strobe is a flash bar that holds eight four-inch wide camera mounted flash units. With 8 Vivitar 285's one LightingStrobe can deliver 480,000 watts of light for the flash duration. It is possible, at 1/1,000 of a second, to take a color pinhole picture with the flash 3 feet from the subject.



Flash Pinhole picture

**SeeFar** is a flash slave receiver. It can perform in the sunlight. It also can fire a slave flash from subjects reflected flash.

**StrobeController** is a user-friendly delay timer, with delays up to 10 seconds.

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