



Alternative Photography Summer School

Home Made cameras



Making a basic homemade 'Paper negative' camera to create long exposure paper negatives which are then scanned and inverted without the need for chemistry.

You will need:

- Shoebox
- Craft knife
- A lens. The camera pictured can be used with the lens provided in the pack, or better still find a short focussing glass magnifying lens which gives better quality.
- Tape Measure.
- Gaffer Tape
- Torch
- Light sensitive photographic paper



Assembly

Measure your shoe box and decide which face of the box to place the lens. The distance should be \geq (greater than or equal to) the infinity ∞ focusing length of your lens. All lenses vary but the 'pack lens' focusses infinity at 13cms. Any closer and the lens wont focus.

This shoe box happens to have a height of 13cm (which would focus at infinity) and a width of 20cm. I am going to use the 20cm distance so I can photograph 'still life' and 'portraits' rather than boring old 'Half Dome' ∞ type views!

Finding the point of focus of a lens

All lenses require focusing so you need to find the distance a lens focuses at infinity, then add a bit to focus a bit closer. Many glass 'magnifying' type lenses will work, and will be far better quality than a plastic 'Fresnel' lens although don't worry about that, any single element lens is going to be interesting!

A larger diameter lens (from a large magnifying glass) will have a shallower depth of field, and require less exposure time but will need accurate focussing.

Hold your lens up to a point source of light, either a light bulb 4m away (ish) or the sun (careful!) and focus the point source on a sheet of paper, then measure this distance. If your shoe box or container is a greater distance than this you are on your way!

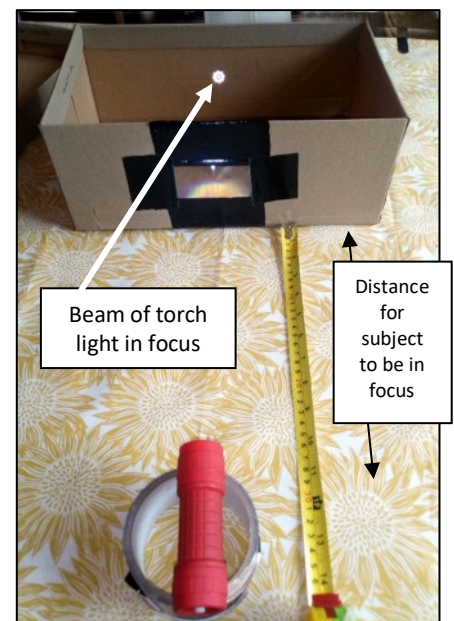
Draw out and cut hole for the lens. (With the Fresnel lens there is a clear 'non lens' edge which should be blacked out). Gaffer tape the lens on.

Point a bright torch at the camera with the lid off. Move the torch closer to the lens until the bulb is in focus on the back of the box (where your photographic paper will be positioned).

On the right it is 27cm from the torch to the lens when the torch is in focus on the inside of the box. Make a note of this measurement and write this on the lid.

If you move the lens to the left and the right it will give you an idea as to both the field of view and the fab way single element lenses distort at the edges.

You could use the length of the box to focus even closer but the exposure will be far greater. Check all holes etc are covered up with gaffer tape to prevent excess light, then wait for a sunny day.



Angle of view

As an idea of the angle of view for the Fresnel lens I have photographed a scrabble board and shown the field of view. As you can see, although the centre has sharpness the image falls away, an aberration known as coma. As with all problems, get the hang of it, and it can become a unique quality.



Lighting

Single element lenses are unforgiving creatures in many ways, one of which, particularly with the Fresnel lens, is stray unfocused light entering the camera and reducing the contrast. To counter this I suggest you photograph



using available sunlight indoors or a long exposure indoors lit by a lamp. This also reduces the potential for wind blowing things around over a several minute exposure.

Inserting the paper

In subdued light (curtains drawn – lightbulb) position a small 3x2 inch piece of photo paper on the inside back of the camera opposite the lens and tape it down. Make sure the emulsion (shiny) side is pointing towards the lens. Using a small piece of paper will allow you several attempts to get the exposure right before using the 5x7 sheet.

Exposure times

There are many variables here however the large accommodating exposure latitude of photographic paper will often give an image which can be improved a second time. Initially I would try 5 minutes in sunlight and evolve from there.

Subjects

Self portraits, dolls, the cat, always consider incorporating a dark background though.

Recovering the image

Don't use chemicals to recover the image. Over a period of time the image appears on the paper as it reacts with light. The image is then scanned into a computer using a flatbed scanner (or you can photograph your image on a mobile phone or camera). This negative image is then inverted into positive using digital imaging software. After which you can play with contrast – levels etc. Store your paper negative in a light tight box.

- Close the curtains in your computer room
- Set the scanner on a high resolution (500dpi is good) and set on 'colour' scan
- Take the photo paper out
- Place it onto the scanner then press scan
- Save the negative image on your computer
- Open up Photoshop / photo manipulation software
- Image > Inverse > Flip horizontal and play around with: contrast, brightness and levels.
- File > save



'Dolly says bye bye'
(Fresnal lens image).

*Light sensitive photographic paper is not the photographic paper used in ink jet printers.
For more paper negative info see [Joe Van Cleaves](#) videos, one of the few people experimenting with this technique.