

(Sun) Tracks on the Film



Prologue

Actually, the proper term is “solargraph” but as the film records the sun’s track across the sky, much as charts record tracks in the sea, I’ve always thought of them as sun track photos. A solargraph can be anywhere from one day to six months, depending mainly on your patience for results.

The photo above was taken by the author with a handmade pinhole camera (not Flyer) in San Lorenzo (in the New Mexico History Museum archives). The sun came out once during a cloudy day, right behind the bottle.

Neutral Density Filters

The Kickstarter edition of the Flyer 6x6 pinhole cameras all came with a stretch goal of 3 ND (neutral density) 1.2 filters. Post-Kickstarter, these are a separate order of \$5 (shipping included).

Each ND 1.2 filter reduces the light by 3-3/4 f/stops, allowing only 6.3% light transmission. Put another way, a Flyer 6x6 photo using Ektar 100 on a sunny day should use a 1-second exposure. Each f/stop doubles the exposure, so rounding off to 4 for simplicity, that becomes 2, 4, 8, 16 seconds. One ND 1.2 filter gives me 16 seconds instead of trying to open and close the shutter in 1 second.

The second ND 1.2 filter extends that to 32, 64, 128, 256 seconds, or 4 minutes 16 seconds.

The third ND 1.2 filter extends that to 512, 1024, 2048, 4096 seconds, or 1 hour and about 8 minutes. Technically, another filter would be needed for an all-day sun track, but most films do better if treated as a lower ASA film than they actually are (overexposing). In addition, a factor called reciprocity failure comes into play. Reciprocity failure means films don’t behave linearly and require progressively longer exposures than mathematically indicated as the light falls.

Three ND 1.2 filters should give you a decent solar graph image. For multi day or multi week exposures, you might need one or more additional filters.

Installation

Remove the o-ring around the pinhole with tweezers or a pin (try not to damage the o-ring) and drop in the 3 ND 1.2 filters on top of the pinhole. Make sure they are clean and dust-free, and handle them with tweezers or by the edges. Replace the o-ring.

If you have film loaded when adding or removing the filters on Flyer 6x6, this will cost you an exposure so be sure to advance the film one count afterward. Clipper 6x18 has an internal shutter and the filters can be changed without costing an exposure.

Preparation

Locating a good spot for a sun track photo is important. The camera should point upwards to the sky (not necessarily vertically) and include something interesting such as a plant, tree, or other objects as a point of reference. The camera should be well propped or mounted on a tripod so it won't shift when opening the shutter or rock in the wind.

The black camera will get hot in a bright sun, and while ABS can tolerate a fair amount of heat, it's not good for the film. I normally take a sheet of white paper, tear a hole in the middle for the shutter, and just wrap the sheet around the camera and tape the ends together in the back. This is sufficient to deflect most of the sun's heat and can easily be torn off afterward.



Shooting

This is simplicity. Open the shutter at dawn (or the night before if you're not an early riser) and leave the camera out. Close the shutter at twilight and advance the film. Repeat (or take the filters out, advance an exposure, and resume normal shooting). Take the film in for processing when you've shot all the exposures or your patience runs out, whichever occurs first.

Advanced

This requires cutting and loading/unloading in the darkroom or a changing bag, but you can unroll 120 film and cut 3 pieces, each about 3.5-4" long, stack them together and drop them into the film slot (no winding). The first piece will be overexposed, the second will be exposed, and the third will be underexposed. The effect varies by film (probably works better with B&W) and can be quite interesting. Remember to tape over the red window with opaque black tape.



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Making Your Own ND Filters

While you can get pre-punched ND filters to fit your Pinhole Printed camera, you can also order or make your own. Commercial ND gel filters can be found from photo supply stores. If you want to do your own, you'll need a roll of B&W film - 35mm is fine for this purpose. Pull the film out, expose it to daylight, and process it. You'll then have a roll of black film. Cut out several 20mm (slightly larger than 3/4") circles and experiment with how many you'll need. Chances are one will do, possibly two, depending on the film.