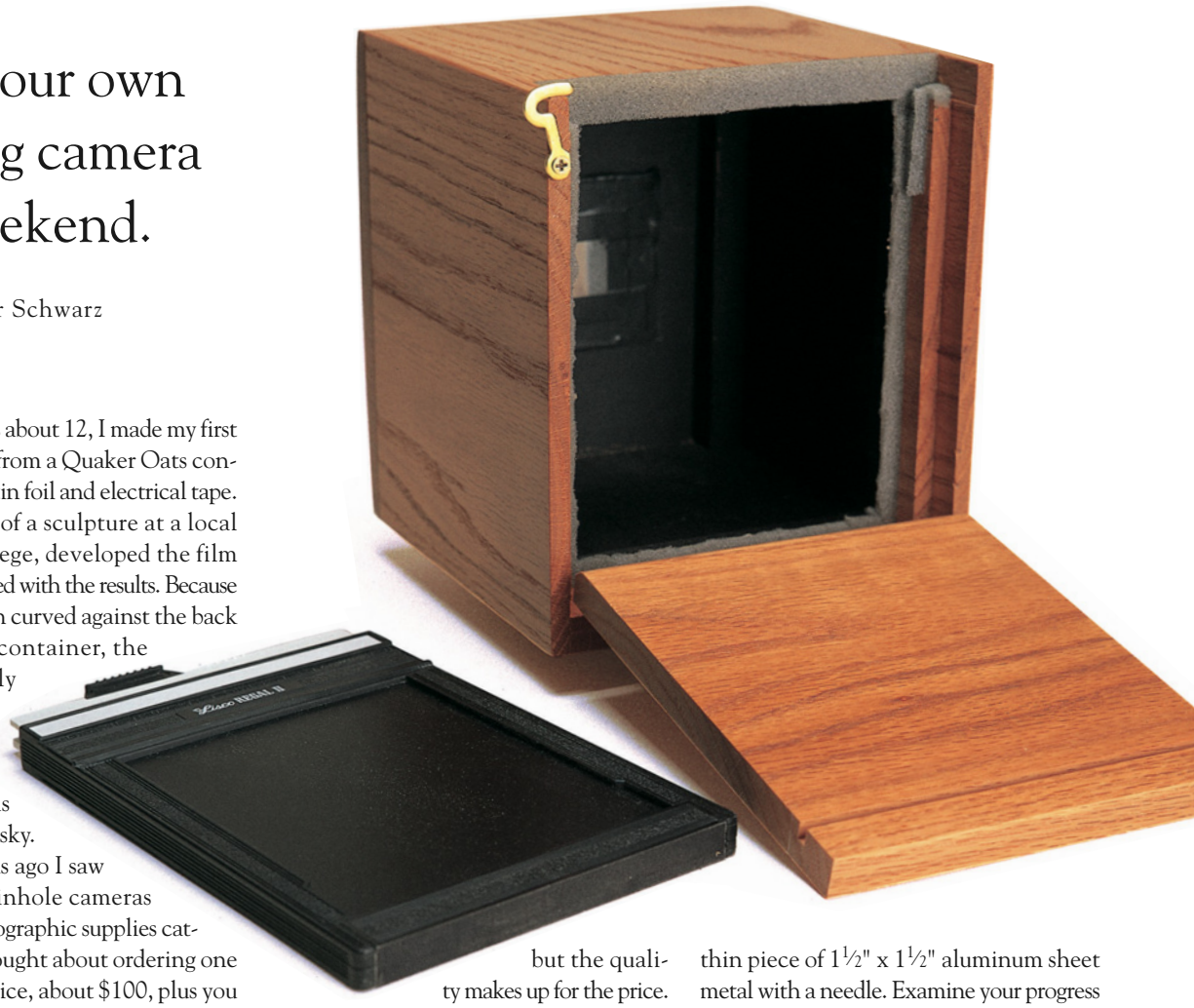
Pinhole CAMERA

Build your own working camera this weekend.

by Christopher Schwarz



When I was about 12, I made my first pinhole camera from a Quaker Oats container, a scrap of tin foil and electrical tape. I took a picture of a sculpture at a local community college, developed the film and was intoxicated with the results. Because the film had been curved against the back of the oatmeal container, the photo was wildly distorted—it looked like the sidewalk around the sculpture was leaping into the sky.

A few months ago I saw some wooden pinhole cameras for sale in a photographic supplies catalog. I briefly thought about ordering one until I saw the price, about $100, plus you had to buy the film back. Ouch. So I did what any self-respecting woodworker would do. I headed for the shop.

This pinhole camera is my fourth prototype. I first played around with trying to build one that would take Polaroid film (a messy disaster). Then I toyed with medium-format 120 film (too much engineering). Finally, I decided simplicity was best. This camera uses a 4" x 5" film back that holds two pieces of 4" x 5" sheet film. You load the film into the film back in a dark closet. Then you put the plastic film back into the camera. When you're ready to make a picture, you remove what's called a "dark slide," and this begins the exposure. To stop the exposure, you replace the dark slide. Then you take the film to the lab. The film isn't cheap (about $2 a shot), but the quality makes up for the price.

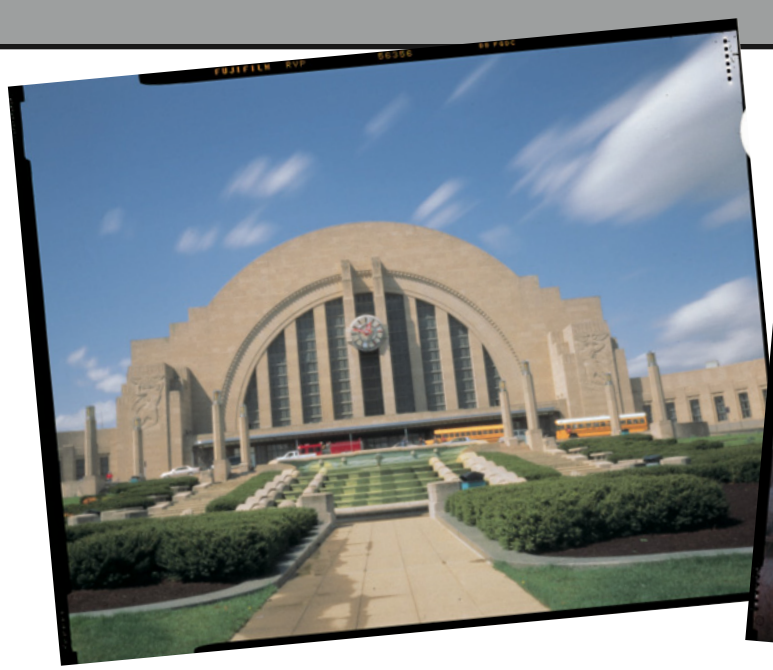
You can enlarge 4" x 5"s to an impressive size. Here's how to make your own camera:

Make the Pinhole

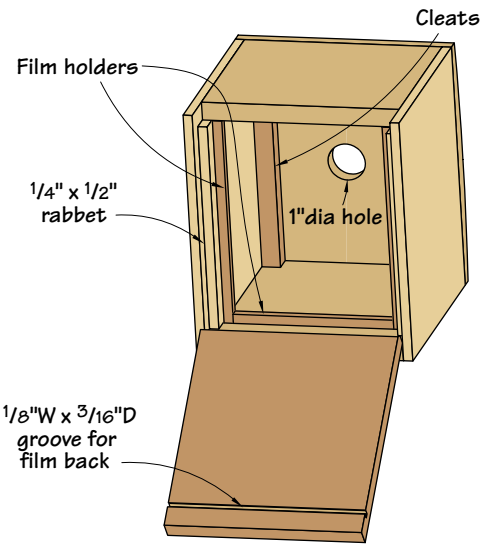
When building a pinhole camera, one of the most important things is the distance between the pinhole and the film. This is called the "focal length." For every size pinhole, there is an optimal focal length. If your focal length isn't correct, your image will be blurrier than it should be. This camera uses a pinhole that is .016" in diameter (about 1/64"). The focal length is (and I hate to do this to you) 120 millimeters. If you're not daring, you can order a set of a dozen pre-cut pinhole apertures from the company listed in the supplies box. Or make your own by poking a hole in a very thin piece of 1½" x 1½" aluminum sheet metal with a needle. Examine your progress with a magnifying glass. When your hole is 1/64", file the burr off the exit hole.

Build the Box

Simple stuff here. The top and bottom are glued into rabbets in the sides. The front is attached using cleats. The back is hinged and also rests in rabbets in the sides. Begin by cutting your pieces to size. Cut ½" x ¼" rabbets on three edges of both side pieces. Glue the top and bottom into the rabbets, clamp and let dry. Now put the film back in place and mark where the three "film holders" will go. These hold the film back in place when you shut the back of the camera. Glue the holders in place. Add lightweight foam weather-stripping to the holders and the back edge of the top. These will help seal out light and give you a tight



Cincinnati's Union Terminal—now the home to several museums—in full sunlight. This exposure was about 12 seconds with 50 ASA Fuji Velvia. Notice the clouds moving in the background ***(left).*** *The Roebling Suspension bridge (the prototype for the Brooklyn Bridge) seen from Covington, Kentucky, at sunset on 100 ASA Fuji Provia.* ***(right)***



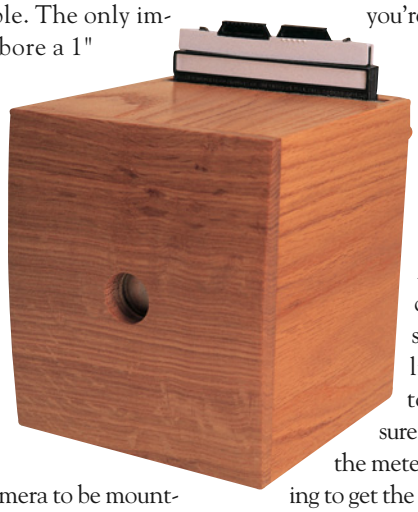
PINHOLE CAMERA

No.	Item	Dimensions TWL
2	Sides	½" x 6⅝" x 5⅝"
1	Bottom	½" x 5 5/16" x 5⅝"
1	Top	½" x 5 5/16" x 4⅝"
1	Back	½" x 5 5/16" x 6⅛"
1	Front	½" x 6⅝" x 5 13/16"
2	Film holders	¼" x ¼" x 5⅝"
1	Bot. film holder	¼" x ¼" x 4 5/16"
1	Tripod mount	½" x 2¼" x 3¼"
2	Cleats for front	½" x ½" x 5⅝"

Note: All parts are White oak

fit. Now fit the back of the camera. You might need to make a saw kerf cut on the back to accommodate a raised lip on the film back. Attach the hinges and add a shutter latch (the kind for shutters in your home) to the back to keep the camera's back shut. Glue the two cleats inside the camera flush to the front. These help keep the front in place. Paint the inside of the camera flat black.

The front is simple. The only important thing is to bore a 1" diameter hole in the dead center. I also cut a curve on my front with a band saw. Now attach your pinhole aperture with electrical tape. Measure your focal length and shim the aperture with electrical tape or thin slices of wood if necessary. Glue the front to the cleats on the case.



To allow your camera to be mounted to a tripod, install a ¼" x 20 tpi threaded insert into the tripod mount piece. Glue and screw it to the bottom of the camera. Add a couple coats of clear finish, and you're ready to take pictures.

Test Drive

Exposure times are long for pinhole cameras. In full sun, this size pinhole needs about 10 seconds of exposure using 50 ASA film. On cloudy days, expect about 40 seconds. If you have a light meter, here's how to determine the exposure for this size pinhole. Set the meter to f64 and take a reading to get the exposure time. Multiply that time by 20. That's your exposure time. Before your exposure, make sure your camera isn't going to move. And keep in mind that this will be a wide-angle shot, so try to get close to your subject. Don't be afraid to experiment. For example, to make it look like a ghost is walking through your photo, have someone stand still in the frame for about half the exposure time. Shots with waves or water will look surreal with the long exposures. **PW**

SUPPLIES

Calumet • 888-888-9083
Lisco Regal II 4 x 5 film holder, item #LS4500, $18.95
Pinhole aperture set, item #PY3005, $29.95

Hardware
1" x 1" hinges (2)
Shutter latch (1)
¼" x 20 tpi threaded insert (1)