

An Applied History of Photography: Constructing a large-format camera SAG Report

Colin Snow, Nathan Weil

May 14, 2021



1 General Description

The modern world more or less lives through photographs. We send them, receive them, take them, tweet them, post them, and use them in pretty much every form of communication. They are our gateway to experiencing world events as much as they are for keeping up with distant relatives. To understand how we got here we must consider where photography began and how it has evolved and grown from a chemistry experiment to the pockets of the masses. Large format photography dominated over a century of this history (1830s-1950s), producing many of the images that defined the era. Over the course of this semester we explored this history through research, interviews, and experimentation.

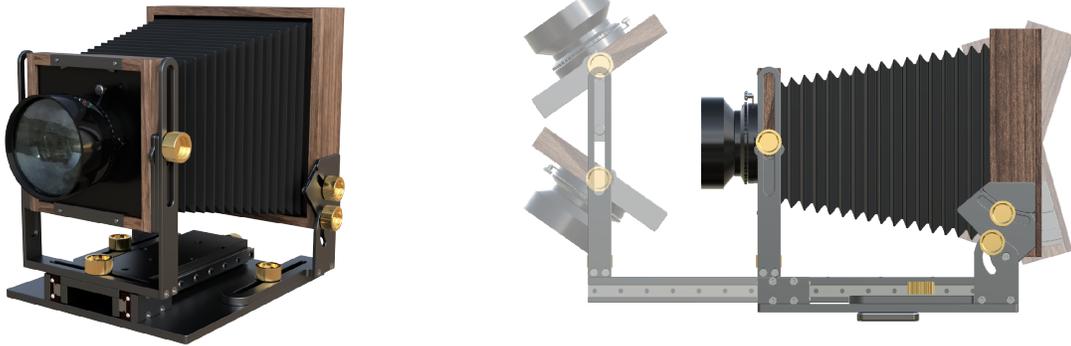
We designed, fabricated, and used a 4x5 film camera that is evocative of this rich history and its role in shaping the modern age. The camera combines a mix of traditional and high tech

manufacturing techniques with an aesthetic style that connects the early age of photography with the modern day.

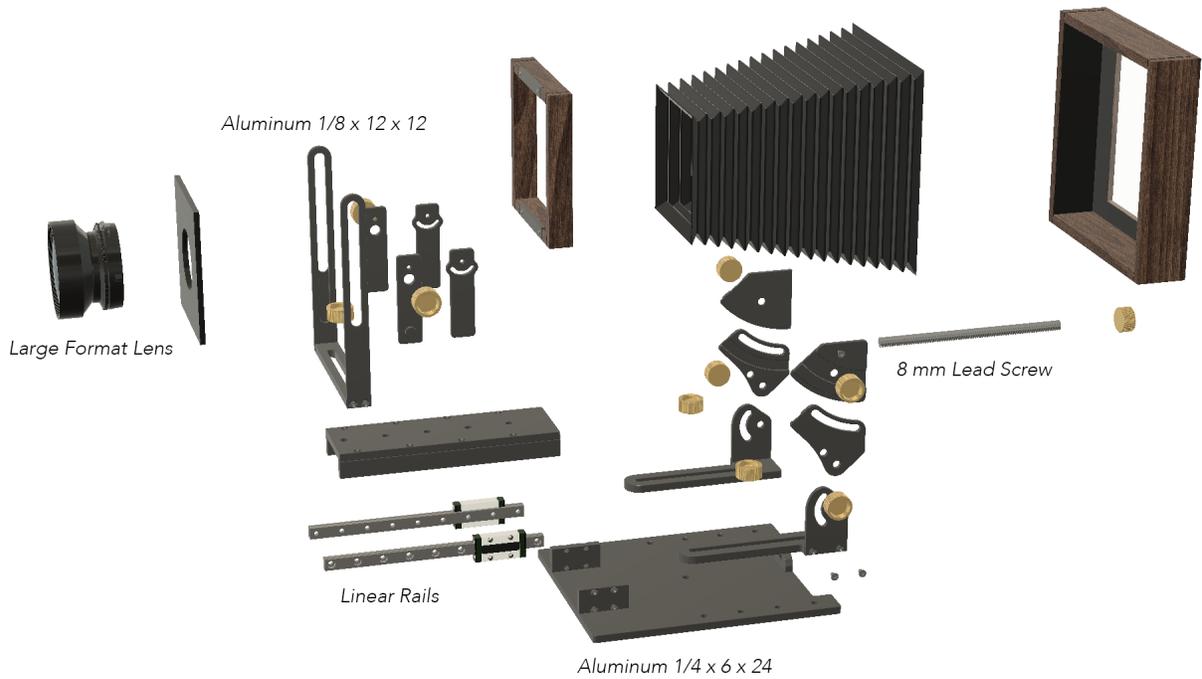
2 Current Work

2.1 Design

We produced a 4x5 camera (4x5 means 4 inch by 5 inch film size) with substantial tilt and shift range and a fine focus adjust.



We began the design process by first understanding the complicated techniques required for large format cameras and the optics that define them. Because of the large film size, a significant range of both position and angle adjustment is required between the lens and the film. After understanding the required movements, we studied existing solutions and how we might improve the usability and image quality.

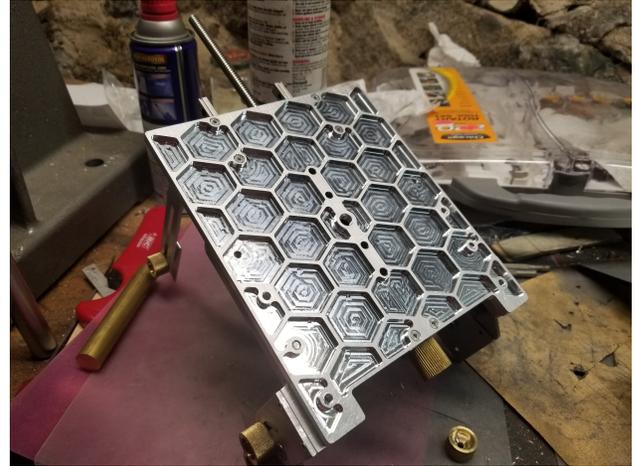


The result is a camera design which is manufacturable, high-quality, and capable of helping us better understand early photographers and their experience.

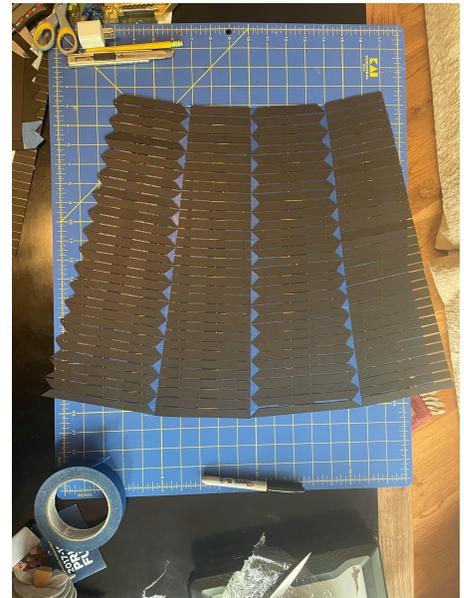
2.2 Manufacture

The camera was manufactured in two distinct parts, with metal components made by Colin in Massachusetts and wood components made by Nathan in Missouri. Due to the large distance between us we needed to work separately and then ship all parts to Missouri for assembly.

Metal parts were mostly created with a cnc mill which allowed for complex shapes and features. We used this freedom to create the intricate folding mechanism as well as to remove weight from the larger plate pieces. We intentionally left the visible pieces of the design quite simple so as not to distract from the overall appearance.



The rest of the parts were mostly hand crafted and created from cad templates. This includes all the wood parts as well as the bellows which are made out of cardstock and fake leather.



3 Gallery

Here are some of our favorite images of the finished camera for you to enjoy.



4 Budget and Resource Use

Compared to digital, large format cameras are less expensive initially, but more expensive per image. We have tried to minimize cost by selecting a 4x5 film size, the smallest and least expensive size that is still in the large format range. Below is a list of items which are required to create the camera and take enough images to create an exhibition.

Item	Quantity	Price Per	Total	Supplier
Film Holder	6	\$ 5	\$ 30.50	Ebay
Linear Rails	2	\$ 12	\$ 29.13	Ebay
8 mm Lead Screw and bearings	1	\$ 21.76	\$ 21.76	Ebay
Aluminum 1/4 and 1/8	1	\$ 104.88	\$ 104.88	Ebay
Film and Chemicals	1	\$ 184.93	\$ 184.93	BH Photo
Darkroom Equipment	1	\$ 35.96	\$ 35.96	Amazon
			\$ 466	