

**Photography  
Art Cart Materials  
Spring 2012**

**Minneapolis Institute of Arts  
Division of Learning & Innovation  
2400 Third Avenue South  
Minneapolis, Minnesota 55404**

## **Art Cart Inventory**

### **Art Cart Interpreters:**

The lead guide for each Art Cart shift should inventory the contents of the cart before **and** after the shift. If this is not done and objects are missing or damaged, the lead guide may be held responsible. (The lead guide is the first guide listed on the confirmation form.)

If an object is missing or damaged, make a notation on the inventory and report it to the Tour Office.

If an object is suddenly missing during your shift, notify security immediately by alerting the guard in the gallery or by calling x3225.

## INVENTORY SHEET: ART CART – PHOTOGRAPHY

Date:

Guides/Docents:

**Objects**

**Comments**

	<b>In</b>	<b>Beginning of Shift</b>	<b>In</b>	<b>End of Shift</b>
<b>Polaroid Big Shot</b>				
<b>Fujifilm: FP 100B Instant Film 100 series pack</b>				
<b>16 Polaroid celebrity portraits (2 sets)</b>				
<b>Flash Cubes: Sylvania MagiCubes</b>				
<b>David Burnett’s Holga Photograph of Vice-President Al Gore</b>				
<b>Set of 16 Holga 120N Photographs taken by Photographer Nathan Lewis</b>				
<b>Holga 120N (Clean/“unhacked”)</b>				
<b>Holga 120N: Hacked 35mm film Camera</b>				
<b>Holga 120N: Hacked with set of 9 attachable filters</b>				
<b>PinHolga 120N: Hacked Pinhole Camera</b>				
<b>Guide to making a PinHolga Camera</b>				
<b>Camera Obscura (3)</b>				
<b>35mm Film: Kodak Professional Ektachrome 400x color</b>				

<b>120 Film: Kodak Professional Ektachrome transparency</b>				
<b>iPad</b>				
<b>Lacey Prpić Hedtke's Photographs (10), slide, and stereograph</b>				
<b>Stereoscope</b>				
<b>Slider viewer</b>				

**Check to see if you are low on any supplies. Let the Tour Office know if you need anything replenished.**

Please share! Use the space below to record visitor questions that “stumped” you and comments or observations you would like to share with fellow guides and staff. If you know the answer to someone's question, please record the answer! Staff will also periodically review questions and try to assist with finding answers.

## INTRODUCTION

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The MIA's Art Carts are hands-on gallery stations outfitted with art objects, props and visual aids related to the museum's permanent collection.

Staffed by Museum Guide Programs volunteers, Art Carts provide visitors with a unique art museum experience where **"Do touch!"** is the rule. Guides use the objects on the Art Carts as tools for facilitating learning experiences that encourage careful looking, thoughtful conversation, critical thinking skills, and further exploration of the Institute's permanent collections. And, they are lots of fun for all ages!

### ART CART GOALS

The goal of each Art Cart experience is to provide a multi-sensory interaction with art objects during which guides help visitors deepen their interest in and experience with the museum's permanent collection. Each object on the Art Carts is thoughtfully selected for its connections to the collection and its ability to engage the senses and inspire questions and observations. Although there are limitless possibilities for each Art Cart, we are constrained by several factors including cost, availability, durability/fragility, and safety and security of art and visitors in the galleries (i.e. most wet materials are not allowed, nor are sharp objects).

Each cart also has a general theme or focus to tie the selected objects together (e.g. Africa – pattern and decoration of everyday objects; China – artist as master craftsperson; Americas – adornment/dress, environment; Japan – tea ceremony; South and Southeast Asia – symbolism; Pacific Islands – relationship to the natural world; Ancient Greece and Rome – daily life).

### BEST PRACTICES

A successful Art Cart-visitor interaction:

- Sparks curiosity and inspires exploration in visitors of all ages
- Involves the visitor in conversation about the objects on the Art Cart
- Allows the visitor to direct the discussion/discovery and explore those things of interest to the individual
- Provides opportunities for visitors to handle art objects with care and to learn about the museum's role in preserving and protecting the world's rich artistic heritage
- Stimulates as many of the five senses as possible/practical
- Encourages visitor exploration in the surrounding galleries to seek out related objects (ideas provided in the "Collection Connections" section of each Art Cart object entry)

**BEST PRACTICES,  
CONT.**

Each docent or guide is expected to:

- Study the written Art Cart materials before *each* shift and be prepared to discuss *all* objects on the Art Cart
- Arrive on time (20 minutes before the shift begins) and insure the cart is ready for visitors at the appointed time
- Exhibit an outgoing, friendly and welcoming attitude while staffing the Art Cart
- Be proactive and invite visitors to explore the Art Cart
- Engage visitors in open-ended discussions about Art Cart objects rather than lecturing to them
- Stress the fragility and authenticity of objects, where appropriate
- Assist visitors in establishing connections between the objects on the Art Cart and the permanent collection

**POLICIES AND  
PROCEDURES**

Refer to the *Handbook for Collection in Focus Guides* available at [www.mgpvolunteers.org](http://www.mgpvolunteers.org) for detailed information concerning Art Cart assignments, arrival times, and responsibilities.

**OBJECT STORAGE,  
HANDLING AND  
SECURITY**

Each Art Cart includes items that can generally be divided into two main categories:

1. Art objects
2. Props, visual aids and general supplies

The art objects themselves are the main focus of each Art Cart. They are generally the most fragile, costly and difficult to replace items. To protect these objects, each is assigned a designated storage container or space, usually on the top shelf of the cart. It is essential each object is returned to its appropriate storage place at the end of each Art Cart shift.

The props, visual aids and other supplies are intended to support the art objects on each Art Cart, helping volunteers and visitors to understand or explore certain aspects of the art objects. These ancillary items are usually more easily replaced or repaired than the art objects themselves.

All items (art objects and supporting materials) must stay on or near the Art Cart at all times. Visitors and volunteers are not allowed to walk away from the Art Cart with objects and props. (Art Cart items are not to be used as tour props.) It is imperative that one docent or guide on duty is present at the Art Cart at all times to assist visitors in carefully handling the objects to insure object and visitor safety.

Should a visitor intentionally or unintentionally leave the Art Cart with art objects, props, or visual aids and the volunteers on duty are unable to recover these items themselves, security should be notified immediately. (Locate the nearest guard or call Security via a gallery phone at x3225.)

**BRINGING PERSONAL  
OBJECTS**

Guides must refrain from bringing personal items from home to use on the Art Carts. All objects used on the carts a) must be vetted by staff to insure they are appropriate for the Art Cart and b) need to remain on the cart/in the museum, so that Security is not put in the position of having to judge whether or not items are guides' personal property or the museum's property. Additionally, the museum cannot assume responsibility for the loss or damage of guides' personal property.

We are happy to consider your suggestions for possible additions to any of the Art Carts.

**ART CART INVENTORY**

Each Art Cart is stocked with a binder containing inventory worksheets listing each of the *art objects* on the cart. (Not all supporting props, visual aids and general supplies are listed on the inventory.) A thorough inventory of the Art Cart should be conducted at the beginning and end of each shift.

At the end of each shift, any damaged or missing objects and/or depleted supplies should be recorded on the inventory *and* reported to a staff member in the Tour Office.

There is also space on the back of each day's inventory sheet to record any questions, comments or suggestions docents, guides or museum visitors may have about the Art Cart. Please take a moment to share your experience with fellow volunteers and staff!

**WHERE IS THE IPAD  
STORED?**

We have one iPad for use at the Photography Art Cart.

It is stored on the Photography Art Cart. Please keep the iPad on the iPad stand while the cart is being used.

To avoid dead batteries mid-shift, please turn off the iPad at the end of the shift by holding down the button on the top right until the "slide to power off" icon pops up. Slide the power off icon. Please plug in the iPad to the outlet on the wall when you return the cart to the storage spot in the third floor costume closet. The power cord will always be stored on the cart.

## Photography Art Cart

- WHAT IS THE THEME OF THE PHOTOGRAPHY ART CART?** The photography Art Cart presents photographic techniques from the advent of photography through the present day. The Art Cart presents photographic processes and mediums that were popular in their time, to tell the history of photography. The cart also connects current day digital photography to the revival of vintage photography. The cart further relates these processes to the Minneapolis Institute of Arts' Photography Collection.
- IMAGE ON THE ART CART** The image on the front of the cart is "Weymouth" (2009.42.1) by Martin Parr, from the "Think of England" series, 2000. Parr was born in 1952 in Weymouth, England. The "Think of England" Series was taken between 1983 and 2003 and guides the viewer from what is regarded as the essence of "English-ness" to the extreme effects of globalization.
- WHERE IS THE PHOTOGRAPHY ART CART STORED AND HOW DO I ACCESS IT?** Each Art Cart has a designated storage space and a usual gallery location. The Photography Art Cart is stored in the Museum Guide Programs costume room/Art Cart room on the third floor. It is located across the hall from the Tudor Room. To access the storage area, pick up a key from the Tour Office. The keys are kept on a hook in the top drawer of the low filing cabinet just inside the tour coordinators' office door.
- WHERE SHOULD THE PHOTOGRAPHY ART CART BE SET UP IN THE GALLERY?** The Art Cart should be set up on the north side of the open lounge area in front of the Harrison Photography Gallery entrance, near the directory kiosk. The back of the cart should face the windows and downtown. The front of the cart should face the Harrison Photography Gallery (gallery 362). Please be aware that visitors come from both directions and position the cart to avoid having your back to approaching visitors.
- UPLOADING IMAGES TAKEN WITH THE IPAD TO [WWW.FLICKR.COM](http://WWW.FLICKR.COM)** Please take photos of visitors at the Art Carts! On the Photography Art Cart, use the iPad stored with the cart to do so.
- *Always get verbal permission before taking any visitor's photo.* This is especially important when taking photos of children. You should obtain permission from an adult responsible for the child(ren). We do not collect or publish the names of visitors pictured in photos taken at the Art Cart.
  - Please do not adjust the iPad's settings.
  - Please upload images taken on the iPad directly to Flickr. You can follow the prompted directions from the Photography applications. Please refer to the iPad/Application guide for step-by-step instructions.



**UPLOADING IMAGES  
(CONTINUED)**

- After uploading visitor photos to Flickr, give them a card with the MIA's Flickr address so they can locate their photo later:  
[www.flickr.com/minneapolisinstituteofarts](http://www.flickr.com/minneapolisinstituteofarts)

**ART CART PASSPORTS**

Travel the globe via the Art Carts! There are 11 MIA Art Carts (listed below), and visitors who pick up an Art Cart Passport and get it stamped at each of the 11 will receive a prize (1 MIA bracelet).

Each Art Cart is stocked with a supply of blank passports and a rubber stamp and ink for stamping. The stamp has a changeable date, so you will want to update the date on the stamp each time you're at a cart.

The 11 current Art Carts are only very rarely all available at the same time, so encourage visitors to begin their passport today and to bring it back each time they visit to collect more Art Cart stamps. The complete schedule of Art Carts is online at [www.artsmia.org](http://www.artsmia.org).

If a visitor to your Art Cart has a full (11 stamps) passport, give them one of the prizes also supplied on each Art Cart (brightly colored rubber bracelets). Visitor and Member Services (VMS) also has a small supply of Art Cart passports and prizes at the 1<sup>st</sup> floor Information Desk.

Africa  
Americas  
China  
Dutch Painting  
Greece/Rome  
Impressionist Painting  
Japan  
Pacific Islands  
Photography  
Renaissance Painting  
South/Southeast Asia

## GENERAL QUESTIONS & ACTIVITIES

**QUESTIONS AND  
ACTIVITIES FOR  
PHOTOGRAPHIC PRINTS  
BY LACEY PRPIĆ HEDKE  
& NATHAN LEWIS:**

- What kinds of photographs do your family keep as heirlooms?
- What photographic processes have you used?
- Did you learn darkroom photography in school?
- Do you prefer to use film or digital photography? If you use the camera on your mobile phone, do you consider yourself a photographer?
- What kind of photographic inventions do you hope you see in the future?
- Compare and contrast two or more of Lacey Prpić Hedke's photographs. Look closely at the appearance of the photograph (color, degree of detail, size of print, texture/weight of material it is printed on). How are the photographs similar? Different?
- Looking at all of the photographic processes represented by prints on the Art Cart, which is your favorite in appearance? Why? If you could have your portrait made using any one of the processes represented, which would you choose and why?

## HISTORY OF PHOTOGRAPHY

Terms in bold are defined in the glossary at the end of the manual.

### **WHEN WAS PHOTOGRAPHY INVENTED?**

The official date of the invention of photography is 1839. The first two processes, the calotype and the daguerreotype, were being developed in different countries simultaneously. The inventors of photography were William Henry Fox Talbot (who developed the calotype), Louis Daguerre and Nicephore Niepce (who were developing the **daguerreotype**), and Hippolyte Bayard (who was developing the direct positive method on paper).

The word photography derives from the Greek *phōtos* or “light”, and *graphé* or “representation by means of lines” or “drawing”, together meaning “drawing with light”. Prior to the invention of photography, the camera lucida and camera obscura were used for centuries. The camera lucida is an optical device that aids drawing (one can be found on the Impressionist Painting Art Cart.) The camera obscura is an optical device that projects an image of its surroundings onto a screen or wall. (A camera obscura is available on the Photography Art Cart.)

The first photographic processes, the daguerreotype, made on a silvered copper plate, and the calotype paper-based method, were at war in early photography. Sharp, clear, and permanent, the daguerreotype was perfect, while the paper images were rough and faded. Paper eventually won out, because it was cheap, easy to use, and it could generate multiple copies by printing a negative again and again. Since the daguerreotype produced a direct, camera-made positive, no negative existed, and no copies could be made.

Women were involved in this new technology from the beginning. In the 18th century, economic changes gave noble and bourgeois women more leisure time. Photography allowed women to express themselves artistically, and allowed them to participate in aspects of modern life outside the usually womanly pursuits of stitchery, drawing, and watercolor painting.

### **HOW DID PHOTOGRAPHY IMPACT OTHER ARTISTIC GENRES?**

While photographers found inspiration in paintings, painters found photography a useful tool for portraits and studying details. The professional portrait painter used photography not only for copying features but also for actually painting upon.

### **ARE PHOTOGRAPHERS STILL USING THESE OLD PROCESSES?**

By 1995 photographers with a wide variety of attitudes and motives, were deliberately re-engaging with the historic materials and processes. They used the history of photography for metaphors, technical insight, and inspiration. The movement to return to old photographic processes is called the “antiquarian avant-garde,” and the processes are sometimes called “alternative

**ARE PHOTOGRAPHERS  
STILL USING THESE OLD  
PROCESSES?  
(CONTINUED)**

processes”.

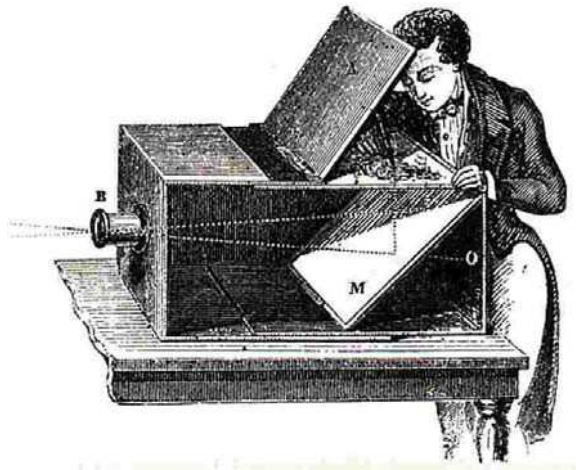
For a more complete historical overview, please read the Introduction to [The History of Photography: An Overview](#) by Alma Davenport (University of New Mexico Press, 1991). It is posted on [www.mgpvolunteers.org](http://www.mgpvolunteers.org) with all the Photography Art Cart materials.

**\*Note:** Because of the sensitivity of photographs, they do not stay on view for extended periods. The “Collection Connections” mentioned in these materials, when not on view, can be found in Photography Art Cart Art Collector Sets on ArtsConnectEd and saved under the Photos icon on the Photography Art Cart’s iPad.

## CAMERA OBSCURA

### WHAT IS A CAMERA OBSCURA?

The precursor to the camera was the *camera obscura*, literally meaning “dark box” or “dark room” in Latin. As its name implies, it was a dark box that let light in through a pinhole. This pinhole would later develop into the camera’s lens. The light would pass through the pinhole and reproduce the image on a screen. The image produced would be reduced in size and upside down, but the colors and details would be preserved.



### HISTORY OF THE CAMERA OBSCURA

The ancient Chinese, ancient Greeks, and early Islamic scientists used devices similar to the camera obscura described above. Although the term “camera obscura” wasn’t coined until the 17th century, Leonardo DaVinci made references to a camera obscura-like device in his sketchbooks. It is believed that Vermeer favored and used a tool similar to the camera obscura before painting his final pieces. Please refer to David Hockney’s [Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters](#). Viking Studio, 2001. New York. (See Bibliography)

### QUESTIONS AND ACTIVITIES

Three Camera Obscuras on the Art Cart  
Experience the earliest kind of camera and look towards a brightly lit area and see the image reflected inside the camera obscura. Encourage visitors to take home instructions to make their own (by emailing them to themselves from the iPad) and make a camera obscura at home. \*\* (See iPad/app guide for instructions.)

## PORTFOLIO OF PHOTOGRAPHIC PROCESSES AND PRINTS

Minneapolis photographer and educator, Lacey Prpić Hedtke, was commissioned to produce a portfolio of images that illustrate a variety of historically significant photographic processes. Her subject matter was in the MIA's sculpture collection. Each subject she selected dates to the period when the process used to photograph it was in use.

### CALOTYPE

MIA Subject: Albert-Ernest Carrier-Belleuse, *Torchère*, 1862 (#74.27.1a-e)

- WHAT IS A CALOTYPE?** The calotype, invented by Sir William Henry Fox Talbot, was one of the first photographic processes. A calotype is a paper negative made in-camera, and can be used to print a positive image. All earlier processes only produced positive images, but not negative images. The daguerreotype, invented around the same time, was a positive image on silver plate. Prints made from early calotype negatives looked more like drawings, watercolors, or prints, rather than photographs. Paper negatives were often, and still are, exhibited on their own as valid works of art.
- HOW IS A CALOTYPE MADE?** A silver nitrate solution is brushed onto paper. When the paper is almost dry, it is immersed in a solution of potassium iodide. The paper changes from white to yellow, and is washed for a couple of hours and dried. The result of this process is iodized paper. Brushing a mixture of silver nitrate, acetic acid, and gallic acid on the iodized paper sensitizes it. The paper is loaded into a camera as if it was film, and exposed while still damp. Then it is developed, fixed, washed, and waxed for strength and transparency.
- WHAT IS THE HISTORY OF THE CALOTYPE PROCESS?** In 1835, Talbot made an image of a window at Lacock Abbey (his home in Wiltshire, England) using a small camera and sensitized writing paper. This is the world's oldest negative image on paper that was made in a camera. At this point the process was still too slow to take portraits.
- In its heyday (1839 – 1850s), some people found the process difficult. Although not completely understood why at the time, some of the problems may have been because of the type of paper being used, the manner in which it was sized, and the impurities in the chemicals being used. Talbot named the paper negative process a Talbotype, but others called it a calotype, from the Greek kalos, meaning beautiful. Talbot's friend Sir John Herschel coined the binary terms "negative" and "positive" representing the two parts of the photographic process. The use of paper for negatives lasted until the advent of negatives on glass plates coated with an emulsion of collodion, invented about two decades later.

**WHAT EFFECT DID THE  
CALOTYPE PROCESS  
HAVE ON PHOTOGRAPHY?**

The calotype had an enormous impact on the history of photography. Since the calotype originated as a negative, photographers had the ability to make multiples of positive prints. This positive/negative technique defined most of photography's processes until the digital era.

## SALTED PAPER

MIA Subject: Charles-Henri-Joseph Cordier, *The Algerian*, 1850-57 (#76.3)

- WHAT IS A SALTED PAPER PRINT?** The first paper photos were contact prints (prints in which the image was the same size as the negative and was not enlarged) of objects, because the exposure time was long, so the subject needed to be something that could hold still.
- William Henry Fox Talbot and others had figured out how to expose the paper lightly and then develop a strong image afterwards through chemical treatment. This way pictures could be made with exposures of a minute or less, making paper photography practical.
- HOW IS A SALTED PAPER PRINT MADE?** Watercolor or drawing paper is sized with gelatin. When the paper is “sized” (or prepared), the same technique is used to prepare the paper as with silver gelatin prints: in subdued light, the paper is coated with a silver nitrate solution. A negative is contact printed and then washed, toned, fixed in sodium thiosulfate, and washed again. The negative is exposed when it’s dry, has a low sensitivity, and produces a tonally limited range. Salted paper produces images that sit directly on the paper fibers, which makes them somewhat rough. They are also completely matte, which means that they can never have strong black values; matte surfaces diffuse the light reflecting off them, preventing the light from absorbing and making the blacks totally black. All salted-paper prints are toned with gold prior to fixing, which gives them a reddish-purple color.
- WHAT IS THE HISTORY OF THE SALTED PAPER PROCESS?** The salted paper process was one of the first photographic processes. William Henry Fox Talbot began his experiments with the process while on his honeymoon in 1833. Working with his small “mousetrap” cameras – so-called because of their small size – he unveiled his “photogenic drawings” as he called them to the Royal Society in London by 1839.
- WHAT EFFECT DID THE SALTED PAPER PROCESS HAVE ON PHOTOGRAPHY?** It introduced the concept of using a negative to produce a positive – so in effect, it defined the route that photography would take for 150 years. The salted paper process developed at the same time as the Daguerreotype process, but the salted paper process won out, due to its ability to make unlimited amounts of copies of the image, unlike the Daguerreotype, which was a one-of-a-kind photograph. In 1841, Talbot placed a restrictive patent on the process, which slowed the growth of its use for a while.



**HOW WAS THIS SALTED  
PAPER PRINT MADE?**

The Art Cart salt print was printed on Arches Aquarelle hot press watercolor paper.

**COLLECTION  
CONNECTION:**

- Gustave Le Gray, *Brig on the Water*, 1856 (#93.21)
- See image and object location at:  
<http://www.artsconnected.org/resource/147858/6/photography-art-cart-salted-paper>

## CYANOTYPE

MIA Subject: Artist unknown (United States), *Odd Fellows Ceremonial Axe, Bow, Key, Ram Horn Scepter*, 1856 (#96.130.3.11, #96.130.3.8, #96.130.3.1, #96.130.3.5)

- WHAT IS A CYANOTYPE?** Cyanotype is an ultraviolet (UV)-sensitive contact printing process that requires a negative the same size as the final print. The blue color of the cyanotype print is the result of the reaction of ferric ammonium citrate with potassium ferricyanide. It will fade if exposed to strong direct sunlight over a period of time. The image can be restored to its original blue intensity by storing it in a dark environment for a short time. The cyanotype print can be toned to provide alternatives to the blue color.
- HOW IS A CYANOTYPE MADE?** Solutions of Ferric Ammonium Citrate and Potassium Ferricyanide are coated with a glass rod or **hake brush** onto watercolor paper. This is placed into a contact frame with a negative, exposed under an artificial UV light source or the sun, then developed and washed in water with a splash of hydrogen peroxide, and then dried.
- WHAT IS THE HISTORY OF THE CYANOTYPE PROCESS?** Sir John Herschel discovered the cyanotype process in 1842. He also coined the term “photography.” The cyanotype was simpler, less expensive, and more permanent than William Henry Fox Talbot’s calotype method developed just three years prior. It was also free from patent restrictions.
- WHAT EFFECT DID THE CYANOTYPE PROCESS HAVE ON PHOTOGRAPHY?** By 1890, most photographers used cyanotype only for making contact sheets and quick proof photographs. The cyanotype was appealing as a procedure for botanical documentation. Cyanotype was the process used for the first photo book, created by Anna Atkins.
- WHO IS ANNA ATKINS?** Anna Atkins made photograms (laying an item on the photo paper directly and exposing it to light, without a negative) to record all the species of algae in the British Isles. Atkins was the first person to use photography to produce a long-term scientific study of the natural world. She bound her photographs, thereby, creating the first photographic book.
- HOW WAS CYANOTYPE USED IN ARCHITECTURE?** The first commercial use of cyanotypes was in 1876 at the Philadelphia Centennial Exposition, which led to the use of the process for blueprint drawings. Years after the cyanotype process went out of style for photographic application, it was adapted for blueprint use.
- HOW WAS THIS CYANOTYPE MADE?** The Art Cart cyanotype was printed on Arches Aquarelle hot press watercolor paper. The emulsion was brushed on with a hake brush.

MINNEAPOLIS INSTITUTE OF ARTS  
Division of Learning & Innovation  
Photography Art Cart  
4/2012

**COLLECTION**  
**CONNECTIONS:**

- Anna Atkins, *New Zealand*, 1853-4 (#2006.10)
- Henry Bosse, *Pine Bend*, 1891 (#95.2)
- Henry Bosse, *Winddams Opposite Robinsons Rocks*, 1891 (#95.65.2)
- Robert W. Fichter, *David at the Sea*, 1977 (#77.39.4) (Not on view)
- View all images and object locations at:  
<http://www.artsconnected.org/resource/147852/1/photography-art-cart-cyanotype>

## STEREOGRAPH

MIA Subject: Mona Htoun, *Cube (9x9x9)*, 2008 (#2010.8)

### **WHAT IS A STEREOGRAPH?**

Stereographs are a panel of two of the same images mounted onto a card that is for use in a stereoscope viewer. Photographers figured out that if they made a pair of images from slightly different positions, and set them up so that the right eye saw the right image and the left eye the left, the brain would interpret the pictures in 3D. Early examples, which had used Daguerreotypes to create this effect, were not very successful because reflections from the metal surfaces interfered with the illusion.

The discovery of stereoscopy is accredited to the English Physicist, Dr. Charles Wheatstone in 1839. By 1900, stereographs were produced in large editions by steam-driven machinery and mounted on cards using assembly-line methods. They were sold through mail order and door-to-door sales. Stereograph publishers offered images of landscapes, views of monuments, and scenes of events, along with educational images of occupations and work environments, works of art, and illustrations of popular songs and stories. Except for photographers who published their own stereo cards, most stereo cards did not carry a credit line. A typical stereo card had the publisher's name, address, name of the series, sometimes the photographer's name, and possibly a caption printed on the front. Stereo views were mainly printed on albumenized paper, and firms began to specialize in the mass production and world distribution of stereographs.

A stereograph could be boring if it did not contain dramatic differences of depth in its subject. This led photographers to make wildly different images from any kind that had been made before. A large number of the more innovative single images in early photography were originally one half of a stereograph. Stereograph halves are nearly square, and this rare format led to the production of more surprisingly structured pictures.

### **HOW IS A STEREOGRAPH MADE?**

To make a stereoscopic negative, a stereoscopic camera must be used. A stereoscopic camera has two lenses placed side by side, which take pictures of the same image. One image is slightly moved to the side, so when viewed in a stereoscopic viewer it will create an illusion of depth and appear to be three-dimensional. The stereoscopic viewer presents the slightly different images, which then your brain combines and perceives as a singular 3D image.

**WHAT IS THE HISTORY OF THE STEREOGRAPH?**

In the latter part of the 19th century, stereography filled the same role as TV does today, providing entertainment, education, propaganda, spiritual uplift, and aesthetic sustenance. Oliver Wendell Holmes promoted it in the US as a significant educational tool in two long articles in the *Atlantic Monthly* in 1859 and 1862. He designed an inexpensive basic viewer to enable ordinary people to enjoy stereographic views.

**WHAT EFFECT DID THE STEREOGRAPHIC PROCESS HAVE ON PHOTOGRAPHY?**

Stereographs were on public display for the first time in 1851 at the Crystal Palace Exhibition in London. Afterwards, the purchase, exchange, and viewing of stereographs became a mania. Many of the top photographers did not respect the stereo card. It was small, and its illusion of depth was considered too close to reality to be aesthetically gratifying. Stereographs of the late 1850s first showed us, in what were called “instantaneous views,” phases of action in the stride of animals and humans never before seen.

**HOW DOES A STEREOSCOPE WORK?**

Stereo cards were extremely popular. To fit human eyes, they had to be a standard size, and could be seen using a handheld viewer (a stereoscope) that forced each eye to see only the image associated with it. When a stereo card is put into a stereoscope, your eyes view the two side-by-side images through the lenses, which enhances the depth of field, causing the images to combine in your brain into a single three-dimensional image.

**WHY CAN'T I SEE THE IMAGE IN 3D?**

Try sliding the card closer or farther away from your eyes. Unfortunately, not everyone's eyes can focus correctly to make the 3D image appear. It is possible to look at a stereo card without the viewer by crossing our eyes until the images fuse, then shifting focus until the combined image is sharp.

**HOW WAS THIS STEREOSCOPE IMAGE MADE?**

The Art Cart stereo image was photographed with a stereo Holga camera on 120 film, printed with the albumen process, and mounted onto bristol board.

**COLLECTION CONNECTION:**

- The Impressionist Painting Art cart includes an antique stereoscope and views of Paris.
- Jeremiah Gurney, *Untitled (Stereoscopic case containing two portraits)*, 1852-1858 (#89.114.31) (Image saved on iPad).

## ALBUMEN

MIA Subject: Hiram Powers, *Bust of the Greek Slave*, 1845-46 (#72.67)

### WHAT IS AN ALBUMEN PRINT?

The albumen process uses egg whites as a binder that allows prints to be made carrying the image, not on the paper fibers but above them, resulting in the smooth egg-white coating. Albumen produces a beautiful semigloss surface, which can be very dark if enough silver is present. The use of albumen gives the prints a new surface, deeper tonality, and far more detail. In many ways albumen is just an improved version of the older salted paper<sup>1</sup>.

### HOW IS AN ALBUMEN PRINT MADE?

A piece of fine quality drawing paper, stationary, or vellum is coated with a thin layer of albumen in a solution of sea salt, in combination with acetic acid and water. The prepared paper is “hardened” and then floated on a solution of silver nitrate and distilled water, which makes it light sensitive. After drying, the sensitized paper is sandwiched with a negative in a contact-printing frame and exposed to sunlight or another ultraviolet light source. During exposure the image prints-out, which means you can see the image as it is being exposed. It is then washed in water, and can be toned to be a warm/reddish color or blue/gray. Then it is fixed with sodium thiosulfate and washed again before being dried.

The silver deposit of an albumen print is extremely fine grained, and when fixed, it changes to a yellow color. To prevent this color change, albumen prints were toned with a gold solution, which gave them a purplish colorcast. Silver is a pretty stable metal, but it does change over time when exposed to the air.

Albumen prints are made from glass negatives. Glass negatives record a long range of tones and semigloss. The negatives had to be the same size as the desired print, so photographers used large glass plates that often recorded a wealth of detail. The prints were more vibrant and rich than in the past. The albumen print did not require developing--it is made by direct exposure.

### WHAT IS THE HISTORY OF THE ALBUMEN PROCESS?

Albumen prints dominated 19th-century photography. Beginning in the mid 1880s and lasting for over 30 years, the albumen process was “the process,” and its consistency and popularity rivaled the use of the silver gelatin papers used before the industry was taken over by digital processes. Prepared albumen paper was commercially produced, and the demand for the paper was unprecedented. The albumen process produced far more prints than all of the other chemical printing methods of

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<sup>1</sup> Refer to the Salted Paper process on page 16

photography's early years combined.

**WHAT EFFECT DID THE ALBUMEN PROCESS HAVE ON PHOTOGRAPHY?**

The development of the albumen process occurred at the same time when many photographers were adopting the practice of shooting very large glass plate negatives. The albumen technique, when combined with a glass plate negative, was considered the first repeatable paper-based system on par with daguerreotype images. The combination of the glass negative and the albumen print transformed positive/negative photography; once this pair of techniques spread, the daguerreotype was dead.

**WHAT IS THE ORIGIN OF THE WORD ALBUMEN?**

The name comes from the fact that the image-bearing material was held onto the paper support by a relatively thick layer of albumen, the soluble protein found in egg white.

**WHAT IS A CARTE DE VISITE?**

*Cartes de visite*, like that found on the Art Cart, were small cards holding photograph of their bearers, which were produced in multiple copies to be passed among friends and family. The name refers to the common visiting card, a paper print pasted on a vertical card measuring 4x2 1/2". Carte portraits became enormously popular after 1859, and rivaled the stereoscope's<sup>2</sup> popularity. Portrait studios turned out millions of full-and bust-length images of working people, the bourgeoisie and aristocracy. Adults displayed the tools of their trade, the marks of their profession, and the emblems of their rank; children were shown with toys; and attention was paid to women's attire and hair arrangements.

In some cases these small pictures were made by using a multiple-lens camera to copy a large print. Six or more lenses would produce that number of separate images on a single large plate. Each print from this negative could then be cut down into many copies to be pasted on cards. The public still believed that hand-painted portraits were more prestigious than photos, and likenesses were often painted over the carte in watercolors, oils, or pastels.

**HOW WAS THIS ALBUMEN PHOTOGRAPH MADE?**

This albumen print was printed on Arches Aquarelle hot press watercolor paper and toned.

**COLLECTION CONNECTIONS:**

- Giorgio Sommer, *Amalfi Cattedrale*, 19<sup>th</sup> c. (#82.57.92)
- Giorgio Sommer, *Tempio di Nattuaio Pesto*, 19<sup>th</sup>-20<sup>th</sup> c. (#81.18.21)
- Pascal Sebah, *Le Sphinx Deterre*, 19<sup>th</sup> c. (#82.57.49)
- William Henry Jackson, *Mammoth Hot Spring on Gardin River*, 1873 (#87.35.38.4)

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<sup>2</sup> Refer to the Stereoscope on page 21

**COLLECTION  
CONNECTIONS  
(CONTINUED):**

- A.L. Eidemiller, *Study for Alexander Grinager's Boys*, 1894 (#2006.60.1)
- View all images at:  
<http://www.artsconnected.org/resource/147851/1/photography-art-cart-albumen>



## TINTYPE

MIA Subject: Raffaello Monti, *Veiled Lady*, 1860 (#70.60)

### WHAT IS A TINTYPE?

The tintype is a photograph made on a thin piece of sheet iron that is enameled black or brown-black, coated with collodion, and sensitized just before an exposure is made. There are two tintype processes: the first process invented in 1853, was the wet-plate collodion tintype. Later came the dryplate tintype, in 1891, which was easier and more mobile than the wet-plate process. Tintypes were made in a variety of sizes, the most common being 2 ¼ x 3 ½ inches (the same size as the carte-de-visite). They were often hand-colored.

Tintypes were usually cheaper than other processes and usually weren't packaged in fancy protective cases like some other types of early photographs – they were instead sold in paper holders with lithographed borders. Because the surfaces of tintypes were not fragile, they could be sent through the mail, carried in the pocket, and mounted in albums.

One of the limitations with the tintype is that they are unique – each exposure produces just one picture. However, it's for this reason that they're so special – they sat in the same room as person in the image, with the stain of the light from the day it was made.

### HOW IS A TINTYPE MADE?

A blackened sheet of metal is coated with emulsion. The emulsion is dried and loaded, as if film, into a large-format camera. The plate is exposed in the camera, and developed in reversal developer and fixed as if it were paper. Then it is washed and dried. The tintype can be varnished to protect the emulsion. Slightly underexposed, the image shows up after developing as a positive against its own black background. If there is any writing in the image, it will be backwards.

Since it only took about 20 minutes to develop, the tintype could be taken, developed, cased, and sold as the sitter waited. The materials were cheap, and by using a multi-lens camera several images could be made at once.

After processing, the plate was cut into single pictures with shears, so they don't have neat edges, and sometimes the corners are snipped to avoid sharp edges.

### WHAT IS THE HISTORY OF THE TINTYPE PROCESS?

Tintypes were popular with soldiers and their families during the American Civil War because they were inexpensive, lightweight and durable. Tintypists often traveled from town to town, working on the street, out of a wagon, a studio or in a rented room, using a camera that had a tiny darkroom built in that allowed the processing to take place inside the camera.

**WHAT IS THE HISTORY OF  
THE TINTYPE PROCESS?  
(CONTINUED)**

Although the image quality left something to be desired, the tintype was extremely popular, especially during the period between 1860-1880. The tintype was significantly faster and cheaper than any process that had preceded it, which allowed subjects to be more personal and candid with their poses. Itinerant and street photographers used the tintype process until the Polaroid process replaced it in the 1950s.

**WHAT EFFECT DID THE  
TINTYPE HAVE ON  
PHOTOGRAPHY?**

Tintyping was cheap to produce, and were the equivalent to the contemporary photo booth. People could be photographed for as little as 25 cents, which meant that more people could afford to have their picture taken, sometimes even more than once in their lives.

The tintype's lower price and its immediacy made having a picture taken less formal. Pictures became less serious and more spontaneous. People played and acted silly for the camera, which was a way of photographing that had never happened before.

**HOW WAS THIS TINTYPE  
PHOTOGRAPH MADE?**

The Art Cart tintype was made using the dry-plate process. It was shot in-camera, so there is no negative, and is unique and can never be reproduced.

**COLLECTION  
CONNECTIONS:**

- Unknown artist, *Untitled (Two Men Pointing to a Drawing of a Horse)*, 19<sup>th</sup> c. (#91.124.4) (See image saved on iPad)
- Unknown artist, *Portrait of a Woman and Portrait of a Man*, 1860 (#2004.144) (See image saved on iPad)

## DIRECT POSITIVE

MIA Subject: William Hunt Diederich, *Cock or Chanticleer*, 1918 (#2006.37)

### WHAT IS A DIRECT POSITIVE PRINT?

A direct positive print is one that needs no negative to produce an image. Direct positive paper is commercially manufactured, and can be loaded into a camera as if it were film. This produces a unique, one-of-a-kind image that cannot be reproduced.

### HOW IS A DIRECT POSITIVE PRINT MADE?

The direct positive paper is loaded into the camera as if it was film, and exposed according to its speed. It is then processed in the darkroom like regular photographic paper. Beginning in the mid-19th century, and into the present day, street photographers used cameras with miniature darkrooms built in so that they could produce an image and process it while a customer waited. Often the direct positive papers doubled as postcards, and images were sold on the site of momentous occasions, such as world fairs and circuses.

### WHAT IS THE HISTORY OF THE DIRECT POSITIVE PROCESS?

Hippolyte Bayard, one of the pioneers of photography, invented the direct positive process. The process was one of the very first processes of photography. Direct-positive processes were present in photography from the beginning – the Daguerreotype and tintype are both direct positive processes. When silver gelatin paper became more widely available, so did direct positive papers because the two processes used the same chemicals and techniques.

### WHAT EFFECT DID THE DIRECT POSITIVE PROCESS HAVE ON PHOTOGRAPHY?

Street photography and postcards were made with direct-positive papers. They don't need a negative, and are developed and fixed in regular darkroom chemistry. This process was used to document events, and people could buy a memento of the event that was produced on the spot. In the late 1860s gelatin-based printing-out process was commercially introduced to the public. This printing-out process was easier to use and replaced commercially produced albumen papers in the marketplace. Direct positive prints continue to be made, and in some parts of the world street photographers still make their living through this process.

### HOW WAS THIS DIRECT POSITIVE PRINT MADE?

This direct positive image was printed on Ilford Harnen Direct Positive fiber base paper, and exposed in-camera.

### CONNECTION COLLECTIONS:

- Jeff Millikan, *The Birds were too Beautiful to Remove*, 1997 (#97.144.1)

## VAN DYKE

MIA Subject: John Scott Bradstreet, *Duluth Room/Prindle House*, 1904 (#82.43.17.3a-f)

- WHAT IS A VAN DYKE?** The Van Dyke is an ultraviolet (UV)-sensitive contact printing process that requires a negative the same size as the final print. They are a rich brown color, and are similar in chemical makeup to the cyanotype.
- HOW IS A VAN DYKE MADE?** The Van Dyke produces an image due to the reaction of ferric (iron) salt conversion to a ferrous state during exposure to ultraviolet (UV) light. The process employs a light sensitive combination of chemicals: ferric ammonium citrate, tartaric acid, distilled water, and silver nitrate. Using a glass rod or hake brush, this sensitizer is coated on to watercolor paper. It is contact printed under ultraviolet light, until an overexposed image appears. It is developed in water, then fixed, a process that stops the development of the photograph, in a sodium thiosulfate dilution, and washed for permanence.
- WHAT IS THE HISTORY OF THE VAN DYKE PROCESS?** Sir John Herschel discovered the process in the early 1840s, but it wasn't patented or named until 1889. The Van Dyke process was never wildly popular, in part because it was invented around the time that commercially coated photographic paper was released. This eliminated the need for hand-coating paper with chemicals, causing Van Dykes to struggle to gain mass popularity.
- WHAT EFFECT DID THE VAN DYKE PROCESS HAVE ON PHOTOGRAPHY?** While not popular in their time, contemporary photographers of the 21<sup>st</sup> century have used the Van Dyke process to learn about antiquated photographic processes, especially since it is relatively easy to produce an image. The sepia-toned color lends an air of history and nostalgia.
- WHAT ARE THE ORIGINS OF THE NAMES VAN DYKE AND KALLITYPES?** "Van Dyke" refers to Anthony Van Dyck, the 17th-century Flemish painter. The paint color named after the artist, is sometimes called Van Dyke brown. Kallitypes are named after the Greek word for pencil.
- HOW WAS THIS VAN DYKE MADE?** The Art Cart Van Dyke was printed on Arches Aquarelle hot press watercolor paper. The emulsion was brushed on with a hake brush.

## SILVER GELATIN

MIA Subject: Hans Ledwinka: Ringhoffer-Tatra Werke AG, *Tatra T87 Four-Door Sedan*, 1848 (designed 1936) (#2005.138)

### **WHAT IS THE SILVER GELATIN PROCESS?**

A silver gelatin print is (usually) a commercially produced black and white photographic paper or film. While it's possible to produce silver gelatin emulsion, almost all photographers who still work in the darkroom purchase silver gelatin film and paper. Until the dawning of the digital age, photographs were printed in a darkroom on silver gelatin paper. When we see movies or photographs of people in a darkroom, they're usually working with the silver gelatin process.

### **HOW IS A SILVER GELATIN PRINT MADE?**

Silver salts are suspended in gelatin and coated onto plastic (in the case of film) or paper (for photo paper). The film or paper must be kept in total darkness, since they are sensitive to light. Once the film or paper is exposed to light, it can be developed. While some processes are printing-out-processes (POP), the silver gelatin process's paper printing is a developing-out-process (DOP). This means that when a negative is enlarged onto a piece of silver gelatin photographic paper, no image appears until the paper is immersed in paper developer, and then in stop bath and fixer. The print is then washed and dried. At its height, silver gelatin paper came in all textures, tones, sizes, and finishes.

### **WHAT IS THE HISTORY OF THE SILVER GELATIN PROCESS?**

The silver gelatin process came about in 1860, and was popular until the 1990s, when digital photography became common. Among fine art photographers, the process remained the standard process until the early 21st century, when digital photography began to dominate photography. Cartier-Bresson has made brilliant use of the 35mm camera's ability of allowing exposures to be made in rapid succession, and works with great intensity up to a climax.

### **WHAT EFFECT DID THE SILVER GELATIN PROCESS HAVE ON PHOTOGRAPHY?**

Photojournalists were the first to make wide use of the 35mm camera (which was considered a miniature camera). Due to the 35mm small size, it opened up new aesthetic possibilities and allowed the photographer show unusual viewpoints.

The development of powerful and portable light sources gave the photographer the opportunity to create his own lighting effects anywhere and to record the most rapid action. In 1929 the flashbulb was perfected. With the flashbulb, pictures could be taken anywhere.

### **HOW WAS THIS SILVER GELATIN PHOTOGRAPHY MADE?**

The Art Cart silver gelatin print was shot with Kodak Tri-X black and white film, and printed on Ilford Multigrade Warmtone fiber base paper.

**COLLECTION  
CONNECTIONS**

- August Sander, *Farm Girls Westerwald*, 1928 (#77.68.5)
- August Sander, *Circus Artists, Cologne*, 1926 (#77.68.3)
- August Sander, *The Wife of Painter Peter Abelen*, 1926 (#77.68.2)
- Richard Avedon, *Charles Chaplin, Actor*, 1952 (#81.94.1)
- Richard Avedon, *Marilyn Monroe, Actress*, 1957 (#81.94.10)
- Henri Cartier-Bresson, *Arena at Valencia, Spain*, 1933 (#95.6.5)
- Henri Cartier-Bresson, *Brie, France, June*, 1968 (#95.6.39)
- See images at:  
<http://www.artsconnected.org/resource/147859/8/photography-art-cart-silver-gelatin>

## SLIDE

MIA Subject: Yoshitomo Nara, *Your Dog*, 2002 (#2007.100)

### WHAT IS A SLIDE?

A slide is a positive transparent color film mounted into a plastic frame intended for projection. A slide can only be seen with the help of bright light (usually from a slide projector), and comes in a range of sizes, from 35mm roll film to 8x10" sheet film. This process has the same limitation as the Daguerreotype, the tintype, and the direct positive processes: each color photograph is unique.

### HOW IS A SLIDE MADE?

All slide film is commercially produced. The process that factories use to manufacture the film is very similar to black and white silver gelatin film. Dye couplers are mixed into the emulsion, which is placed onto the transparent base.

### WHAT IS THE HISTORY OF THE SLIDE PROCESS?

Glass color slides were first used in 1907, but the slide process wasn't widely used until Kodachrome was invented, which was the most successful, popular and legendary slide film. Kodachrome was available in 1935 for 16mm motion picture cameras and in 1937 for 35mm still cameras. Kodachrome has a song and a state park named after it, it was loved so much. The last roll was processed in 2010, amid much sadness in the photographic community.

### WHAT EFFECT DID THE SLIDE/TRANSPARENCY PROCESS HAVE ON PHOTOGRAPHY?

By the 1950s, small-format cameras had become easy to use, relatively inexpensive, and perfectly suited for the amateur. Their film was sold in rolls that could hold 36 exposures, and the practice of sending 35mm film away to labs for processing was long established.

### HOW WAS THIS SLIDE MADE?

The Art Cart slide was taken with Fujifilm Velvia Professional Color Slide Film, in a 35mm camera.

There is a portable/personal slide viewer on the cart to assist visitors in seeing the image.

## DIGITAL

MIA Subject: Nick Cave, *Soundsuit*, 2010 (#2011.12)

### WHAT IS A DIGITAL PHOTOGRAPH?

A digital photograph is one that is captured using a digital camera of any sort, and can be viewed on the camera itself, transferred to a computer, or printed out. A digital image can have a small amount of pixels, or it can capture an immense amount of visual information, depending on the camera used.

### HOW IS A DIGITAL PHOTOGRAPH MADE?

Digital photography uses light sensitive sensors to capture an image. The image is then stored as a digital file ready for digital manipulation, viewing, emailing, uploading, or printing. No chemicals are needed, and the results are instantaneous. While thousands of dollars can be spent on sophisticated cameras and printers, the only technology needed to create a photograph is a digital camera, which range from disposable digital cameras, to mobile phone cameras, to point-and-shoot cameras.

### WHAT IS THE HISTORY OF THE DIGITAL PROCESS?

In 1975, Kodak attempted to build a digital camera that used cassette tapes to record the images. In 1990 the first digital camera was commercially available, and the industry has been growing ever since. The history of the digital process is short, and the process is in its infancy. The more exciting question is – what is the future of the digital process?

### WHAT EFFECT DID THE DIGITAL PROCESS HAVE ON PHOTOGRAPHY?

The popularity of digital photography has revolutionized how photographs are made, distributed, seen, and has changed who is considered a photographer. In the past, a separate device was needed to make a photograph, and there was more deliberate intention in the planning of and making photographs. Now, with cameras built into phones, anyone anywhere may take a photograph without any knowledge of the workings of a camera. The results are instant. Digital photography has radically changed how we get our news, and has made citizen journalists out of bystanders. We are only in the beginning stages of digital photography technology. Any other photographic process is now considered antiquated or an “alternative process.”

### WHAT WAS THIS DIGITAL PHOTO MADE ON?

The Art Cart image was taken with an iPhone camera.

### COLLECTION CONNECTION:

- Cory Prahl, *Whitehirst Manor Drive*, 2011 (#2011.43)
- Barbara Karant, *Untitled Birthday Party*, 1979 (#81.70.2) See image and object location at:  
<http://www.artconnected.org/resource/147853/1/photography-art-cart-digital>



## **POLAROID PRINT**

MIA Subject: Dale Chihuly, *Sunburst*, 1999 (#99.132)

### **WHAT IS A POLAROID?**

Polaroid film is a type of instant film for use in a Polaroid instant camera. The film comes in a sealed pack, and is loaded into the camera. Each piece of film contains the chemicals needed to develop and process the photograph instantly. The early peel-apart Polaroid films were pushed out of the camera through rollers, which broke a pod of chemicals that were smeared over the photograph upon exiting the camera. These chemicals were caustic, so some care needed to be taken with the photograph. In 1972, Polaroid introduced integrated film, meaning that the chemicals were incorporated into the film, and the photograph didn't need any attention from the photographer. Most Polaroids were 3 ¼ x 4 ¼", had a white border, and took about three minutes to develop. There are five Polaroid cameras in the world that can photograph up to 20x24". Today, most people are primarily familiar with the Polaroid 600 Series: the popular and relatively inexpensive models of the 1980s and 1990s that used film packs with integral batteries. Most Polaroid cameras had plastic lenses with a fixed focus of around 4 feet, making them ideal for portraiture. A "close-up" lens was often included, but this took the form of a simple plastic meniscus that slid into place. Furthermore, many Polaroid cameras had a fully automatic exposure system that was equipped with an electric eye to determine the correct exposure.

### **HOW IS A POLAROID MADE?**

The Polaroid process is one that relies heavily on specialized equipment. One must first have a Polaroid camera and corresponding film. The film is loaded into the camera, and is an instant process – that is, there is no darkroom processing involved. When the Polaroid company was still producing film, a type of 4x5" film was available that produced both a positive print and a film negative that could be printed again at a later time. Commercial photographers loved this film, as they could check their exposure and lighting before shooting with more expensive slide sheet film.

### **WHAT IS THE HISTORY OF THE POLAROID PROCESS?**

Edwin H. Land founded the Polaroid Corporation in 1937, and in 1948 they released their most famous product, the instant film camera. Originally, the company's focus was in polarized sunglasses, a product of Land's self-guided research in polarization, but the instant film camera quickly became Polaroid's flagship product, and later forced Kodak out of the instant camera business. Many of the company's early cameras were named Land Cameras, after the inventor, Dr. Land.

The Polaroid camera could be considered a precursor to contemporary digital camera because it was the first camera to provide instant

**WHAT IS THE HISTORY OF THE POLAROID PROCESS? (CONTINUED)**

photography. With the advent of digital technology, Polaroid instant film became obsolete. The Polaroid Company did not adapt to digital photography and in 2001 Polaroid filed for bankruptcy and the brand name was sold. In 2008, the company decided to stop producing instant film cameras, and focus only on digital photography products. A group called The Impossible Project has taken over old Polaroid factories and is using their equipment to manufacture instant film. Currently, no film is being manufactured under the Polaroid name, but there has been a revival in the demand for instant Polaroid cameras as people begin to collect the vintage cameras and use them for artistic means. The materials are quite expensive and the process depended on specialized, hard to find cameras.

**WHAT EFFECT DID THE POLAROID HAVE ON PHOTOGRAPHY? WHO USED THE POLAROID CAMERA IN PROFESSIONAL AND RECREATIONAL PHOTOGRAPHY?**

Since, the production of the instant Polaroid camera in 1948, the camera was used professionally, artistically, and recreationally. It gave people the instant gratification of immediately seeing their photographs and not having to engage in a darkroom, something that we expect today but was unheard of before the 1990's. Since the Polaroid camera was generally affordable and quite inexpensive, it allowed any family to capture moments and create their own personal portraits, as well as view the results almost instantaneously. In the commercial and professional photography world, Polaroid's became the great test material to save time and money (before the instant playback of digital cameras). The photographer could shoot a complex studio setup with a Polaroid to check the lighting, before exposing the conventional transparency, which would have to be sent out for processing. Polaroid cameras were also commonly used to take ID and Passport photos. The Polaroid camera allowed people to make photographs without having to process the images or pay someone else to process it for them. The results were immediate, which might account for the air of casualness of images that artists and amateurs produced.

**WHAT CAMERA WAS THE POLAROID TAKEN ON?**

The Art Cart Polaroid image was taken with a Polaroid One Step camera, with Fujifilm instant film.



**COLLECTION  
CONNECTIONS:**

- Bruce Charlesworth, *Elevator*, 1978 (#78.43)
- Melisande Charles, *Untitled*, 1982 (#84.39)
- Paolo Gioli, *L'Uomo di Eakins*, 1982 (#87.13.1)
- Olivia Parker, *Lumber Exchange, Minneapolis*, 1983 (#96.37.48)
- See above images at:  
<http://www.artsconnected.org/resource/147855/1/photography-art-cart-polaroids>
- Nancy Rexroth, *Untitled*, 1979 (#2000.110.12) (Image saved on iPad)

## POLAROID BIG SHOT CAMERA, FILM, & FLASH CUBES

### WHAT IS THE BIG SHOT?

The Big Shot was one of the most unique cameras Polaroid ever introduced because it dwarfs all other cameras in the 600 series. Released in 1971 and produced until 1973, it is designed for portrait use, and has a fixed **focal length** of a few feet. Although the lens is plastic, the image quality is quite clear, making the Big Shot a good camera for passport and ID pictures. The camera is very user-friendly and the **aperture** is easy to adjust for there are only two options: open (for a lighter image) and slightly closed (for a darker image).

The view-finder acts like a periscope in order to create the camera's fixed-focus. This forces the photographer to move back and forth until the subject appears in focus (the image is in focus when the two double images match up to create one image). This technique has been named the "Big Shot Shuffle."

The Big Shot does not require batteries and has a single-speed mechanical **shutter**. It has a giant flash diffuser that softens shadows cast from the light of attachable flash cubes. The Big Shot requires ASA 75-100 packfilms (100 series) which are not manufactured under the Polaroid name anymore. There is also a 60-second timer on the back of the camera to time the development of the photo. In 1971, the Big Shot was very common and affordable (the original retail price was \$19.95). Today, they are quite rare and much more in demand.



### WHAT ARE MAGIC FLASH CUBES?

The Magicube is an attachable flash bulb used with the Polaroid Big Shot, as well as many other cameras from the 1960's and 1970's. It does not require electrical power – each bulb was set off by a plastic pin in the cube mount that released a cocked spring wire within the cube. This wire, in turn, strikes a primer tube, at the base of the bulb, which contains a fulminate. The fulminate ignites shredded zirconium foil in the flash producing an artificial light. Each box contains three magicubes with four flashes in each bulb. (They are quite expensive today! Please show them to visitors and let them handle the bulbs, but do not actually "flash" the bulbs on the camera.)

## ANDY WARHOL AND THE BIG SHOT

**ANDY WARHOL:** Andy Warhol was born Andrew Warhola on August 6, 1928, in Pittsburgh, Pennsylvania. When Warhol was about nine years old, he received his first camera. He enjoyed taking pictures, and he developed them himself in his basement. Warhol attended Carnegie Institute of Technology (now Carnegie Mellon University) from 1945 to 1949. He earned a Bachelor of Fine Arts degree in Pictorial Design with the goal of becoming a commercial illustrator.

Soon after graduating, Warhol moved to New York City to pursue a career as a commercial artist. Warhol became one of the most successful illustrators of the 1950s, winning numerous awards. Warhol's first exhibition of sculptures was held in 1964 and consisted of hundreds of replicas of large supermarket product boxes, including *Brillo Boxes* and *Heinz Boxes*. In 1974, Warhol started a series of *Time Capsules*: cardboard boxes that he filled with the materials of his everyday life, including mail, photos, art, clothing, collectibles, etc. The artist produced over 600 time capsules and they are now an archival goldmine of his life and the era he lived in.<sup>3</sup> Warhol died in February 1987 at 59 years old.

**POP ART:** Pop Art emerged as an art movement in the mid 1950s in Britain and spread to the United States (primarily New York) in the late 1950s. The movement was a counter-movement to Abstract Expressionism. Pop art used aspects of mass culture, mass production, and advertising to represent the “modern” world. Pop Art was aimed to employ images of popular culture, opposed to elitist culture in art, and the movement emphasized the mundane or kitschy elements of modern culture, most often through the use of irony. Artists associated with the Pop Art Movement included: Jim Dine, Richard Hamilton, Keith Hering, David Hockney, Jasper Johns, Alex Kats, Yayoi Kusama, Claus Oldenburg, Robert Rauschenberg, James Rosenquist, and Andy Warhol.

**ANDY WARHOL AND THE BIG SHOT:** For Andy Warhol the power of immediacy was very important and something completely foreign in photography. Warhol purchased the Polaroid Big Shot camera in 1971 (the year it was first available), and it quickly became a favorite camera and tool to help him capture the heat of the moment instantaneously. The camera served as an indispensable tool for Warhol in the production of commissioned portraits. He would take several packs of film at each sitting, and then select his favorite image to be silk-screened onto canvas by his assistants. The resulting image became the ground and basis of each painting. Warhol began studying photography when he was a child and used photography as a preparatory tool for silk screens and large scaled paintings throughout his career. The Big Shot's fixed focal length and point-and-shoot mechanism were perfect for the snapshot-loving artist. The simplicity of Warhol's method gave the tiny images (4 1/4" x 3 3/8") purity, sincerity, and intimacy that belied the radiance and aura of greatness coming from the celebrated

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<sup>3</sup> Time Capsule: See activities

**ANDY WARHOL  
AND THE BIG  
SHOT  
(CONTINUED)**

sitters.

“Within the tight rectangle that the camera dictated, and behind an implement that provided a necessary barrier between himself and his sitter, we see Warhol finding numerous ways to create memorable, varied, and iconic compositions. They may be small in size, but Warhol's Polaroids serve as vivid portraits and artful time capsules of an era.”<sup>4</sup>

**THE BIG SHOT  
CAMERA IN THE  
21ST CENTURY:**

With the passage of time and advent of digital photography, there has been a revival of vintage Polaroid photography. There have been recent exhibits at USC, Duke and UC Berkley that have highlighted the importance of Andy Warhol's Big Shot instant photos not only as preparatory images for his final works, but also as significant works of art themselves.

Furthermore, contemporary photographers have begun to experiment with Polaroid cameras, as a means to produce vintage-looking prints. A recent example can be found at the photography blog “From Me to You” (by New York City based photographer, Jamie): “A break from digital, a pocket full of flash cubes, a camera put to use by Andy Warhol... This past New York Fashion Week I did the “Big Shot Shuffle” backstage at Donna Karan with this fixed focal length, Polaroid producing, enormous plastic camera.”<sup>5</sup>



<http://fromme-toyou.tumblr.com/tagged/favorite>

**QUESTIONS AND  
ACTIVITIES:**

- Polaroid Guess Who?: Two decks of 16 reproductions of Warhol's vintage celebrity Polaroids. Warhol's original celebrity Polaroids were taken between 1970 and 1986.
  - Y Who are these celebrities?
  - Y Let visitors play against each other and see who can identify all the celebrities in the deck the fastest.

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<sup>4</sup> Danziger Gallery: Big Shot Press Release. [http://www.danzigerprojects.com/exhibitions/2011\\_1\\_big-shots/?view=pressrelease](http://www.danzigerprojects.com/exhibitions/2011_1_big-shots/?view=pressrelease)

<sup>5</sup>From Me to You. <http://fromme-toyou.tumblr.com/tagged/favorite>

**QUESTIONS AND  
ACTIVITIES:  
(CONTINUED)**

Step 1. The guide makes sure that each deck of the 16 Polaroids are in the same order. Give each player a deck facing up (the answers are on the back!)

Step 2. On the count of three let the players call out the name of the celebrities, as quickly as they can (keeping the cards in order).

Step 3. When the first player names the first celebrity, he or she can lay the polaroid reproduction down on the cart or put it to the back of the deck.

Step 4. The players should continue going through the cards until they have named all 16 celebrities. The first person to correctly name all the celebrities the first, is the winner. (The correct identity of the celebrity is on the back of the image.)

Note: This game can be played by one person playing against themselves or playing against the clock (the player should try to name all 16 celebrities in 45 seconds). For one player, the guide can hold them up like flash cards.

Other ways to use the Warhol Polaroids:

Y Looking at the Polaroid portraits what can you say about the sitter? What does the sitter's appearance tell you about him/her? About the era when the photo was taken? What can you tell about the sitter's mood? Personality? Lifestyle? How do you think the sitter wants to be portrayed/how do you think they want to be seen by others? How do you feel the artist thought of or felt about the sitter?

Y You can connect Andy Warhol's Polaroid portraits to other portraits in the collection. See the Collection Connections below.

- Use the idea of instant portraiture in a digital age and use one of the iPad apps to create a portrait of someone or yourself and upload it to the MIA's Flickr site and/or your Facebook using Instagram/Hipstamatic/Camerabag on iPad
- Using the D.I.Y: POP Andy Warhol App on the iPad: Create your own digital silkscreen print in the style of Andy Warhol. Take a photo on our iPad, crop, Expose, underpaint, and print a virtual silkscreen. Then upload it to the MIA Flickr account and your Facebook to share your virtual silkscreen.
- Do the "Big Shot Shuffle": Let visitors focus the Big Shot Camera and do the famous "shuffle" to focus on a subject through the viewfinder

**QUESTIONS AND  
ACTIVITIES:  
(CONTINUED)**

Pop art & Polaroids:

- Andy Warhol, *Chicken Noodle, from Campbell's Soup I*, 1968
- Andy Warhol: Factory Additions, New York, *Marilyn*, 1967 (#P.90.28.8)
- Andy Warhol: Leo Castelli Gallery, *Self Portrait*, 1966 (#P.70.64)
- Richard Hamilton, *Swinging London 67*, 1968 (#P.70.38)
- See images above and object location at:  
<http://www.artsconnected.org/resource/147856/1/photography-art-cart-pop-art-polaroid-big-shot-warhol>
- Andre Kertesz, *Untitled*, 1985 (#2007.35.121) (See image saved on iPad)

Portraiture in painting:

- Chuck Close, *Frank*, 1969 (#69.137)
- Lucas Cranach The Elder, *Portrait of Moritz Buchner*, 1520 (#57.11)
- Lucas Cranach The Elder, *Portrait of Anna Buchner*, 1520 (#57.10)
- Edgar Degas, *Portrait of Mlle. Hortense Valpincon*, 1871 (#48.1)
- Thomas Sully, *Portrait of George Washington*, 1820 (#32.12 )
- Paulus Moreelse, *Portrait of Catharina van Voorst*, 1595-1650 (#88.64.2)
- Paulus Moreelse, *Portrait of Lucas van Voorst*, 1590-1669 (#88.64.1)
- Amedeo Modigliani, *Little Servant Girl*, 1916 (#59.30)
- Walker Evans, *Subway Portrait (three photographs out of series of five)*, 1938-1942 (#75.25.14, # 75.25.11, # 75.25.10)
- Man Ray, *Portrait of Lee Miller*, 1932 (#2005.28.1)
- View all images and current locations at:  
<http://www.artsconnected.org/resource/147857/5/photography-art-cart-portraiture>

**COLLECTION  
CONNECTIONS:**



## HOLGAS AND HOLGA PRINTS

Minneapolis College of Art & Design professor, professional photographer, and Holga camera “hacker” Nathan Lewis was commissioned to create three Holga camera variations and produce related images from the “hacked” Holga cameras. The four cameras Lewis worked with were: a “clean” Holga, Pin Holga, Hacked 35 mm film Holga, and an attachable filter Holga (including nine attachable filters).

## HOLGA CAMERA

### WHAT IS A HOLGA CAMERA?

The Holga camera is light, fast, quick, and cheap. It is a camera that is made entirely from plastic (including the lens), with the exception of the shutter (which is a metal spring). The Holga has a single **focal length**, single **shutter speed**, and single **aperture**.

The original model requires **120 film** and is capable of shooting in either 6x4.5 cm or 6x6cm (2.4x1.8 in or 2.4x2.4 in) formats. The shutter speed is fixed at approximately 1/100<sup>th</sup> of a second, but because the shutter operates on a spring, it can be much slower depending on how old the camera and spring are. It has a 60mm focal length lens. There is a switch that is divided into “daylight/cloudy” that changes the aperture. Due to an early manufacturing defect, the switch did not affect the aperture, meaning that you were always in “cloudy” which was a wider aperture. This resulted in more light, but less **depth of field**. The defect was only fixed in the last couple of years, and all of the MIA’s Holga cameras on the Art Cart have functioning aperture controls.

The Holga has four focus marks: Portrait = three feet, small group of people= six feet, large crowd = 18 feet, and landscape/distance = 30 feet to “infinity”. One simply turns the barrel on the lens to the desired focal distance. Since the lens is plastic, the contrast is low and images tend to lose detail in darker areas. Underneath the lens, there is a function to extend the exposure. B= a manual exposure: for images taken in the dark or at night. In this mode, the photographer has complete control over the how long the shutter stays open (how much light is let into the camera) and a tripod is necessary so that the image does not become blurry. Otherwise, the exposure should stay in the N position. N=Normal exposure: a shutter speed of approximately 1/100<sup>th</sup> of a second.

The Holga is completely manual (no batteries required). After taking each photograph (with the clicker on the right side of the lens), one must wind the film in order to advance it forward for the next photo. It is very important that the film stays tightly on the spool each time one advances the film. Since the Holga is made in such an inexpensive way, no two Holga’s are exactly alike and each camera will always let light in differently.



**HOLGA HISTORY:** The name “Holga” derives from the Cantonese term “ho gwong,” which translates to “very bright.” It was designed and engineered by T.M. Lee of the Universal Electronics Company (Hong Kong, China). The Holga was introduced to the Chinese public in 1981 as an inexpensive camera using 120 film, the most popular film format in the country at the time. This was during a pivotal moment in China because the country was opening its doors to the West. Chinese were able to travel more freely as tourists throughout both China and the West, and the Holga was the perfect camera to document their trip because of its affordability. Unfortunately, when **35 mm film**, was introduced in China a couple years later, the new smaller and compact film overran 120 film, causing the Holga to lose popularity.

As the Holga spread to the West, people started to discuss the importance of the Holga as a means for artistic creativity, and the Holga developed a devoted following of users throughout the world. Since the camera is inexpensive and easy to take apart, it is simple to experiment with, using different film and letting light leak through in different places. The “toy camera” has somewhat of cult following, today, because of the **vignetting** affects of the light leaks and distortions due to the camera’s “flaws”.

**THE HOLGA IN  
THE 21ST  
CENTURY:**

The Holga has made a come back in the 21<sup>st</sup> century because of the retro look of its photographs, low cost, and the ease in manipulating the images. It aims to “break free from the dependence on technology, precision, and uber-sharpness”<sup>6</sup> of digital photography by creating “flaws.” These “flaws” create a “softness of the image,” altering the color and therefore creating a vintage look.

Today, the Holga has a devoted following of professional photographers, educators, and artists. The camera is easy to disassemble to understand how the different parts work. It also allows for artistic creativity through a new visual vocabulary with which to describe and see the world. The Holga is prized for its lack of precision, light leaks, and inexpensive qualities, which forces the photographer to concentrate on creative vision instead of increasingly expensive camera technology.

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<sup>6</sup> Holga 4<sup>th</sup> Edition Camera Manual (available on the Art Cart)

Photographer Nathan Lewis (who took all Holga images and “hacked” the Holgas on the Art Cart) cherishes the Holga because, unlike digital photography, it upholds the true principles of photography and creates an artistic image. In many ways, the Holga adheres to the basic principles of surrealism because there is a constant sense of uncertainty and surprise that creates a hyper-authentic photograph.

An example of an important photograph taken by the Holga is David Burnett’s photograph of former vice-president Al Gore during a campaign appearance. The Holga photo earned a top prize in a 2001 White House News Photographers’ Association “Eyes of History” award (reproduced on the Art Cart).

**HOW TO “HACK”  
A HOLGA  
ACCORDING TO  
NATHAN LEWIS  
OF MCAD:**

- Prevent Light Leaks:

There are many things you can do to your Holga to alter the image. The camera lets in a lot of light through holes and cracks in the plastic called “light leaks”. Although there is no guarantee that even the total tape mummification of the Holga will eliminate every light leak, to prevent some of these light leaks, it is recommended to tape around the outside of the camera where the back cover meets the front of the camera. Another trick to reduce light is to paint the inside of the camera matte black. Although the inside of the camera is already black, it has a lustrous shine that allows light to bounce off it.

- Loosen or tighten the film:

The 120 film spools do not have the light-tight canister to protect the film from exposure that 35mm film has. If the 120 film is not rolled tightly while shooting, light can sneak in under the loose paper backing of the film and can over expose the film. If the film is loose, the buckled film can produce a dynamic image that has a sense of movement to it, but this affect is rare and hard to achieve.



- Multiple exposures:

Since the Holga’s shutter works independently from the film advance, one can press the shutter multiple times and take many pictures on the same frame. This creates multiple images similar to a panorama on one photograph.

- PinHolga 120N: Hacked Pinhole Camera:

The “Pinholga” is a modified Holga 120N camera where the lens, and sometimes the entire shutter assembly, can be replaced with a pinhole. The lens and shutter are

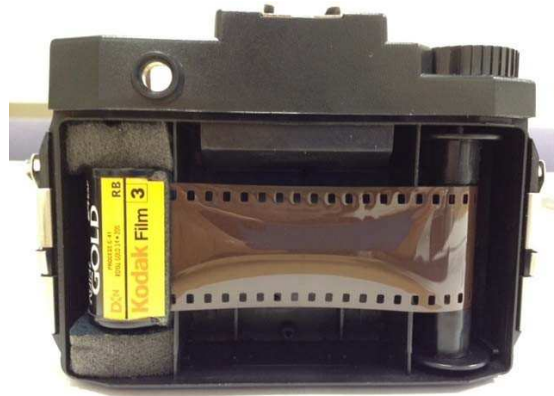
**HOW TO “HACK”  
A HOLGA  
ACCORDING TO  
NATHAN LEWIS  
(CONTINUED):**

taken off and replaced with a piece of aluminum with a small hole made from a pin. The pinhole camera works similarly to the Camera Obscura. It is a camera without a lens and with one single aperture (essentially it is a lightproof box with a pinhole). The lens-less body produces infinite depth of field, meaning that everything is sharp and detailed. The finer the hole, the sharper the image. It is recommended that you rest the camera on a ledge or use a tripod and expose the camera to sunlight for 30 seconds before covering up the pinhole. (Refer to the Pinhole camera guide for more details)



- Holga 120N: Hacked 35mm film Camera.  
The 35mm film Holga is a modified Holga 120N camera where 120 film is replaced with 35mm film. By using 35mm film, instead of the traditional 120 film, one can produce a much longer image where the entire section of the film frame is exposed, including the sprocket holes (the perforations along to the sides of 35mm film that are usually not visible). Correct modifications must be made for the 35mm film to remain flat and centered inside the camera. To ensure that the 35mm film stays centered and travels straight across the film plane and behind the lens, cut two foam pieces out and place them on either side of the cartridge of film. Then tape the other side of the film so that it is securely on the opposite spool. One must completely tape up the film counter window as to not let any light in (if the film counter is not covered, the 35mm film will become completely over exposed). Since there is no way to see the number of exposures, one must estimate how far to advance the film after each shot. This involves counting the clicks as you wind the film. There are usually 34 clicks per each 6x6cm frame.

**HOW TO “HACK”  
A HOLGA  
ACCORDING TO  
NATHAN LEWIS  
(CONTINUED):**



- Change lenses and attach filters:  
The plastic lens can also be replaced with a glass version, called the "Woca" or can be completely removed all together. Holga plastic lenses have also been adapted to the Canon EOS, the Nikon f-mount, Pentax, Sony, Olympus and Minolta. You can also add as many different filters as you like. These filters screw on the lens and can affect the lighting, color, and magnify the image.



- Set of 9 attachable filters:
  - 81B: A very warm filter that prevents excessive blue with daylight color films in cloudy weather, shade, or indoors with electronic flash.
  - No. 8 (K2): A yellow filter that renders an accurate tonal reproduction of daylight scenes as the eye sees them. It creates a natural rendition of contrast between sky and clouds, flowers and foliage.
  - UV-Haze: A clear filter that can be used all the time under all conditions. It eliminates ultra-violet light to which film is sensitive, has no effect on any light visible to the eye.
  - 85B: A warming filter that converts indoor films for use in daylight.
  - +1 magnifying filter
  - +2 magnifying filter
  - Soft Focus: Produces a delicate soft focus atmosphere especially suitable

**HOW TO “HACK”  
A HOLGA  
ACCORDING TO  
NATHAN LEWIS  
(CONTINUED):**

- for portraits and “moody” landscapes.
- Cross Screen: Produces dramatic star-shaped flares on highlights in night scenes, seascapes and still-lives.
- SGT Tele 2.0x 37mm: telephoto lens that doubles optical zoom.
- Set of 16 Holga 120N Photographs taken by Photographer Nathan Lewis:
  - 1 “Clean” photograph (with six frames)
  - 4 Pinhole camera photographs
  - 4 35mm film photographs
  - 7 Photographs with attached filters
- David Burnett’s Holga Photograph of Vice-President Al Gore during a campaign appearance. It earned a top prize in a 2001 White House News Photographers’ Association “Eyes of History” award ceremony.

**QUESTIONS AND  
ACTIVITIES:**

- This camera is a good one to disassemble and handle:
  - Y Using the “clean/unhacked” holga camera point out the shutter and the shutter release. Underneath the lens, there is a function to extend the exposure. Put the dial in the “B= manual exposure” and see what happens. This is for images taken in the dark or at night and the shutter will remain open (to let light in) for as long as you hold the exposure button down. Put the dial back to the “N=normal” and click the exposure button to see a shutter speed of approximately 1/100<sup>th</sup> of a second. Explain how the shutter lets in light to expose the film.
  - Y See how the aperture changes (opens and closes) when you switch the dial from “daylight” to “cloudy.”
  - Y Point out how to change the focal distance.
  - Y Point out where the film goes and how to advance it: put the 120 film spool in the left side of the camera and pull it out until it reaches the right side of the camera. Then slip the paper backing into the slit of the second empty spool and wind the film a couple times with your fingers. Then place the second spool into the right side of the camera. Wind the camera with the advance button on top once or twice to make sure the film is connected to the second spool and advancing.
  - Y Point out how light leaks can happen if the film is loose and light gets between the paper backing and the film. Show how light can leak between the camera and the camera backing. Refer to the light leaks and loose film section of the hacking guide.
- View the three “hacked” Holgas: The Pinholga, the 35 mm film Holga, and the Attached filters Holga. Show how they were modified.
- Explain how different photos were created through different techniques of hacking; show the images that go along with the camera. Have the viewer try to guess which image goes with which camera.

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Division of Learning & Innovation  
Photography Art Cart  
4/2012

**QUESTIONS AND  
ACTIVITIES:  
(CONTINUED)**

- Show Holga Hacks photos and their associated photos (labeled on back).
- View and take home (via email from the iPad) Nathan Lewis' PinHolga Camera Guide
- Take a digital Holga photo using the "Camera Bag" app on the iPad, which has a Holga filter, and upload it to the MIA Flickr site and your Facebook.
- Take a digital Holga using the app "6x6" and upload it to the MIA Flickr site and your Facebook.
- View "Get the Picture" bookmarked on the iPad: Explore artist Robert Pope, Jr.'s use of the toy camera. <http://www.artsmia.org/get-the-picture/index.html>

**COLLECTION  
CONNECTIONS:**

- Carl Robert Pope, Jr. *Carbondale, Illinois* (Series of three), 1982, (#89.76.4, #89.23.4, #89.76.2)
- Eric Renner, *John Wood and Eric Renner, Santa Fe*, 1976 (#76.61.16)
- Paolo Giolo, *L'Uomo di Eakins*, 1982 (Giolo worked with pinhole cameras throughout the 1980s) (#87.13.2)
- Ruth Thorne-Thomsen, *Untitled from the Expedition Series*, 1976-1980 (Thorne-Thomsen worked with pinhole cameras throughout her career) (Walker Arts Center: #1982.12)
- See images above and object locations at:  
<http://www.artconnected.org/resource/147854/1/photography-art-cart-pinhole-toy-holga-camera>
- Rita DeWitt, *Question: How Many Times Has Venus Worn Gloves*, 1982 (DeWitt worked with pinhole cameras throughout her career) (#99.203.5) (Image saved on iPad)
- Nancy Rethrox, *My Mother, Pennsville, Ohio*, 1970 (#2000.110.13) (Image saved on iPad)

**Glossary and Important Terms:** (In order as they appear in the preceding pages)

***Daguerreotype:***

Commercial portrait photography was created with the invention and popularization of the camera. The *daguerreotype* was the first successful photographic process. In the mid 19<sup>th</sup> century, the daguerreotype process became relatively inexpensive, leading to the popularity of portraiture. Portraiture, which had once been exclusively for elite, wealthy, and important figures, was now affordable, allowing anyone to commemorate him or herself or capture an important moment. Daguerreotype is a direct positive, made on a silvered copper plate in the camera, so there were no duplicates. This is the same idea that Polaroid photographs used, making each photograph one of a kind.



***Hake Brush:***

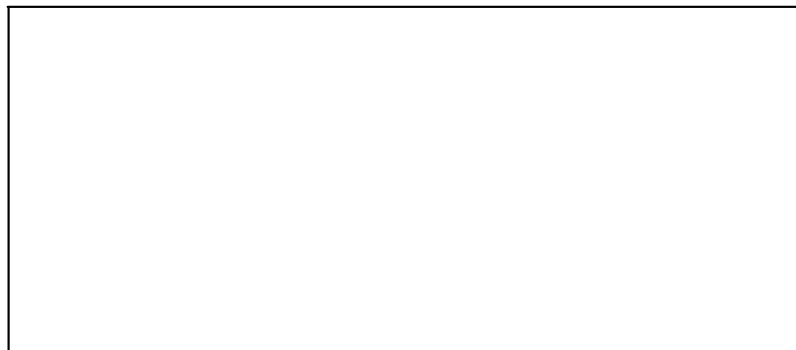
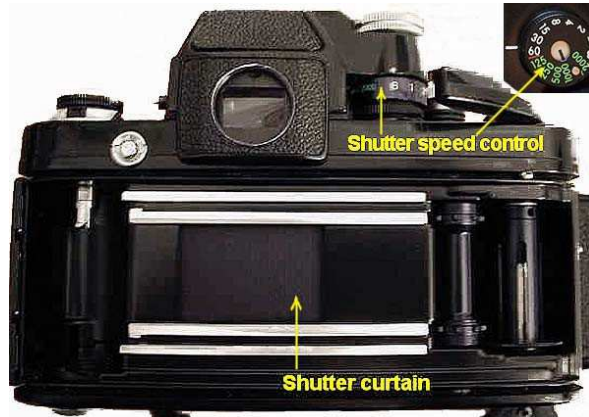
A hake brush is an Asian-style wash brush on a long flat handle. It is useful for laying in large areas of water or color, for wetting the surface, and for absorbing excess media. Hake brushes are usually very soft and are made of goat hair.





***Shutter:***

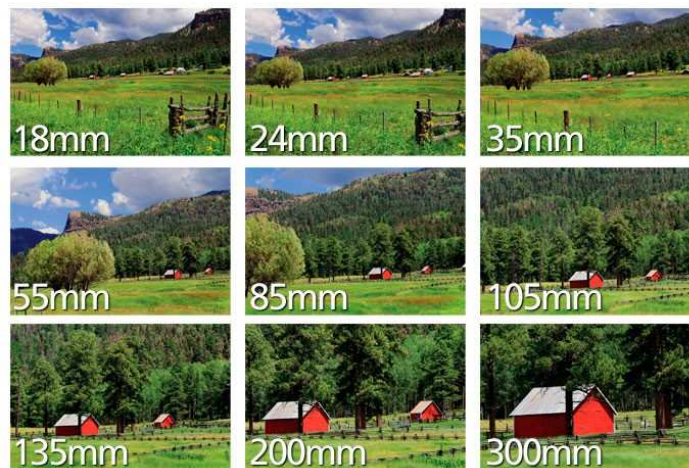
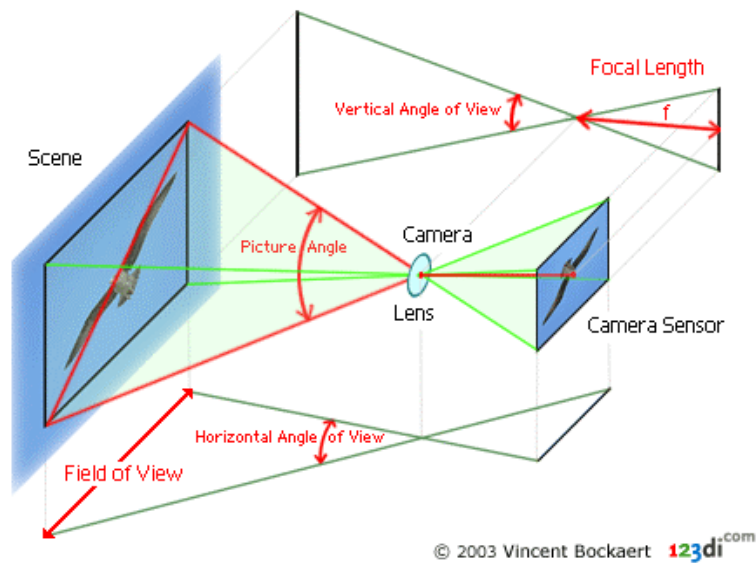
The shutter is the device in the camera that allows light to pass for a determined period of time, for the purpose of exposing photographic film and creating an image. The shutter speed can be adjusted to determine how much light is let into the camera. The slower the shutter speed (or the longer the shutter is open), the more light is let into the camera, the more exposed the film becomes. The illustration below shows the shutter speed control on a 35mm camera.



1. Shutter plate
2. Aperture covered by leaf shutter
3. Aperture during exposure
4. Leaf blade
5. Catch mechanism
6. Butterfly spring

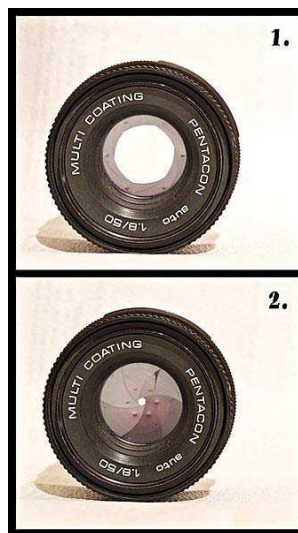
***Focal length:***

Focal length is the measure of how strongly the camera converges or diverges light; this means that the focal length is the distance over which initially collimated rays (parallel light rays) are brought to focus. Camera lens focal lengths are usually specified in millimeters (mm). The Polaroid Big Shot has a fixed focal length, meaning that you can't change the length of the camera to focus the image. Instead the photographer has to move closer and further until the object and image are in focus (the "Big Shot Shuffle").



***Aperture:***

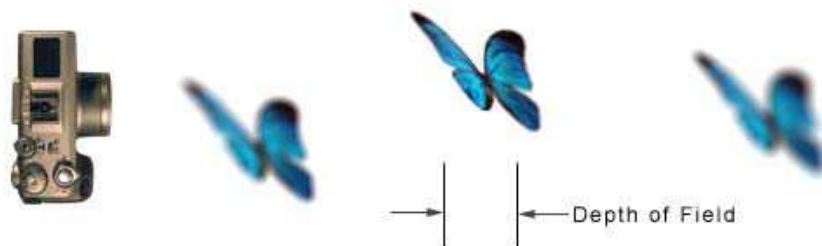
The aperture is the hole or opening through which light travels. The aperture determines how collimated the admitted rays are. (Collimated light is light whose rays are parallel). If the aperture is narrow, then highly collimated (parallel) rays are admitted, resulting in a sharp focus of everything that is in the viewing field. This means that a wide aperture results in an image that is sharp only around what the lens is focusing on and blurry in the background. In combination with variation of shutter speed, the aperture size will regulate the film's exposure to light. A faster shutter speed will require a larger aperture to ensure sufficient light exposure, while a slower shutter speed will require a smaller aperture to avoid excessive exposure.



A large (1) and a small (2) aperture

***Depth of field:***

The Depth of Field (DOF) is the distance between the nearest and farthest objects in a scene that appear acceptably sharp. Although a lens can precisely focus at only one distance at a time, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is not noticeable under normal viewing conditions (refer to the following image). If there is a larger DOF, the entire image is sharp. A smaller DOF emphasizes the subject while de-emphasizing the foreground and background.



***120 Film:***

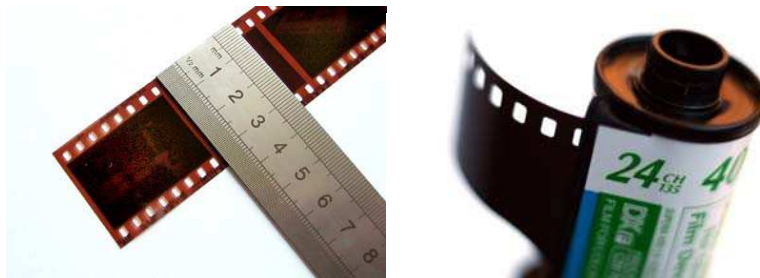
120 is a film format for still photography introduced by Kodak for their *Brownie No. 2* in 1901. (See the Brownie camera on the Impressionist Painting Art Cart.) The 120 format is typical of roll film. The film is at least 30 inches (76 cm) long, and up to 32–33 inches (81–84 cm). Attached to the film is a piece of backing paper longer and slightly wider than the film. The backing paper protects the film while it is wound on the spool, with enough extra length to allow loading and unloading the roll in daylight without exposing any of the film. It was the most common use of film for professionals and amateurs, until the introduction of 35mm film.



***35mm Film:***

35mm (millimeter) film is most commonly used for chemical still photography and motion pictures. The name of the gauge refers to the width of the photographic film, which consists of strips 35 millimeters (about 1 3/8 inches) in width. Image formats on 35 mm film are generally 24 mm wide, between the perforations in the 35 mm wide film. The common "full-frame" image size is 24×36 mm. While the Leica camera popularized the format, several 35 mm still cameras used perforated movie film before the Leica was introduced in the 1920s. It quickly grew in popularity, surpassing 120 film by the late 1960s, and becoming the most popular photographic film size.

Each roll of 35mm film is enclosed in single-spool, light-tight, metal cassettes to allow cameras to be loaded in daylight. The film is clipped or taped to a spool and exits via a slot lined with flocking. Most cameras require the film to be rewound before the camera is opened. Some motorized cameras unwind the film fully upon loading and then expose the images in reverse order, returning the film to the cassette; this protects all images except the last one or two, should the camera back be accidentally opened.



***Vignetting:***

Vignetting is an effect common in older and vintage cameras. It is the reduction of an image's brightness or saturation at the periphery compared to the image center, creating a darker border around the photograph. Adding and stacking filters to a camera's lens usually causes vignetting on the image.



### **How to Make a Camera Obscura:**

#### Materials:

- Ruler
- Marker
- Long aluminum snack can with transparent lid (example a Pringles can)
- Knife
- Vellum, tracing paper, or wax paper
- Duct tape (preferably black)
- Pushpin or large safety pin
- Decorative paper
- Double-sided tape
- Foam

#### Directions:

- Measure and draw a line around the can 2 inches from the bottom.
- Cut through the line with the knife to create two can sections (use adult supervision).
- Trace the bottom of the can onto a sheet of vellum (tracing or wax paper), then cut the circle out.
- Stack the pieces in this order: the bottom of the can (open end up), the lid, the vellum circle, and the top of the can.



- Thoroughly wrap the seam with duct tape so that no light can come in.



- Flip the viewer over and use the pushpin to make a small hole in the center of the can's bottom. The smaller the hole, the sharper the image.



- Cut out a piece of foam to put over the perimeter of the open end of the can. Cut the foam piece in a circle and then cut the center out so it looks like a bagel. (This will make the camera more comfortable and by shaping to your face, it will prevent light from coming into the camera.)
- Tape down the foam and cover the camera with the black duct tape (again this will prevent any light leaks).
- For a more finished look, cover the viewer with paper secured with double-sided tape. Then decorate it to personalize your camera.



- To use your viewer, hold it up to one eye and gaze at a bright scene (something lit by sunlight or outside on a sunny day works best). To block out light, use one hand to cup the viewer to your eye.
- Note: It is best to be in a bright room or outside on a sunny day. Your image may appear clear if you cover your head and “camera obscura” with a hood or dark sheet. The goal is not to have any light in the “camera” or around the viewfinder area but a lot of light outside the “camera obscura” so that you have a bright image reflected on the vellum inside. The image you see will be an exact replica of what is around you except that it will be inverted upside down.

These directions are adapted from Disney Family Fun:

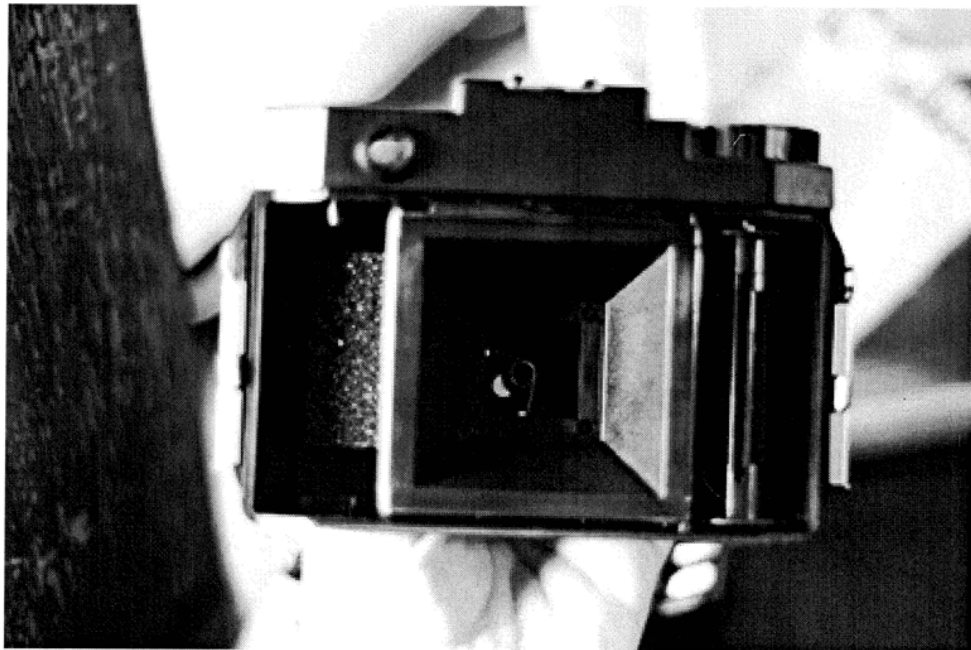
<http://familyfun.go.com/crafts/how-to-make-a-camera-obscura-841057/>

**How to Modify your Holga into a PinHolga!** - Nathan Lewis

1. Remove the Holga from the Box, and bask in its simple glory!

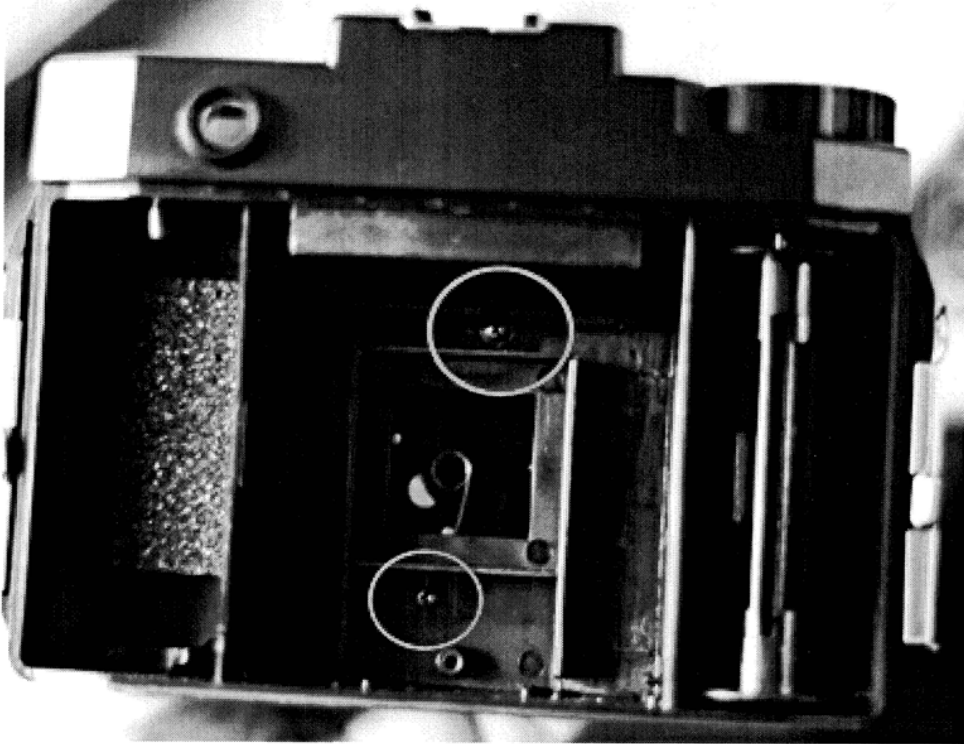


2. Flip it over, open it up, and you should see this.





3. Remove the guide and notice the two small screws holding the lens on.



4. Take those bad boys out!



5. Your lens and shutter mechanism should come right off.

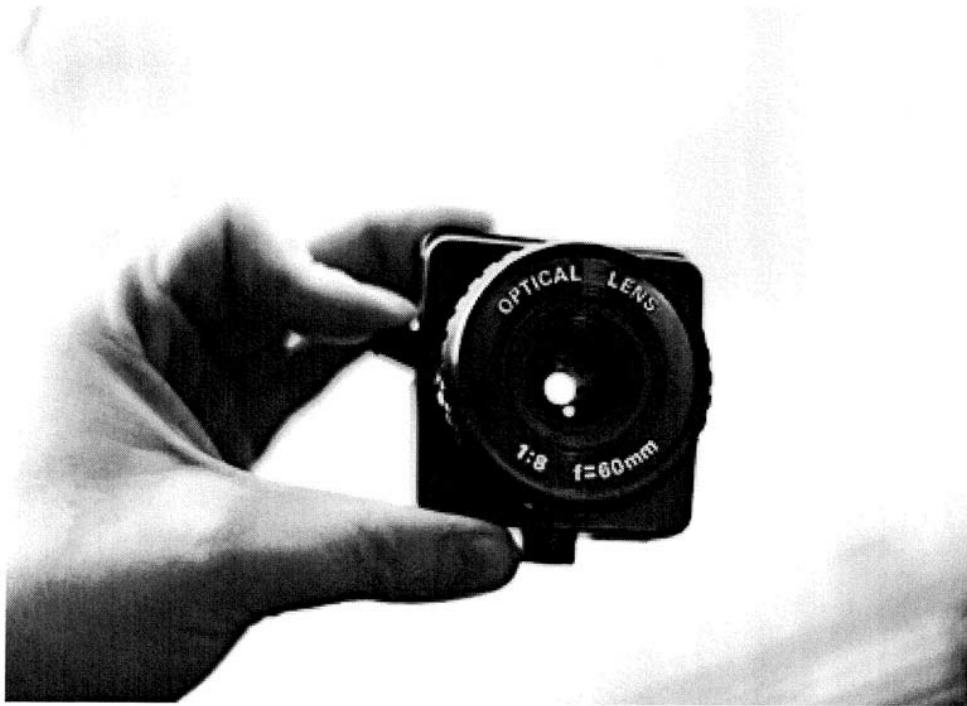


6. Now cut the umbilical!

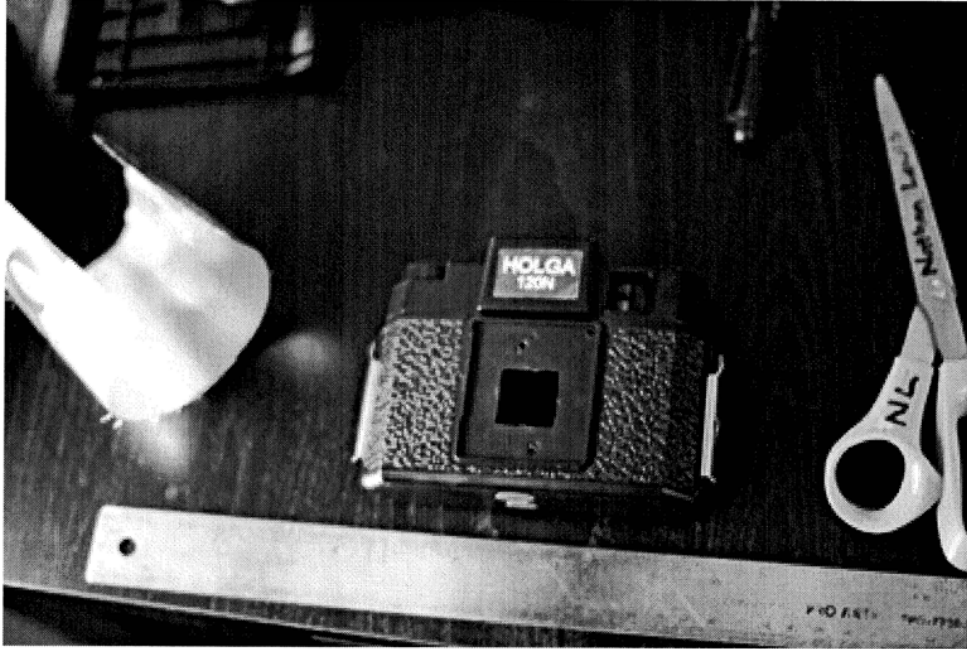


**\*\*\*Save the lens, you can use it for future projects. Holga-SLR anyone?\*\*\***

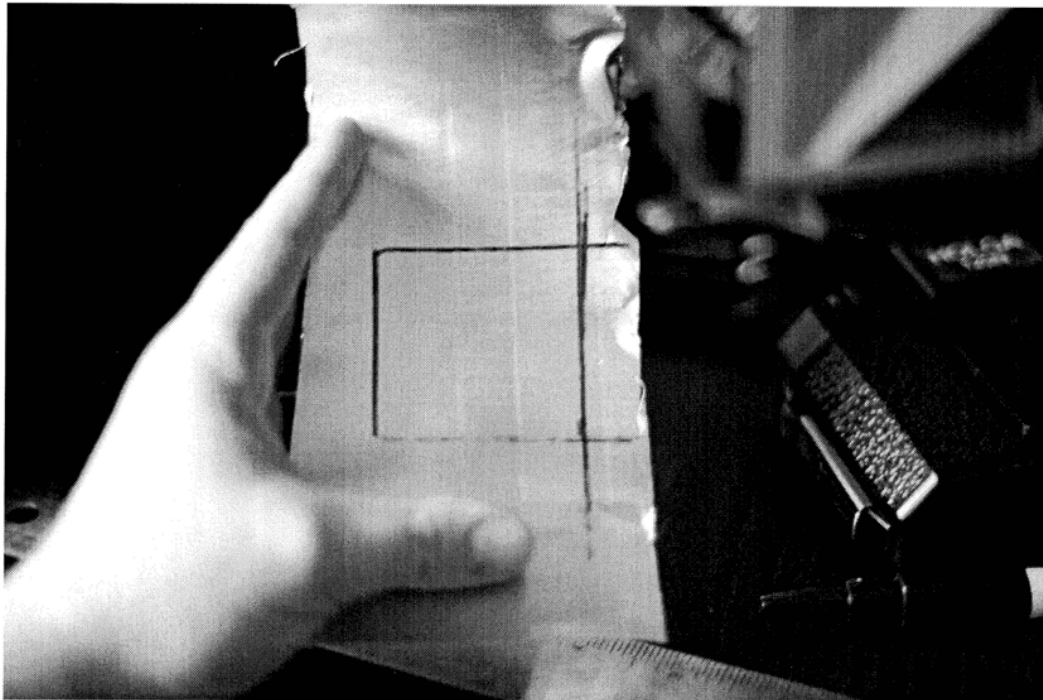
7. Say "Neat!"



8. Ready your supplies: Aluminum can, ruler, scissors, and marker.



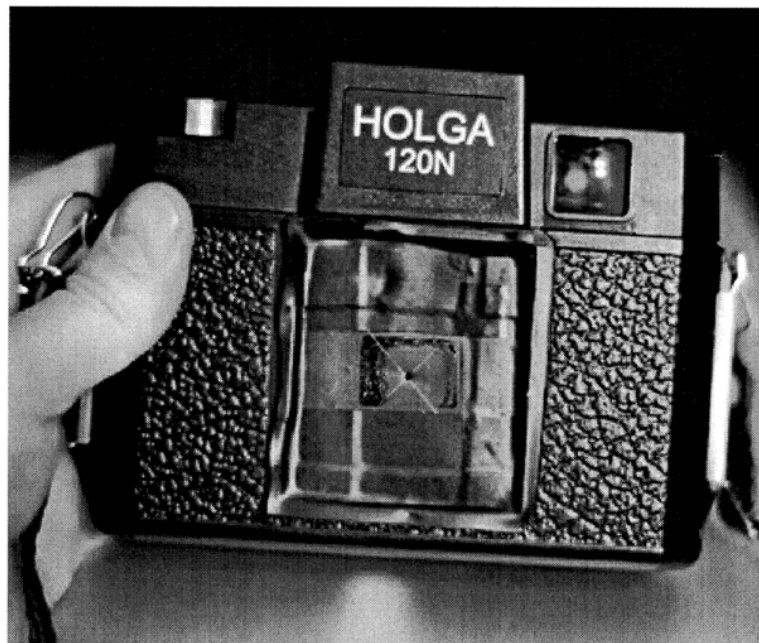
9. Measure the lens cavity, and transfer it to the can.

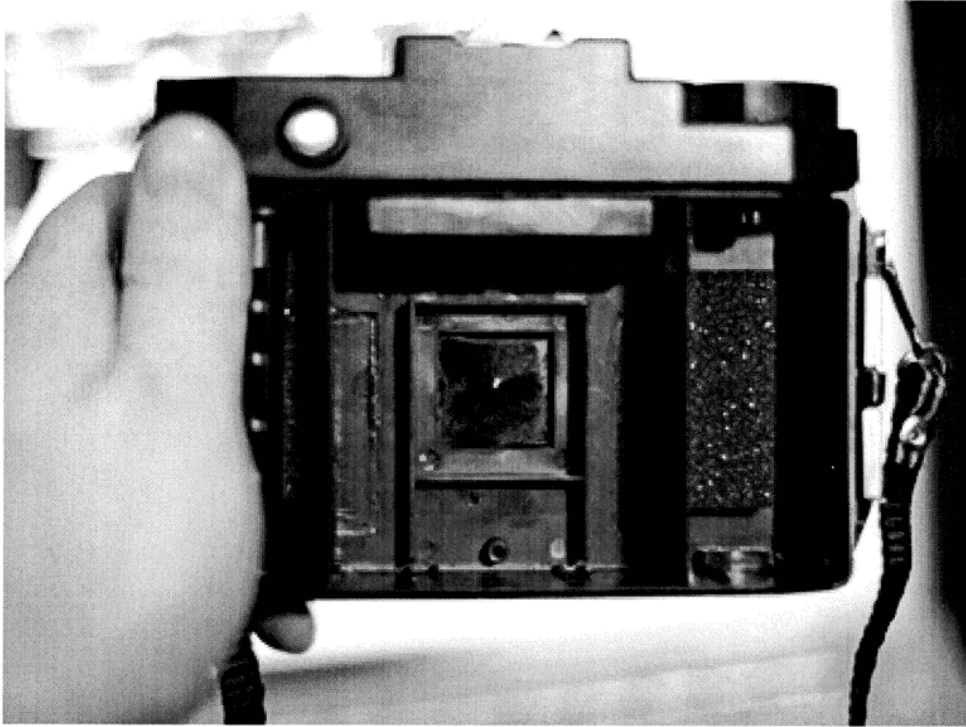


10. Do some trimming, measure the center, and fit the new aperture in place. Pierce the center with a needle, the smaller the better!

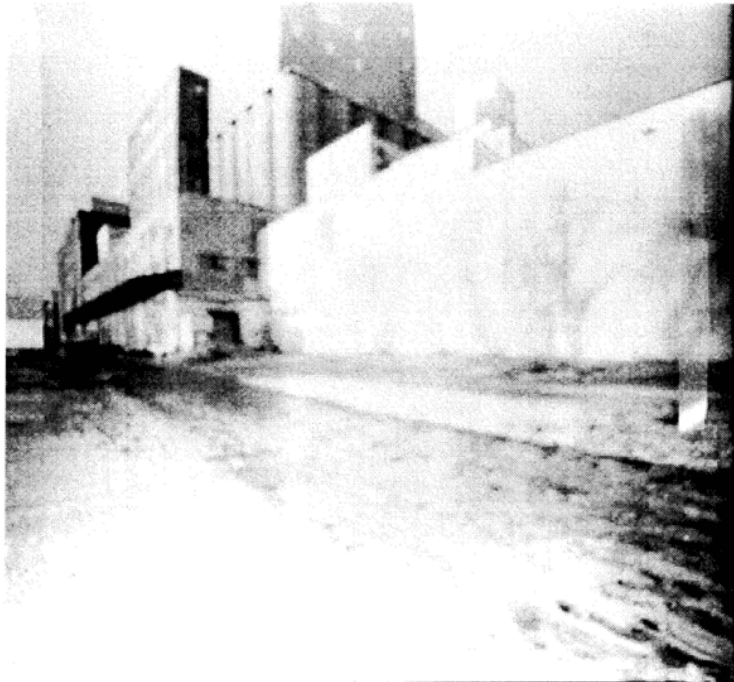


11. Scuff up the aluminum and paint it black. After the paint has dried, scuff it up again as well as the Holga, apply super glue generously, mask with electrical tape and Voila!





12. You can see the smaller aperture. Under bright sun your exposure should be about 30 seconds.



**Bibliography and further reading:**

**Benson, Richard.** The Printed Picture. The Museum of Modern Art, 2008.

- A good history of photography for visual learners. Each text is paired with an image.

**Davenport, Alma.** The History of Photography: An Overview. University of New Mexico Press, 1991.

- A short overview that's easy to read. Great for beginners or dabblers.

**Hirsch, Robert.** Seizing the Light: A History of Photography. McGraw Hill, 2000.

- An introduction to the history of photography that incorporates social, cultural, and historical events.

**Hockney, David.** Secret Knowledge: Rediscovering the Lost Techniques of the Old Masters. Viking Studio, 2001. New York.

- Focusing on the artists throughout history who used optical devices in their artistic processes.
- Information on the Camera Obscura, Daguerreotype, and the Camera Lucida.

**James, Christopher.** The Book of Alternative Photographic Processes. Delmar, 2002.

- A thorough and complete guide to a range of alternative photographic processes. A staple for any darkroom, with good historical information and contemporary photographer's work.

**James, Christopher.** The Book of Alternative Photographic Processes. Delmar, 2009.

- Even more processes, and setup details than the first edition.

**Newhall, Beaumont.** The History of Photography. The Museum of Modern Art, 1982.

- If this history of photography has a bible, this is it. A great text on the beginnings of the medium.

**Renner, Eric.** Pinhole Photography: Rediscovering a Historic Technique 2<sup>nd</sup> Edition. Focal Press, 2000.

- A history and theory of pinhole photography. Includes how-to's and information on the Camera Obscura and the Holga.

**Rexer, Lyle.** Photography's Antiquarian Avant-Garde: The New Wave in Old Processes; Harry N. Abrams, Inc., Publishers, 2002.

- An overview of contemporary photographers working in 19th century processes. Mainly images, with a few process-based texts.

**Rosenblum, Naomi.** [A History of Women Photographers](#). Abbeville Press Publishers, 1994.

- A compendium of the history of photography including women photographers. This book fills in the holes that many photo history books leave. Also, gorgeous images.

**Rosenblum, Naomi.** [A World History of Photography](#). Abbeville Press publishers, 2007.

- A hefty overview of the history of photography, from the camera lucida to the present.

**Danziger Gallery:**

[http://www.danzigerprojects.com/exhibitions/2011\\_1\\_big-shots/?view=pressrelease](http://www.danzigerprojects.com/exhibitions/2011_1_big-shots/?view=pressrelease)

- Information on Danziger Gallery's show on Andy Warhol's Polaroid Big Shot celebrity portraits.

**Disney Family Fun:**

<http://familyfun.go.com/crafts/how-to-make-a-camera-obscura-841057/>

- Guide to making a camera obscura at home

**The Fisher Museum of Art:**

[http://fisher.usc.edu/exhibitions/looking\\_into\\_andy.html](http://fisher.usc.edu/exhibitions/looking_into_andy.html)

- Information on the Fisher Museum of Art's exhibit on Andy Warhol's Polaroid Big Shot celebrity portraits.

**The Land List -- Packfilm Cameras**

<http://www.rwhirled.com/landlist/landdcam-pack.htm#BigShot>

- History and information on the Land Cameras, Polaroid Cameras, and Polaroid Big Shot.

**The Nasher Museum of Art:**

[http://www.nasher.duke.edu/exhibitions\\_warhol.php](http://www.nasher.duke.edu/exhibitions_warhol.php)

- Information on the Nasher Museum of Art's exhibit on Andy Warhol's Polaroid Big Shot celebrity portraits.

**UC Berkeley Art Museum and Pacific Film Archive: Andy Warhol: Polaroids / MATRIX 240**

<http://www.bampfa.berkeley.edu/exhibition/240>

- Information on the UC Berkeley Art Museum and Pacific Film Archive's exhibit on Andy Warhol's Polaroid Big Shot celebrity portraits.

**The Warhol Foundation:**

<http://www.warhol.org/collection/aboutandy/biography/#ixzz1k1RAaSvY>

- History and information on Andy Warhol, his life, work, and artistic processes.



**The Wright Center for Science Education: The Camera Obscura and Pinhole  
Photography:**

[http://www.tufts.edu/as/wright\\_center/products/lessons/pdf/docs/activities/camera\\_obscura.pdf](http://www.tufts.edu/as/wright_center/products/lessons/pdf/docs/activities/camera_obscura.pdf)

- Information about the Camera Obscura

**MIA Resources (Bookmarked on the iPad):**

**ArtsConnectEd:** <http://www.artsconnected.org/>

- See Sets: Portraiture: Photography Art Cart; Holga Camera: Photography Art Cart.

**Get the Picture:** <http://www.artsmia.org/get-the-picture/>

- See seven photographers work that are in the MIA's permanent collection. Learn about their history and photographic process.
- See Carl R. Pope, Jr. Who worked with the "toy" camera, similar to the Holga.
- There is a very good glossary that defines many different photographic processes.

**New Pictures Blog:** <http://www2.artsmia.org/blogs/new-pictures/>

- A blog focusing on photographers and photography exhibits at the MIA

**Photography Applications on iPad:**

- Instagram
- Hipstamatic
- Camera bag
- D.I.Y.: Pop Andy Warhol
- 6x6
- Muybridgizer

Note: Please refer to the iPad/App manual for tips on iPad, App, and portable printer use.