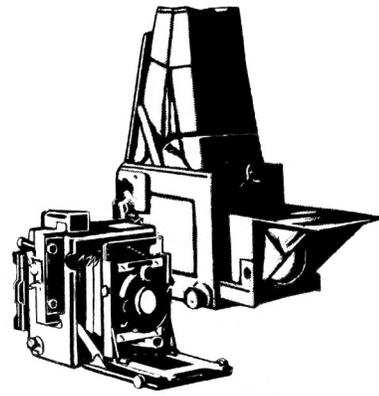


# GRAFLEX HISTORIC QUARTERLY

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SECOND QUARTER 2014

## FEATURES

Flashbulbs in the Darkroom; Using a Graflex Synchronizer Tester, Part 1 by Les Newcomer.....	1
The Mystery 5x7 Naturalists'.....	4
Graflex Advertising by Ken Metcalf with Rob Niederman.....	6
Graflex Products, LLC by Bill Cress.....	7

### FLASHBULBS IN THE DARKROOM; USING A GRAFLEX SYNCHRONIZER TESTER Part 1

By Les Newcomer

Synchronization, simply put, is getting the shutter to open and close when the flash bulb is at its brightest. The difficulty is that the duration of the light output of a typical flashbulb is 50-60 milliseconds<sup>1</sup> and needs about 20 milliseconds to get to half-peak, or 50% light output.

Until mid way through WWII, flash synchronization was achieved by tripping the shutter through a solenoid. The photographer pushed the button on the flash battery case that closed two circuits: one to the flashbulb and one to the solenoid. Linkage in the solenoid delayed tripping of the shutter for about 20 milliseconds, enough to get the flash to peak brightness.

But this linkage was, pardon the phrase, a weak link in the design. Too tight and it wouldn't have enough inertia to trip the shutter, too loose and the shutter would open too late. Links stretched and solenoids shifted during the hard knocks a press camera took. It didn't take much to cause a *weak flash*. Photographers are inveterate tinkers, and it didn't take long for several companies to come up with synchronizing testers, including Graflex.



The Graflex Synchronizer Tester<sup>2</sup> is unique among testers in that it is the only one to use gravity as a standard. The testing was done in two phases, the first a visual to get close and the second using flashbulbs and photo paper to get it right on.

The apparatus consists of a two-piece L-frame, an angled flashlight and special film holder that's been modified and weighted.



In operation, the lens-board is mounted to the tester. The micro-switch on the right is wired to the trip circuit (behind the red button, on the flash), and the solenoid is wired to the battery case normally. A lever on the tester is set to the center, which opens two small holes behind the lens.

The film holder has an oval hole milled through it, and the dark slide has three holes in it. Two are covered with red and blue filters, the center one is left white.

The test is made by turning on the flashlight and dropping the film holder down the back of the upright while looking at the lens. As the film holder falls, it closes the micro-switch that closes the solenoid circuit and trips the shutter. Light from behind the tester illuminates the holes. Graflex instructions say, "If all





is well, you'll see a blue light at the top, white in the center and red at the bottom. A red light at the top or center means the shutter opened early, a blue light at the center or bottom means the shutter opened late." In operation, the colors don't mean a whole lot. If it's not in sync, you won't get three lights. Top, or top and center, means it's early. Bottom, or bottom and center, means it's late.

Before getting too deep in the testing, make sure the solenoid and the battery case are compatible. Graflex originally stated that a No. 2 solenoid was used with 2-cell battery cases, and the No. 3 was used with 3-cell cases. While you can use a No. 2 solenoid with a 3-cell flash (*over voltage*), using a No. 3 solenoid with a 2-cell flash (*under voltage*) is asking for misfires. To complicate matters (*it is Graflex after all*), by the 1950s, solenoids were used mainly for tripping internally synchronized shutters, and Graflex moved to referencing the solenoids (2, 3 and even a No. 0) to the size and trip-strength of specific shutters. For this article, I'm sticking to the earlier designation, a No. 3 solenoid with a 3-cell flash, and a No. 2 for a 2-cell flash.

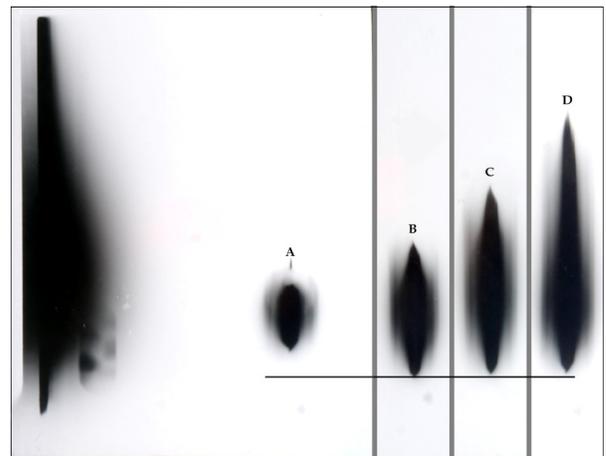
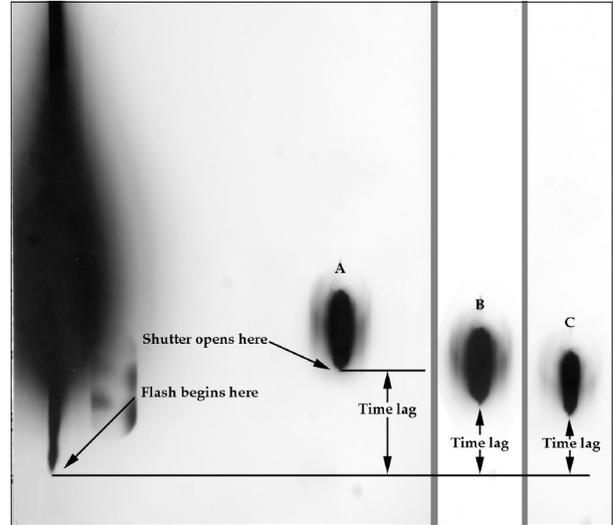
With the solenoid cap screwed on about half way, start by slightly loosening the solenoid mount, and pushing the solenoid up slightly. Now cock the shutter and set it to 1/400. Press the button on the flash unit to trip the shutter, then carefully and slowly pull the solenoid down until it just trips the shutter. This is the base synchronization. Test using the visual method. Further adjustment can be made by pulling it down to decrease the time-lag, or up to increase it.



Phase two requires photo paper and flash bulbs. Back in the day, this was the cost of maintaining your equipment. Today, with the smallest bulbs reaching over a dollar each, this part could get expensive.

Take the equipment into a

darkroom with a safe light. Graflex says to set the shutter to the highest setting. Graph No. 2 suggests 1/200 might be a more accurate setting, as the starting times for 1/200 and 1/50 are the same. Move the lever to its up position. This closes the top and bottom holes behind the shutter, leaving only the center hole. It also uncovers a hole outside of the lensboard. Place the Graflex flash in the hole, and aim the flash (with a bulb) at the shutter. Go dark. Load the paper in the open side of the holder. Close your eyes, and drop the holder.



Graph 1 at top, and Graph 2 at bottom.

After developing the paper, the left side of the paper will have a long black trace that is tapered on both ends. This is the flash trace. The right should have a relatively short black spot. That's the shutter trace. Comparing my trials with that from the Signal Corps instruction book, it seems photo paper has gotten a lot faster in 70 years; what they show as a line with a slight bulge in the center has become something like a line drawn with leaky fountain pen.

Graflex says, "If the shutter trace is centered in relation to the bulb trace, it's 'in sync.' If the shutter trace is low, it went off too soon. If the shutter trace is high, it was too late." If you like to shoot flash at 1/200 or above, then follow their advice. However, Graph No. 2 shows the trace straight from passing the Visual Test. By Graflex standards, it looks early at 1/400, and it certainly isn't centered to the brightest part of the flash. But at 1/50, the shutter is in sync. Mark the solenoid cap with a refer-

ence line. Adjust the sync by either tightening (decreasing time lag) or loosening (increasing time lag) the cap. Before you test with a bulb, make sure the solenoid trips. Extreme adjustments at either end can cause a misfire (flash but no exposure). In which case, you'll need to move the solenoid within its mount. In either case, you're gonna need more flashbulbs and paper.

While this tester was designed for solenoid synchronization, it will work equally well on internally synchronized shutters. However, adjusting those shutters is more of a dark art left to somebody experienced with such things.

Finding a Graflex Synchronizer Tester is difficult. Finding one complete is even harder. The angled flashlight is a TL-122-A issued by the government to just about every GI who wore a uniform. These were later improved (less brass, more plastic) to the TL-122-B and C. A mint condition TL-122-A (*which is what should be found in a Graflex Synchronizer Tester*) is coveted by WWII re-enactors almost as much as Graflex flash units are to fans of "Star Wars." Consequently, they are often missing. That said, any bright light source behind the shutter area will work, but don't pay a high price for an incomplete tester.

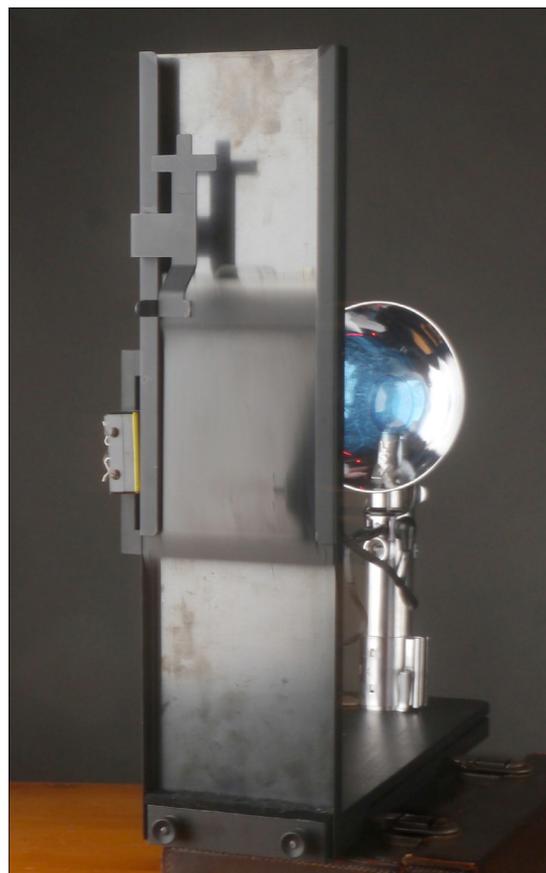
Part 2 - "Life Outside of Graflex" (*Yes, William, it does exist*); The Kalart Synchroscope, the Wilcox Flash-O-Graph and adjusting non-Graflex solenoids.

<sup>1</sup> G.E. Synchro-Press No. 5, 50ms; Wabash Superflash Press 40, 60ms; PHOTO-LAB-INDEX, 8<sup>th</sup> edition, Henry M. Lester, 1946.

<sup>2</sup> The Signal Corps called the tester a *Timer, PH-191-A*, and the War Department prepared a technical manual TM 11-2378, dated 4 October 1944. The U.S. Navy didn't bother giving this one a name. They just rubber-stamped an anchor on the instructions in the box.

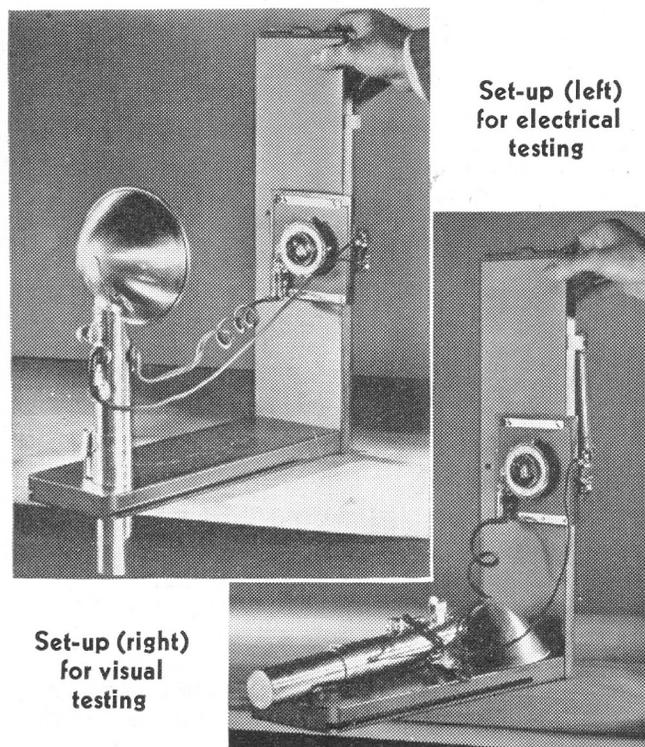
The tester was first shown in a Graflex civilian catalog dated November 15, 1945, with the following "new products" description: "Developed for military use, it is compact but a very serviceable unit.... At present, designed for use with lenses mounted on 4" square lensboard, but can be adapted by the user for operation with smaller lensboards."

The tester (patent 2,353,896) was applied for in 1942 and granted in 1944 to J. A. Sprague, and assigned to the Folmer Graflex Corporation.



Holder dropping during phase two darkroom test.

## GRAFLEX Synchronizer Tester



Pricing Supplement to 1945 Graflex catalog.

## THE MYSTERY 5X7 NATURALISTS'

2013

GEORGE EASTMAN HOUSE

ENCLOSED ARE PHOTOS FOR YOUR USE OF OUR 5X7 NATURALIST GRAFLEX. THE NAME PLATE IS SLIGHTLY DIFFERENT THAN THE ONE ON YOUR WEB SITE.

THE CAMERA IS SLIGHTLY FADDED, HAS A FEW SCUFF MARKS, AND MISSING THE FRONT LID LENS COVER - HAVE NOT SEEN IT IN YEARS. OTHERWISE, ALL THERE IN GOOD WORKING CONDITION. THE LENS IS ZEISS PROTAR SERIES VII F 4.5 11<sup>3</sup>/<sub>16</sub> PAT JAN 8, 1895. BOTH CAMERA BODY AND LENS HAVE SERIAL NUMBERS.

IT HAS ORIGINAL 22<sup>1</sup>/<sub>2</sub> X 10<sup>1</sup>/<sub>2</sub> X 16 CARRY CASE IN FAIR CONDITION, BUT ALL THERE, THE STITCHING IS WEAK AND LEATHER DRY ROT.

THERE IS DOCUMENTATION TO THE ORIGINAL OWNER. THIS WAS A MADE TO ORDER CAMERA. WE HAVE REASON TO BELIEVE THIS IS THE ONLY 5X7 NATURALIST GRAFLEX MADE.

NATURALIST WITHOUT AN 'S' IS SPELLING ON NAME PLATE.



The Naturalists' Graflex was always listed in Graflex catalogs as a 4x5 camera. Over its 15-year life, around 150 were produced. The Graflex production book, however, lists only one 5x7 (serial number 111700), circa 1920.

Last year the George Eastman House received the above unsigned letter, along with some pictures, shown on the following page.

Here is a summary of the highlights in the letter:

- The name plate is "slightly" different from the one on the Eastman House web site, and Naturalist without the "s" is spelled on the name plate.
- The hinged cover for the lens standard is missing.
- The lens is a Zeiss Protar Series VII f/4.5 11-3/16.

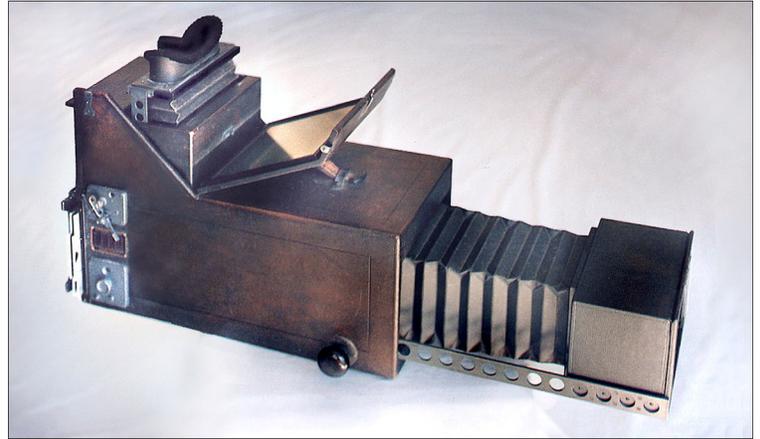
- There is documentation to the original owner.
- This was a made-to-order camera.
- "We" have reason to believe, suggesting others are involved.
- There are serial numbers on the camera and the lens.

Comments on the letter:

- The name plate (speed plate), from known examples, does not refer to the camera as a Naturalists', but as an Auto Graflex.
- The degraded picture of the lens/shutter suggests a Compound shutter with two rows of f/stop numbers, that is, a convertible lens. According to a Graflex catalog, with a front element focus of 11-3/16, the lens would have a rear element focus of 8<sup>3</sup>/<sub>4</sub> and a combined focal length of 5-5/8. With a minimum focal capacity of 12<sup>3</sup>/<sub>4</sub> for the camera, it would appear that the Naturalists' long focus capabilities were not used.



PHOTOS ENHANCED BY ROBERT LANSDALE.



Here is what is known:

- The material was postmarked in Rochester, NY, with an Eastman House return address. A copy sent to a British publishing house used a U.S. stamp.
- The material was sent to both of the copy addressees, with one returned as undeliverable and one received, but with no further action taken.
- The sender has, in general, good knowledge of the Naturalists' camera.

Also unusual, enclosed with the letter was a deckled portion of a US\$1.00 bill; no explanation of its significance was given.

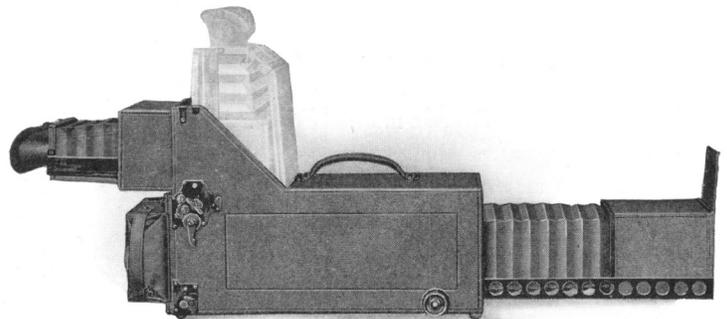
According to the serial number book, two small 4x5 batches were produced after this camera, and a camera from one of these batches, at the George Eastman House, has the pre-1921 flat hardware. This camera has the raised hardware associated with cameras made from 1921 and later. Also, the focusing knob is of the type from the Home Portrait camera.

If the pictures have not been manipulated, it is reasonable to assume that the camera is authentic and different from all other Naturalists'. If a picture of the camera serial number were available, that would be conclusive evidence.

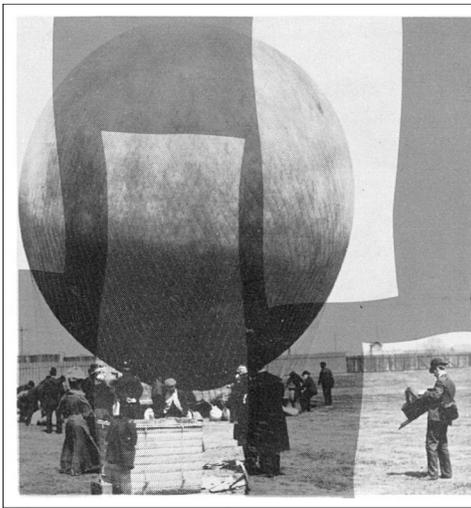
It is not known why this intriguing information was sent to the Eastman House and others in an anonymous form; however, it is of value, even at this level of disclosure.

If Quarterly readers have any information about this camera, please get in touch with Les or Ken. If the owners read this article, the Quarterly would like to have more information to share with our readers.

Also, depending on the details, George Eastman House may be interested in acquiring the camera. Contact Todd Gustavson at: George Eastman House, 900 East Avenue, Rochester, NY 14607.



4x5 Naturalists' Graflex from 1921 catalog, for comparison to the possible 5x7 Naturalists'.



## ON THE COVER

Typical of the millions of photos that have been taken with Graflex-made cameras is our cover illustration. Here is the free balloon "Philadelphia II" being prepared for ascension in Philadelphia during the year 1895. In the right foreground you see Mr. W. N. Jennings preparing his Graflex single lens reflex camera to record this event for his contemporaries and for history. The original picture is from the Graflex exhibition "Graflex Remembers."

## GRAFLEX ADVERTISING

By Ken Metcalf  
with Rob Niederman

Was Graflex advertising truthful? If not, was it deliberate, and what were the consequences?

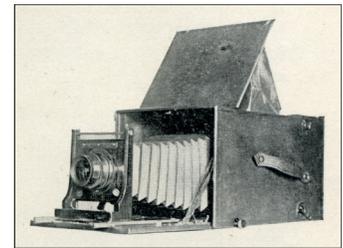
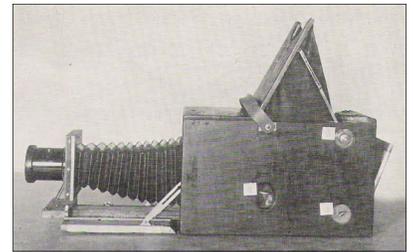
While doing research for the article on Arthur Princehorn, the above captioned picture was found in the October 1957 issue of Grafolks (a Graflex in-house publication). Earlier, in a February 1951 edition of Grafolks, the picture was shown and a flight date of 1902 given. The picture was also widely used in a traveling exhibit called "Graflex Remembers." To quote Grafolks: "Typical of the millions of photos that have been taken with Graflex-made cameras is our cover illustration. Here is the free balloon 'Philadelphia II' being prepared for ascension in Philadelphia during the year 1895. In the right foreground, you see Mr. W.N. Jennings preparing his Graflex single lens reflex camera..."

### Was either date correct?

From two period articles found by Linda Grimm and Les Newcomer, it appears that the Philly I was around in 1908, and in a June 1909 issue of Aeronautics magazine, the Philly II was under contract to be built. 1895 is way too early, as neither Folmer nor Princehorn had anything in writing about their cameras at that date, and 1902 is possible, as both Folmer and Princehorn had published information about their cameras.

### Was Mr. Jennings the photographer?

Very little is known about Mr. Jennings, but according to the Franklin Institute (<http://learn.fi.edu/learn/case-files/jennings/>), he was taking lightning pictures around 1893 to 1895 with a 4x5 Scovill camera, fitted with a Waterbury lens. Also from the files of the Franklin Institute, Mr. Jennings wrote that he took balloon photographs of Philadelphia as early as 1893, although the balloon name was not recorded. Graflex states that Jennings was taking "news of the day" pictures, although the record so far showed that he did only scientific work. Lacking a picture of Mr. Jennings with the camera in the ad, there is not enough evidence to conclude that he was the photographer. The closest camera to the Waterbury-fitted Scovill camera Jennings describes (<http://www.antiquewoodcameras.com/watr-ad.html>) is not close to the camera pictured in the ad.



Clockwise from top left, Jennings camera, Princehorn camera and 1903 Long-Focus Reflex camera.

### Was the photographer holding a Graflex?

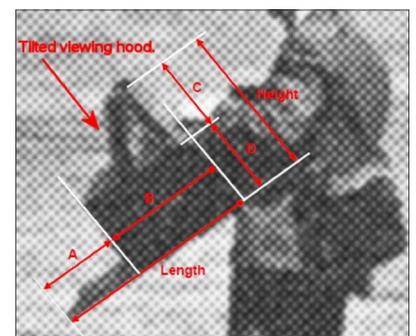
This question was put to Mr. Princehorn's grandson and to camera collector and historian Rob Niederman.

James Princehorn performed a measurement comparison of the Jennings and Princehorn cameras and found a variance of only 5%. However, many cameras of this era had similar designs and were very close in their physical sizes.

Rob Niederman ([www.antiquewoodcameras.com](http://www.antiquewoodcameras.com)) dug deeper and made a careful assessment of the design and construction details of other cameras similar in design to what is seen in the Grafolks image. In addition to three different Princehorn cameras, Rob examined commercially available models by the Reflex Camera Company. As there was no Graflex camera that was remotely close to the pictured camera, it was eliminated.

According to Rob:

"A comparison of the Princehorn and Long-Focus Reflex cameras to the apparatus shown in the Jennings image can be summarized as follows:



- All three cameras have a front drop bed held in place by a pair of angled metal supports. This is a traditional design.
- All three cameras have a viewing hood; however, the Jennings camera's leather hood has pleats similar to the Long-Focus Reflex. In contrast, the Princehorn camera's leather viewing hood is supported by metal brackets, and its body-door has a concave viewing port that is not seen on Jennings' camera.
- Both the Jennings camera and the Long-Focus Reflex cameras also have the following design elements in common:
  - o An angled hand strap mounted on the body side.
  - o A pair of raised, widely spaced focusing rails on the front drop bed (difficult to see in the Jennings' image but it's there).
  - o Mechanical knobs on the side of the body located at the top rear (upper right) and bottom front (lower left) of the side body.

In looking closely at Jennings' hands, it appears he is manipulating something (i.e. a plate holder) at the top-rear of his camera. The Long-Focus Reflex is a top and side loading camera. The examples of Princehorn cameras I've seen all appear to have a solid wood piece across the top rear and is side loading. Unfortunately, Jennings has not extended the front standard that would allow us to examine its design in detail. Front standards are like fingerprints and very distinctive. As shown in the images, the Princehorn and Long-Focus Reflex front standard designs are quite different, and it would be beneficial if another image of Jennings' camera with the front extended could be found.

Although the front standard of Jennings' camera is not shown, adding up the other design elements leads me to believe that the Long-Focus Reflex is a very close match. No other reflex mirror commercial camera of this time period closely matches the apparatus Jennings is holding. Yet there is still a remote possibility that Jennings was using a new design or custom build. Yet, if we consider that a professional photographer would prefer to use reliable equipment on an important shoot, the Long-Focus Reflex camera would be a very good choice.

The creation of Princehorn's camera and how it fits into the pantheon of turn-of-the century single lens reflex plate cameras is its own fascinating story. Yet, in researching the story of Jennings and his camera, two conclusions can be made. First, the Grafolks image appears to be completely misattributed, because history notes that the Philadelphia II actually flew in 1909-10, as opposed to Graflex's claim of 1895 and 1902. Second, even as the Graflex company was making single lens reflex cameras by the time of the Philadelphia II's flight, none of the company's reflex cameras have a body pattern similar to what is seen in the Grafolks' photo. More so, as a working professional, Jennings would probably rely on a proven commercial apparatus. Although a careful assessment of the design indicates that Jennings possibly used a Long-Focus Reflex camera instead of a Graflex, maybe another image of Jennings and his camera will be found to close out this fascinating story."

In conclusion, it is possible that the ad agency looked at "Folmer's first model Graflex" in the company's collection, which to the untrained eye looked like the camera in the picture and looked at some other source, where they found the date "1895" and wrote the caption. I don't think it was deliberate, but it did create a problem for those interested in Graflex history.



## GRAFLEX PRODUCTS, LLC

By Bill Cress  
President, Graflex Products, LLC

Cress Photo was established in 1983 to provide photographers, scientific testing, the military, the film industry and other organizations access to older technology that was not available anywhere else. These items consisted of new old-stock photographic flashbulbs, classic press cameras, as well as repair parts and access to my extensive library on the subject.

Why flashbulbs? Because nothing produces the quality and quantity of light generated by a small flashbulb. They are small, portable, easily fired and relatively inexpensive for the effects they create.

Then in March of 2006, I purchased and registered the name "Graflex" and formed "Graflex Products LLC." The name had been owned by many major companies over the years, but it was abandoned and available, so I acquired it for my use.

Graflex had always produced top-quality products, and we have continued in that tradition.

The products we custom manufacture can be seen at [www.graflexllc.com](http://www.graflexllc.com).

## Graflex Historic Quarterly

*The Quarterly is dedicated to enriching the study of the Graflex company, its history, and products. It is published by and for hobbyists/users, and is not a for-profit publication. Other photographic groups may reprint uncopyrighted material provided credit is given GHQ and the author. We would appreciate a copy of the reprint.*

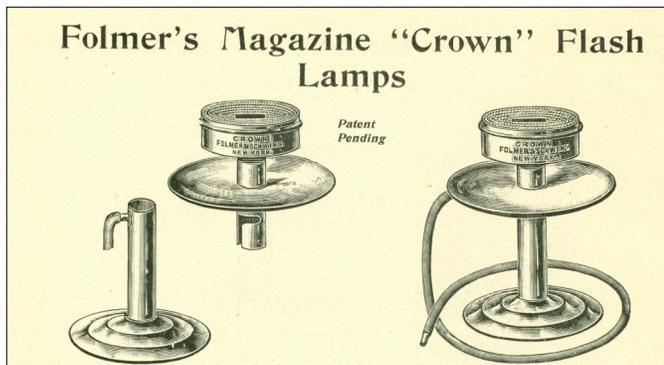
Presently they consist of the first new flashpan using flashbulbs in 30± years, The Big Red Flash (above).

Also, we custom manufacture classic flashpans, the Graflash 1 and 2, that use flash powder and other materials to create the early photographer look of the 20s and 30s, when there was nothing else available.

We have used our 50+ years of experience to create some of the most unique products that recreate what was available back in the day.



.....and in 1906.



1904 Folmer & Schwing Mfg. catalog.

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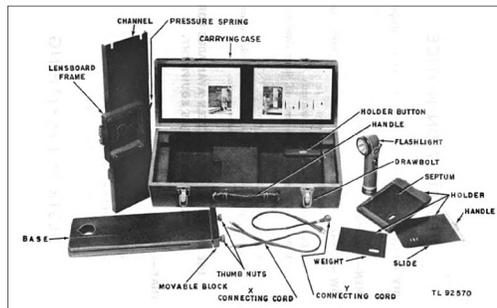
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### October 10-12, 2014, PhotoHistory XVI George Eastman House Rochester, New York

PhotoHistory XVI, back after a three-year layover, will present a full day of lectures on the history of photographic practice, aesthetics, collecting, technology and sociology, followed by a full day of browsing and buying of that illusive collectible at a photographic trade show, which attracts dealers from across North America and internationally. Many dealers are now downsizing, so you can acquire that rare item. Definitely a "must-attend" event. For more information, see the Society's web site at <http://www.tphs.org>.

Jim Chasse has a Graflex Synchronizer Tester (without the flash) for sale. If interested, call Jim at 978-387-8387 for further details and price.



Timer, PH-191-A manual page.