Graflex Historic Quarterly

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The Enlarging, Reducing and Copying Camera

Part 1

By Thomas Evans

The "Crown" Enlarging, Reducing and Copying Camera



Figure 1.

At least as early as 1899, Folmer and Schwing catalogs listed two models of the ERC Camera, the "Crown" (Figure 1) and the "F & S" (Figure 2), and described them as being: "made very substantial and compact, which is a great convenience in shipping or storing away when not in use. The rear section of the bellows is made much longer than the front, which is a decided advantage for enlarging work. The opening in front and center compartments being the same size, makes the lensboard interchangeable, and may be used in front as a copying camera, with an extra long draw of bellows, or set in the center compartment for enlarging or reducing. The center compartment has both front and rear rabbets, which allows the operator to bring the lens closer to the negative when enlarging."

The difference between the two models was that the Crown had front rise and fall and side shift, while the F&S added tilt to the front,



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which also 'oscillated,' or rotated somewhat around the center point. When copying a negative or transparency, the combined movements of the front would allow "an operator to produce straight-lined lanternslides from very crooked negatives." The Crown was available in four formats, from 8x10 to 18x22-inch, while the F&S was available in 8x10 and 11x14-inch only, and both offered "Special sizes made to order." "Reversible Center Adapter" camera backs were offered to step down to smaller formats, from 16x20-inch plates down to $3\frac{1}{4} \times 4\frac{1}{4}$ -inch, or 'quarter-plate.'

The F. & S. Enlarging, Reducing and Copying Camera



Both cameras were delivered "with a full set of reversible front kits, which hold any size plate from lantern-slide up." The nesting 'kits' were a series of wooden frames in standard formats which accepted the frame of the next smaller format. The 8x10 ERC Camera had an 11x11-inch square lensboard. The 11x11 kit accepts the 8x10-inch kit, which accepts the $6\frac{1}{2} \times 8\frac{1}{2}$ -inch (full plate) kit, which accepts the 5x7-inch kit, which accepts the 4x5-inch kit, which accepts the $3\frac{1}{4} \times 4\frac{1}{4}$ -inch, quarter-plate kit. The kits are held in place by 'finger springs' which would also hold the plate in place. Therefore, it is possible to fit

a glass plate negative in the front of the camera, the lens in the center compartment, and the desired format of plate or film in the back, in order to enlarge, reduce or copy 1:1. The most common use of this camera appears to have been to make positive lantern slides (quarterplate) from negatives, and a special camera back was offered for this purpose (Figure 3). This back 'oscillated' to allow image straightening, as well as having rise and shift.



Figure 3.

The 11x14-inch ERC Camera (Figures 4 & 5) has a bellows extension of seven feet, and with an 8¹/₄-inch (209mm) lens used with full extension, one can produce a seven-times increase in size on the film. That is, a two-inch long object can be enlarged to 14 inches long on the film. Referring to this camera as "substantial and compact" is rather charming.



Figure 4. 11"x14" F&S ERC Camera, serial number 45416, dating from about 1915.





Figure 5. 11"x14" F&S ERC Camera serial number 45416 in vertical position.

While the Enlarging, Reducing and Copying Camera was available in two models and eight standard formats during the early part of the century, the choices soon diminished. Based on entries made in the Graflex serial number book, the last 20x24-inch ERC appears to have been made in 1915, and the last 11x14-inch Crown ERC, and the last F&S ERC cameras of any format, appear to have been made in 1920. The 8x10-inch Crown ERC continued to be made until 1953. As seen in the Folmer & Schwing Laboratory Apparatus catalog of about 1915, and the Eastman Professional Photographic Apparatus and Materials catalog of 1927, a 5x7-inch version of the ERC was made as the "Century Lantern Slide Camera." The 5x7-inch ERC was also available as part of the "F&S Universal Laboratory Outfit," with a stand, for photo-micrographic, lantern slide, and copying work.

The ERC camera was shown in the 1947 Navy Training Courses, Photography Vol. 1 as "The copying camera." In the illustrations from that publication, one can see the ERC camera mounted on the F&S Tilting Laboratory Stand, and a 'nest of kits' is also clearly visible. Although the text discusses the 8x10 model, the illustrations appear to be of the 11x14 model.



The Navy text has this to say about the camera: "You will find specially designed copying cameras in all the larger laboratories where this work is done. The camera used most frequently is the 8x10 enlarging, reducing, and copying camera shown in figure 80.



A bed which can be extended to 7 feet 4 inches carries the easel and the copying camera. The bed is mounted on a stand arranged so that it can be swung through an arc of 180 degrees and locked in any desired position. By this means, the camera can be used in either a vertical or horizontal position. The entire camera can be moved along the bed by a crank-operated worm gear.

The body of this camera is in three sections that slide along the camera bed. The sections are connected to one another by bellows. The back section is fitted with an 8x10 removable ground glass focusing screen and accepts 8x10 sheet film holders. The front section is designed so that it will accept a lens mounted on a large lensboard. There are sliding, rising, and falling movements which enable you to adjust the composition of the image on the ground glass.

It's also possible to insert a holder for negatives in the camera front. If you do this, you must place the lens in the center section, and then your camera becomes a lantern slide camera or a camera for making film positives from negatives. There's still another use for the camera when the lens is placed in the center section. In this position, the lens provides a short bellows extension which is necessary in copying large originals or originals which must be produced at a small scale.

There is an easel at the forward end of the track that has adjustable clips for holding an original as large as 10 inches square. The total construction of this copying camera insures parallelism between the copy and the film plane, and perpendicularity of the lens axis with the film plane."

While William Folmer invented many versatile and useful cameras, and Folmer & Schwing manufactured the ERC camera for many years, he did not invent the ERC camera.

In an article appearing in an 1886 issue of the journal, The Microscope, William Henry Walmsley describes a camera which he designed to facilitate the making of photographs through a microscope. or 'photo-micrographs' (Figures 6 & 7). He wrote: "The instrument in its present form is simple, compact, and most perfectly adapted to every description of Photo-Micrographic work, with high or low powers. It is substantially constructed of mahogany; the body being square, and carrying a single dry plate holder, which permits the use of a $4\frac{1}{2}$ x $5\frac{1}{2}$ or $3\frac{1}{4} \times 4\frac{1}{4}$, vertically or horizontally, as may be necessary... the front of the camera is removable, and carries either a board to which a lens may be secured for ordinary photographic purposes, copying, etc.; or a short cone to receive the tube of the microscope. The bellows are in two sections, with a centre division of mahogany, and a total extension of two feet; which is sufficient to give a range of magnification from 100 diameters to 230, with a one-fifth inch objective...The bellows slide smoothly upon V ways, and are secured at any desired point, by means of a cam operated by a lever, convenient to hand. For greater portability, and also for convenience when using powers requiring only a short extension of the bellows, the frame upon which they slide is made in two sections, which can be readily and firmly united by means of a stout thumb screw."



Figure 6. Walmsley's Photo-Micrographic Camera.



Figure 7. Walmsley's Photo-Micro Enlarging, Reducing, and Copying Camera.

In Andrew Pringle's 1890 book <u>Practical Photo-Micrography</u>, published by the Scovill & Adams Company, both Scovill's 'Enlarging, Reducing and Copying Camera,' and W. H. Walmsley's 'Photo-Micrographic Camera' (the latter made by the American Optical Company) were advertised. The ERC camera was offered in eight formats, from full-plate up to 20x24-inch, with the option to have special sizes built to order! (Figures 8 & 9).



Figure 8. Scovill's ERC Camera.



E. & H. T. Anthony's 1891 <u>Illustrated Catalog of Photographic Equipment</u> offered the Climax Enlarging, Reducing and Copying Cameras in nine formats, from 4x5-inch up to 20x24-inch. The cut used in Anthony's catalog (Figure 10) is surprisingly like that used in the Scovill advertisement shown above (Figure 8).

> Climax Enlarging, Reducing and Copying Cameras.

THE form of construction of this new camera is made apparent by the illustration here shown. The experienced copyist will not need any such simple directions for use as we append.



Figure 10. Climax ERC Camera, E. & H.T. Anthony & Co.

Part 2 will continue the history of the ERC, including its manufacture by Folmer & Schwing.

References:

1899 Catalogue and Price List of Photographic Apparatus, Folmer & Schwing Mfg. Co, pp. 3334.

Graflex serial number book, pp. 1, 13, 16, 31, 63.

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- Pringle, Andrew. 1890. <u>Practical Photo-Micrography</u>, Scovill & Adams 3 Company, New York, NY. pp. v-vi.
- Illustrated Catalogue of Photographic Equipments and Materials for Amateurs 1891, E. & H. T. Anthony & Company, John Polhemus Printer, New York, NY. Reprint 1980 Morgan & Morgan Inc. NY. pp. 22-23.

Figure 9. Walmsley's Photo-Micrographic Camera.



GRAFACTS.....

The New Graflex Strobomatic 500 Electronic Flash System

1968-1973

Copyright William E. Inman, Sr.

In 1968, the same year the Singer Company acquired GPE/ Graflex, they introduced a new electronic flash system. The first of the new electronic flash units was the Strobomatic 500, which consisted of a Lamphead, a Power Pack Top and three Power Pack Base units.

The Power Pack Top was provided with four pushbutton switches: off, ¹/₄, ¹/₂, and full power (50-, 100- and 200-watt seconds), which were color-coded black, white, yellow, and red. The power top had two recessed outlets for lamphead cords, one at each end. If two lampheads were used, it divided the power equally.

There was a choice of three bases for the Power Pack Top:

1. The **HV Power Pack Base** was supplied with a 450-volt Eveready dry battery #496. The battery would deliver approximately 1,000 to 3,000 flashes, depending on the power level.

2. The **RG Power Pack Base** was supplied with a General Electric rechargeable nickel cadmium battery. The battery delivered approximately 150 to 300 flashes per charge, depending on the power level selected. Battery life was approximately 25,000 flashes.

3. The **AC Power Pack Base** was powered by a 117-volt AC transformer and a rectifier circuit which produced high voltage to the power top.

The Eveready 450-volt battery and the General Electric dry battery are no longer available, thus leaving the AC unit as the only useable option.

The Strobomatic 500 Lamphead offered unique features:

1. Built in the lamphead, and recessed behind the flashtube, was a photocell which turned the Strobomatic 500 into a "slave" with the flick of a switch, which was located on the back of the lamphead. This feature eliminated the need for an external slave cell on the lamphead.

2. Also located on the back of the lamphead was an exposure calculator dial. It was cross-referenced to the power top selector switch to assist in selecting the correct f/stop.

3. On the top of the lamphead was a red button for "Open Flash," which made light-painting a scene easy.

4. A Lamphead Ready Light indicated the capacitors were 85% charged, ½ f/stop below being fully charged. Full charge was reached in another one to three seconds.

5. A Wide Field Deflection Lens was available that could be fitted to the front of the lamphead which increased the coverage from 52° to 80° , but reduced the light output by $\frac{1}{2}$ -stop. The Strobomatic lamphead had a smaller concentrated reflector ($3\frac{1}{4}$ ") than the Stroboflash's $5\frac{1}{4}$ " reflector. See <u>GHQ</u> Volume 13, Issues 1 and 3.



6. The Strobomatic Lamphead featured a tripod socket that allowed the use of the Rubber Battery Case Adapter (included with the unit), or aluminum adapter, for mounting on cameras, mounting tubes, the xl flash bracket, and "L" and platform brackets.

The Strobomatic 500 had a very good recycling time, HV and AC units - 2 to 9 seconds, and the RG unit - 3 to 10 seconds. The flash duration was 1/1900 to 1/850. The lamphead was made of Cycolac, a moisture-proof, light-weight, and high-impact plastic for maximum reliability.

The GPE/Graflex lamphead underwent a design change under the Singer/Graflex label, from a silver aluminum back cover to a black molded housing assembly and a bubble-type ready light cover, instead of a flat cover, for easier viewing.





There were some great additional side features:

1. A special seven-foot coiled cord (catalog number 2256) was used to adapt Stroboflash Lampheads to Strobomatic 500 Power Packs, to adapt the Stroboflash Battery Analyzer and the SR Battery Booster to HV and RG Power Packs, and to adapt Stroboflash extension cords to the Strobomatic 500 Power Pack.





Stroboflash Lamphead with Strobomatic battery.

2. The Globe Strob 500. The bare tube flash unit was introduced in 1971. Average conditions required opening the diaphragm 2 f/stops.

3. The Globe Strob 250 and the Strob 250 Flashguns, also introduced in 1971, worked on the Strobomatic 500 Power Pack. Since the 250 units contained capacitors in the handle, this feature added more light output (50- to 100-watt seconds) to the 200-watt second power pack, depending on whether you added one or two 250 units to the power pack. This is a littleknown feature.

In 1971 Singer/Graflex introduced a **Strob 500 Portable Lighting Outfit**, an "on-the-spot studio-in-a-second for the pro on the go."



5

The outfit consisted of a Strob 500^{*} (HV, RG, or AC unit)

- 1- Extra 500 Lamphead
- 2- Pic Feather Lite Stands with Adapters
- 2-27" Reflectasol Umbrellas
- 1- Wide Field Deflection Lens

2-20' HV Extension Power Cords; 1- 25' Sync Extension Cord and 2- 3' DIN or PC Cords

1-Vulcanoid Carrying Case

^{*}The Strobomatic 500 name was changed to Strob 500 in the 1971 Singer/Graflex price schedule and advertising literature and probably later on the units themselves.

Lenzar Optics purchased most of Graflex's electronic flash line in 1974, along with other accessories, and attempted to market the flash products under the name of Graflite with little success, and they eventually went under in 1982.

In 1971 Singer/Graflex introduced the Strob 250 and Strob 350. These Strob units, along with some new Strob accessories, will be covered in the next issue of the <u>Graflex Historic Quarterly</u>.

1968 GPE/Graflex Strobomatic 500 Instruction Manual

1968 GPE/Graflex price list.

- 1971 Singer /Graflex literature
- 1973 Singer /Graflex literature
- 1974 Lenzar Optical news release
- 1974 Lensar Graflite Photo Products catalog

Strobomatic 500 units in author's personal collection





The Teakwood Graflex



A "tropical camera" is generally defined as one that was produced to withstand high temperatures and humidity, especially a camera that was promoted for this purpose. One of the most interesting examples is the Tropical Model Soho Reflex c. 1932 shown at right^{*}. Is the similar-looking Graflex camera shown above a tropical model or something else? This 3¹/₄ x 4¹/₄ R. B. Auto Graflex is made of clear-coated teakwood, satin chromeplated hardware, red leather bellows, and a red leather hood. It is fitted with a Wollensak Raptar lens in a Synchro Matic Alphax shutter.



Stories have long circulated about a tropical Graflex or Graphic camera. Prior to the Combat Graphic of the Second World War (<u>GHQ</u> Volume 10, Issue 2), some crude non-Graflex attempts have been produced and sold. Prior to and after the Combat Graphic, the Speed Graphic was a standard issue combat camera, even though, as stated by Peter Maslowski in <u>Armed with Cameras</u>, "Another problem was that it had a bellows and other parts, which were susceptible to fungus growth."



Combat Graphic.



Fake tropical Speed Graphic.

The story of this teakwood Graflex initially began in 1935 but was not updated until 1968, when a Rochester-area camera collector attended a house sale held by Hod Schumacher, a prominent retired vice president at Graflex. Arriving at the sale, he saw two cameras, a nicely finished red hood and bellows Graflex and a Super Graphic. He purchased the Graflex and passed on the Super.

As a way of providing provenance for the camera, he requested a letter about the camera from Mr. Schumacher and received the letter reproduced here.

From Graflex's founding, they made many special order cameras. Regarding this camera, factory records show an order for 100 Revolving Back $3\frac{1}{4} \times 4\frac{1}{4}$ Auto Graflex cameras was posted in April 1935, then it was listed as a single item (serial number 188,639) in August 1935, and, finally, six more Autos were posted in September 1935, all with the same job order number – 7664. Which serial number, if any, was given to the first of the two cameras is not known. According to Tim Holden, teak was hard on their cutting blades, and the factory was not too happy making the cameras. As no specific mention of the special nature of the camera was made, it is possible other such cameras of this type were produced at other times, but, so far, no other camera has surfaced with the degree of care and craftsmanship shown in this camera.

As indicated in the attached letter, this camera was used as a "showpiece" by Graflex for some time after it was made. For this reason, it appears that the lens and shutter were updated from the one originally fitted to the camera.

Because of the use of a Raptar lens, which was a renamed Velosigmat (based on a contest in 1945), and the "coated lens" designation on the lens, the lens and shutter were made at least as late as 1945. Also, the ASA "Bi-post" flash contact suggests the later production date. Interestingly, Graflex listed only a leaf shutter for this camera for part of 1940, and it was a Kodak Anastigmat in a Compur shutter. As this camera was taken to shows for a number of years, it is quite understandable that Graflex would update or add the shutter for a more modern appearance.

Although similar in appearance to the Tropical Soho, I don't think it was made as a tropical camera, but it is an outstanding example of Graflex craftsmanship and pride. KM

*Photograph courtesy George Eastman House Technology Collection and Curator Todd Gustavson. Teakwood Graflex photographs courtesy Bob Lansdale, The Photographic Historical Society of Canada.





- 2 -	June 4, 1968	to build for him on special order a camera like the $3\frac{1}{2}x4\frac{1}{4}$ RB Auto Graflex which he had so successfully used on his trip excepting that he wanted it built out of teakwood and wanted it equipped with a red leather bellows and a red leather focusing hood; and he wanted all of the metal parts to be satin chrome- plated.	You will readily understand that at the very depth of the depression in 1932, this constituted a rather unusual request. When Mr. Atterbury was asked about a source for the teakwood he volunteered that he had brought some back with him from India. When he was asked if perchance he had enough available for two of the cameras such as he described, he ventured that he thought he might have, since he had brought back enough teakwood to re-deck his yacht, and he also planned to do over the complete interior of a shooting lodge of his.	When it was then suggested to him that if he would supply enough teakwood so that two of the cameras such as he desired could be built and if he would pay the actual manufacturing cost of the two cameras, one would be turned over to him for this aggregate cost while the other would be retained by Graflex as a showpiece. He was delighted with that proposal and that was the source of this beautiful teakwood Graflex camera which you now possess.	Whether or not Mr. Atterbury kept the mate to your camera for any length of time or whether or not his heirs ever realized what it was if it ended up in his estate, we have no way of knowing. The prob- ability is that it has long since disappeared. The further probability is that you have the only one in existence although I must fore- warn you that there were actually two of these unique cameras built but only two.	Confident am I that this addition to your very extensive camera collection is a worthy one and a unique one. I personally am happy to have it move into your hands. Sincerely,	1pw	
	Howard A. Schumacher 865 Allens Creer Road	Коснавтак 18. Мжw Yовж June 4, 1968	Dear Mr. After I made the hard decision to break up my photographic equip- ment collection, it was particularly gratifying to have you in sole	possession of the one camera in my assortment which has some- what more than casual background attached to it. As I told you, when I retired from Graflex Inc., where I had served as an officer, director and President of their Canadian and overseas operations for so many years, my associates there were kind enough to stage a memorable retirement party for me. Among the many gifts which were presented to me that evening	When I left the Kodak Company to join the Graflex or agains and a very special $3\frac{1}{4}4\frac{1}{4}$ then the newest product in their line; and a very special $3\frac{1}{4}4\frac{1}{4}$ to this latter camera that I should like to afford you a bit of docu- mentation. When I left the Kodak Company to join the Graflex organization in 1932, it was almost coincident with the visit to the then Folmer	Gratlex Corporation by a very wealing genuteman from the greater New York area by the name of Atterbury. It is my recollection that Mr. Atterbury was at that time a very prominent member of the New York financial community and I believe that at that time he was also President of the New York Central Railroad.	In any event he came to the plant in Rochester shortly after re- turning from a trip to the Far East which included tiger shocking in India and extensive picture-taking with a well-used $\frac{34}{2}$ x4 ⁴ RB Auto Graflex throughout his journey. His interest in coming to the plant in Rochester was to ascertain if the company would be willing	

Graflex Historic Quarterly

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Any subscriber wishing to place a want ad or seeking Graflex-related items may send them to the <u>GHO</u> for inclusion at no charge (at this time). The editors reserve final publication decisions.

Ontario Legislative Building, Queen's Park, Toronto 1919, showing Press Graflex and cine cameras, courtesy Bob Lansdale. The "I" in the photo is Roy Tash of the Associated Screen News. Roy is standing with a cine camera at the extreme left. Other notable Canadian photographers are Fred Davis, seated on the front row on the left; with a cap on the left, sports photographer Nat Turofsky; standing: to the right of Roy is Frank O'Byrne, two over is writer Ken Edey, then Charles and Len Roos in the center. At far right is William James, whose photographic collections of Toronto and events have become a noted history resource.

The credit stamp on the photograph is "Canada Pictures Limited, 493 Davenport Road, Toronto, Neg #5892."

Editors: Ken Metcalf and Les Newcomer

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Contact:

Ken Metcalf 94 White Thorn Dr. Alexander, NC 28701-9792 E-mail: metcalf537@aol.com

Les Newcomer 33922 Grand River Avenue Farmington, MI 48335-3432 E-mail: LNPhoto@twmi.rr.com

