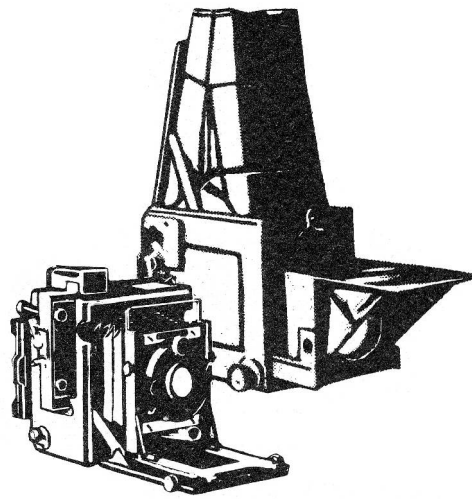


GRAFLEX HISTORIC QUARTERLY



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Flashbulb Basics

By Bill Cress

Why would anyone today want to use flashbulbs in our modern hi-tech world?

Surely there are many alternatives to this antique method of illumination. Well, guess what! There are none at a reasonable cost. Nothing produces the quality and quantity of light generated by a flashbulb. Small, portable, easily fired and relatively inexpensive, flashbulbs are able to provide a tremendous amount of illumination from the palm of your hand. Certainly, there are electronic flashguns, lasers, and other hi-tech methods of producing light, but they simply don't match the size and characteristics of a simple flashbulb. This article will provide you with some of the basics necessary to begin or continue your exploration of flashbulb usage.

As a first step, you need a basic understanding of photography, manual camera operation, flashbulb specifications and lighting application. This is not as difficult as it may appear. All flashbulbs have a rated guide number (GN) determined by the original manufacturer. This is a subjective number that is only a starting point for you to refine and determine your own working GN based on equipment, locations, etc. At various times, manufacturers assigned different guide numbers to the same bulb depending upon manufacturing, raw materials, testing and marketing requirements.

The guide number is affected by the bulb type, reflector type and size, shutter speed, wall and ceiling color, vol-

ume of room, etc. You need to perform a variety of test shots to arrive at your own working guide number for a particular type of bulb using your equipment. To start using the manufacturer's guide number is all right, as most films have enough latitude to compensate for some of the variables. Guide numbers can be obtained from various old photography literature, manufacturers' photo lamp data guides and on the www.flashbulbs.com website.

Once you have the guide number for the flashbulb and film speed (ISO/ASA) you are using, you are ready to determine your f-stop. If your shutter has an M setting, you can shoot at any shutter speed up to 1/500sec. If it has an F setting and you are using focal plane bulbs, you can shoot up to 1/100sec. If the camera is newer and has only an X setting, you will need to set your shutter speed to 1/30 sec. or slower. Should you use a faster speed on the X setting, the flashbulb will not synchronize with the shutter, and a part of your image area will be black.

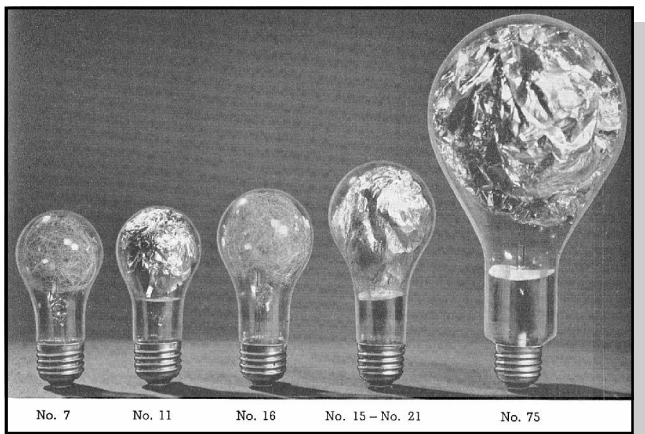
F-stop is determined by dividing the distance from your lens to the subject into the guide number.

$$f\text{-stop} = \frac{\text{Guide Number}}{\text{Distance to Subject}}$$

For example: Using ISO 100 color film and blue AG1 flashbulbs with a shutter speed of 1/25sec, a subject distance of 10 ft., a guide number of 140, and a distance of 10 ft. $\frac{140}{10}$ f-stop = 14.

Since your shutter probably doesn't have a setting at 14, set your f-stop to the next higher available value, which is f11.

In their heyday, a half billion flashbulbs a year were manufactured in many parts of the world, such as the USA, Japan, Europe, Korea and China. Today the only remaining producer is Meggafash Technologies Ltd., in the Republic of Ireland. This company manufactures 3 bulb types: PF200, PF300 & PF330, using the same equipment that Sylvania used in the 60s. Meggafash's high quality bulbs are the relative equivalent of the older Number 22, 3, and FF33.



The General Electric Company introduced the first commercially available flashbulb in the United States in 1930. The No. 20 Photoflash lamp contained several sheets of very thin (0.4 to 0.45) ten-thousandths inch aluminum foil. It had a light output of 45,000 lumen-seconds. The smallest individual flashbulb made was the AG1 (GN 150, ISO 100 @ 1/30sec, 7000 lumen seconds of light). The largest was the Mazda 75 unsynchronized (used only with the open flash technique) 180,000 lumen seconds of light. The No. 3 bulb manufactured by Sylvania was the largest synchronized bulb commercially available. It had a GN of approximately 550 and provided 110,000 lumen seconds of 3800k-color temperature light.

You can see that there is a flashbulb for virtually every application imaginable. Light produced is what determines the cost of a flashbulb, so it is important that you choose a bulb based on your intended application. Since smaller light output bulbs cost less, pre-planning will be cost effective.

Many flashgun models were made to fire flashbulbs. Companies such as Minolta, Canon, Nikon, Graflex, Heiland Research, King Sol, Honeywell, Zeiss Ikon, Linhof, Kodak, Kalart, Waltz, Accura, Mendelsohn, Zenobia, Abbey, Samigon, and Agfa all produced devices that let you use flashbulbs with your camera. Today, all of these items are still available. They can be found listed in the classified section of classic camera magazines, at camera shows, at older photo dealers' shops, on eBay and by searching the Internet. New sync cords for your older flashguns can be obtained from Paramount Cords, Bronx, New York.

The majority of the older flashguns used standard flash-light batteries for power, either AA, C, or D cells. The B-C models used either 15V or 22½V batteries that are still available. There are many adapters available which allow you to use various sizes and different base bulbs in one flashgun. Screw-base bulbs can be used in a bayonet base flash and vice versa; an AG1 glass base or an M3 miniature base can be adapted to any gun. Phillips European flashbulbs can also be adapted.

What kind of an image can you expect by using flashbulbs? Why should I bother with this old technology? What is the difference anyway? A flashbulb is made up of a base in either metal or glass, a glass envelope usually coated on the interior and exterior with a plastic safety

coating, primer paste, a tungsten igniter filament, a filling of shredded aluminum or other alloys with aluminum and oxygen. It fires when a voltage of 3-30V is applied to the ignition filament.

Clear bulbs are used for black and white photography, and blue bulbs are used for color film because they are balanced to 5500k, the same as color film. Blue bulbs may also be used with B&W film, but they are less powerful because of the blue coating, so you lose approximately two stops of light.

Due to the inherent nature of flashbulbs, they ignite and burn from the center of the bulb, consuming the filling materials toward the glass envelope, where they extinguish. This produces a more intense light (halo) in the center of the image plane that tapers off at the edges of the image. "Hotter in the center" and "Hollywood lighting" have been used to describe the images obtained with bulbs. It is a uniquely different look.

Electronic flash tends to correct and whiteout imperfections, while flashbulbs bring out the detail in more depth and provide better features in the shadow areas. Bulbs burn more slowly than electronic flash, so I believe they capture more quality in the overall image. Using flashbulbs today is an attention-getter. A photographer will find that many people are very interested in what you are doing and how you apply your craft using bulbs. Recently, while photographing the bull near Wall Street in New York City, I was inundated by a group of Japanese tourists who could not believe that I was using a Graflex press camera and flashbulbs, in the rain, to capture an image. They all had expensive cameras; however, they stood by watching me work for an hour. The Polaroids™ quickly made them believers in the method.

There is considerably more effort involved in using flashbulbs, as one has to search out sources for the equipment and bulbs, read manuals and charts, perform tests, keep accurate exposure charts, maintain equipment, dispose of the expendables and carry around a bunch of bulbs. If you are a point-and-shoot type person, this method is not for you. However, if you understand or are willing to find out the difference between Weegee and a Ouija Board, flashbulbs may provide a key to your photographic creativity.

If you have an artistic desire to capture classic images in a style almost forgotten, are willing to expend the energy involved and want to create a uniqueness to your photographs, then this medium will enhance your skills and help you develop a unique signature style.

[Bill Cress (The Flashman) is an expert on flashbulbs. His company, Cress Photo (www.flashbulbs.com), provides services to a variety of industries related to flashbulb usage. Bill may be contacted with any questions at wccress@ix.netcom.com.]



Graflex Notes

By Edward T. Richardson, Jr.

Although I got my first camera at age ten (I'm now 84.), I was in high school in 1938 when I bought my first Graflex, a National. That little gem went with me to Washington, the 1939 World's Fair in New York, and it served me well in college and after the war in law school. I had learned developing and printing in 1935 and produced a lot of pictures with that fine little machine.

Then one day in 1952, I was in my camera dealer's store when an older man with a very aggressive manner came in, thumping a big Graflex on the counter, and declaring to Inness, the manager, that the camera was too much for him. Inness took it back and sold him an Exakta. While their discussion was going on, I was falling in love with the Graflex, a 3¼ x 4¼ Super D, which the man had had for only about a week. Inness, who had coached me in photography for years, sold it to me for half the new price. That really got me into the art. As soon as I had developed the first batch of negatives, I was hooked.

Graflexes tend to draw attention. A couple of years later I was photographing in the sand dunes at Ogunquit, Maine, a seaside resort town, and I noticed that I was being watched by an elderly gentleman. Presently he approached me, remarked on the Graflex, and asked if he might examine it. He then invited me to his nearby house. I was astonished to find the walls of his first floor rooms covered from floor to ceiling with photographs, many of eminent persons of the 1930s and 1940s, many of whom I recognized. Featured were a couple of large prints of President Roosevelt. He had been a cook for many years at West Point and had been an active amateur photographer. He then brought out four Graflexes, as far as I can remember, all 4x5 model

Ds, each in a case and obviously well cared for. He handled them lovingly. A couple of years later when I went by his house, it had been replaced by a development.

My Super D served me well for many years. I had equipped it with an eleven-inch Cooke tele, two roll film backs, one for 2¼ x 3¼ and one for 2¼ x 2¼. The latter I used mostly for color slides, and there had been a flash unit with it from the start.

Later a photographer friend gave me his father's old camera. His father had been a news photographer on the Christian Science Monitor in Boston in the 1920s. The camera, a 4x5 Auto Graflex, was a wreck, but it was mounted with a remarkably heavy 165mm f/2.8 Zeiss Bio-Tessar lens in a steel mounting board. This I discovered would fit in my Super D, although to get it in I had to mount the metal board and then screw in the lens. It wouldn't focus quite to infinity, but since its best use was for portraits or indoor work, I was able to make good use of it. It also had a brake on the bed, I suppose to use when the camera was sharply tilted, the lens was so heavy. I later transferred this brake to a 4x5 model D.

After buying the Super D in 1952, I joined the Portland Camera Club, a very active organization dating to 1899, to which a great uncle had belonged near its beginning (I have his camera, a Cycle Poco 4x5.). Here I came to know many photographers, and from one I bought a 4x5 D. After having the curtain replaced, I used this until the early 80s. For black and white work, I had become firmly attached to the large format. Then I acquired a 4x5 Super D, in much better condition than the old D, which from the early 80s became my general workhorse camera.

This big Super D did indeed attract attention. One day in Naples, Maine, a lakeside resort town, a distinguished looking man rushed up to me and said, "Sir, I'll give you any reasonable price for that camera." Although he was persistent, I turned him down. On the same day, a young boy who had been watching me approached and inquired, "Mister, is that a box camera?" I answered him that it might be thought so. On another occasion, in a wild part of the state, by a deep gorge with a waterfall, a group of teenagers came to me, and one of them showed great interest in the camera. I let him hold and look through it, and he then offered to dive off the cliff into the pool below if I would like to take a picture. I assented, he dove, and I got the picture. His friends had assured me that he was used to doing it. More recently I was standing with it near the Portland waterfront, sighting on some old buildings there. A car stopped at the curb, a gentleman looked out and said, "Are you people up here in some kind of time warp?" I answered, "Why do you ask?" He then remarked that he hadn't seen a big Graflex being used for 30 years. He was a member of a Massachusetts camera club and an active camera enthusiast.

The 4x5 Super D had come with a Graflock back which enabled me to use new film holders and also a Polaroid back with which it worked well. Also I found for it a 15" tele, apparently a former military item.

My interest in subject matter, while general, centered on nature subjects, especially close-up work like mushrooms and small plant forms. My favorite Graflex for this was the RB Auto 3¼ x 4¼ that I bought from Ed Romney* in the early 1970s. He had refurbished it and put it in top operating condition. It came with a 180mm Zeiss Tessar, the diaphragm of which would close down to f/64. Combining this with the rising front, double extension bellows and tilting bed, gave great possibilities in photographing extreme close-ups. By mounting a 127 Kodak Ektar f/4.5 lens from a model B on this camera, I could even make enlarged images. For this close-up work, I usually used a roll film back.

For a decade I used this camera, and then one day I saw an advertisement for one of them in "like new" condition. Skeptical, for I knew they were not made after 1941, I called the advertiser. I was assured that this camera had been owned by a collector for exhibition purposes only. I bought it. It arrived, and to my delight it was as advertised. It came with a B&L Compound lens, but I swapped this for the Tessar, and that became my naturalist camera. It also had the rear ground glass. Then I found a 14-inch Dallmeyer tele for it, a post-war coated model in new condition (See photo.). This one I have kept busy since 1981.

In the spring of 1984, I acquired from a press photographer the body of a 5x7 Press Graflex for \$10. It lacked a back, a lens, and most of the leather was gone, but the shutter, mirror and ground glass were intact. I cleaned it up, lubricated the shutter and softened the bellows. I had used a 210 mm Zeiss Tessar as a long lens for my 4x5 D, and since this would be right for the 5x7, I repaired the lens mount area to accept it. The result was it would focus from infinity to 5:1. Then I dyed and waxed the outside of the box. The biggest problem was the back. This model had a special spring back. I did not imagine I could find one, so I designed and built one using a piece of thin, hard wood from an old view camera, some felt, three hooks and some big elastic bands. To my surprise it worked, and I could use new film holders. So now I had 12½ pounds of camera with speeds up to 1/1500 sec. These higher speeds required a stronger spring on this model than on other Graflexes. As a result, when it went off, it produced a loud report. When I demonstrated it one evening in front of the camera club, some wit in the back of the room shouted for everyone to take cover. I used it successfully to produce the big negatives I needed to make some Palladium prints.

Another interesting acquisition was an old Spencer-

Portland soft-focus lens from the 1920s. This enabled me to indulge in a bit of nostalgic photography, after I found it matched up well with the 4x5 D. This did more than produce soft focus, but could surround a subject with a halo of light resulting in effects out of the old Pictorialist era.

In the mid-50s, I frequently passed a camera shop that showed a 2¼ x 3¼ model B in the window. This went on for two years until I could stand it no longer and bought it, together with roll back. Later I used this in teaching a young man photography, and when he went on to open a small portrait studio, I gave it to him, and he used it to produce some fine results. Meanwhile, I found two more, together with a new 10-inch tele. One of these I carried in my car for many years, ready for found subjects.

In May of this year, I loaned a model B, my old RB Auto, the National and a 1930s vintage Speed Graphic, along with the old Cycle Poco to the local art museum which was showing the Magnum photo show. It was well received. These cameras are now first-rate curiosities.

My cameras are still perfectly functional. A Graflex will, I am convinced, go on for a century, at least if it is well cared for. Keeping the springs unwound, and the leather waxed helps. That Super D I was so lucky to get in 1952 is still operating in fine shape. They were advertised as durable and reliable, and that is certainly what they have proved to be.

*Ed Romney, formerly editor of New Pictorialist Magazine.



1949 3-1/4 x 4-1/4 Super D Graflex.



U.S. Army Signal Corps

By Ken Metcalf

Part I

Unlike most military equipment, the still camera was purchased in a form similar to its civilian appearance. The notable exceptions were the ordnance and aerial cameras. Cameras were used in all branches of the military, even if not the defined mission of that organization. The Signal Corps was, however, the Army branch initially assigned the primary responsibility for still photography.

Although not specifically related to Graflex, here are several interesting quotes from the Army's 1896 Manual of Photography: "Experience with selected non-commissioned officers has shown that about one in ten can be made a good photographer, about four out of five will become fair operators, while about one in seven will fail to comprehend enough of the process to render his services valuable to his military superiors." "The hand camera and roll holder [Illustrated in the manual is a 5x7 Henry Clay hand camera.] are especially valuable in rapid reconnoissance [sic] work when used in conjunction with the bicycle, and results may be obtained more rapidly than by a mounted reconnoissance using the cavalry sketching board." In describing a desirable camera, the author stated that "The two ends [of the camera] are connected by an extension bellows, which should be made of red Russian leather, if the camera is to be used in the field, since red ants will not eat this kind of leather."

The following is a brief chronology of the use of photography by the Signal Corps, which was drawn primarily from Ms. Raines' book, Getting the Message Through:

1896 - "During the [Spanish-American] war the Signal Corps also experimented with another device [i.e., in balloons, and on the ground] - the camera. Although not an official assigned function, photography fell within the broad definition of communication. Beginning in 1894 photography had been taught as part of the signal course at Fort Riley [Kansas], and in 1896 the Corps had published a Manual of Photography." The book's author had used photographs to create topographical maps. In addition, still cameras were used to document operations. Although I could find no evidence that Graflex cameras were being used at that time, they certainly may have been.

1905 - The Signal School was opened at Ft. Leavenworth, Kansas, and it included photography and was open to other military branches, including the National Guard.

1912 - The Signal Corps experimented with airplane photography in the new Wright Type C "scout" airplane at College Park, Maryland.

1916 - Aerial photographs were taken on Pershing's "Punitive Expedition" in Mexico.

As an indication of the status of photography at this time, in a three-inch "Photography" entry between "Rings, Bridle, Enamel Coated," and "Screw Anchors" (Manual No. 3, Technical Equipment of the Signal Corps 1916), in part is the following: "For service in the field, where a photographic outfit is required, the Signal Corps will supply a high-grade camera and holders, of a type intended for the use of film packs or film rolls, and taking a picture 3¼ x 4¼ inches. When all films ... have been exposed [they should be] ... mailed immediately to the Chief Signal Officer of the Army... in the signal office, Washington... and the person sending them will be furnished one unmounted print of each, enlarged or of size of negative. Pictures which are of a special interest and value will be enlarged from the negatives to 8x10 size and placed in the official album.

It is not intended that photographic plates, films, chemical, or other materials liable to deteriorate be kept in stock at general supply depots of the Signal Corps."

1917 - Photographic Sections formed. - the first time that photography had been assigned as an official function. It included both ground and aerial photography. The first Folmer patent (1,236,419) for an aviation camera was applied for and granted in 1917.

1918 - The first use was made of detailed specifications for all Signal Corps equipment purchased and the use of centralized purchasing. At least by 1920 in a Signal Corps Storage Catalog a PH-1, PH-2 and PH-3 (motion picture equipment) were listed. Also, in this 1920 inventory, a PH-4 camera was listed as follows: "...a long-range telescopic camera in which the bellows is mounted vertically between the legs of the tripod and the telescopic lens is prismatic making a right-angle turn to the horizontal just above the tripod plate; Folmer & Schwing, manufacturers." Although not listed in this inventory, at least by 1916 a PH-6 Ordnance camera was shown in the Graflex serial number book.

Bauch & Lomb started making high quality optical glass, and Kodak started making fine grade chemicals to offset the losses from Belgium and Germany.²

The Signal Corps lost control of all aviation responsibilities, including aerial photography.

1925 - The Signal Corps continued to maintain two photographic laboratories in Washington, D.C. The Corps sold copies of its photographs, as well as those of other branches. Finally, they became responsible for the "Army's pictorial publicity. In this capacity it supervised and coordinated the commercial and news photographers who covered Army activities."¹ "Signal Corps cameramen used the same type of still cameras that newspaper photographers use. The War Department isn't allowed to name brands, but it has been noted that most Army photographers use Speed Graphic and Graflex cameras in standard sizes."³

1942-1944 - In addition to the still photographic facilities at the War College in Washington, the Army opened facilities in the Pentagon, and a still photography library at their motion picture facility in Astoria, New York. "... the Signal Corps used standard commercial photographic products almost exclusively. Due to the limited supply of those items, the Signal Corps early in the war urged private citizens to sell their cameras to the Army."

During the war the bulk of personal correspondences were microfilmed under a "V-Mail" program, which used Kodak equipment.

Post WWII - V-Mail was discontinued, and the War College facility was closed. However, the Signal Corps re-

sumed the sale of its photographs, which had been suspended during the war.

Korean War - The Signal Corps provided tactical, historical and publicity coverage.

1966 - "The 160th Signal Group received responsibility for countrywide photographic support, providing backup services for signal battalions."

1980s - Although most Signal Corps training was done at Fort Gordon, Georgia, a "notable exception" was photographic training, done at Lowry Air Force Base, in Colorado.

From manuals currently available to me, it appears that a "PH" system was started during WWI and went



through a phase-out period, but there were models which carried that designation throughout the 1950s, and some non-camera models carried it into the 1960s. An example of this change was the 4x5 Pacemaker Speed Graphic, which had a PH-47-E (through J), and was changed to KE-12(1).⁴

Thanks is again due the U.S. Army Signal Corps Museum at Fort Gordon, Georgia, for their help in preparing this article. If collectors contemplate donating Graflex cameras that are designated with a Signal Corps nomenclature, the museum is interested in building their photograph collection, and Delores Oplinger, Collections Manager, can be contacted at (706) 791-5324 or at delores.oplinger@us.army.mil.

Part II will be specific to Graflex cameras.

¹Getting the Message Through by Rebecca Raines, pp. 97-8, etc.

²Images and Enterprise by Reese V. Jenkins, p. 313. The Photographic Manufacturing Companies of Rochester by Rudolph Kingslake, p. 5.

³Under Fire with the Army Pictorial Service by Alfred Toombs, Popular Photography, January 1940, article courtesy of Jim Chasse. Puzzling is that Raines states that the Army Pictorial Service was created in 1942!

⁴Signal Corps TM 11-487F 28 July 1958, p. 163.



Ask Tim Holden....

Trade Notes, February 1955 - Graflex Solenoids - We are frequently asked whether we recommend the use of the No. 2 or No. 3 Graflex solenoid release. The

No. 2 release has a resistance of 2.5 ohms and the No. 3 of 5 ohms. The latter is the high resistance unit which we prefer to have used whenever possible, since it provides for more efficient operation of the flash outfit and longer life of the batteries. By its very nature, it does not have much pull and cannot be used with shutters which are stiff, either originally or as a result of extended use and accumulation of dust inside the shutter mechanism.

At the present time, we fit the No. 3 solenoid releases to almost all shutters, with the current exception of the No. 3 Graphex shutters which require the stronger pull of the No. 2 solenoid. This has not always been true, and it seems that through the years, different sizes and makes of shutters tend to drift one way or another. Therefore, there is no hard and fast rule as to which solenoid should be used on a given shutter. Furthermore, a shutter which originally may operate satisfactorily with the No. 3 release and probably will continue to do so for some time, may eventually require the stronger pull of the No. 2 release, especially if it has reached the state where it should be cleaned and overhauled.

Remember that shutters can accumulate dust and dirt, and the lubrication can dry out. It is a good idea to have a front shutter checked over every 5 or 6 years minimum. If the photographer depends upon his equipment as a means of livelihood, he should have it checked over, cleaned and overhauled at least every 2 years.

Synchronizations will always be affected by battery strength. Be sure that the batteries are up to par, and be sure that the solenoid connection has not been shifted, either as a result of a loosening of the mount on the lens board or having been tampered with by someone turning the knurled collar on the solenoid. All Graflex solenoids, when properly adjusted, will trip and synchronize Graphex and Spermatic (X) shutters at Time, Bulb and the 1/400 settings.

Trade Notes, August 1959 - Solenoid and CF-904 Special Crown Graphic Camera - We occasionally receive orders for the CF-904 Special Crown Graphic Camera (sold with a 135mm Schneider Xenar f/4.7 lens in No. 0 Compur Shutter) with notation "with solenoid installed." This causes some confusion,

since the solenoid can be used in two entirely different ways on the CF-904 combination. If the customer wishes to use the solenoid as a synchronizing means, it is necessary for us to remove the M-gear train from the shutter, converting it to an X shutter. This is covered by Cat. No. 9463, which is the conversion charge amounting to \$3.90 net, \$5.20 list. On the other hand, if the customer wishes to use the solenoid only as a tripping device, he can accomplish the synchronization through the shutter itself. This requires the use of the Graflite battery case with the circuit control set at 1 and two connecting cords, one to the solenoid, and the other to the contact posts on the shutter.

Orders written for the CF-904 combination with solenoid installed, where the solenoid is to be used for *synchronizing* purposes, should also show Cat. No. 9463 for conversion charge plus 9460 installation and synchronization of the solenoid. Orders received for this combination, which do not show this reference, will be handled on the assumption that the solenoid will be used only as a tripping device with synchronization accomplished within the shutter through the use of two connecting cords from the battery case as described above.

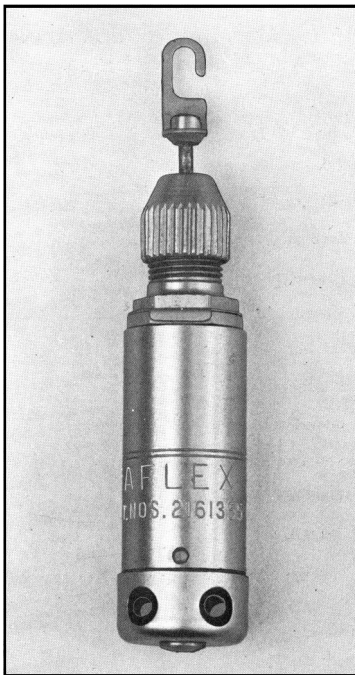
Trade Notes, January 1955 - B-C Cartridge and Solenoid Releases - The Graflex Solenoid Release will not be harmed by the use of a standard B-C Cartridge Insert. However, the dumping of the current from the capacitor,

in the cartridge, will cause the solenoid to operate much more rapidly than is normal, and, therefore, the shutter may be opened in about 10-12 ms. For proper synchronization at top speed, this opening of the shutter should occur in about 18 ms. The flash lamp still reaches peak in 18-20 ms, and, therefore, a shutter speed of 1/100 or slower must be used, so that the shutter blades will remain open long enough to catch the peak of the flash lamp when it fires.

Therefore, while not an ideal arrangement, the B-C Cartridge Insert can be used with a solenoid and will fire a flash lamp in the battery case. It should be noted, however, that the B-C system is best used with only a series circuit. The flash lamp in the top of the average battery case and the solenoid release on the shutter are in parallel, as is any sidelight from an extension outlet. Since the current from the capacitor will follow the path of least resistance, it cannot be expected that the solenoid will operate and that both of the

flash lamps will fire. One or the other will probably fail to go off.

From the foregoing, it will be seen that a B-C Cartridge Insert can be used to fire a lamp on the battery case and trip the solenoid, if a slow enough shutter speed is used, but extensions cannot also be used successfully.



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, and is not a for-profit publication. Other photographic groups may reprint material provided credit is given GHO and the author. We would appreciate a copy of the reprint.

Graphic 5x7 STEREO Body

Missing lens but has new lensboard.
Missing ground glass carrier, VF, and handle. It needs small wood repair around latch, BUT it has nice, working shutter! Best part is the price, only \$175.

Good start for a twenty-five hundred dollar camera. See pictures at:
<http://www.equinoxphotographic.com/stereographic1.jpg> and <http://www.equinoxphotographic.com/stereographic2.jpg>.

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Signal Corps photo, Graphic "70."

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