

Large Format Camera Backs

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ABSTRACT

In large-format film cameras (and smaller-format cameras whose design is derived from large-format cameras) there are three principal types of back used: the *spring* (Graphic) back, the *Graflex* back, and the *Graflok* back. This article describes these three types and gives insights into their implications.

INTRODUCTION

Large-format film cameras (and smaller-format cameras whose design is derived from large-format cameras) generally use one of three principal types of *back*. Here we will discuss the role of the camera back, and describe and distinguish these three types.

BACKGROUND

The camera back

In a 35-mm film camera, “back” usually refers to the door that closes the rear of the camera, and which carries the pressure plate that presses the film against the guide rails.

In a medium-format film camera, “back” usually refers to a module that carries the film supply and take-up spools and also includes the film transport mechanism, film “gate”, guide rails, and pressure plate.

In a large format film camera (or equivalent), “back” usually refers to the part of the camera that receives a film (or plate) holder. It may also include a ground glass focusing screen.

Large-format back types

The three types of back commonly found on “modern” (post 1890!) large-format cameras are (in order of their date of introduction):

- Spring (Graphic) back
- Graflex back
- Graflok back

Discussion of these is sometimes confused by the fact that the word "Graflex" is used in this field with several meanings:

- The actual name, from 1945 onward, of the organization that, over its history, under different names and corporate affiliations, was responsible for many important camera products.
- What we call the "Graflex Organization" (regardless of its actual corporate name or affiliation at any particular time).
- The Graflex camera, a single-lens reflex camera with waist-level viewing through a chimney-like hood. (This is sometimes called the "Graflex SLR camera" when it is important to make clear we do not mean just some camera made by Graflex.)
- The Graflex type of camera back.

Reference orientation conventions

When we speak of left, right, etc., it will be in this context:

- As seen from the rear of the camera
- With the film holder in horizontal ("landscape" orientation) with the dark slide entry end to the right.

Before the spring back

In many early view cameras, a plate carrying the ground glass focusing screen was mounted in the location where the plate holder would later be when the shot was taken. After focusing, the focusing plate would either be swung completely away (to the side or downward) on hinges, or removed entirely and set aside. The plate holder would then be mounted in essentially the same space, usually engaging pins at the bottom and held by a spring latch at the top.

In the era of the wet plate process, where preparing the plate for the shot just before use was an elaborate process, the additional work of moving the focusing plate out of the way before each shot and then replacing it for the next was of little consequence. But the emergence of "dry plates" and the double-sided plate holder speeded up the whole operation, and made the need to move the focusing plate each time seem rather burdensome.

THE THREE TYPES OF BACK

The spring ("Graphic") back

The spring back eliminated the need to swing away or completely remove the focusing plate to allow the plate (or film) holder to be mounted¹. It was developed—at least in the form we now recognize—prior to 1896 (perhaps as early as the late 1880s).

In the product lines of the Graflex Organization, this back was used for many years on almost all cameras but the Graflex (SLR) series. Many of those cameras had the Graphic tradename, and thus in that milieu the spring back is often identified as the *Graphic back*. The type of film holder it accommodates is also called the *Graphic type*. It is the most common film holder type in the large format field.

Figure 1 shows a spring back and a Graphic-type film holder.



a. (r.) Back with no holder in place;
(l.) Graphic-type film holder

b. Back with holder in place

Figure 1. Spring (Graphic) back

Camera: Anniversary Speed Graphic 4 × 5 (1943)—focusing hood removed

In a spring back, the focusing plate that holds the ground glass screen is permanently mounted on (usually four) flat cantilever springs emerging from the back.² They hold the focusing plate against the back. When focusing is complete, the film holder is inserted between the focusing plate and the back, the focusing plate retreating on its

¹ We will speak henceforth only of a "film holder", recognizing that in most cases a plate holder of comparable design could also be used.

² By "back" here, and in most of the discussion to follow, I mean the main structure of the back, even though of course the focusing plate is formally part of the "back".

springs to accommodate the insertion. The force of the springs causes the focusing plate to press the film holder tightly against the back.

The film holder has a vertical rib on each face just to the right of the film opening. It engages a matching groove in the face of the back. This serves both to locate the holder left-to-right and to provide a “light trap” to prevent light from passing through the (admittedly very thin) space between the face of the holder and the back. A rail at the left side of the back provides the light trap at that side. This also serves as a stop as the film holder is inserted.

The rib has a diagonal edge on the left. This prevents it from catching on the right edge of the back as the holder is inserted. This would make the rib somewhat ineffectual in preventing improper displacement of the holder to the left, but the stop rail takes care of that. Thus the rib only has to prevent unwanted displacement to the right.

After the introduction of roll film, there was interest in adapting large format cameras to use roll film. However, a roll film holder of straightforward construction cannot be used on a spring back—the space required to accommodate the film spools would make it too thick to fit under the focusing plate (whose range of rearward travel is limited).³

The Graflex back

The *Graflex* back is the type ordinarily provided on the Graflex camera (introduced in 1901), and takes its name from that. In that camera, focusing is not normally done with a ground glass screen at the film location. Rather, it is done on a nearly-horizontal ground glass screen at the top of the camera body, to which the image produced by the lens is directed by a reflex mirror. Thus, a back that uses a focusing plate to hold the film holder in place would not make sense. The Graflex back was optimized for this context.

The film holder used on the Graflex back has “fins” extending from its upper and lower edges, flush with the two faces of the holder (we presume here a double-sided holder).

³ Of course, it is possible to make a compatible roll film holder in which both spools are in a “doghouse” at the far right of the holder (clear of the focusing plate), the film traveling across the thinner main part of the holder (able to be accommodated under the focusing plate) and then going around a small roller and back across to the take-up spool. This is not, however, a desirable arrangement.

The original Graflex back has at its bottom a fixed metal retaining plate, spaced away from the face of the back by the thickness of a plate holder fin. To mount the film holder, its "frontmost" bottom fin is dropped between the retaining plate and the back, and the holder is swung forward until it lies against the back.

Then a second retaining plate, at the top of the back, mounted with diagonal slots on two shoulder screws, is slid to the side and thus moves downward to engage the (frontmost) top fin of the holder.

The face of the back has, near its right edge, a vertical rib that engages a groove in the holder near its right end. This rib serves to lock the holder in the proper position (left-to-right) and in addition forms a "light trap" (similar to what we have on the spring back).

A metal "fence" on the back at the left edge of the back serves the same purpose at that end. This in fact is what really prevents the holder from being too far to the left (the rib really only preventing mislocation to the right). The fence also serves as a convenient way of properly positioning the holder before it is swung into place.

Figure 2 shows a Graflex back and a plate holder of the type it accommodates (known as the *Graflex type*, which is different from a Graphic-type holder).



a. (r.) Back with no holder in place;
(l.) Graflex-type plate holder

b. Back with holder in place

Figure 2. Graflex back

Camera: Revolving Back Tele Graflex $3\frac{1}{4} \times 4\frac{1}{4}$ (1922)

In later models of the Graflex camera, the fixed lower retaining plate is replaced by a sliding plate like that on the top. Both are slid in the same direction to engage the two ribs on the film holder. However,

this is the opposite direction from that in which the single sliding retainer of the original design was moved to engage the film holder.

I conjecture that this was done so that a photographer, familiar with the "single slider" camera, but encountering a "double slider" camera, would not inadvertently engage only the top slider, thinking that the holder was then secure, and then find that the holder would fall out since the bottom slider hadn't been engaged. (The accustomed direction of movement of the top slider wouldn't work, thus alerting the photographer that this is the other kind of camera.)

In some cases, it is desired to focus a Graflex camera using a ground glass screen at the film location. To allow this, an accessory focusing plate, carrying a ground glass screen, and equipped with single fins top and bottom at the front edge (just like a single-sided film holder), is mounted in the same way as a film holder. After focusing is complete, the focusing plate is removed and set aside and the film holder mounted for the actual shot.

Note that a film holder for roll film (even a straightforward, "thick" one) could be readily made to work with this back. Like a single-sided film holder, it would have fins top and bottom at its front edge to be engaged by the retaining plates.

The Graflex back remained the standard back for all the Graflex (SLR) camera models through the end of the product line's life in 1958 (although from 1955 on, the then-current Super D Graflex could be specially ordered with a Graflok back).

As mentioned above, the film holders for use with the Graflex and Graphic backs are different and not interchangeable. For one thing, a Graflex type holder is higher (overall) than a Graphic style holder for the same format size; they are the same height to the bottom of the grooves between the fins in the Graflex holder, but the overall height is increased by the presence of the fins. There is also a difference in the gender (and location) of the locating/light trap rib arrangement.

The Graflok back

To combine the flexibility of the Graflex back for mounting alternative kinds of film holder with the convenient focusing plate management of the spring back, Graflex in 1949 introduced the "Graflok" back. Here, the focusing plate is supported on two stout arms, with hooked ends pivoting on pin-like features on the back above and below the plate location, centered. Torque is applied to the arms by coil springs in the plate itself, causing the plate to be pressed against the back.

The film holders used here are identical with those used on the spring back (the Graphic type), and operation with them is the same: when the film holder is inserted, the focusing plate moves back to accommodate it, and then presses it against the back.

Figure 3 shows the Graflok back and a “Graphic-type” film holder.



a. (r.) Back with no holder in place;
(l.) Graphic-type film holder

b. Back with holder in place

Figure 3. Graflok back

Camera: Pacemaker Speed Graphic 4 × 5 (1951)—focusing hood removed

However, to apply a roll film holder of “straightforward” (thick) construction, or some other more specialized alternative media holder, the focusing plate is first removed by depressing the arms to disengage their hooked ends from the “pins”, sliding the plate to the right so the arm ends clear the pins, and then removing the plate and setting it aside. Figure 4 shows the back with the plate removed.



Figure 4. Graflok back with focusing plate removed

Then, the roll film holder is mounted by engaging a pair of sliding retainer plates, mounted on diagonal slots, over fins on the holder, just

as with the Graflex back.⁴ (These sliders play no role in operation with conventional film holders.)

From 1951 on, all Speed Graphic and Crown Graphic cameras were equipped as standard with a Graflok back.

The Graflok back interfaces are covered by an international standard, as are the dimensions of the film holders used with spring and Graflok backs.

IMAGE ORIENTATION

The format sizes normally used in large-format photography are not square, and thus the photographer may wish to have the long axis of the image oriented horizontally (what we today often call "landscape" orientation) or vertically ("portrait" orientation).

Of course one way to do this is to rotate the entire camera, and on some large-format cameras (e.g., most Speed Graphic models), that is the only available method (an alternate tripod socket often being provided on the side of the case for the purpose). But, especially on the more bulky cameras, this is very cumbersome. Thus, over the years, many systems of allowing the back alone to be oriented either way were introduced. Two arrangements were common, and have their own "code names" used in product descriptions.

The reversible back

Here, the entire back assembly is square in overall dimensions, and is mounted to the camera's "back house" with some type of latch arrangement (often involving small pins on the edges of the back). The entire back can be removed, rotated 90°, and reinstalled to attain the vertical orientation.

In some cases, the arrangement also allows the back to be installed 180° from the basic orientation, keeping the horizontal orientation of the image but providing for the dark slides of the film holder to be withdrawn from the left (an accommodation for left-handed photographers).

⁴ For trivia fans, they moved in the same direction to engage as on the later ("double slider") form of the Graflex back.

The revolving back

Here, the back is mounted to the camera's backhouse on a turntable arrangement. By releasing a latch pin, the back is freed to be rotated to the vertical orientation⁵, or, in most cases, to the "left-handed" horizontal orientation, if desired. In fact, in most such arrangements, the back can be rotated to any arbitrary orientation, including "oblique" ones that may be desired for special artistic effect.

"R.B."

Often, in the names of cameras, the short form "R.B." is used to mean either "reversible back" or "revolving back". For example, two different camera models once made by the Graflex Organization are the *Reversible Back Cycle Graphic* and the later *Revolving Back Cycle Graphic*. Both show on their nameplates "R.B. Cycle Graphic"!

CREDITS

The photographic illustrations in this article are by the author, Douglas A. Kerr. The cameras illustrated are from the Doug and Carla Kerr Collection.

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⁵ On many Graflex models, the "inverted" vertical orientation (with the dark slide end of the holder at the bottom) is used, in order for the dark slide handle to be clear of the camera body so that it can be grasped more easily.