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INSTRUCTIONS FOR OPERATING THE

*Six-Three*

# PREMOS

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EASTMAN KODAK COMPANY,

SUCCESSOR TO

ROCHESTER OPTICAL CO.,

ROCHESTER, N. Y.

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# GENERAL INSTRUCTIONS.

The general instructions in your Premo manual apply equally well to the camera, whether fitted with R. R. or Anastigmat lens.

The only difference lies in the timing of exposures and the use of the diaphragm stops, inasmuch as the anastigmat lens will work at a larger stop or opening than the single lens.

Therefore if you have a *Six-Three* Premo, just follow all the instructions given in the manual with exception of those pertaining to the operating of the shutter, the diaphragms used and the making of instantaneous, bulb, and time exposures, for which substitute the instructions in this leaflet.

## OPERATING THE SHUTTER ON THE *Six-Three* PREMOS.

Perfect familiarity with the shutter is essential to successful picture taking with any camera. The following directions should, therefore, be care-

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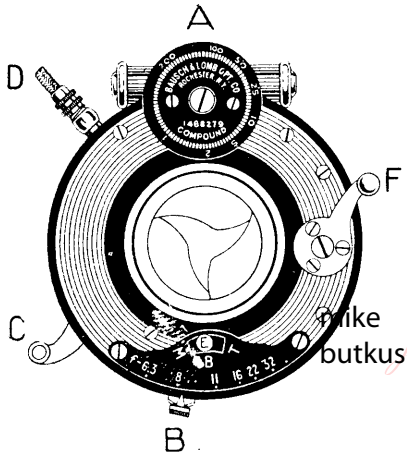


fully read and the shutter operated several times before threading the film up for use.

## INSTANTANEOUS AND RETARDED EXPOSURES.

FIRST—Set knob E at the point M.

SECOND—Revolve disc until the figure representing the time of instantaneous or retarded exposure you desire to make, is opposite to the little white dot at A.

NOTE.—This disc is graduated in fractional parts of a second. Thus 1, 1-2, 1-5, 1-10, 1-25, 1-50, 1-100 and 1-250 parts of a second. On the 3¼ x 5½ and 4 x 5 *Six-Three* Premos 1-200 of a second is substituted for 1-250.

For instantaneous exposures, when the sunlight is unusually strong and there are no heavy shadows, such as in views at the seashore or on the water, a shutter speed of 1-100 of a second and stop f. 16 should be used. When light clouds or slightly smoky atmosphere, use f. 11.3 and a speed of 1-50 or 1-25 or f. 8 and a speed of 1-100.

As a general rule, the speed of 1 200 or 1-250 should be used only in making snap shots of moving objects in bright sunlight, and ordinarily the stop f. 6.3 should be employed for all such pictures.

With heavy clouds, do not attempt instantaneous exposures.

**THIRD—Pull down lever F to its limit of motion.**

**FOURTH—Set lever B controlling diaphragm openings at proper point, according to the time of exposure and subject.** See instructions for use of diaphragms, page 16.

**FIFTH—Press Push-pin at end of antinuous release D, or press down the release C.** *This makes the exposure.*

NOTE—Press Push-pin on antinuous release with a firm quick movement, at the same time be sure to hold the Kodak rigid, as a slight jarring will cause a blurred negative.

## TIME EXPOSURES.

**FIRST—Set knob E at the point T.**

**SECOND—Turn disc until Figure 1 is opposite little white dot at A.**

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THIRD—Set lever B at F. 6.3, 8, 11, 16, 22 or 32, according to time of exposure and nature of the subject. See instructions for use of diaphragms, page 16.

FOURTH—Press the Push-pin. This opens the shutter. Time exposure by a watch. Again press push-pin. This closes the shutter Shutter may be opened by pressing release C and closed by a second pressure, if desired, but great care should be taken not to jar the camera.

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## BULB EXPOSURE.

For short time exposures, the bulb exposure is often advantageous.

FIRST—Set knob E at the point B.

SECOND—Turn disc until Figure 1 is opposite little white dot at A.

THIRD—Set lever B at *f*. 6.3, 8, 11, 16, 22 or 32, as desired.

FOURTH—Press Push-pin to open the shutter and release it to close the shutter.

This makes the exposure. The shutter will remain open as long as the Push-pin is under pressure.

Do not oil any part of the shutter.

In case of accident return shutter to your dealer or to us for repairs. As a general rule, make exposures with the autinuous release instead of release C, as former release is less liable to jar the camera.

## THE LENS.

The *Six-Three* Premos are equipped with an Anastigmat lens, the speed of which is indicated as *f*. 6.3, meaning that it will cut to the corners at its full opening which is 1/6.3 of its focal length.

## GET ACQUAINTED WITH YOUR LENS.

The user of any lens should familiarize himself with its limitations as well as with its capabilities. This is particularly true in the case of the Anastigmats, and we therefore ask that those who are not entirely familiar with photographic optics, read the following brief explanation, that they may get the full benefit of the power of their lens and, that, on the other hand, they do not ask of it the impossible. It should be borne in mind, however, that what we have to say here *is applicable only to lenses of from 5 to 8 1-4 inch focus*, such as are supplied on our hand cameras. These directions make no pretension to covering the entire field of photographic optics.

In comparing the work of one lens with another, you must, first of all, remember that such comparisons must be made with a stop opening of the same relative size (*f* value). In comparing the Anastigmat with the ordinary Rapid Rectilinear lens, do not expect as great a depth of focus with

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your Anastigmat set at an opening of *f*.6.3 as your R. R. lens gives at its largest opening, *f*.8. The Anastigmat at *f*.8 will give as great depth of focus as will an R. R. of the same focal length with the same opening, while on the other hand, the R. R. will not work at all at *f*.6.3.

NOTE—It should be borne in mind that the shorter the length of focus, the greater the depth of focus. This explains why very small cameras can have a "fixed focus" (immovable), while larger cameras are all made so that they can be focused.

## WHAT DEPTH OF FOCUS MEANS.

Suppose now, that you are using your Anastigmat at the full opening *f*.6.3 and have set the focus at say 15 feet. An object 15 feet distant will be absolutely sharp, but objects 10 and 20 feet distant will not be. Stop your Anastigmat down to *f*.8 or *f*.11.3 and those objects each side of the exact point of focus will materially increase in sharpness. Go further and use stop *f*.22.6, or a still smaller stop, and everything from 10 feet on to infinity will be sharp. It will thus be seen that the smaller the stop, the greater the depth of focus, i. e., the greater the power of the lens to sharply define, at the same time, objects nearer the camera and further from the camera than the principal object in the picture, which of course, is the object focused upon. But it is obvious that with the small stops the exposure must be correspondingly lengthened.

## ANASTIGMAT SPEED

Using a stop of *f*.8 or smaller, the advantage of the Anastigmat over the really excellent Rapid Rectilinear lenses furnished with our cameras is not marked, but there is an improvement in definition and in the correctness of lines. But let us suppose that we desire to photograph a rapidly moving object or to take a picture on a cloudy day. What do we find? The *f* value of a lens denotes the relation of the opening in that lens to its focal length. Suppose, then, that we have a single achromatic lens of 5 inch focus, speed, *f*.14, a Rapid Rectilinear lens of 5 inch focus, speed *f*.8, and an Anastigmat lens, speed *f*.6.3, of the same length of focus, 5 inches. How do they compare in speed? To reduce this to its simplest terms we will divide the focal length (five inches) in each case by the *f* value.

$$5 \div 14 = .357$$
$$5 \div 8 = .625$$
$$5 \div 6.3 = .793$$

It will thus be seen that in using the single lens the largest opening is $\frac{357}{1000}$ of an inch in diameter with the R. R. lens $\frac{625}{1000}$ of an inch, and with the Anastigmat $\frac{793}{1000}$ of an inch. The amount of light admitted by a lens in a given time depends, of course, upon the area of the opening at that time being used in that lens. The amount of light admitted in a given time with these different

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lenses would, therefore, be in direct porportion to the square of their diameters. Here, then, omitting the fractions, is the result:

| | |
|---|---|
| Single lens | .357 × .357 = .127 |
| R. R. lens | .625 × .625 = .390 |
| Anastigmat lens | .793 × .793 = .628 |

We thus find that the speed of R. R. lens is over three times that of the single lens, and the speed of the Anastigmat is 61% greater than the speed of the R. R. lens. Therein lies the greatest Anastigmat advantage. But simply because it has this speed, you don't always need to use it. The speed must be used with discretion, just as greater care is required in operating an automobile than in operating a bicycle.

Under conditions that would give you good results with an R. R. lens at *f*.11.3, (U. S. 8) use stop *f*.11.3 with your Anastigmat—don't use the largest opening for every occasion; use it only for emergency. Your greatest Anastigmat advantage lies in the fact that when the light is so poor that you cannot get a properly timed negative with your R. R. lens at its greatest opening, *f*.8, (U. S. 4) without resorting to a time exposure, you can open up your Anastigmat to its full opening and get a successful snapshot.

For the same reason, i. e., because the Anastigmat admits more light in a given time than does the R. R. lens, it is used in connection with high

speed shutters for photographing rapidly moving objects. Even in bright sunlight the R. R. lens will not give sufficient illumination to make its use practical with the extremely high speed shutters when worked at their shortest exposures—but the Anastigmat, by reason of the large opening that can be used, enables you to take advantage of the high speed shutter.

## SHUTTER SPEED AND LENS SPEED.

Strange as it may seem, there are some amatures who do not understand the difference between a fast lens and a fast shutter, thinking, apparently, that because they have a fast lens they should catch all moving objects sharply, or because they have a fast shutter that their pictures should be fully timed. The reverse of this proposition is the truth. The fast shutter, by reason of shortening the exposure, cuts down the light and tends toward undertiming.* Remember that these speeds are always relative. Your Anastigmat opened to *f*.6.3 will not give as fully timed a negative in $\frac{1}{200}$ of a second as your R. R. lens will at

*This refers in particular to between-the-lens shutters. With a focal plane shutter, such as used in the Speed Kodaks and Graflex Cameras, other factors enter. Such shutters give more illumination of the plate in a given time than between the lens shutters—but, on the other hand, work many times faster when at full speed.

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*f*.8. in $\frac{1}{100}$ of a second. Your *f*.6.3. Anastigmat is 61 per cent. faster, not 100 per cent. faster, than the R. R. lens.

## UNFAIR COMPARISONS.

We have had some complaints that the Anastigmats were not giving as fully timed negatives as they should in comparison with the R. R. lens, which our customer had previously used. *In every case* we have found that the fault was not in the Anastigmat, but in the old shutter with which the R. R. lens was used—such shutter having become dirty, or through the springs weakening or other cause, failing to work at its supposed speed. The result under such circumstances being that the old lens was getting the benefit of a much longer exposure than was intended, while the Compound shutter fitted to the Anastigmat was chopping off the light with greater accuracy.

## TWO "STOP" SYSTEMS.

The user of an Anastigmat should bear in mind that there are two systems under which shutters are marked for stop openings, and this must be reckoned with in making comparisons. Most shutters for R. R. lenses are marked on the Uniform System (abbreviated to U. S.), while the shutters for Anastigmats are marked by the *f* system. The

*f* value of a stop is the proportion that its opening bears to the focal length of the lens. For instance, *f*.8 means that the diameter of the stop opening is 1-8 of the focal length of the lens, etc. The uniform system is based on the *areas* of the openings, each next higher number having half the area of the preceding number, and therefore requiring twice the exposure. For instance: If 1-100 of a second be correct for stop U. S. 4, then, with the same light conditions and stop U. S. 8, 1-50 of a second would be required. However, the two systems are easily compared.

TABLE

| | |
|---|---|
| U. S. 4 - - - | *f* .8 |
| U. S. 8 - - - | *f*.11.3 |
| U. S. 16 - - - | *f*.16 |
| U. S. 32 - - - | *f*.22 6 |
| U. S. 64 - - - | *f* 32 |
| U. S. 128 - - - | *f*.45.2 |

There is no exact U. S. designation for *f*.6.3, but it is approximately U. S. 8.

## A LAW OF OPTICS.

The larger the stop opening, the less depth of focus. This is not a rule covering any particular lens that we or any one else exploits. It's as fixed as the course of the planets. With a large opening, depth of focus must be sacrificed. In this matter of opening, then, the difference between the R. R. and the Anastigmat is this: The Anastigmat will

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cut perfectly sharp on objects *at the focused distance*, over the entire picture with a large opening, admitting a large amount of light, thus requiring a relatively short exposure; but when this large opening is used, there is no great depth of focus. The R. R. lens will not cut the entire picture sharp with its large opening, even if correctly focused. With the smaller openings, as *f*.8, etc., the Anastigmat has the same depth of focus as the R. R. lens and gives sharper definition over the entire picture.

## DEDUCTIONS.

It is perfectly evident then that it is best to use only a moderately large stop opening (say *f*.8 or *f*.11 3) even with an Anastigmat, and time accordingly when conditions will permit. However, when the light is dull and a snap shot is desired. the full opening may be used, or if it is desired to photograph rapidly moving objects in good light, the full opening may be used with a high speed of the shutter. It must not be expected, however, that with such full opening, objects in the foreground, in the middle distance and at a long distance can *all* be sharp. Set the scale for the correct focus on the principal object and that object will be sharp. *As a rule, your picture will be rather better for having the unimportant parts less sharply defined than the principal subject.*

The Anastigmat will do everything better than the R. R. It will do some things that the R. R lens cannot do at all—but no lens has yet been invented, or is likely to be, that can combine extreme speed with depth of focus, except in very small sizes, or, in other words, except in lenses of very short focus. Even in these, the error, though not noticeable, is there—but that's another story.

## INSTANTANEOUS EXPOSURES.

IMPORTANT—Although with this camera they may be made at 1-200 or 1-250 of a second, as the case may be, all exposures slower than 1-25 of a second must be considered time exposures so far as providing a tripod or other firm support is concered. The camera cannot be held steadily enough in the hand or work at less speed than 1-25 second.

To take instantaneous or snap shot pictures the object should be in the broad open sunlight, but the camera should not. The sun should be behind the back or over the shoulder of the operator.

## USE STOP F.8 AND EXPOSURE 1-100.

For all ordinary out-door work when the sun is very bright use stop *f*. 8 and exposure 1-100. If a smaller stop be used, the light will be so much reduced that it will not sufficiently impress the image on the film and failure will result.

In views on the water when the sunlight is *unusually strong* and there are no heavy shadows,

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or in tropical or semi-tropical climates, diaphragm *f.* 16 may be used.

If a smaller stop opening than *f.*16 be used for ordinary snap shots *absolute failure will result.*

## TIME NEEDED FOR INTERIOR EXPOSURES.

The table in the manual used for this camera gives the time of the exposure required for interiors under varying conditions of light with stop *f.* 16 in the lens. If stop *f.* 11 is used give only one-half the time, with *f.* 8 give one-fourth the time, at *f.* 6.3 give one-sixth the time, if stop *f.* 22 is used give twice the time of the table, at *f.* 32 give four times the time of the table. the smaller the stop the sharper the picture. Stop No. 16 gives the best average results for interiors.

## TO MAKE A PORTRAIT.

Portraits should not be too sharp, hence ordinarily we advise the use of stop *f.* 6.3 for such work.

## TIME EXPOSURES IN THE OPEN AIR.

When stop *f.*32 is in the lens the light admitted is so much reduced that time exposures out of doors may be made the same as interiors, but the exposure must be much shorter.

WITH SUNSHINE—1-10 second.

WITH LIGHT CLOUDS—From 1-5 to ½ second will be sufficent.

WITH HEAVY CLOUDS—From 1 to 3 seconds will be required.

## DIAPHRAGMS,

The stops should be used as follows:

F.6.3—For quick exposures of moving objects, with shutter speed of 1-250 or 1-200 second as the case may be. Occasionally for slower speeds on cloudy days; for indoor portraiture.

F.8—For retarded exposures of 1-50 on *slightly* cloudy days, and for 1-100 exposures in bright sunlight.

F.11—For 1-50 exposures when the sun shines.

F.16—For instantaneous 1-100 exposures when the sunlight is unusually strong and there are no heavy shadows: such as in views on the seashore or on the water, or in tropical or semi tropical climates; also for interior time exposures, the time for which is given in the table in manual used with this camera.

F.22 and 32—For interiors. For time or retarded exposures out of doors in deep shadows or on very cloudy days. *Never for instantaneous exposures.* The smaller the stop the sharper the picture.

Absolute failure will be the result if you use the smallest stop for instantaneous exposures.

## FLASHLIGHT PICTURES.

When making flash light pictures use stop *f*.11.

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