TELEPHOTOGRAPHY

WITH A

Pancratic Telephoto Lens

INSTRUCTIONS AND RULES

MADE BY

Gundlach-Manhattan Optical Company

ROCHESTER, N. Y.

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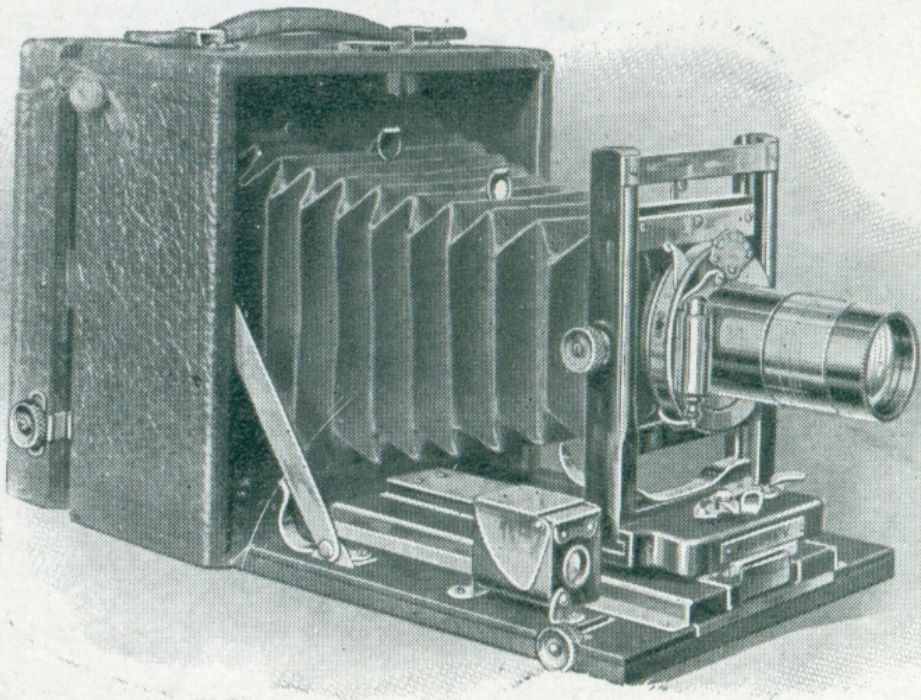
A TELE-PHOTO LENS is merely an optical combination which produces a lens having a short back focus and long equivalent focus. The latter determines the size of the image and if we know the focus of the positive lens and multiply it by the magnification we then know the equivalent focus of a lens of any kind which will produce an image of the same size. For example, a 6″ positive combination with a magnification of 4 diameters gives an image equal to that produced by a lens of 24″ equivalent focus or four times larger by linear measurement than an ordinary 4 x 5 lens but 16 times larger by surface measurement. A magnification of 4 times is a greater enlargement of the image than one would realize until they see the comparative size of the images and for these reasons the beginner in Tele-Photo Work is inclined to experiment at the wrong end and try to get the greatest enlargement of the image the lens will produce before becoming competent to get results under easier conditions.



INSTRUCTIONS

FOR USING THE

Pancratic Telephoto Lens

The Pancratic Telephoto Lens is composed of a positive front combination of about 6″ focus and a negative back combination of about 3″ focus. Both lenses are achromatic.

The positive combination forms the image which is enlarged or magnified by the negative lens and the separation between them determines the magnification. The mount of the positive lens is adjustable to permit altering the separation so the magnifying power can be regulated and it also may be used as a means to focus the image.

The negative lens is separated from the shutter by a length of tube which is furnished in two pieces. The two together make the separation correct for shutters 14 m/m thick and both should be used with Winner, Regular or Automatic Shutters. All other shutters are 21 m/m thick and with these the short tube is not required because the lens mount must be shortened this much to allow for the greater shutter thickness.

To test the separation put the positive combination alone in the back of the shutter and focus on a prominent object, then measure the width of the image, suppose it is a chimney and measures ⅛″ wide. Next assemble the Pancratic Telephoto Lens complete and adjust the mount to 4 magnifications. The image of the chimney when focused should be ½″ wide or magnified 4 diameters.

Focus by turning the adjustable mount and if the image is not sharpest when exactly set for 4 magnifications then the difference represents the error in the separation. Of course, the separation to agree with the graduation upon the mount cannot be made exact without individual fitting of each lens owing to a little variation in the focal length of the lenses and a difference in shutters, but this is of no importance.

Magnification	3	4	5	6	7	8
Light Circle	5½″	7½″	9½″	11½″	13½″	15½″
Bellows required	8″	11″	14″	17″	20″	23″

Focus upon a prominent object somewhere about the centre of the subject or the principal object and first extend the bellows to approximately the required length for the magnifying power used then turn the adjustable mount slowly one way or the other until the image shows the best definition. With the higher powers this cannot be done very well because the bellows extension is too long for the reach of the arm. In this case focusing must be done by adjusting the Camera front or back. Careful focusing is worth all the time it takes as it is the only way to make sure that the definition is as good as possible. Stop down a little at a time and do not use a smaller aperture than necessary.

The usual factors enter into the question of exposure and the problem is no more difficult than in ordinary photography and it is subject to the same latitude.

Great care must be taken to avoid vibration or movement of the Camera during the period of exposure. The enlargement of the image and the increase in exposure both tend to impair the definition from this cause if the operator does not make sure that the Camera

is perfectly still and rigid. Telephotography will not produce the microscopic definition given by Anastigmat lenses of short focus but negatives sharp enough to stand further enlargement can be made and it is very difficult to tell a telephoto negative from one made with an ordinary lens.

Telephoto subjects should be chosen judiciously and should be as free as possible from small details. A broad lighting effect is also desirable.

Do not take a telephoto picture from one high point to another in the middle of a hot day, the heat rays rising from the valley between will make a sharp negative impossible. Work with the lower powers first until good results are secured and even then use the higher powers judiciously for suitable subjects.

The magnifying power is expressed in diameters so at 4 diameters an object will be 4 times as wide or 4 times as high as compared with the image made by the positive lens from the same view point.

Do not try your first telephoto pictures with the highest magnifying power nor choose a subject full of fine details and at a time when the light and weather conditions make ordinary photography difficult.

The telephoto lens is only beginning to be appreciated and it undoubtedly has a useful future when photographers learn how to use it to advantage and more fully realize that telephotography includes many subjects that are comparatively close but just beyond the range of lenses of normal focus.

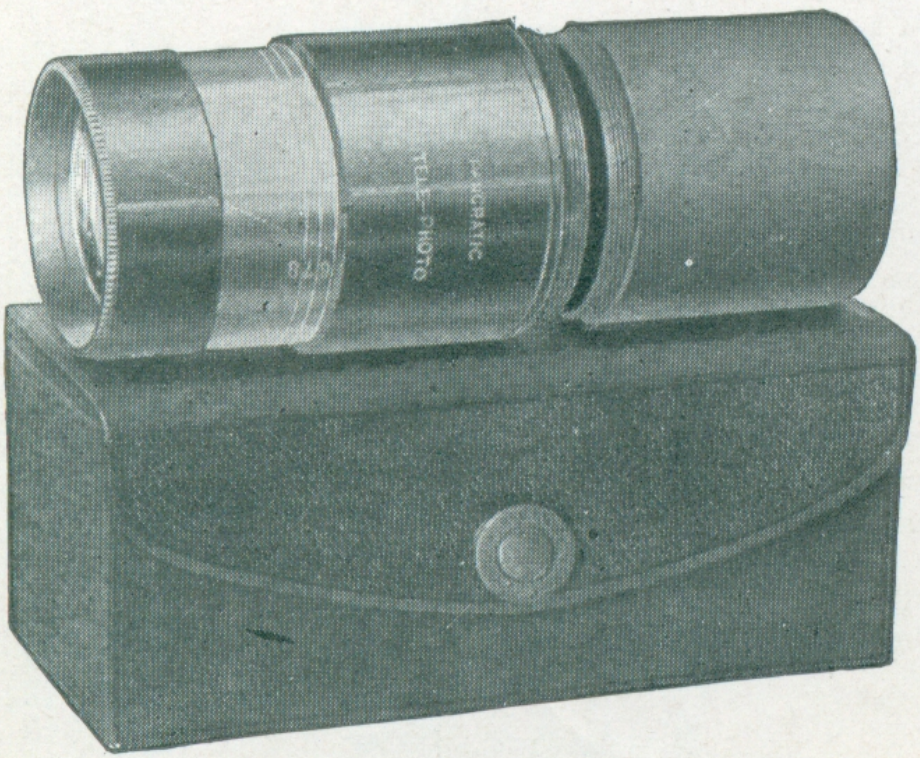
Rules TO FIND THE CAMERA EXTENSION for any magnification. Multiply the focal length of the negative lens by the number of magnifications less one. For example—To find the extension required for eight magnifications multiply the focal length of the negative lens by seven. Note that the difference in the camera extension between two magnifications is equal to the focal length of the negative lens which is a simple way to determine the latter.

TO FIND THE FOCAL LENGTH OF A POSITIVE LENS giving an image of the same size as the telephoto lens. Multiply the focal length of the positive lens by the magnification. Example: A six inch positive lens at four magnifications produces an image of the same size as a lens of twenty-four inches focus.

TO FIND THE *F* VALUE OF THE DIAPHRAGM OPENING. Multiply the value of the diaphragm opening for the positive lens

by the magnification. The permanent stop located in the mount of the positive combination of the Pancratic is equal to F:12 and at 5 diameters becomes F:60.

TO DETERMINE THE EXPOSURE. Multiply the exposure that would be given for the positive lens alone by the square of the magnification. Example: 1/25 second is a fair exposure at F:12 under good light conditions and 1/25 x 25 is only one second and 1 2 second will probably be sufficient for a well timed negative.



Size of Case

1½ x 1½ x 3½

Weight of Lens and Case, 6 oz.

PRICE

No. 1 Pancratic Tele-Photo Lens in cells with leather case	**$15.00**
Korona Victus Shutter extra . . .	5.00

Full information regarding the practice and possibilities of tele-photo photography is given the Photo miniature. No. 90, entitled Practical Tele-Photography, price 25c, sold by all dealers.

MADE BY

Gundlach-Manhattan Optical Company

Rochester, New York