

INSTRUCTIONS
for
 $2\frac{1}{8} \times 2\frac{1}{2}$
National
GRAFLEX
Series II
with
Telephoto Lens



Made in U. S. A.

FOLMER GRAFLEX CORPORATION
ROCHESTER, NEW YORK

#209140

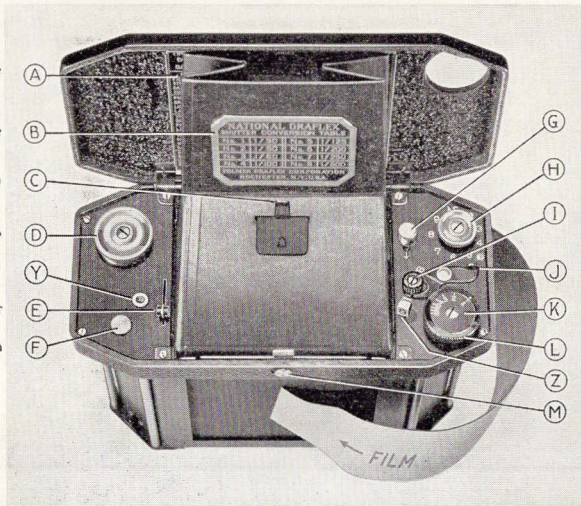


INTRODUCTION

The National Graflex Camera Series II incorporates features made possible by more than 30 years of practical experience by Graflex in the manufacturing of precision cameras. Its design enables anyone to make keepworthy photographs regardless of previous photographic experience.

In order that you may best familiarize yourself thoroughly with the mechanism of this camera, before starting to make any pictures, we suggest that before putting the film in the camera you acquaint yourself with the various steps in the making of all classes of pictures with the National Graflex.

Exposure Guide
Shutter Speed Table
Magnifier Projecting Arm
Film Winding Knob
Cable Release Socket
Mirror Set Lever
Mirror Release Button



Film Lock Release
Film Indicator Knob
Bulb Projecting Arm
Bulb Release Lever
Shutter Winding Knob
Knurled Ring
Cable Release Socket
Cover Catch

FIGURE 1

Instructions for Using the *National* GRAFLEX

I. GETTING READY TO TAKE THE PICTURE

Open lens door by sliding the Lock Button T downward and pulling outward. See that lens door swings downward and snaps into firm position.

Open top cover by pressing inward on Cover Catch M.

Set mirror to focusing position by moving lever E toward the back of the camera.

See that the dot on the Bulb Control I is located nearest "I" (instantaneous).

Because of the increased sensitivity of present day films it is advisable to fold down the hood when winding the shutter. This also makes the film winding knob more accessible.

Wind shutter by turning shutter winding knob K clockwise as far as possible.

Set shutter to the desired speed by lifting upward on Knurled Ring L and permitting it to drop into position when the dot is opposite the chosen speed number.

It is important that the shutter should not be wound when the lens door of the camera is folded in.

USING THE NATIONAL GRAFLEX EXPOSURE GUIDE

Note: Exposure Guide is readily visible when hood is held in folded position.

Select from the five groups under "Description of Picture" the classification which best describes the subject to be photographed. Set the slider with its left edge at the hour of day opposite the line indicating the group of months in which you are making the picture.

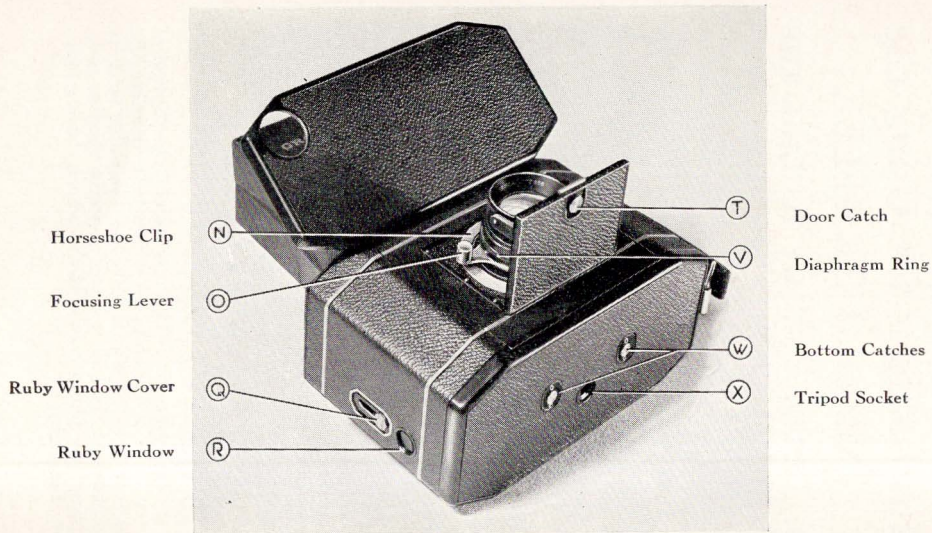


FIGURE 2.

The Exposure guide classifies light conditions into three groups which may be described as follows: If the sky is clear and there are very dark shadows, it is considered Bright. If there are light clouds or haze and the shadows are gray or transparent, it is Hazy. When the sky is overcast and there are no well defined shadows, it is Dull. If it is raining or very dark clouds fill the sky, good pictures may sometimes be made by allowing double that exposure indicated for "Dull;" i.e., where No. 4 is directed, use No. 2.

Select the prevailing light condition, "Dull" "Hazy", or "Bright" In the horizontal row of numbers in the windows opposite description of picture and the kind of daylight available you will find the correct shutter speed number for each of the lens diaphragm settings indicated directly above at the top of the slider.

Example: If the subject to be photographed is a person standing in the shade; the time is 3 P M; it is a day in July; the light condition is "Hazy;" the proper exposure is determined as follows:

1. The subject is classified in the second group under "Description of Picture."
2. It will be noticed that "July" appears in the lowest of the month groups.
3. The slide is set with the left edge at "3 P.M." in the bottom row of figures opposite "Time of Day."
4. Using lens diaphragm setting $f/8$, shutter speed No. 2 will give the correct exposure. (This you will find in the "8" column, directly opposite the "Hazy" adjoining your chosen picture subject group.)

The speeds, expressed in whole numbers on the exposure guide and shutter setting knob, are converted to fractions of seconds on the table attached to the focusing hood.

Where there is no motion in the subject, select from the guide the lowest possible speed number and use the correlated $f/$ number indicated on guide

TIME OF DAY	A.M.	9	10	11	12	NOV	DEC	SET THIS SLIDER TO THE TIME OF DAY OPPOSITE THE MONTH GROUP. FIND SPEED NUMBER UNDER THE F NUMBER SELECTED - OPPOSITE THE DESCRIPTION OF THE PICTURE AND LIGHT CONDITION.							
	P.M.	3	4	5	6	JAN	FEB								
	A.M.	7	8	9	10	MAR	APR								
	P.M.	5	6	7	8	SEP	OCT								
DESCRIPTION OF PICTURE	A.M.	6	7	8	9	MAY	JUNE								
	P.M.	6	5	4	3	JULY	AUG								
DESCRIPTION OF PICTURE						F. NO	22	16	11	8	56	4	35		
FIGURES IN DEEP SHADE OR DARK STREETS. VIEWS IN SHADY WOODS						DULL					1	3	4		
DARK OBJECTS. BUILDINGS ALSO						HAZY				1	3	5	6		
SUBJECTS NEARER THAN 5 FEET						BRIGHT		1	3	5	7				
PORTRAITS OUTDOORS IN SHADE						DULL					3	5	6		
OR WITH DARK BACKGROUND.						HAZY			1	3	5	7			
LIGHT BUILDINGS. OPEN STREETS						BRIGHT		1	3	5	7	9			
LANDSCAPES WITH DARK TREES						DULL				2	4	6	7		
VIEWS. GROUPS. LARGE FIGURES IN						HAZY			2	4	6		9		
OPEN. SNOW SCENES WITH DARK						BRIGHT		2	4	6					
FIGURES. LANDSCAPES WITH						DULL				2	4	6		9	
LIGHT FOREGROUND.						HAZY			2	4	6				
SEMI DISTANT VIEWS IN THE						BRIGHT	2	4	6						
OPEN. NEARBY VIEWS ON						DULL				1	3	5	7	9	
WATER OR WHITE SAND. DISTANT						HAZY			1	3	5	7	9		
DARK MOUNTAINS OR FORESTS						BRIGHT	3	5	7	9					
DISTANT VIEWS. LIGHT MOUNTAINS						DULL									
SNOW SCENES. OPEN BEACH & SAND						HAZY									
(FOR OPEN WATER & SKY ADD 1)						BRIGHT									
SEE TABLES FOR MOVING OBJECTS															

FIGURE 3. THE EXPOSURE GUIDE.

directly above. This is the procedure for most pictures.

The Exposure Guide is calibrated for films with the speed of Verichrome (24 Weston). Adjustment for emulsions of different speeds can be made by varying the diaphragm stop *or* the shutter speed, remembering that each successive smaller stop or each second higher shutter-speed number reduces the exposure by one-half. For example: a film twice the speed of Verichrome (48 Weston) will require $f/16$ instead of $f/11$, *or* Speed 6 (1/200) instead of 4 (1/100).

Shutter Speeds applicable to action pictures are provided on page 16.

Allowances to be made when National Graflex filters are used are shown on pages 20-21-22.

If you have any questions relating to the use of films other than those treated herein, or regarding the use of the National Graflex Exposure Guide in different latitudes, you are invited to write our Service Department.

FOCUSING

Bring the concealed magnifier into position in the focusing hood by pressing downward on Magnifier Control C (fig. 1).

With the lens wide open, focus on principal object of interest by moving focusing lever O (fig. 2) up or down until the object appears sharpest on the ground glass.

Fold down magnifier.

Set lens diaphragm V (fig. 2) at predetermined *f*/ number.

Compose picture on ground glass.

II. MAKING THE PICTURE

Holding the camera firmly, press Mirror Release Button F *all the way* downward. This releases both the mirror and shutter.

A cable release threaded into cable release socket Y (fig. 1) may be used. Depressing the plunger will cause the exposure to be made. A self-timing device, if attached to the cable release, will delay the exposure permitting the operator to be included in the photograph.

III. GETTING READY FOR NEXT PICTURE

Reset mirror to focusing position by moving Lever E toward the back of the camera.

Release the film lock by sliding Button G in the direction of the arrow. Then release it.

Turn Film Winding Knob D clockwise until, without strain, it turns no further.

(Automatically the pointer on the film meter, has turned and is now pointing to the number of the next picture to be made. For the tenth and last picture it will again point to "S.")

Wind the shutter.

IV. CLOSING THE CAMERA

First: SEE THAT THE MIRROR IS SET IN FOCUSING POSITION (KNOB E BACK

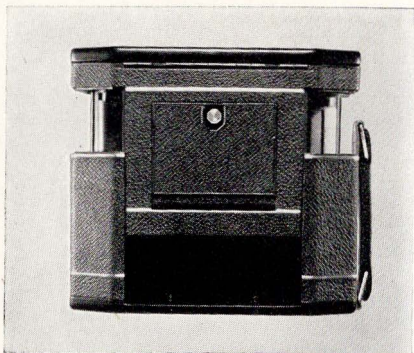


FIGURE 4. SEPARATING THE CASES.

FIG. 1). Release the shutter by pulling Bulb Release Lever J (fig. 1). *Be sure that Magnifier is folded down before closing hood.* Close down the hood by pressing at the sides near the base and fold top toward back of camera. Close the cover.

Second: To close the lens door, turn focusing lever O (fig. 2) to lowest position, and swing lens door upward into locked position.

V. LOADING THE CAMERA

Open cover by pressing the Cover Catch Button M (fig. 1). When the cover opens, the focusing hood automatically erects itself.

Pull Bulb Release Lever J (fig. 1) to make sure shutter is released. Close cover. Slide the Bottom Catches W to "O" (open), (fig. 2).

Separate inner from outer case as shown in fig. 4. Open cover.

Insert roll of film into film chamber under H (fig. 1) so that slot in end of spool is engaged in key. Note: Lower spool supports are swung out of way when inserting and removing spools.

Insert empty spool in spool chamber under Winding Knob D (fig. 1) so that the slot engages properly.

Remove sticker from film. Holding Film Release G (fig. 1) in direction of arrow, unroll sufficient film to reach take-up spool. Thread into long slot with film leader spaced evenly between flanges. Turn the Winding Knob D until the film tightens.

Place the bottom case back on the camera, making sure that it is seated against the top. While pressing the bottom firmly into place, slide the Catches W toward "C" (closed). Open ruby window by Sliding Button Q (fig. 2) upward.

While holding Film Release G in direction of arrow, wind the film with Knob D until number 1 appears in the center of the Ruby Window R (fig. 2) *Close ruby window slide.*

Holding the Release G toward arrow, pull up on the Indicator Knob H (fig. 1), permitting it to turn freely until the pointer is just clear of the starting position S toward the number 9. Release G and turn Film Winding Knob D until the film tightens. The film is now in position for the first exposure.

VI. UNLOADING THE FILM

When the Indicator hand returns to "S," film is in position for the last exposure. Following this exposure, hold the Film Release G toward arrow, and turn the winding knob D until the film is completely wound on the take up spool.

Turn film winding knob several revolutions after film indicator knob stops turning.

Removing the lower case, take out the exposed roll. Fold the end of the film trailer and paste the sticker around the roll.

VII. MAKING BULB EXPOSURES

(Use Tripod or other firm support. See Page 28)

To make pictures under unusual light conditions,

not covered by the Exposure Guide, the procedure is as follows:

BULB EXPOSURES

See that mirror is set in focusing position before (1) changing the position of the I-B knob or (2) winding the shutter.

Set camera on firm support.

Judge the duration of exposure required. (Since this depends on variable factors, fixed rules cannot be given).

Set mirror.

After winding shutter, set to No. 1.

Fold down the focusing hood and hold down with left hand. Turn the Bulb Control Knob I counter-clockwise so that the dot is located nearest "B" (Bulb).

Focus.

Set diaphragm to desired $f/$ number.

Press down on mirror release button F (This will allow mirror to raise but curtain will not run down as for instantaneous exposures.) The camera is now ready for the exposure.

Open shutter by pulling toward the back of the camera on Bulb Release Lever J with index finger, holding this lever back while counting off the time determined for the exposure. At the expiration of desired time terminate the exposure by releasing pressure on lever J

Note: When pulling back on lever J to start exposure, be careful not to hold the shutter winding knob K. Do not allow the lever to snap back at end of exposure, but release in a gentle, even manner.

A cable release threaded into cable release socket Z may be used for making bulb exposures. To make the picture, depress the plunger of the cable release for the duration of the exposure. Release the pressure on the plunger to terminate the exposure. The

Self-Timer and Delayed Exposure Device supplied as an accessory for the National Graflex Series II Cameras provides exposures of controlled duration ranging from one-half second to ten full seconds. This accessory should be operated according to the instructions accompanying it.

Re-set mirror.

Wind film for next exposure.

To re-set for instantaneous use, turn I (fig. 1) clockwise so that the dot is located nearest "I" (instantaneous).

Instantaneous "shots" at night: The fast $f/3.5$ lens and efficient focal plane shutter, in combination with fast film, will capture excellent close-ups at night with only one photoflood lamp.

VIII. LENSES

The 75 mm. B & L Tessar $f/3.5$

This National Graflex lens is of the Tessar Series IC type, made especially for this camera. To those who are familiar with lens qualities this will stand for the best.

The focal length is 75 millimeters. The speed is $f/3.5$.

DEPTH OF FIELD*

The diaphragm settings are marked $f/3.5$, 4, 5.6, 8, 11, 16, 22. Each number from 5.6 to 22 designates an aperture approximately one-half as great as the preceding number. For example, the diaphragm set

* *The distance between nearest and farthest object in focus*

Depth of Field Table for 75 mm. B & L Tessar f/3.5 Lens

Dis- tance of Object from Camera	Lens Diaphragm Settings						
	<i>f</i> /3.5	<i>f</i> /4	<i>f</i> /5.6	<i>f</i> /8	<i>f</i> /11	<i>f</i> /16	<i>f</i> /22
Feet							
4	3' 10" - 4' 3"	3' 9" - 4' 3"	3' 8" - 4' 5"	3' 7" - 4' 8"	3' 5" - 4' 11"	3' 3" - 5' 6"	3' 0" - 6' 5"
6	5' 7" - 6' 5"	5' 6" - 6' 9"	5' 4" - 7' 0"	5' 1" - 7' 6"	4' 9" - 8' 4"	4' 4" - 10' 0"	4' 0" - 13' 4"
8	7' 3" - 9' 0"	7' 1" - 9' 3"	6' 10" - 9' 10"	6' 5" - 10' 11"	6' 0" - 12' 6"	5' 4" - 17' 0"	4' 9" - 29' 0"
10	8' 10" - 11' 8"	8' 8" - 12' 0"	8' 2" - 13' 0"	7' 7" - 14' 11"	7' 0" - 18' 3"	6' 2" - 29' 2"	5' 5" - 99'
12	10' 4" - 14' 6"	10' 1" - 14' 11"	9' 6" - 16' 6"	8' 9" - 19' 9"	7' 11" - 26' 0"	6' 10" - 56' 0"	5' 10" - Inf.
16	13' 1" - 20' 8"	12' 9" - 21' 7"	11' 10" - 25' 2"	10' 8" - 33' 4"	9' 5" - 56' 0"	8' 0" - Inf.	
20	15' 9" - 28'	15' 2" - 29' 7"	13' 10" - 36' 6"	12' 3" - 57'	10' 8" - 180'	8' 10" - Inf.	
30	21' 1" - 51' 9"	20' 4" - 58'	18' 0" - 93' 0"	15' 4" - Inf.			
40	25' 8" - 98' 0"	24' 5" - 112'	21' 1" - 400'	17' 8" - Inf.			
60	32' 7" - 380'	30' 8" - Inf.					
80	38' - Inf.						
Hyp. f. Dist.*	71' 6"	62' 6"	44' 8"	31' 2"	22' 8"	15' 7"	11' 5"

**Hyperfocal Distance*: focused on this distance at this aperture, Depth of Field extends from ∞ to half the Hyperfocal Distance.

at $f/8$ admits one-half as much light as when set at $f/5.6$. Likewise, $f/11$ admits one-half as much light as $f/8$ or one-fourth as much as $f/5.6$.

On the ring, back of the focusing lever on your camera, are shown four settings, namely: infinity (∞) 4, 8 and 16, the last three of which refer respectively to the lens diaphragm settings $f/4$, $f/8$ and $f/16$. The following settings will produce the depth of field indicated below when customary focusing through the hood is impracticable.

4	$f/4$	32 feet to infinity
8	$f/8$	16 feet to infinity
16	$f/16$	8 feet to infinity

The above are for the most part desirable settings. However, if a condition requires a smaller diaphragm opening, increased sharpness in the picture will be noticed on the ground glass focusing screen.

If sharpness of foreground is not important set the focusing ring at the infinity mark (∞) and the camera will be in focus for all subjects 125 feet or more from the camera, irrespective of lens diaphragm opening used.

REMOVING THE LENS

Remove the lens and mount by lifting up and removing the nickel finished horseshoe clip N (fig. 2) directly back of the focusing lever free from the lens board. Note: Turn the focusing lever O (fig. 2) to lowest position before detaching lens.

The 140 mm. B & L Telephoto $f/6.3$

The telephoto lens is used in exactly the same manner as the Tessar lens. With the exception of the largest diaphragm opening, which is $f/6.3$, each

Depth of Field Table for 140 mm. B & L Telephoto f 6.3 Lens

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When Focused at	f/6.3		f/8		f/11		f/16		f/22	
	Sharpness Extends		Sharpness Extends		Sharpness Extends		Sharpness Extends		Sharpness Extends	
	from	to	from	to	from	to	from	to	from	to
12'	11' 4"	12' 9"	11' 2"	12' 11"	10' 11"	13' 5"	10' 6"	14' 1"	9' 11"	15' 2"
16'	14' 10"	17' 4"	14' 7"	17' 9"	14' 1"	18' 7"	13' 4"	19' 11"	12' 6"	22' 2"
20'	18' 3"	22' 2"	17' 10"	23' 8"	17'	24' 3"	16'	26' 7"	14' 10"	30' 9"
30'	26' 2"	35' 2"	25' 3"	36' 11"	23' 9"	40' 10"	21' 10"	48'	19' 7"	63' 10"
40'	33' 5"	49' 10"	32'	53' 5"	29' 6"	62'	26' 8"	80' 4"	23' 5"	137' 6"
60'	46' 3"	85' 5"	43' 6"	96' 5"	41' 4"	128' 8"	34' 2"	245' 9"	27'	Inf.
80'	57' 3"	132' 10"	53' 2"	181	46' 6"	278' 10"	39'	Inf.		
100'	66' 8"	200'	61' 2"	273' 9"	50'	Inf.				
120'	75' 1"	300'	68' 1"	503' 6"						
150'	85' 9"	600'	78'	Inf.						
200'	100'	Inf.								
Hyp. F. Dist.*	200' 1"		157' 7"		103' 3"		78' 9"		55' 9"	

**Hyperfocal Distance* focused on this distance at this aperture, Depth of Field extends from ∞ to half the Hyperfocal Distance.

diaphragm number on the telephoto lens corresponds with the same diaphragm numbers of the Tessar lens so that the correct exposure for it will be indicated by the exposure guide.

The use of the 140 mm. Telephoto $f/6.3$ lens gives an image on the film which is approximately twice as large as that obtained with the 75 mm. $f/3.5$ lens. This has the same effect as reducing the distance from the camera to the subject by approximately one half.

The lenses may readily be interchanged. Removing the nicked horseshoe clip on the lens mounting door permits the removal of the regular lens. Note: Turn focusing lever O to lowest position before detaching lens.

The Telephoto lens is placed on the camera with the focusing lever on the left side when facing the camera from in front. Replace the nicked horseshoe clip.

A depth of field table applying to the Telephoto lens appears on opposite page.

CLEANING

Since dust will accumulate on lens, ground glass, and focusing mirror, it is desirable to occasionally clean the surfaces thereof. To facilitate cleaning, remove the lens and mount from the camera.

Light dust accumulations can best be removed by using a fine camels' hair brush.

To clean lens, breathe on the glass and wipe gently with a soft clean cloth, free from lint, or with lens tissue. *Do not* touch the surface of the lens elements with anything hard or rough.

The surface of the mirror is scientifically coated with a highly reflective aluminum compound, which retains its brilliancy in the absence of a protective coating. In order to insure maximum benefit from its use, care must be exercised in cleaning to guard

Table for Photographing Moving Objects

Use the EXPOSURE GUIDE to determine the correct diaphragm setting.

Speed of Object	Distance of Object from Camera						
	25 ft.	50 ft.	75 ft.	100 ft.	150 ft.	200 ft.	300 ft.
	*	*	*	*	*	*	*
	**	**	**	**	**	**	**
	***	***	***	***	***	***	***
	♀ ♂ ♂	♀ ♂ ♂	♀ ♂ ♂	♀ ♂ ♂	♀ ♂ ♂	♀ ♂ ♂	♀ ♂ ♂
2½ Miles per hour	2 3 4	1 1 2	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1
5 Miles per hour	4 5 6	2 3 4	1 2 3	1 1 2	1 1 1	1 1 1	1 1 1
7½ Miles per hour	5 6 7	3 4 5	2 3 4	1 2 3	1 1 2	1 1 1	1 1 1
10 Miles per hour	6 7 7	4 5 6	3 4 5	2 3 4	1 2 3	1 1 2	1 1 1
15 Miles per hour	7 7 9	5 6 7	4 5 6	3 4 5	2 3 4	1 2 3	1 1 2
20 Miles per hour	7 9 9	6 7 7	5 6 7	4 5 6	3 4 5	2 3 4	1 2 3
30 Miles per hour	9 9	7 7 9	6 7 7	5 6 7	4 5 6	3 4 5	2 3 4
40 Miles per hour	9	7 9	7 9 9	6 7 7	5 6 7	4 5 6	3 4 5
60 Miles per hour		9	9 9	7 7 9	6 7 7	5 6 7	4 5 6
80 Miles per hour			9	9 9	7 7 9	6 7 7	5 6 7
120 Miles per hour				9	9 9	7 9 9	6 7 7
160 Miles per hour					9	9 9	7 7 9

♀* Objects moving toward or away from the camera.

♂** Objects moving toward or away from the camera at 45 degree angle.

♂*** Objects moving at right angles to the camera.

against scratches from grit or other foreign matter. Loose dust may be removed by brushing with a tuft of clean cotton saturated with water. Any marks left by the drying liquid may be removed by condensing breath moisture upon the mirror and rubbing with cotton. The mirror should not remain wet for any prolonged period as water is likely to contain acid or alkaline which may slowly attack the aluminum.

Replace the lens in the camera by placing it with the slotted band in front of the guides and gently push it back so that the guide pins enter the slots. Replace the clip. Note: The focusing knob should be on the left side when facing the lens from in front.

IX. THE FOCAL PLANE SHUTTER

The focal plane shutter is so called because it operates near the focal or picture plane, i.e., at the film instead of at the lens as other shutters do. This shutter consists of two curtains so arranged that they may be moved with respect to each other thereby providing changes in the shutter opening. These changes vary from an opening full picture width, to an opening a small fraction thereof. The shutter moves at the same velocity for all speeds and, through the varying aperture, provides a wide range of exposure times. The eight settings provided are numbered 1, 2, 3, 4, 5, 6, 7 and 9.

These shutter speed numbers showing on shutter winding knob K (fig. 1) correspond to those appearing on the exposure guide.

SHUTTER SPEEDS

The individual shutter speed numbers have the following equivalents when expressed in terms of fractions of seconds:

No. 1— $1/30$

No. 5— $1/125$

No. 2— $1/50$

No. 6— $1/200$

No. 3— $1/60$

No. 7— $1/250$

No. 4— $1/100$

No. 9— $1/500$

Added efficiency in your Graflex Focal Plane Shutter has made it possible to provide this group of shutter speeds, all of which permit holding the camera in the hand without danger of movement. Operating in the closest possible proximity to the focal plane, and utilizing all *the added light* obtained, this shutter assures *National* GRAFLEX users outstandingly sharp reproduction of both still and action subjects.

In photographing moving objects the motion table will assist you in determining what shutter speed number will be ample to arrest the action.

You will note in referring to the table that arresting motion depends on:

1. The speed with which the object is moving.
2. The distance of the object from the camera.
3. The angle in which the object is moving in its relation to the camera.

The "Table for Photographing Moving Objects," page 16, deals with each.

Having determined the shutter speed number, refer to the Exposure Guide for the *f/* number which will permit the correct exposure.

NOTES ON FILTERS

In order to obtain a greater versatility and flexibility from the NATIONAL GRAFLEX, we recommend the use of filters, a number of which are available for the camera. By means of them, better color rendition and cloud effects can be secured, and in addition, various objects to be photographed can be strengthened or subdued, in accordance with their color and the results wanted in the final photograph.

A set of ten different filters are regularly available for the regular 75 mm. Bausch and Lomb Tessar Lens of the NATIONAL GRAFLEX. These consist of the following Wratten filters: K1, K2, Aero 1, Aero 2, X1, X2, G, A, F and Sky. These filters are mounted in metal slip-on mounts with split prongs which can be bent to make the filter fit the lens snugly.

Any Wratten filter for the 140 mm. Bausch and Lomb Telephoto Lens may be obtained. The following are regularly supplied as standard equipment: Wratten K1, K2, Aero 1 and Sky. Any other Wratten filter of the proper size may be ordered separately. The filters for this lens are unmounted; that is to say they are not provided with a metal mount by means of which they may be placed over the lens. Instead, they are merely glass filter discs which fit into the recess of the telephoto lens, just to the rear of the special lens shade which is provided with the lens. To use any of these filters, merely unscrew the lens shade, place the filter into the recess provided for it on the lens mount, and rescrew the lens shade in place, over it. The shade adequately secures the filter in position. When not in use, they may be stored in their respective boxes or wrapped in tissue paper and stacked in a pocket or special case which can be easily and quickly made by the NATIONAL GRAFLEX owner.

National GRAFLEX Filters—Uses and Factors

TABLE NO. 1

The following table contains information relating to the use of specific filters with the National Graflex

Filter	Function	Uses	Filter Factors				
			Veri- chrome	Panatomic-X		Super-XX Panatomic	
			Day- light	Day- light	Art. Light	Day- light	Art. Light
Sky	Partially absorbs blue light rays present in the sky,	Use with Verichrome film only. Greater contrast between clouds and sky without altering exposure.	1				
K-1 Aero #1	Medium correction for violet and blue light rays.	Cloud Effects, Beach Scenes, Mountain Vistas, Pastoral Scenes.	2.0	1.5	1.5	1.5	1.5
K-2 Aero #2	More complete absorption of violet and blue. Renders blue darker than K-1.	Cloud Effects, Beach Scenes, Light Buildings against sky, Mountain Vistas, Pastoral Scenes, Removing haze, etc.	2.5	2.0	1.5	2.0	1.5
X-1	For Kodak Panatomic Film. Reproduces all colors in correct tonal relation, in daylight.	For daylight photography of highly colored subjects requiring correct rendering.				5	4

X-2	For Kodak Supersensitive Panchromatic or Panatomic Film. With tungsten light reproduces all colors in correct tonal values.	For photography of highly colored subjects requiring correct rendering using tungsten light (Photo-flood Lights, etc.)					5
G	Absorbs more of the violet and blue, and renders blue darker, than does the K series.	Cloud effects, general beach scenes, mountain vistas. Records less haze than the eye sees.	5	3	2	2.5	2
A	Absorbs all violet, blue and blue green. Renders blue as very dark and yellow and orange as white.	Striking cloud effects, distant scenes. Records still less haze than the G filter.		7	4	4	2
F	Absorbs all violet, blue and green. Renders blue as black and yellow, orange and red as white.	Used for "moonlight" effects. producing pure white clouds against black sky. A contrast filter.		15	8	8	4

Note: The National Graflex sun shade used with filters is also a great help in securing negatives with clear, sharp detail.

Filters for the 140mm Bausch & Lomb Telephoto $f/6.3$ lens are available to fit into the sun shade incorporated in the front of this lens. Filter factors same as above.

TABLE NO. 2

USE OF FILTERS WITH NATIONAL GRAFLEX EXPOSURE GUIDE

The vertical column at the extreme left contains the shutter speed numbers given by the Exposure Guide. In the horizontal columns opposite each of these numbers appear the shutter speed numbers which should be used with the combination of film and filter given directly above. e.g., if the Exposure Guide gives shutter speed No. 7 when using a K-2 Filter and Verichrome film, the shutter speed number to be used is number 4.

Shutter Speed Number Given by Exposure Guide	Sky	K-1			K-2			G			X-1	X-2
	Veri- chrome	Veri- chrome	S.S. Pan.	Pana- tomic	Veri- chrome	S.S. Pan.	Pana- tomic	Veri- chrome	S.S. Pan.	Pana- tomic	Pana- tomic	Pana- tomic
1	1		2			1						For use with tungsten light. See note
2	2		3	1		2			1			
3	3	1	4	2		3	1		2			
4	4	2	5	3	1	4	2		3	1		
5	5	3	6	4	2	5	3		4	2		
6	6	4	7	5	3	6	4	1	5	3	1	
7	7	5		6	4	7	5	2	6	4	2	
9	9	7			6	9	7	4		6	4	

Note: When taking photographs with filters under conditions such as tungsten light, not covered by the Exposure Guide, please refer to filter factors given in table No. 1.

Only the Sky, K1, K2, Aero 1, Aero 2 and G Filters may be used with orthochromatic film (such as Verichrome). All other filters demand the use of panchromatic film (such as Panatomic-X and Super-XX Panchromatic). Observe the filter factors for not only each filter, but also, for each film. The filter factor represents the number of times the exposure should be lengthened.

Generally speaking, the Sky filter should be used principally for normal cloud effects in cases where a necessarily prolonged exposure is not possible. Because the lower half of the filter is clear glass, no increase in exposure is required. Be sure, when placing this filter over the lens, that the yellow half is over the top of the lens (for the sky area), and the clear portion over the lower part (for the foreground).

The K1, K2 and Aero 1 and Aero 2 filters are chiefly used for over-all correction and for reproducing clouds in the sky. Sky areas reproduce in print as white without a filter. The filter will tone down the sky portions and give a more natural effect in the print. The Aero filters are similar in use to the K filters, but are preferred when distance is to be photographed.

The X filters are to Kodak panchromatic films what the K filters are to orthochromatic film; in other words, better tonal correction is secured. The X1 should be used only for sunlight, and the X2 only for tungsten (Mazda) light. Full color correction is obtained in each case indicated when Kodak panchromatic film is used. The K filters will give full color correction with other brands of panchromatic film.

The G filter is for a heavy, over-correction of sky areas and cloud effects. It is the deepest color filter permissible for use with orthochromatic film, but it is ideal for a somewhat strong correction with panchromatic film.

A and F filters are, strictly speaking, contrast filters, and should be used mainly for very dark or even black sky areas and white, fleecy cloud effects. The A or F red filters are also excellent for cutting through aerial haze in distant scenes where vast distances are involved. In this respect, these filters are better than the Aero filters.

A good rule to keep in mind with regard to the use of filters is, that objects of the same color as the filter in use will be reproduced in the print as white, or nearly so. On the other hand, objects of the opposite color (complimentary) than the color of the filter will be reproduced as dark gray in tone.

A few words regarding the care of filters will be found useful, and if the following suggestions are carried out, your filters will be a life-time investment and add to your enjoyment of the NATIONAL GRAFLEX.

1. Keep the filter clean at all times.
2. Keep the filters in the special filter case when not in use.
3. Use only lens cleaning tissue for the cleaning of filters.
4. Never use chemicals as a cleaning medium on filters.
5. Make sure that the filter is properly seated over the lens to prevent it from dropping off or introducing optical disturbances in the negative.
6. Select each filter with a purpose. Don't use a filter promiscuously. Make sure that it will improve the result before you decide upon using it.
7. Check the filter factor table (Table 1) for factor of the filter and film used.
8. Use the NATIONAL GRAFLEX lens shade over the 75 mm. lens for every exposure.

National Graflex Lenses and Accessories



FIGURE 5.

THE COPYING ATTACHMENTS

These handy devices permit the photographing of subjects lying quite close to the camera and are easily slipped over the front of the Bausch & Lomb Tessar lens.

The 18" attachment permits the filling of the entire picture area with a head and shoulders portrait. A 12" attachment may be used for photographing subjects that distance from the camera.

The shorter the distance from the subject to the lens, the shallower will be the depth of field at a given stop; hence it is advisable to use the smallest possible diaphragm stop with the copying attachments.

Since there is no appreciable change in the distance from the lens to the film with these supplementary lenses, the relative apertures remain as indicated by the diaphragm scale and no compensation need be made in determining exposures. It is advisable to keep a complete record of all data concerning exposures with artificial light to permit duplicating satisfactory results: intensity of light and its distance from the subject; working distance; diaphragm stop; and exposure time.

SUNSHADE

This worthwhile accessory prevents the entrance into the lens of extraneous light. It folds and slips into its own flat leather case when not in use.

DIRECT VISION SIGHT FINDER

This is of the optical type and fitted with cross lines for the proper centering of the subject when sighted with the finder approximately three inches from the eye. When attached to the bottom of the camera, with the small screw fitting into the tripod socket, it permits making photographs over the top of nearby subjects. It is especially useful in a crowd. For prefocusing of the lens see page thirteen.

CARRYING CASES

Although the National Graflex requires no carrying case, such an accessory affords added protection as well as convenience in carrying. There is available a choice of four distinct cases—each having its worthwhile features.

The New Carry-All Case

The new Carry-All Case provides a convenient means for carrying the camera and all its accessories.

This case is made with compartments for the National Graflex Camera, Telephoto lens, an exposure meter, two filter cases, the direct vision sight finder, sunshade and slow exposure device as well as space for additional rolls of film. It is made of black sole leather, plush lined and supplied with lock, handle and shoulder straps.

The "Sportsman" Case

The "Sportsman" positions the camera on the chest—at natural picture-making position—and permits using the camera *in the case*. (See fig. 5).

This case is made of black genuine leather; is plush lined; has an adjustable leather neck strap which can be quickly extended to permit carrying the case suspended from one shoulder; and *completely* encloses the camera for carrying.

The Zippered Suede Case

Made of soft waterproofed tan suede, this case has proven a popular favorite. It folds for pocket carrying, and is complete with an adjustable leather shoulder strap.

The Hard Leather Case

Made of black, genuine leather, and of rigid construction, this case meets a wide acceptance. Will withstand hard usage, and with its adjustable leather shoulder strap, is a great convenience.

The Crown Jr. Tripod

The Crown Jr. Tripod, as supplied, includes three legs, a detachable top, and an ingenious carrying unit. It is made of ebonized cherry, with nickel metal fittings. Its length closed is 17 inches; when extended, 44 inches. The tripod top measures $3\frac{3}{8}$ inches.

When the tripod is folded up for carrying, the legs are nested within the carrying unit—the top attaching to it by means of the camera clamp screw.

Microscope Adapter

By removing the lens, a microscope adapter which will slip over the eye piece of a microscope can be fitted to the National Graflex. This will permit the camera to be used for photomicrography

GRAFLEX Enlarg-or-Printer

Many times interesting picture possibilities are discovered in a section of a negative. An enlargement from a small negative section makes an interesting and “keepworthy” picture.

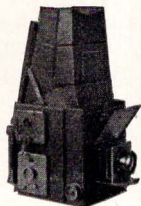
The Graflex Enlarg-or-Printer was designed to allow your using the National Graflex lens for making these interesting enlargements. With one compact unit you are provided with an enlarger, contact printer and retouching desk, almost a complete dark-room in itself. The compactness of this unit will be appreciated by those who are forced to work in a confined space. It requires no installation or setting up. It is always set to go.

Not only will the Graflex Enlarg-or-Printer accept your National Graflex negatives but will accommodate any negative ranging from 35mm to $2\frac{1}{4} \times 3\frac{1}{4}$ or that area of negatives up to 4x5.

The Graflex Enlarg-or-Printer will completely round out your enjoyment of National Graflex photography. Complete information on this versatile unit will be sent you upon request by our Service Department.

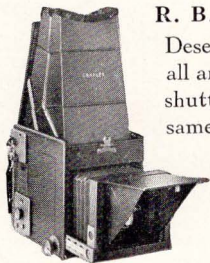
Other Graflex Favorites

R. B. Series B GRAFLEX: Reliable, practical, popular. Focal plane shutter gives 24 speeds up to 1/1000 and any Time desired. Kodak Anastigmat $f/4.5$ lens. Uses sheet film, roll film, plates, film packs. Made in sizes $2\frac{1}{4} \times 3\frac{1}{4}$, $3\frac{1}{4} \times 4\frac{1}{4}$, 4×5 . Also made without Revolving Back in 5×7 size.

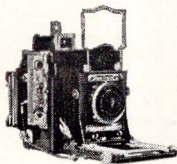


R. B. Series D GRAFLEX:

Deservedly popular because of its all around utility and ability. Same shutter as R. B. Series B and provides same choice of film and plates. Removable lens board permits wide selection of lenses. Revolving Back is standard equipment. Made in sizes $3\frac{1}{4} \times 4\frac{1}{4}$, 4×5 .



SPEED GRAPHIC: Approved and praised by Press Photographers. GRAFLEX focal plane shutter gets even the most difficult shots. Both direct vision and ground glass focusing. Accommodates plates, films, and film packs. Removable lensboard to take regular or ultra-fast lens and between-lens auxiliary shutter. $2\frac{1}{4} \times 3\frac{1}{4}$ Miniature, $3\frac{1}{4} \times 4\frac{1}{4}$ and 4×5 Anniversary and 5×7 Models.



The Graflex Repair Department is equipped to inspect, clean and repair all Folmer Graflex products, and to fit accessories and special lenses to Speed Graphic and Graflex cameras. All correspondence concerning repairs should be addressed to the Repair Department.

The Graflex Service Department is anxious to help you get the most out of your National Graflex. Do not hesitate to write us about any photographic problem you may have.

The Registration Card attached to your camera when it left the factory should be filled out completely and accurately, and returned to us promptly. It furnishes us with information that facilitates answering your letters, and assures a permanent record of your equipment that may prove valuable in case of theft or loss. If you did not receive a Registration card with your camera, write today for another.



FOLMER GRAFLEX CORPORATION
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