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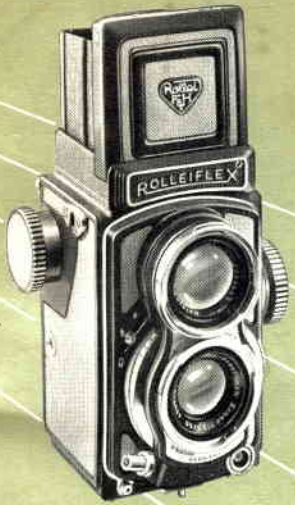


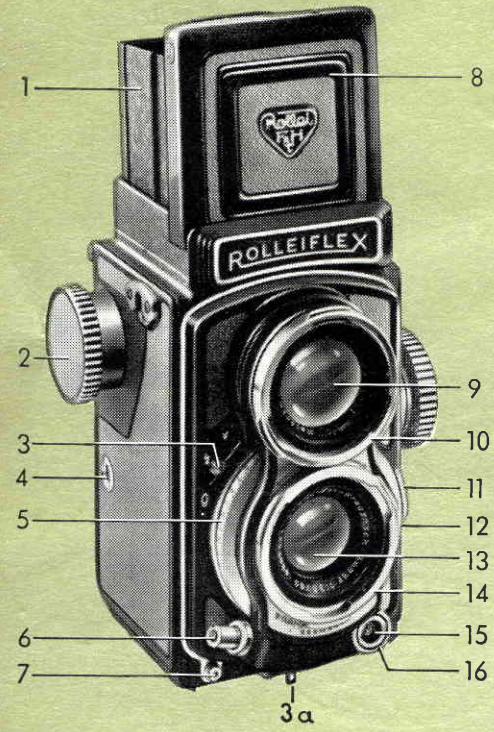
Rolleiflex

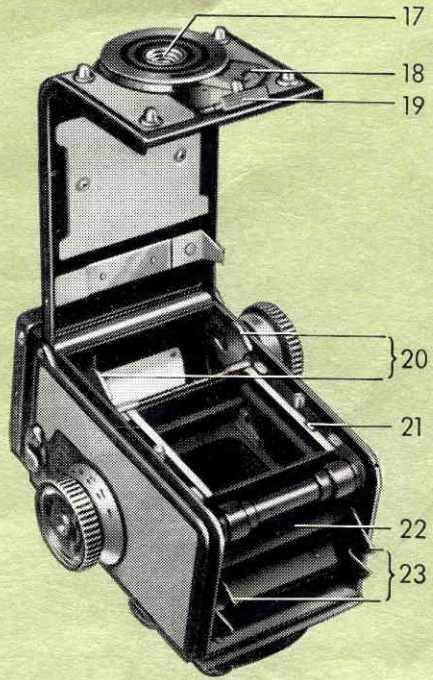
4×4

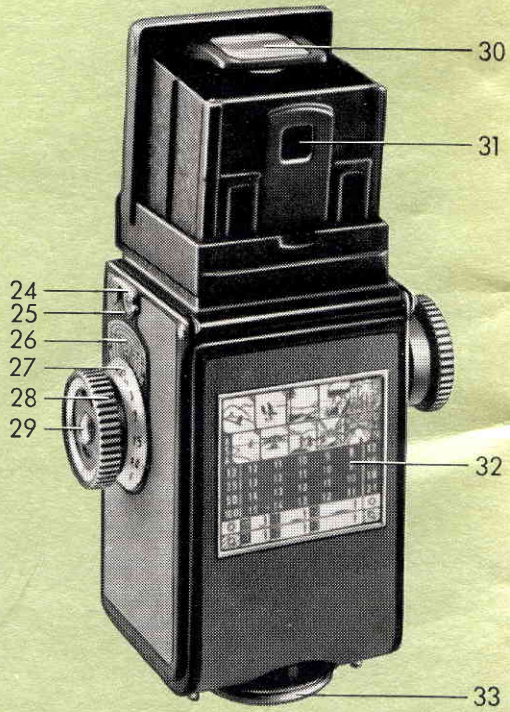
IN PRACTICAL USE

Rolleiflex

4×4







D. B. P. u. D. B. G. M. · U.S., Brit., Ital., Schweiz., Jap. pat. · Brev. s. g. d. g. · Pat. pend.

TO LOCATE THE MOST IMPORTANT PARAGRAPHS QUICKLY

DESCRIPTION OF CAMERA

* Bayonet size I

The Rolleiflex is extremely simple to use. Nevertheless you should read the instructions beforehand. For those in a hurry, a good start can be made by examining the illustrations, page 7 – 18. All the necessary operations will be made clear. A more thorough reading of this booklet should follow later. You will find many useful tips and tables covering the most important elements of photography. This booklet has been designed to help you achieve quick success with your Rollei. Think of it as a most useful accessory to the camera.

FRANKE & HEIDECKE · BRAUNSCHWEIG

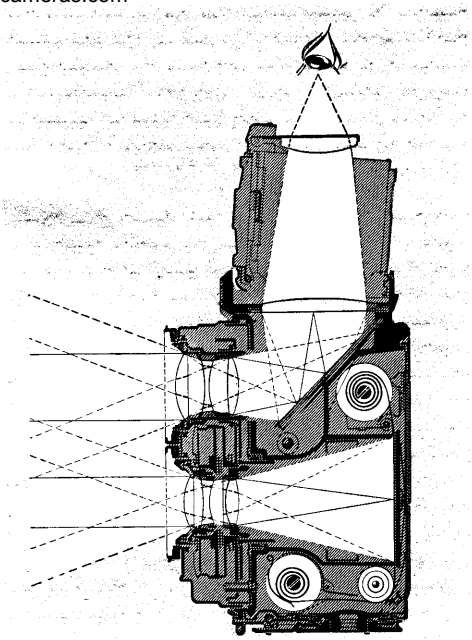
A BRIEF ROLLEIFLEX ANATOMY

From the Rolleiflex 6 x 6, which from the beginning set the pattern for the development of the twin-lens reflex camera, the Rolleiflex 4 x 4 has taken the basic principles of its construction. Two separate cameras are joined, by means of a common sturdy die cast body, to make a twin camera: below, the **taking camera** for exposing the film and above, the **viewing camera,** using the reflecting mirror principle. The special function of the viewing part of the twin camera is to permit focusing on the ground glass and to supply a control image essentially similar to the wanted picture. The image forming rays are transmitted by the fully open viewing lens, projected on to the ground glass via the mirror to form a full picture size, right-side-up ground glass image. This viewing image is visible at all times and every detail of composition and framing may be observed, even through the exposure. To recognize and avoid such picture errors as excessively converging lines and off-level horizons, the ground glass is divided into

four squares. The lines provided will enable quick and easy leveling and straightening the camera.

Most importantly, the ground glass serves for direct **focusing** of the image. This is accomplished by rotating the focusing knob. Both lenses, inflexibly coupled by means of a common sturdy front plate, are thereby adjusted simultaneously: a sharp viewing image is a guarantee of an equally sharp picture. Because of the special cam drive (built on the principle of Archimedes spiral) the front of the camera can be racked either in or out with complete uniformity and with complete freedom from play. The focusing range extends from infinity to 40", measured from the film plane to the object. Since the Rollei possesses a fast viewing lens and, in addition, a one sided flat, smooth field lens, extreme focusing sensitivity with great brilliance and clarity is obtained.

The folding hood has a pivoting 4 x **magnifier** for easy checking of sharpness. The inner panel of the front part of the hood folds inward to provide a direct **viewfinder.** The subject can then be observed in natural size for conveniently following fast moving objects.



Parallax is compensated for by a corresponding limiting of the ground glass image. The photograph produced, in every case will have the desired framing. In close-up shots with the supplementary Rolleinar lenses, the additional parallax correction needed is supplied by a prism which is built into the Heidosmat Rolleinar.

Both lenses have the same focal length (f = 60 mm, angle of picture = 52°) for the certain focusing of both the viewing and taking parts of the camera. The taking lens, Schneider Xenar 1 : 3.5, is a three section, four glass lens (modified Taylor type), with excellent correction for black and white and color photographs. The three glass Heidosmat 1 : 2.8 viewing lens is especially designed to suit the requirements for critical ground glass focusing. Both lenses have abrasion resistant antireflection coatings. The double bayonet rings around the lenses are for attaching the lens hood and optical lens accessories and to hold them in optically correct and firm position. The same size (Size I) filters, lens accessories and Rolleiflash which fit the 6 x 6 cm Rollei Xenar 3.5, Tessar 3.5 and Triotar camera models also fit the Rolleiflex 4 x 4.

The **Synchro-Compur Shutter** is a between-the-lens shutter with evenly graduated speeds from 1/500th to 1 second. It is automatically cocked when the film is wound and can be released only when the camera is ready to shoot; even the viewing hood must be open, since it acts as a shutter safety guard when closed. The shutter is fully synchronized for both electronic and bulb flash guns, up to 1/500th sec. Setting for X or M contact is done with the Synchro lever, which also serves to tension the self-timer.

Coupling the shutter and diaphragm, combined with the use of the Light Value system simplifies exposure setting and also permits rapid changing from one shutter speed-diaphragm combination to another.

Loading the camera has been reduced to the fewest number of operations. The A8-127 roll film (metal spool) and the take-up spool (to which the film can be attached even outside the camera) are simply dropped into the special pivoting spool holders and the camera closed. Everything else is automatically attended to by the film transport mechanism.

Turning the film wind knob spools up the backing paper leader. When the film itself reaches the feeler pin of the film feeler mechanism, the automatic measuring system is set in motion. From this point on the film knob can be turned only as far as the stop, when it will be seen that the counter has moved from 0 to 1. The camera is ready for the first shot, and only after releasing the shutter can the film knob be wound on, moving one more picture length into position and causing the next number to appear in the counter window. In addition, the shutter is again cocked. This procedure offers complete protection against double exposures or blank frames. Since many kinds of film are available for use in the Rollei, a **film speed reminder** (normally set when loading to any speed between 8 and 800 ASA, 10/10 — 30/10° DIN) has been built into the focusing knob.

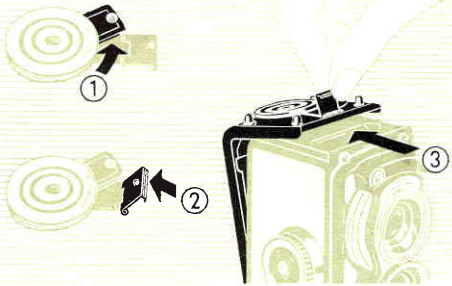
When the twelfth and last picture has been taken, the film stop ceases to function; the film knob turns freely to permit complete and rapid winding of the exposed film. Opening the back automatically returns the counter to 0, ready for the next roll.

The Eveready Case

For safety's sake hang by means of strap from the neck before opening!

To release: grip camera at bottom with right hand, push with thumb.

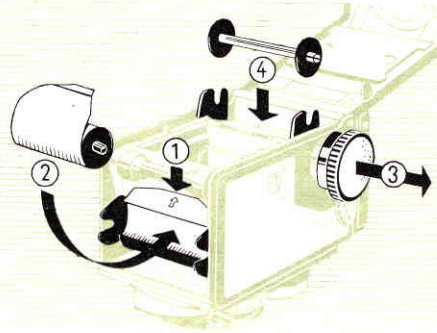
Back



To Open: Slide the back locking lever at the bottom of the camera in the direction of the arrow (1), lift the back lock clip (2), and pull open the back (3). The clip serves as a pulling tab.

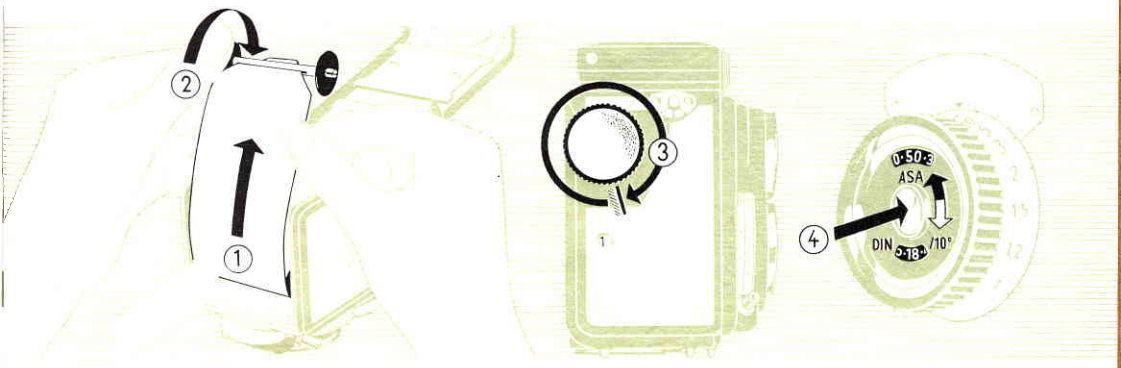
To Close: Press the back closed with the palm of the hand, push down the clip and slide the locking lever back to original position.

Insertion of Film Spool



A. Lower Chamber (supply spool): Open film holder by pressing red arrow (1), close by inserting and pressing film spool (2).

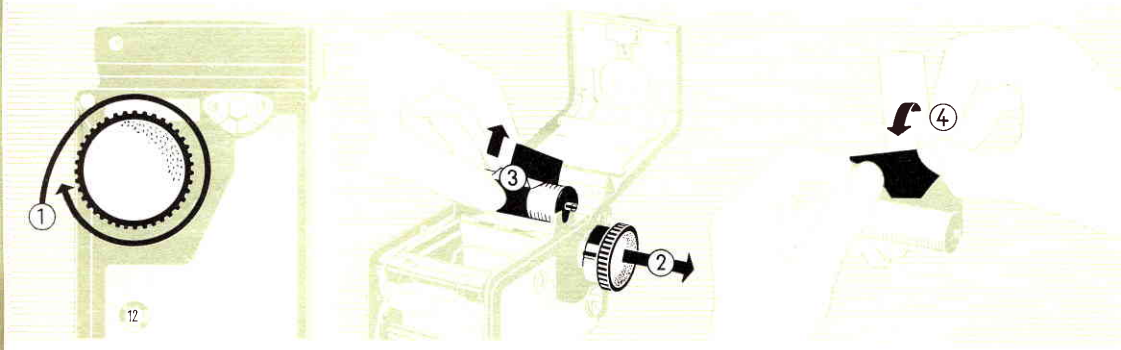
B. Upper Chamber (take-up spool): Open by pulling out the film wind knob (3). Close by inserting spool, slotted end toward film knob (4).



Insert the new roll into the bottom spool holder, after tearing open the tape. Remove empty spool from camera. Draw a bit of the protective paper in the direction of the red arrow (while holding the film supply spool down with the thumb) (1), insert into the long side of the empty spool slot and wind spool two rotations with the printed side of the paper out (2).

Insert take-up spool into upper spool chamber and close back.

Turn the film knob (3) until it stops with the counter indicating 1. The shutter will automatically be cocked and the camera is ready for shooting. Set film speed in reminder by pressing knurled knob in center and turning to desired value (4).



After each exposure wind the film to the next number.

Do not change the film in direct sunlight; use, if need be, the shadow of your own body for protection. Avoid exposing the camera to dust and dirt conditions, clean occasionally with soft brush.

After the twelfth and last shot: Wind up the protective paper fully (1). Open the camera in shade, pull film knob (2) and take out the spring lifted film (3). Fold the end of the protective paper (for convenient tearing when developing) (4) and fasten securely with sticker. Preferably, store the exposed film safely in original packing.

Taking the Picture

1. Ascertain light value, using exposure table or meter, and set on the red scale (➤ page 12).

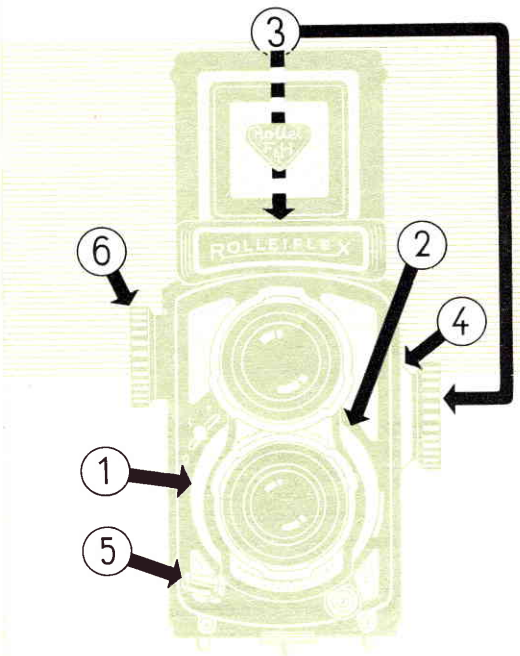
2. Set shutter speed — keeping in mind the motion of the object (➤ page 22).

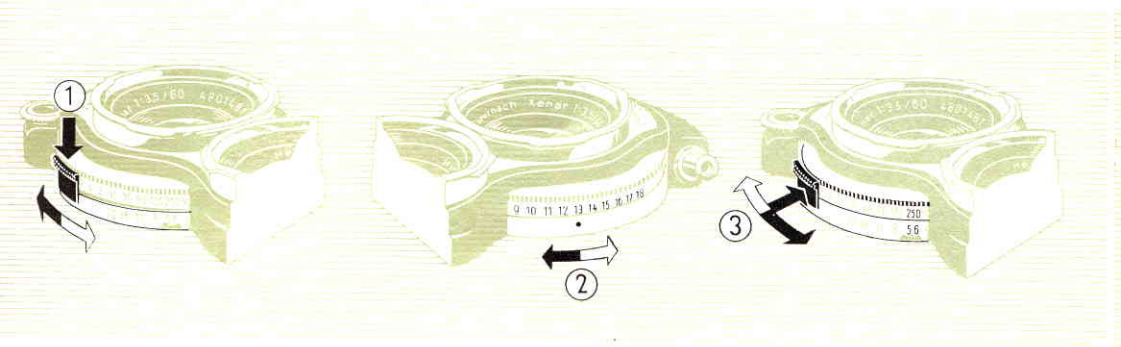
3. Open hood (caution: shutter safety catch now inoperative) and focus on the ground glass (➤ page 15).

4. Check depth of field. Increase zone of sharpness, if need be, by further stopping down the lens or moving back with camera (➤ page 23).
   The choice of whether to place prime importance on shutter speed (for greater sharpness of moving objects) or on the diaphragm setting (depth of field) depends, of course, on the subject.

5. Release the shutter (➤ page 16).

6. Wind the film to the next stop: the camera is once again ready for shooting (➤ page 10).





Setting Light Value: Press diaphragm button release and move up or down (1) until the red dot indicates desired light value (2). (If the light value is still not reached: re-engage diaphragm and move back a short distance; repeat original procedure).

Special Case: Choosing speed and diaphragm separately.
Rule: First set speed, then diaphragm.
Shutter Speed: Turn setting ring (3) (if necessary move the co-rotating diaphragm in the opposite direction).
Diaphragm: Disengage diaphragm button and turn (1).

Choosing Speed and Diaphragm:
Turn shutter ring and diaphragm button together (3) until the sought after speed-diaphragm combination appears opposite the indicator.

Light Value Scale

This is the red scale on the shutter speed ring and the desired values are set to the red dot on the diaphragm ring. Midpoint light values can be used. Each lower light value indicates double the exposure.

Shutter Speed Scale

The black numbers are for instantaneous speeds, in fractions of a second (for example 30 = 1/30th sec.). Half values between numbers cannot be used. The figures for each shutter-diaphragm combination, when chosen, must be set to center of indicator.

1/60th sec. is the most frequently used speed, reducing effect of camera motion.

For sharpness of moving objects: ➤ table page 22.

The green letter "B" is for time exposures (➤ page 16). The green numbers aid in calculating exposures somewhat longer than 1 sec. (➤ page 19).

Diaphragm Scale

Half (dots between figures) as well as full (4 to 22) diaphragm stops can be set. The line next to diaphragm 4 indicates 3.5, a mid-point stop between f : 4 and f : 2.8 in the international diaphragm scale. Half stops are obtained when working with half light values.

Both speed and diaphragm scales are evenly divided so that each figure represents half or double the one before. As is shown by the shutter speed-diaphragm combinations, closing the diaphragm one stop requires double the exposure duration (see chart).

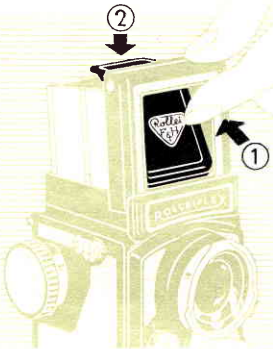
Tripod Pictures											Hand-Held Pictures				
Time Exposure (➤ page 19)							Slow Speeds					Fast Speeds				
125	60	30	15	8	4	B	1	1/2	1/4	1/8	1/15	1/30	**1/60**	1/125	1/250	1/500 sec.

Hood

To Open: Lift back edge of hood and raise cover panel to vertical position (1). Caution: shutter safety now in off position!

To Close: Press sides inward, simultaneously pulling back cover panel (2); press closed. Shutter release locked.

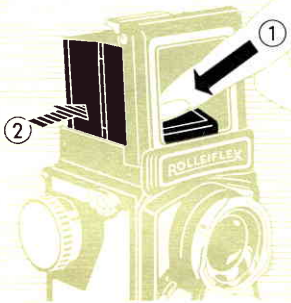
Magnifier



To Open: Press direct viewfinder panel inward; magnifier automatically springs into position (1).

To Close (Before closing hood): Push magnifier down (2).

Direct Viewfinder



To Open: Press the center panel of the front of the hood inward until it catches ①.

To Close: Press lightly on the right hood panel ②. The direct viewfinder panel instantly returns.

Focusing

Turn the focusing knob while simultaneously examining the image for sharpness on the ground glass through the magnifier. The distance scale on the focusing knob should be consulted only when checking depth of field (➤ page 23).

General Rule for Focusing:
Be sure that the principal area in the subject is the one in sharpest focus!

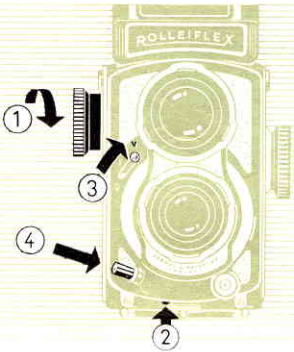
To Release Shutter

With Focusing Hood Open:

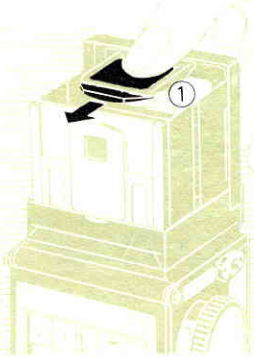
Instantaneous Exposure: Press shutter release smoothly (1). Shutter will automatically open for length of time set.

Time Exposure "B": Press the release and hold for desired interval. Shutter closes when release is allowed to return to normal.

Self-Timer



Cock shutter (1). Unlock Synchro-lever (2) and set on "V" (3). Release (4). The shutter will open approximately 10 seconds after releasing. All speeds from 1/500th to 1 sec. can be used. Shutter and self-timer can remain cocked, when camera is not in use, without undue weakening of the springs.



Attaching Cable: Insert tip into flash contact socket (1); locks automatically.

Choice of Contact Setting: Depending upon light source (page 28) unlock Synchro-lever (2) and set it to (M contact) or (X contact, also usable for self-timer flash shots) (3).

To Detach Cable: Turn small locking wheel (4) and pull out cord tip.

Various magnifiers ranging from + 3 to — 3 diopters, are available for users who prefer to use camera without glasses. (Specify prescription for glasses.)

To Change: With the direct viewfinder open, pull out (1) the magnifier, pressing a bit downward and backward.

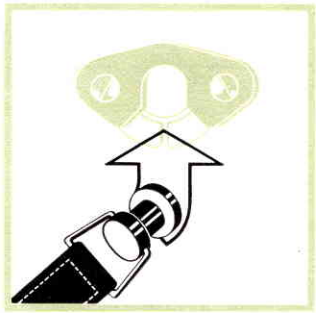
To Install: Insert magnifier between holder and springs

Eveready Case

To insert camera: Slide grooved base plate of camera from the rear into the retaining device until it catches. To remove: Slide camera backwards out of case.

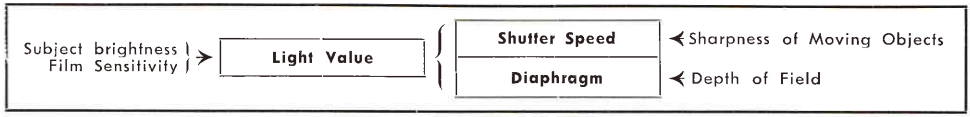
Carrying Strap

To attach: press down safety blades on strap holder with knob at end of strap and slide upward. To remove: Press safety blades with fingernail and slide knob out.



Exposure and Light Value

Exposure is adjusted in accord with the existing lighting conditions (more exactly: in accord with the amount of light reflected by the subject). The light value serves as the measurement for correct exposure. It is ascertained from the exposure table or from an exposure meter, taking into account the sensitivity of the film being used. It is then set on the light value scale of the camera. In this way both speeds and diaphragm openings are adjusted in relation to each other to provide correct exposure. Since the scales are firmly coupled, it is possible to select either a desired speed or diaphragm opening without further need to compensate for exposure.



Special Case: Time Exposure

In general you use the light value within the range of the evenly graduated speeds from 1/500th — 1 sec. If conditions are such that setting "B" is reached and it is necessary to close down the lens still more, the light value must be abandoned.

As an aid to determining the longer exposures with "B" setting, the green figures are provided (125 60 30 15 8 4 B [= 2] sec.). The correct figure will be found opposite the appropriate diaphragm value. Rule: observe the number in seconds above the desired diaphragm stop; uncouple the diaphragm and set the opening desired opposite the indicator, then expose for the number of seconds previously observed. (Uncoupling and moving the diaphragm control causes light values to become invalid with "B" setting.) Example: light value 4:

sec.	125	60	30	15	8	4	B (= 2)	1
diaphragm			22	16	11	8	5.6	4

Desired diaphragm 22 — observe required exposure 30 sec. — set diaphragm 22 opposite the indicator (under "B") — expose thirty seconds.

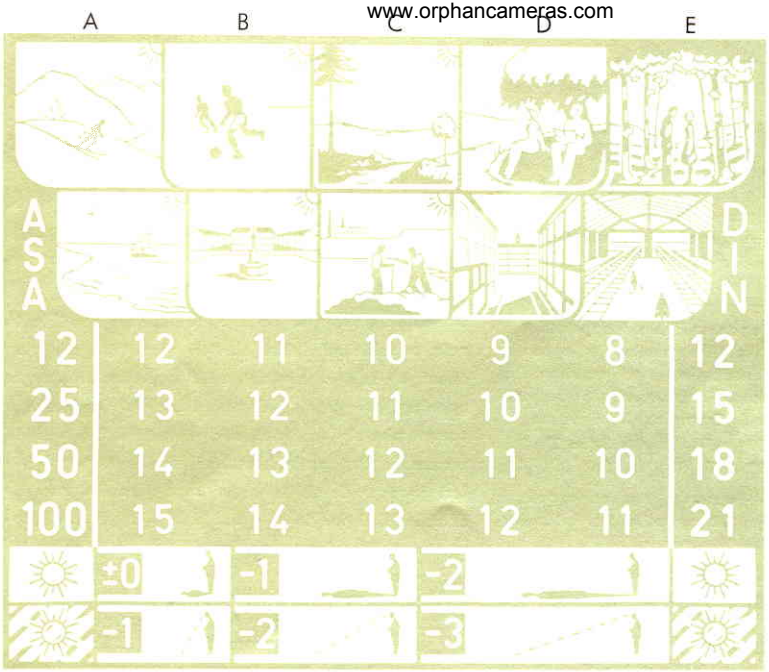
If the diaphragm stops at the mid-points between the green numbers, half values of exposure are obtained.

125	60	30	15	8	4	B (= 2) sec.
93	45	23	12	6	3	

The Exposure Table with its light values takes into consideration only the approximate light conditions and eliminates gross errors in exposing. In difficult cases, consulting an electric exposure meter is recommended. If the meter being used does not read in light values, it is necessary to transpose the speed and diaphragm readings separately to the camera. Thus the valid light value is indirectly set and sweeping up or down the speed or diaphragm scales can proceed in the prescribed manner.

General Exposure Rule: It is not always possible to pair a sufficiently fast shutter speed (to minimize effect of subject motion) with a small diaphragm opening (for greater depth of field). Obviously a compromise is required and it would be well to remember that under-exposure results in hopelessly lost shadow detail, whereas over-exposure may be compensated for to a great extent by proper processing. Therefore: a good general rule for exposure:

> Always expose for the **shadows,** rather a bit **more** than too little!



Explanations of the Picture Examples:

A
High mountains (snow) without foreground. Open beach.

B
Sport scenes. Bright streets and squares, open landscapes.

C
Landscapes with foreground. Groups in open air.

D
Groups in shade. Street scenes with shade.

E
Groups under trees, lightly shaded. Groups in glass-roofed halls.

The Exposure Table

Subject brightness is easily judged and classified by means of the five standard lighting conditions represented by two illustrations each at the top of the table.

Film speed is indicated at the left by ASA figures and at the right by 1/10° DIN values.

Light value is found where brightness and film speed columns cross.

Light value adjustment, due to overcast sky or when sun is lower in the sky, is made by use of lower scale. Upper scale: full sunshine — lower scale: overcast sky. The length and intensity of your own body's shadow will give some idea of light conditions. The ability to estimate and choose the correct light values for various lighting conditions and time of day will soon come when you begin working on sunny and cloudy days.

Example: Color film 25 ASA (15/10° DIN), landscape with foreground, sunny, noontime (shadows short, no light value adjustment): light value 11. Available speed-diaphragm combinations: 1/125-f:4, 1/60-f:5.6, etc. Same subject in the afternoon, longer shadows, would require adjusted value, perhaps 11 — 1 = 10.

Speed of Photographic Emulsions

(Comparison values approximated)

ASA (BS)	DIN	Weston	General-Electric	Scheiner (Europe)
6	9/10	5	7,5	20
8	10/10	6	9	21
10	11/10	8	12	22
12	12/10	10	15	23
16	13/10	12	18	24
20	14/10	16	24	25
25	15/10	20	30	26
32	16/10	24	36	27
40	17/10	32	48	28
50	18/10	40	60	29
64	19/10	50	75	30
80	20/10	64	100	31
100	21/10	80	120	32
125	22/10	100	150	–
160	23/10	125	200	–
200	24/10	160	250	–
250	25/10	200	300	–
320	26/10	250	400	–
400	27/10	320	500	–
500	28/10	400	600	–
650	29/10	500	800	–
800	30/10	650	900	–

Speed of Moving Subjects and Shutter Speeds

	Miles per hour approximately																
	3 mph			6 mph			12 mph			30 mph			60 mph			120 mph	
Example:	Pedestrians			Runners Moving air			Bicycles Windy			Light Athletics Stormy Surf			Automobiles Railway Trains Racing			Motor Racing	
Distance (yards) 40		$\frac{1}{30}$	$\frac{1}{60}$	$\frac{1}{30}$	$\frac{1}{60}$	$\frac{1}{125}$	$\frac{1}{60}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{250}$	$\frac{1}{500}$		$\frac{1}{500}$	50
15	$\frac{1}{30}$	$\frac{1}{60}$	$\frac{1}{125}$	$\frac{1}{60}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{250}$	$\frac{1}{500}$		$\frac{1}{500}$				25
8	$\frac{1}{60}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{250}$	$\frac{1}{500}$		$\frac{1}{500}$							12
4	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{250}$	$\frac{1}{500}$		$\frac{1}{500}$										6

Distance (yards)

Moving Objects require short shutter speeds in order to be reproduced sharply. For this purpose the table contains computed minimum values, depending on the factors: speed, distance and direction.

Taking distance: the yard column on the left stands for sufficient sharpness (f/1400), the yard column on the right for increased sharpness (f/2000). In spite of these normally correct figures, it is often possible in actual photography to use longer shutter speeds. This is because the eye interprets slight unsharpness as giving an added impression of speed.

Long arrow = direction of movement.

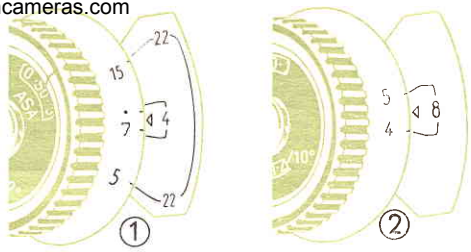
A short arrow = taking direction (→ up to 10°, ↘ up to 30° and ↓ up to 90° to the direction of movement).

Depth of Field Indicator

Both before and behind the plane of sharp focus there is always a relatively sharp zone. The width or depth of this zone can be artfully increased. It increases in depth when either closing down the lens or moving back from the object on which you have focused. Therefore it is evident that if the subject requires an extended depth of field, it is necessary to change the shutter speed-diaphragm combination to one with a smaller stop or to move back with the camera.

The Depth of Field Indicator consists of the special diaphragm scale located next to the distance scale and the distance scale itself. Two stroke marks outline the zone covered by each diaphragm opening. The marks are located on either side of the distance indicator ▼, showing "before" and "behind" focus. (For stop 3.5, use the inner and for 5.6, the outer marking next to 4).

To Use: To find the limits of the depth of field, both before and behind the principal plane of focus, after focusing and after choosing the diaphragm opening. The beginning and end of the depth of field is read off on the distance scale. The sharp area lies between the distances bracketed by the marks extending from the diaphragm opening figure.



1. Example: Focusing on about 7.5 ft with diaphragm 4 produces a depth of field from about 7 to 8 ft. (The black dot between 7 and 10 ft means 8 ft.) If, on the other hand, stop f: 22 is used with the same distance setting, the depth now extends from about 5 to 15 ft. (Closing down increases depth of field.) Considerable closing down always requires prolonging the exposure. It will be found that somewhat less stopping down can result in sufficient depth of field if the focusing is judiciously changed:

2. Example: The subject requires a sharp rendering of distances from 4 to 5 ft. (These limits can be determined exactly for any subject by focusing on nearest and furthest objects, meanwhile reading distances off scale.) Solution: Turn the focusing knob until both footage values lie opposite the same diaphragm stop. This gives the most favorable stop, in this case f: 8.

Depth of Field Table

(distances in feet)

Taking distance (in feet)	Diaphragm	4	5.6	8	11	16	22
	∞	78'11'' – ∞	69'1'' – ∞	49'5'' – ∞	34'8'' – ∞	25'3'' – ∞	17'5'' – ∞	12'9'' – ∞
	30'	21'10''-48'2''	21' – 52'10''	19'9'' – 94'6''	16'2'' – 222'6''	13'10'' – ∞	11'1'' – ∞	9' – ∞
	15'	12'8'' – 18'5 1/4''	12'4 3/4'' – 18'12''	11'7'' – 21'4 1/2''	10'6 3/4'' – 26'1 1/2''	9'o'' – ∞	8'2'' – 105'10''	6'11 3/4'' – ∞
	10'	8'11'' – 11'4 3/4''	8'9 1/2'' – 11'7 1/2''	8'4 1/2'' – 12'5 1/4''	7'10'' – 13'10 3/4''	7'3'' – 16'4''	6'5 1/2'' – 22'11 3/4''	5'8 3/4'' – 45'1 3/4''
	7'	6'5 1/2'' – 7'7 3/4''	6'4 3/4''–7'9''	6'2 1/8''–8'1''	5'10 1/2'' – 8'8 1/8''	5'6 5/8'' – 9'6 1/2''	5'1'' – 11'5 1/2''	4'7 1/2'' – 15'1 1/4''
	5'	4'8 3/4'' – 5'3 3/4''	4'8 1/4'' – 5'4 3/8''	4'6 7/8'' – 5'6 1/4''	4'5''–5'9 1/4''	4'2 3/4'' – 6'1 3/4''	3'11 1/2'' – 6'10 1/4''	3'8'' – 7'11 3/4''
	4'	3'9 7/8'' – 4'2 1/4''	3'9 1/2'' – 4'2 5/8''	3'8 5/8'' – 4'3 3/4''	3'7 3/8'' – 4'5 1/2''	3'6'' – 4'8 1/8''	3'3 3/4'' – 5' 3/4''	3'1 3/8'' – 5'7 3/4''
	3 1/2'	3'4 3/8'' – 3'7 5/8''	3'4 1/4''–3'8''	3'3 1/2'' – 3'8 3/4''	3'2 1/2'' – 3'10 1/8''	3'1 3/8'' – 3'11 7/8''	2'11 5/8'' – 4'3 3/8''	2'9 3/4'' – 4'8''
	Diaphragm	3.5	5.6	8	11	16	22	

The Depth of Field Table

Since the sharp zone in the picture does not end abruptly, but gradually changes to something less sharp, it is generally sufficient to read the depth of field in round figures. With this in mind the scale on the focusing knob has been calibrated for quick and practical use.

If exact figures are desired, these may be found in the table on page 24. Depending upon whether normal or increased sharpness is needed, either the upper or lower diaphragm figures are used:

Use the u p p e r figures when enlargement of the entire $15/8 \times 15/8$" negative area is planned (circle of confusion, 1/1400 of the focal length).

Use the l o w e r diaphragm figures when enlarging from a portion of the negative (circle of confusion = f/2000).

Explanation: the degree of sharpness required from a negative is exclusively dependent on the magnification of the prospective enlargement and its subsequent viewing distance.

To obtain correct perspective at normal viewing distance in this case, a 4.2 times linear enlargement of the $15/8 \times 15/8$" negative to $63/4 \times 63/4$" is required. Enlargements of this size, viewed at 10", determine the basis for the minimum acceptable sharpness. With this in mind the size of the circle of confusion is computed and the limits of the depth of field ascertained. Negatives made in this way will permit enlargements also to larger sizes, while still retaining the same impression of sharpness. This is because the viewing distance is always correspondingly increased.

With enlargements from portions of Rollei negatives the requirements with regard to sharpness are more critical. In this case depth of field is calculated using a smaller circle of confusion. In practical use the required depth is obtained through the use of a smaller diaphragm opening = (lower diaphragm figures).

The effectiveness of the scale on the camera itself may be extended in the same manner merely by using the next smaller diaphragm opening than the one indicated for the desired zone.

If enlargements of very great size are to be made use a diaphragm opening two stops smaller than the one indicated.

Scale of focus in feet	Depth of field (in inches) behind / in front of the object with diaphragm 5,6	8	11	16	22	Reproduction Size Approximately	Field covered (sq. in.):
∞	3 11/32" / 3 3/4"	4 23/32" / 5 29/32"	6 3/32" / 8 27/32"	8 9/32" / 14 3/16"	10 5/8" / 22 27/32"	1 : 16,5	26 3/4" x 26 3/4"
30'	2 7/8" / 3 5/16"	3 15/16" / 4 27/32"	5 1/8" / 7 5/32"	7" / 11 5/8"	9 1/16" / 17 23/32"	1 : 15	25" x 25"
15'	2 3/8" / 2 11/16"	3 7/32" / 4 1/32"	4 1/8" / 5 23/32"	5 13/16" / 9 1/8"	7 15/32" / 13 1/2"	1 : 13,5	22" x 22"
10'	1 31/32" / 2 7/32"	2 3/4" / 3 11/32"	3 17/32" / 4 23/32"	5" / 7 17/32"	6 13/32" / 10 29/32"	1 : 12	19 1/4" x 19 1/4"
7'	1 21/32" / 1 25/32"	2 9/32" / 2 9/16"	2 15/16" / 3 3/4"	4 3/16" / 5 29/32"	5 11/32" / 8 3/4"	1 : 10,5	16 7/8" x 16 7/8"
5'	1 3/16" / 1 3/8"	1 9/16" / 1 31/32"	2 3/32" / 2 3/4"	3 5/32" / 4 1/8"	3 15/16" / 6 7/32"	1 : 9,5	15" x 15"
4'	31/32" / 1 1/32"	1 3/8" / 1 3/8"	1 25/32" / 2 9/32"	2 9/16" / 3 5/16"	3 11/32" / 4 23/32"	1 : 8,5	13 3/8" x 13 3/8"
3,5'	25/32" / 7/8"	1 1/4" / 1 5/16"	1 21/32" / 1 31/32"	2 3/8" / 2 25/32"	2 31/32" / 4 3/32"	1 : 7,5	11 3/4" x 11 3/4"

Errata: On this and next page please read "in front / behind" instead of "behind / in front".

Depth of field, Reproduction Size, Field covered

Scale of focus in feet	Depth of field (in inches) behind / in front of the object with diaphragm 8	11	16	22	Reproduction Size Approximately	Field covered (sq. in.):
∞	1 1/4" / 1 13/32"	1 21/32" / 1 31/32"	2 5/16" / 3 1/32"	3 1/32" / 4 13/32"	1 : 8,5	133/8"x133/8"
30'	1 1/8" / 1 9/32"	1 1/2" / 1 25/32"	2 3/32" / 2 23/32"	2 3/4" / 3 15/16"	1 : 8	125/8"x125/8"
15'	1" / 1 5/32"	1 3/8" / 1 5/8"	1 29/32" / 2 7/16"	2 17/32" / 3 17/32"	1 : 7,5	113/4"x113/4"
10'	29/32" / 1 1/32"	1 7/32" / 1 15/32"	1 23/32" / 2 3/16"	2 5/16" / 3 3/16"	1 : 7	11" x 11"
7'	13/16" / 29/32"	1 3/32" / 1 9/32"	1 17/32" / 1 29/32"	2 1/32" / 2 25/32"	1 : 6,5	101/4"x101/4"
5'	11/16" / 3/4"	7/8" / 1 1/16"	1 9/32" / 1 9/16"	1 11/16" / 2 1/4"	1 : 6	91/2"x91/2"
4'	19/32" / 21/32"	25/32" / 29/32"	1 3/32" / 1 11/32"	1 1/2" / 1 29/32"	1 : 5,5	85/8"x85/8"
3,5'	9/16" / 19/32"	23/32" / 13/16"	1" / 1 1/4"	1 3/8" / 1 23/32"	1 : 5	77/8"x77/8"

Circle of confusion = 1/100 of the focal length f = 60 mm

Example: If the focusing mark, after focusing, is at 10' then one obtains at diaphragm 11 a depth of field of 1 7/32" behind and 1 15/32" in front of the sharply focused object and the total zone of sharpness extends 2 11/16". With this setting field covered is 11" x 11". The scale of reproduction is 1/7 of the actual size.

Flashlight technique

In modern flashlight technique the camera shutter takes over the task of firing the bulb electrically at the right moment. In this way instantaneous flash exposures are possible with a hand-held camera.

The Synchro-Compur shutter in the Rolleiflex is, for this purpose, equipped with electrical contact. The contact may be adjusted to the required delay of the flash lamps by means of the Synchro-lever:

When Synchro Lever is set		
Proper contact * is	M-Contact	X-Contact
Source of flash	**Flash bulbs** and electric firing flash powder (capsule flash)	**Electronic flash** and some flash guns with short duration of flash
* Time of contact is	16.5 thousandths of a sec. before shutter is half opened	Immediately before full shutter opening

The M contact stands for **full synchronization** for flash bulbs with a firing delay of 16.5 thousandths of a sec. The fastest shutter speeds up to 1/500 sec. can be used. Because of the delayed contact, the shutter always opens to catch the greatest volume of the light.

Selection of M-X lever position, applicable speed range and exposures can be learned from the instructions of the different flash light products. For the best known makes the table on page 30 contains the necessary information and the permissible shutter speeds.

All commercially available flash guns and electronic flash units may be used. Current-carrying capacity of the contact when several flash lamps are connected simultaneously: 10 ampères at 24 volts for a period up to a maximum of 1/15th sec. For safety reasons one pole of the contact is grounded to the camera body (isolation-test: 700 volts).

The selection of flash lamp-type depends on the light output required by the subject. Many makes are available in three groups (normal, medium and high light output). The selection is dependent on the taking conditions, especially as to whether a room of shallow or great depth is to be illuminated.

The power of flash illumination decreases according to the square of the distance: i. e., an object six feet away receives only one-fourth the light as an object at three feet. Distance from flash to subject must therefore be carefully considered in selecting diaphragm opening. Lamp manufacturers supply easy to use guide numbers which are divided by the distance in feet to obtain the required diaphragm opening.

When using the built-in self-timer, only X-contact is employed. It is best to use 1/30th sec. with this contact setting for most lamps.

Flash as fill-in light: useful in brightening shadows whether due to insufficient illumination or to the

Sun

Sun + flash

fact that the picture is being taken "against-the-light", in full sunlight. The fill-in light must be kept at a lower intensity level than the main source of illumination, otherwise the strong flash will give an unnatural effect, not at all like daylight. Too strong a flash might even cause an apparent underexposure of the sky or the area not reached by the light. Electronic flash units are particularly well suited for use as fill-in lights when shooting color sports pictures. Use smaller lamps or keep them at greater distance.

Flash Contact and Permissible Shutter Speeds

FLASH LIGHT SOURCE		Contact	Shutter Speed: Fastest — Recommended — Slowest	Symbol
Make	Type			
I. Electronic Flash	Without Relay (1/2 ...)	X	1/500 **1/250** 1	
II. Flash Lamps — General Electric Westinghouse	SM (1/200)	X	1/60 **1/60** 1	
Sylvania	SF (1/200)			
West, Japan	SS (1/200)			
Osram	F0 (1/100) F1, F2 (1/50) XP, X0 (1/200)	X	1/30 **1/30** 1	
West, Japan	12 (1/100)			
Osram	S2	M	1/500 **1/30** 1	
	S0, S1	M	1/500 **1/60** 1	
Philips (Mazda)	Pf 3 N, PF 14, PF 25, PF 56			
General Electric Westinghouse	5, 11, 22			
West, Japan	0, 3, 5, 11, 22			
Sylvania	Press 25, 40, 0, Bantam 8			
	2	M	1/125 **1/60** 1	
Philips (Mazda)	PF 110	M	1/60 **1/30** 1	
General Electric Westinghouse	50			
Sylvania	3			
General Electric Westinghouse West, Japan	6, 31	M	1/250 **1/30** 1	
Sylvania	FP 26, 2A			
III. Capsule Flash	Average	M	1/125 **1/30** 1	

Explanation of the Table

The "Contact" column indicates the correct setting of the M-X lever for each lamp type.

The "Shutter Speed" column shows the permissible speed range.

Center: the recommended shutter speed includes practically the entire light output of the flash lamp. This assures the maximum illumination as well as the **smallest** diaphragm (for greater depth of field). The following applies as a general rule:

> Use the standard recommended speed together with the correct setting of the M-X lever for the lamp in use.

Left: the fastest speed indicates the limit to which the shutter may be set. For lively action or sports subjects, the faster speeds are employed.

Right: the exposure time may be increased to the slowest speed (1 second or even time exposures), if, in addition to the flash, it is desired to make use of existing light. In such cases the total amount of light from all sources must be considered in choosing the diaphragm opening.

The Effective Exposure Time (as indicated in the table by means of colored ink) is not in each case identical to the shutter speed, but depends on the portion of the flash lamp light output utilized:

1. With X-Contact the duration of the flash itself is actually shorter than any of the permissible shutter speeds. Therefore, the light duration of the flash (specified in parenthesis after the make) will be the actual, constant exposure time so that the selected diaphragm opening must be maintained even when using slower shutter speeds.

2. With M-Contact the shutter speeds, from "fastest" to "recommended" fall within the duration of the flash: they therefore represent the actual exposure time and if the shutter speed is increased, the diaphragm must be opened accordingly. Only when slower shutter speeds are employed is the fully utilized light output equal to the actual exposure time, and this is the same as the recommended speed.

The illustration should make the utilization of the available flash light still more obvious: the white symbols represent the flash, and their size, the utilized light at the shutter speed employed.

TIPS ON PICTURE-TAKING

Portraits

Large heads: do not work closer than 40 inches to avoid possible perspective distortion. If necessary, enlarge from a smaller section. Focus on the eyes. Use quiet, neutral colored backgrounds and do not stop down too much (f : 5.6) so as to keep backgrounds from intruding. If possible, move subject away from background. Out of doors, try using sky as only background. For portraits with panchromatic film in the open air, choose a soft lighting, preferably in the morning or late afternoon. Favor soft light, avoid deep shadows. If necessary, light up the shadows with an aluminium foil — covered cardboard used as a reflector, or with flash. You can sometimes make effective use of light walls, clothing and snow as reflectors. Simple, proven artificial light procedure: lamp No. 1 next to camera somewhat above head level, lamp No. 2 on the side to lighten shadows. For special effects, lamp No. 3 as overhead or back-light. Important: use lens hood. Moisten lips (highlights!). To reduce sharpness and add "glamor": Rolleisoft (soft diffusion disc) 0 or 1 (stronger) over lens. Use larger diaphragm openings and backlight for sunny effects.

Children

Never use force, watch for interesting effects and expressions carefully. A clever assistant to divert children's attention from camera is often a valuable aid. Try close-up shots of children's expressions as they listen to favorite or exciting stories. Laughter, astonishment, pity and even an occasional yawn provide wonderful material for good shots or picture series. For close-up shots use same technique as for portraits. For children in motion, use snapshot technique outdoors and flash indoors. Low viewpoints and close-up effects are best.

Animals

Patience, quietness and familiarity with the animal and its peculiarities are great assets. Close-up pictures are most rewarding; use portrait technique. Make use of natural light effects such as backlighting. Action pictures: use snapshot or sport technique (with flash, if needed). Rolleinars are often helpful with small animals. Zoo: animal portraits — avoid bars or netting. Hint: netting often becomes invisible when lens nearly touches wire. — Fish in aquarium: use side and overhead lighting in otherwise darkened room. A good trick is to limit movement of fish within sharp zone by means of vertical glass plate in tank.

Landscapes

Focusing for distant views with foreground may be accomplished simply without using ground glass except for viewing: set infinity mark (∞) opposite diaphragm opening used — second corresponding diaphragm mark will indicate nearest point in focus. Example: ∞ at f : 11 — sharp area ∞ to 17 ft (5 meters).

Use of Filters is important in black and white shots to separate and emphasize the tones of the dominant colors, such as those of the blue sky, green foliage and yellow grain fields. Specific changes in the atmospheric mood of the picture can also be effected.

1. Blue Sky with Clouds: yellow filters darken blue skies and thus improve the reproduction of clouds. The deeper the color of the filter, the stronger and more dramatic the effect. Blue snow shadows are also rendered truer to tone. The green filter tones down the sky, brightens foliage and darkens the occasionally too lightly rendered reds (with pan film) such as sun-tanned flesh and red tile roofs. For filtering the sky but not the landscape: the Rolleipol filter darkens the blue sky only by eliminating the polarized light.

2. Haze and Mist: the blue filter, useful for pictorial effects, increases hazy effect. The orange or red cut through and improve the clarity of distant views. The blue filter reduces contrast, the red or orange increase brilliance. Maximum penetration of light haze is obtained with infra-red film and infra-red filter (700 mμ). Barely visible mountain chains are reproduced clearly. An odd effect with this combination is that green leaves are rendered almost white. Using filters for better cloud rendition is of no use in really bad weather when there is a good deal of moisture in the air.

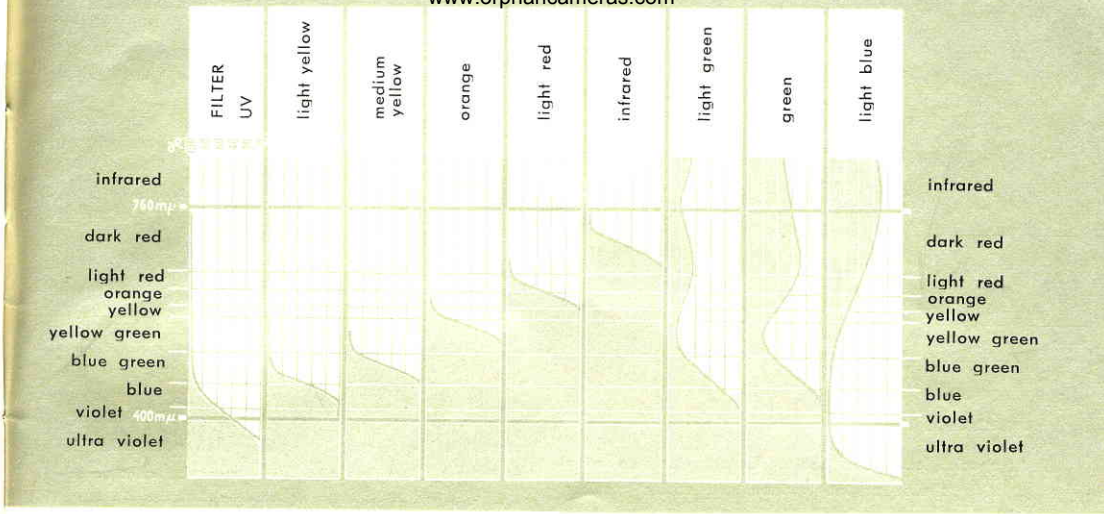
3. Sea, Beach, Mountains: strong ultra-violet rays must be absorbed through use of UV filter. Results will otherwise be dull. The H 1 filter serves the same purpose for daylight-color film. Reduction of the bluish cast is quite marked. When color temperatures drop (cloudless blue sky, with sun to the side and also in the shade): use color conversion filters of R group (➔ page 39). When in doubt, use the weaker filters.

Picture Composition Rules: distant views are generally better if foreground contains (for added depth impression) trees, people, animals, etc. Foliage is often used as a frame for the distant view. Focus should be sufficiently sharp in the foreground. Strong effects are created when deep shadows in the foreground are set against the lighter distance. Side lighting or even back lighting give the most impressive pictures.

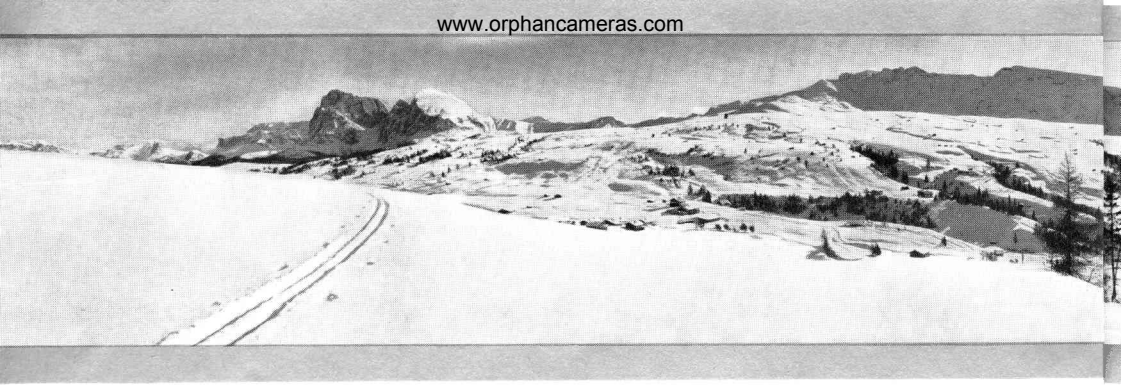
Rollei filters for black and white shots

Special compensation factors for light values are given when using filters, and these may be varied to suit type of film and lighting conditions.

Rollei Filter	Light value compensation		Application and effect
	Pan	Ortho	
Light yellow	−1	−1.5	Landscapes, snow, clouds. Renders yellow and green lighter, blue darker.
Medium yellow	−1.5	−2	
Light green	−1	−1.5	Landscapes, snow, clouds. Renders green lighter, red (complexion) and blue darker. For pan emulsions.
Green	−1.5	−2	
Orange	−1.5 to −3		Hazy distant views. Renders yellow-red lighter, blue darker, distant objects clearer.
Light red	−2 to −3.5		Hazy distant views. Gives stronger effects than orange filter.
Light blue	−0.5	−0.5	Artificial light. Renders red darker. For ultra-pan emulsions.
UV	−0.5	−0.5	High altitudes above 6000 feet. Seascapes. Eliminates ultra-violet rays which reduce contrast.
Infra-red	Exposure depends on the type of emulsion		Special filter for infra-red emulsions. Transmits dark red above 700 mμ and infra-red.
H 1	–		UV-Filter, especially designed for long distance color photography. Absorbs ultra-violet rays, subdues predominance of blue and cuts aerial haze in distance shots.

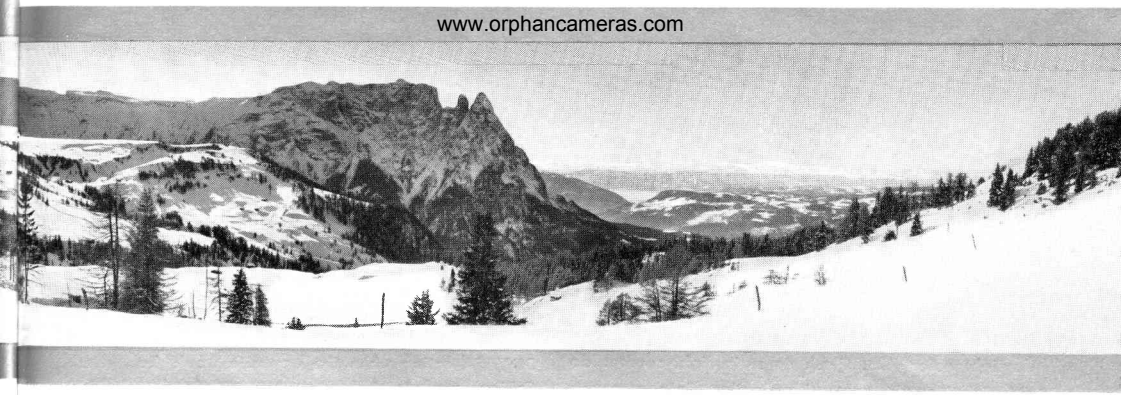


The filter curves show the absorption of the various Rollei filters in the spectral ranges ultra-violet, visible spectrum blue to red (appr. 400—760 mμ), and infrared. This means: darker portion of the spectrogram = absorbed light; lighter portion = useful light. The light-transmission of the filter from the lowest point to the peak point of the curve thus increases from 0 to 1000/n. While the UV filter cuts out the short wave ultra-violet portion of the spectrum, the green filter absorbs a substantial portion of the long wave red and infrared range.



Panorama Pictures

As special landscape photos: distant views covering a wide stretch of the horizon are easily possible with the panorama head. Any number of shots, from two to a complete circle (360°) ten may be taken to form a partial or complete panoramic view. Use a sturdy tripod and carefully level the camera by means of the spirit level provided in the panorama head. You may easily include yourself in one of the pictures by means of the self-timer, thus adding interest in the form of a figure when none other is available. Changes in lighting must be considered in making the separate exposures. Fast moving clouds require that the succeeding pictures be made quickly in order to get easily matched joints. There is ample overlapping between each picture to make accurate cutting and joining easy. Of course, the prints should be well matched in tone and contrast as well.



1 : 11 · 1/60 · filter light yellow · panorama head

Plants

Flowers, blooms and grass are most effective in close-ups taken against the light. Use Rolleinars with fill-in light or reflectors. Stop down for needed depth of field and shoot in bright light with no wind. A semicircular shaped cellophane shield is an effective guard against the ground breezes that destroy definition. Use filters to differentiate between equally bright colors. Keep in mind that a filter renders its own or similar colors lighter, whereas its complementary color comes out darker.

Night

Include direct light sources as symbols of the night in the picture. Only very strong, close lamps must be hidden behind natural foreground objects (building, tree, persons), otherwise overexposure will result. Make use of effects: reflections in wet streets, light deflected by snow, early twilight with traces of brightness in the sky. Use fast pan film only. For time exposure: cover up lens when auto headlights cross the picture area, to avoid streaks. Use flash for snapshots at night, not for night shots.

Use fresh batteries. Condenser or capacitor flashguns are more consistent since lamp ignition is somewhat less dependent on battery power (Rolleiflash). Be sure that the contacts of the battery and lamp sockets are clean. Handle flash cable with care, avoid kinking, otherwise there will be danger of short-circuit and premature flash ignition. — Note: the contact must n o t be connected to house current! Blue flash lamps, like electronic flash, simulate daylight and are intended for use with daylight color film. Flash as main light source: do not take weak room illumination into account, expose strictly according to flash output. To light up long rooms or to achieve special illumination effects, one or two Rolleiflash comb. extension units may be connected to the Rolleiflash. Connecting cords adding up to a total length of 33 feet (66 feet with fresh battery) may be used. After attaching the cable: Put flash bulbs in Rolleiflash f i r s t and t h e n in Rolleiflash comb. In order to conserve the battery: Insert the flash bulbs a short time before shooting. Detach the cable to Rolleiflash when not using.

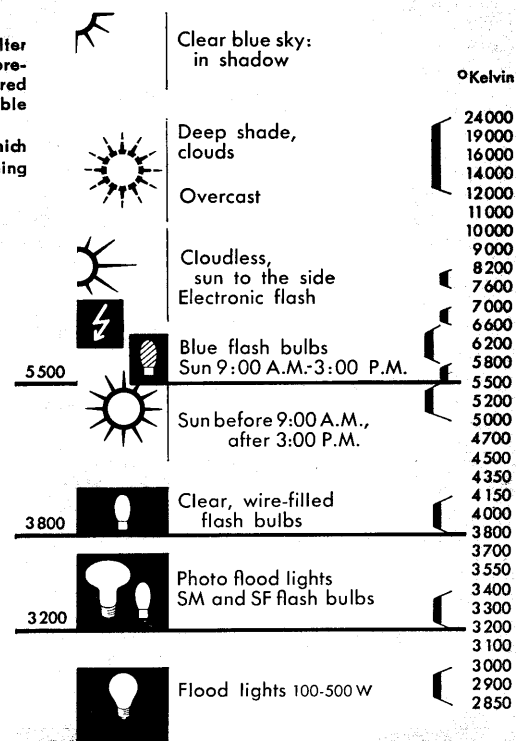
Use extreme care in exposure when strong light contrasts prevail. In case of doubt take three shots, using the same shutter speed but varying the diaphragm a half-stop on each side of the estimated exposure. Make a note of the exposure data for future aid when facing similar conditions. The slightly longer exposure will result in lighter, more transparent colors in the slides, while the shorter exposure will result in deep color effects. You may of course set the meter for a lower film sensitivity when a longer exposure is desired and for a higher DIN/ASA rating when the opposite would be better. Critical workers will carry out such a test before going on vacation and then use a batch of film with the same emulsion number. Color films should be developed as soon as possible since storing exposed films adversely affects the colors. Color conversion filters can be used to correct for the deviations that occur in daylight or studio illumination. The Rolleipol filter is used to diminish reflections and to control the tone of the blue sky (page 33). Subjects with large plane areas are generally most pleasing; close-ups are most rewarding. Do not choose subjects displaying a conglomeration of harsh colors.

Color Conversion Filters

Modern color temperature meters will indicate the proper filter to use, taking into consideration the type of film and the prevailing light conditions. The most commonly encountered ranges of color temperature are also covered in the double table A + B, pages 39 and 41.

Example: Ektachrome daylight film, overcast sky . . . which filter? Solution: 1. Film — Look up film type (brand) being used. (Ektachrome—daylight = upper part of page), follow the appropriate guide line to edge of page (5500° Kelvin), slide page 39 to the left until guide line A (5500° K) and B (page 41) meet. Hold pages in this position! 2. Lighting — Observe the type of lighting and its color temperature range (overcast = 6600—7000°). 3. Filter — Select the filter indicated opposite the correct temperature range (in this case, R 2). Note that table B gives correction for light value (— 0.5) and the increase in required exposure (1.5 times). The guide lines hereunder listed require sliding page 39 somewhat further to the left.

	Film Type
Daylight	Agfacolor T
	Anscochrome
	Ektachrome
	Ferraniacolor
	Gevacolor
	Ilford Colour D
	Kodachrome
	Pakolor
Artificial light	Anscochrome F
	Ektachrome F
	Kodachrome F
	Agfacolor K
	Ektachrome B
	Gevacolor
	Pakolor



Snapshots

Unexpected picture opportunities or rapidly changing subject distance make a simplified technique, based on depth of field zones, highly desirable. The following three settings have been found very effective:

1/125 sec.	**Diaphragm opening f : 8**	
Short distances approx. 7 to 14 ft.	Medium distances approx. 10 to 26 ft.	Long distances approx. 16 ft. to ∞
10 ft.	**15 ft.**	**30 ft.**

Shutter speeds and diaphragm openings do not often need changing in sunlight. Those suggested cover most contingencies. Thus instead of wasting time focusing when in a hurry, use one of the above settings. This snapshot technique is especially useful with the direct viewfinder. Further closing down increased depth of field (➔ page 24). Chief uses for this technique: groups in motion, street scenes, playing children, reportage, sports.

For unobserved snapshots: turn camera 90 degrees (using ground glass for focusing and viewing) and shoot "around the corner".

Sports

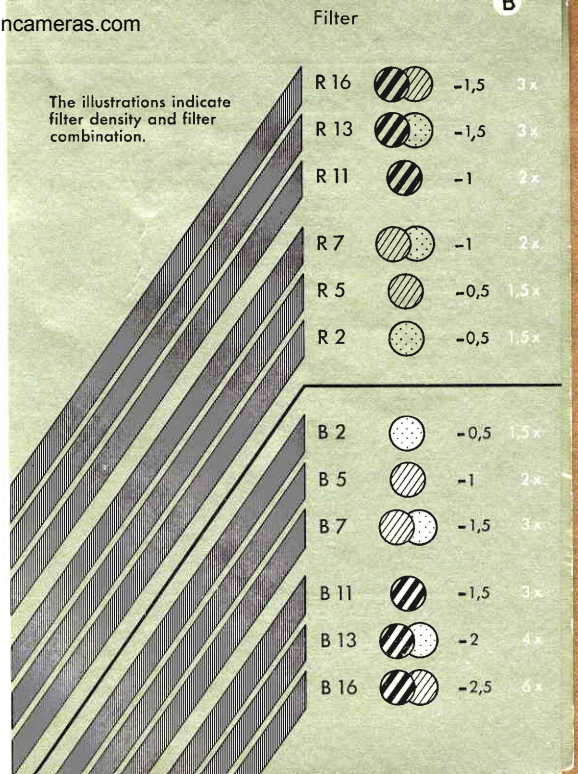
Sports pictures are generally most effective when the original rapid motion has been sufficiently "arrested" and the subject remains well defined. The fastest shutter speeds are essential, together with careful focusing. Sometimes pre-focusing on the spot where the action is to take place is possible. Do not overlook the possibilities of training sessions, since greater cooperation can often be had at such times. Snapshot technique is valuable for turf and ice shots and for any case when it would be difficult to guess exactly where to focus. Watch your shutter speeds and viewing angle. Shooting at right angle to the direction of the action requires a much faster speed than when the action is going in other directions (see table page 22). If the action is very fast or takes close to the camera, it is best to pan or follow with the camera. This results in a sharply rendered main object against a blurred background, thus increasing the impression of speed. There is often a fine moment for shooting when the action reaches a peak and stops momentarily, such as when a pole-vaulter "hits the top" before starting to come down again. With insufficient light or indoors use synchro-flash and 1/500th sec. The extremely short duration of electronic flash is highly desirable in some instances. Use the direct viewfinder.

Care of the Rolleiflex

A precision camera demands care in handling. Protect it against moisture, dust, sand, strong sunshine, hard blows or falls. Important for this purpose: the ever ready case. Proper camera protection is especially important on expeditions, in the tropics and for water sports. In addition it is recommended that a rubber or plastic bag be used as protection against water splashes, windblown sand and blizzards. Carry camera around neck to minimize transportation shocks. Keep all parts clear and clean lenses with a soft camel's hair brush or doeskin. Although the mechanism is not unduly sensitive to cold, some condensation may form on the lenses when the camera is brought into a warm room from outside in cold weather. Do not wipe off — let moisture evaporate. — In the tropics keep camera in air-tight case, when not in use.

In Case of Damage to the Rolleiflex

The task of repairing major or minor damage is the special province of the expertly trained mechanic. Franke & Heidecke maintain their own special workshop in which all repairs are done with precision at nominal prices. Abroad, apply to photo dealers and factory representatives for full information.



*Rolleiflex 4 x 4 and the Practical Accessories**

Code:	
VYBAX	Rolleiflex 4 x 4/Xenar 3.5
BERVY	Eveready Case
VYOBE	Lens Hood
BAUNE	Rolleinar Lenses, set 1 (40-18 in.)
BADOS	Rolleinar Lenses, set 2 (20-12 in.)
	Rollei Filters:
BAIHE	light yellow
BAIMI	medium yellow
BALIN	light green
BAEEN	green
BAORA	orange
BAUBI	light red
BABLA	light blue
BAFIR	infrared
BASKY	UV-protection-filter
BAHAZ	H 1 filter (UV filter for daylight color film)
	Rollei Color Conversion Filters:
BARWO	R 2 |
BARFU	R 5 } red colored
BAREL	R 11 |
BAWOB	B 2 |
BAFUB	B 5 } blue colored
BAELB	B 11 |

Code:	
BATAR	Rolleipol Polarising filter
BATNU	Rolleisoft Diffusion Disc 0
BATON	Rolleisoft Diffusion Disc 1
VYCOM	Leather Case containing: 1 lens hood, 2 sets of Rolleinar lenses and your choice of 5 filters
VYLEE	Leather Case as above, without contents
VYSET	Leather Case containing: 1 lens hood and your choice of 2 filters
VYSOF	Leather Case as above, without contents
ETSIX	Leather Case with 6 color conversion filters
ETVER	Leather Case as above, without contents
BASYN	Rolleiflash Attachment
BOXIN	Boxin Case for 1 Rolleiflash + 1 Rolleiflash comb.
CEKAB	Extension Cord for Flash-Attachment 10 ft.
FLACO	Extension Flashholder Rolleiflash comb. with Connecting Cord 80 in.
TRIKA	Extension Cord for Rolleiflash comb. 10 ft.
BLIKA	Flash Connecting Cord 32 in.
FOFIX	Rolleifix Tripod Head
FOEAD	Panorama Head
VYGUZ	Shoulder Pad for Neck Strap

* to fit Xenar 3.5 bayonet size I.

To avoid errors when ordering accessories please specify camera-number. Full information on the use of Rollei accessories in the booklet "The Practical Accessories".