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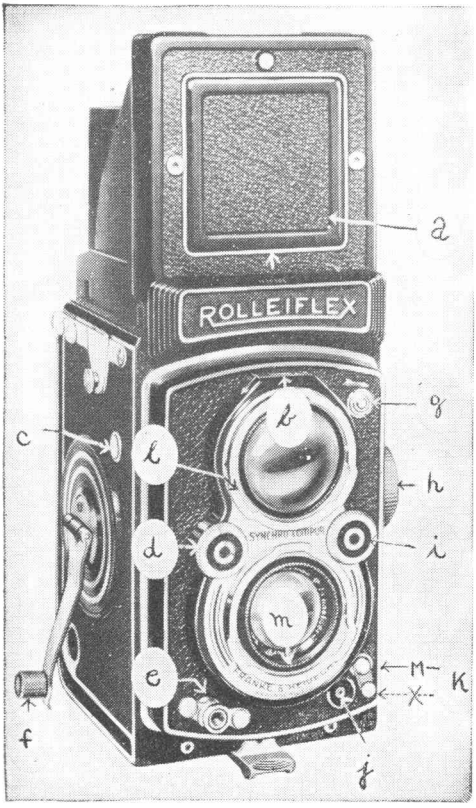
the modern ROLLEIFLEX and Rolleicord GUIDE

by Kenneth Tydings, S. P. E.

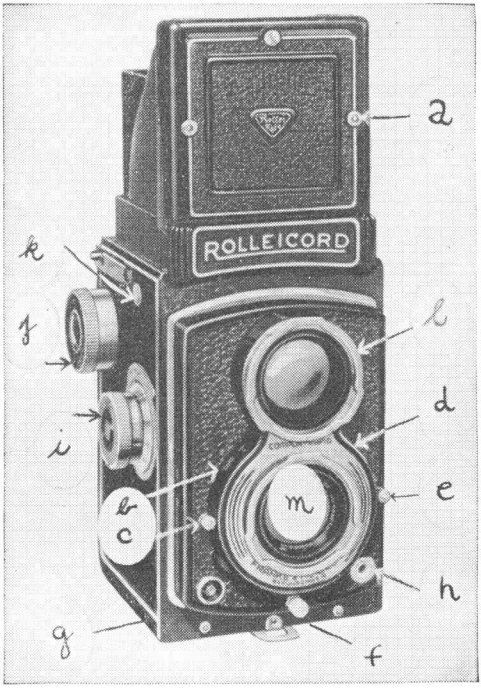
with special COLOR section

THE MODERN CAMERA GUIDE SERIES



The M-X Rolleiflex f/3.5 or f/2.8

a. New Sports Hood.
b. Peep Window; shows shutter speed and iris settings.
c. Film Number Indicator.
d. Shutter Speed Adjusting Knob.
e. Hand Release with Cable Release Socket.
f. Crank Handle; advances film and tensions shutter.
g. Delayed Action Button.
h. Focusing Knob.
i. Iris Opening Adjusting Knob.
j. Flash Plug Receptor.
k. M-X Delay Changer (M-up; X-down).
l. Bayonet Mount.
m. Push-on Mount.



The Rolleicord III

a. New Sports Hood.
b. Speed Peep Window.
c. Speed Adjusting Lever.
d. Iris Peep Window.
e. Iris Adjusting Lever.
f. Double Action Lever (tensions to the right; releases to the left).
g. Flash Plug Receptor.
h. Cable Release Socket.
i. Focusing Knob.
j. Film Advance Knob.
k. Film Number Indicator.
l. Bayonet Mount.
m. Push-on Mount.

CHAPTER 1 / RAPID RESULTS WITH YOUR ROLLEI

As a new owner of a Rollei, you do not wish to wait for even one moment with a preliminary study of photography in order to use your camera, especially because you have heard how wonderful it is. You will want to use it immediately with some assurance of getting good results.

To secure immediate results in color with your Rollei, simply do this:

1. Load the camera with daylight color film as per the instruction sheet, or have a camera store clerk assist you.

2. Set your distance indicator at either 30 feet for a longer distant scene or 12 feet for a medium close-up.

3. Set your aperture so that the space between 8 and 5.6 comes opposite the indicator line.

4. Set your shutter dial so that the 50 is next to the marking line or appears in the window. The Automatic Rollei winds your film and cocks the shutter at the same time. The Rolleicord generally requires a separate setting movement of the cocking lever (towards your right hand) when you are holding the camera with lens facing the subject. Do this gently; you will hear a click when the shutter is set.

5. Hold the camera firmly.

6. Look at your ground glass. Keep your eyes focused on the ground glass and look at it, not through it. You will see your subject on it, but much smaller than it actually is. But whatever is seen on the ground glass is exactly the same size as the negative will be.

7. With color, it is desirable to wait for that type of day when colors will be most brilliant. Colors will photograph best on a clear sunny day. If the sky is dull and overcast, your final pictures will also be dull and overcast. You will find that the camera controls described here are correct for a bright day—which will yield the best color. For other conditions, consult an exposure chart or use an exposure meter.

If the weather is not ideal, you may use your camera indoors or outdoors with an accessory flash unit. A very simple unit is the Flashflex (Chapter 7) which mounts directly into the upper bayonet and requires no extra bracket. In addition, it is instantly removable from the bayonet mount for use in an off-the-camera angle.

With the flashlamp (bottled sunshine), you can become totally independent of the weather. In using flash, remember that your flash synchronization takes place at certain specific speeds, with 1/25 second a safe choice for all types of flashlamp. The Rolleis that have

the M-X shutters can be synchronized for flash even with the top speed of 1/500 second. For flash efficiency:

A. Choose your subject distance from the subject-size chart.

B. Set your distance scale.

C. Choose the aperture for this distance from the chart for the SM-SF flash (Recommended for Kodachrome A without a filter), the ※5–25 Lamp indoors (with appropriate color filter), or the ※5B, 25B lamp outdoors and set the iris. You now have pre-set the shutter, the distance, and the iris.

D. Now approach your subject to the approximate distance that has been set and observe your subject either through the open sports finder, the reflecting mirror image on your ground glass, or directly on the ground glass. Move back and forth with or to your subject until the image is sharp on your ground glass. When the image is sharp and the subject's action is at its peak, squeeze the release and you have taken your flash picture. Note: Even if you are a few inches before or behind your actual distance setting, don't worry about it as your depth of field (Chapter 4) adequately compensates for any slight variance.

E. Outdoors without flash, leave the camera setting exactly at 30 feet for a depth of field from approximately 15 feet to infinity, and at 12 feet for a depth of field from approximately 9 to 15 feet. By using either of these pre-focused settings, you can be certain of a sharp picture within either area as long as your subject is anywhere within the 30- or the 12-foot setting even though you do not have time to check your exact focus on the ground glass. For shorter distances, the ground glass should be used, but after some practice, you can guess focus within six inches easily.

F. Rewind immediately after taking your picture. The Automatic Rollei mechanism winds your film and cocks the shutter at the same time. The Rolleicord winding mechanism does not have an interlock. Therefore, for the Rolleicord I suggest that you immediately cock your shutter, so that it is impossible to take an unintentional double exposure.

When you have finished your roll, do not open the camera back until your film has been completely wound forward and you hear the paper backing flapping in the take-up spool chamber.

G. Remove the film after opening the back by pulling out the knob holding the take-up spool. Keep a firm grip on the paper backing and then bend the paper end under so that the adhesive label may be wrapped around to seal the spool.

H. Mail your film to the appropriate processing center after carefully addressing the shipping tag and checking your postage.

The returned color transparencies or prints may be viewed, enlarged, or projected. These instructions are simple and at a minimum. The only judgment required on your part is to wait for a bright, sunny day, pre-select your subject size and then keep the subject within the focused distance from your camera. If these elementary instructions are followed, you can be sure of fine results.

Learn to pre-set your camera controls either indoors or outdoors for existing, flash or artificial light. To do this:

1. Pre-set your distance after choosing your subject size. For people, the 3½-, 5- and 10-feet distances are the most useful.
2. Pre-set your shutter.
3. Pre-set your iris.
4. Pre-view your subject.
5. Release at the peak of action or expression.

Your camera is an instrument capable of flexible changes for use under varying light, shutter speed, and distance conditions. The following four chapters will show you how to change the simple settings of the Safe-Set Method to meet all possible needs. The time to remember all the picture-taking factors is before the exposure is made. As an aid in memorizing these important points, always recall the word *SAFE* before you take a picture:

S—Shutter
A—Aperture
F—Focus
E—Exposure

Advantages of the Rollei

The 2¼-inch square film size of your Rollei produces a negative which is easily enlarged and allows the camera to be kept compact for portability and maneuverability. Using an 8x10 enlargement as a means for standard comparison, you can see by simple arithmetic that only a four-times enlargement is needed with the larger Rollei film size. A 35mm camera (1 inch x 1½ inches) would need at least an eight-times blow-up. In addition to these enlargement benefits, the Rollei size may be contact printed for use in a wallet or handbag. Other advantages of the Rollei which have made it a favorite for exhibitors, magazine writers, advanced amateurs, and many beginners are:

1. Twelve-exposure roll. You can see your results quickly. No need to wait for 20 or 36 exposures.

2. Direct focusing and combined viewfinding by means of a ground glass (an ideal focusing method).

3. The camera is small, hand-sized, so that it is easily carried and ready for instant picture taking.

4. Uses a standard roll film size (120 or B2) which is available anywhere in the world.

5. Easily adapted for cut film, 35mm film, or Bantam sized rolls.

6. Fine-grain development is not entirely necessary. The moderate 8x10 enlargement produces a sharp enough image with a medium grained developer and lets you use the full emulsion speed of your film.

7. F/3.5 or faster lenses are available. The lens chosen by the manufacturer will produce the finest quality picture possible. He knows what lenses must be used to maintain the high quality picture necessary to maintain the Rollei reputation.

8. Color film in all sizes, 35mm, Bantam and 120, is easily available for the Rollei size. Many advanced workers use only color.

9. The square format permits composition in three pleasing patterns: (a) square, (b) vertical, and (c) horizontal.

10. The three-inch lens of short focal length has a great depth of field and hyper-focal distance. A sharp image for most far or middle distances results because of this, and the need for critical focusing is lessened.

11. Easily adaptable for studio portraiture, copying and medical, child, pet and scientific photography.

12. The between-the-lens shutter is trouble-free and easily synchronized for flash. You may use regular flashlamps and flashtubes that are plentiful, easily obtained, and can be accurately synchronized.

13. Wide open focusing. This most important feature lets you view and focus with the top viewing lens at all times when the top lens is wide open so that the clearest and brightest image can be seen throughout the picture-taking process. This sharply contrasts with the single-lens reflex which must be stopped down just before exposure. If you forget to narrow the lens opening of your single-lens reflex, your picture will be over-exposed. This problem is completely eliminated by the twin-lens reflex plan of design.

14. The automatic film wind of the Rolleicord and the automatic combined film wind and shutter-setting effect of the Rolleiflex

are advanced design features which have not been readily duplicated.

15. The new ground-glass mirror reflecting hood enables you to focus on the ground glass and then shift your eye to the open sports finder. In this way, you focus and instantly follow your subject in life-size proportions.

The operational and optical simplicity of your Rollei combined with the sureness of the Safe-Set Method will enable you to produce successful pictures.

To use the following charts to best advantage:

(1) Copy field sizes onto a piece of labeling tape.

(2) Standardize on one film, one flashlamp, etc. and copy this onto the tape. e.g.

Lens of 2″ focal length

SM or SF with Kodachrome Type A Shutter 1/25

UV-16 with Ansco Color Indoor Shutter 1/25

Vertical—Head		2.5 feet	f/22
	Head & Shoulders	3.5 feet	f/16
	¾	5.5 feet	f/11
	Full Body	10 feet	f/5.6

(3) Place it on your camera case or on the back of your flash reflector for easy reference.

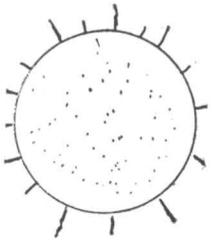
(4) Pre-select and Safe-Set each exposure.

You can make out a chart for any flashlamp or flashtube and for different films or shutter speeds.

Once the chart is filled out, you have all the information for taking your picture. These apply for average subjects. For light subjects, pre-select all your factors and then narrow your opening one half stop. For dark subjects widen the opening one half stop. An opening is conveniently widened or narrowed one half stop by moving it one half the space between each stop. High efficiency reflectors are suggested. If your reflector is inefficient, make your preliminary settings and then widen or narrow your opening one half stop.

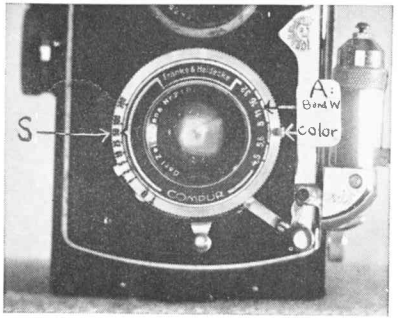
Dr. Tydings' Outdoor SAFE SET Formula

OUTDOORS



FILM: Daylight color, Type A with #85 Conversion Filter, or Ansco Color tungsten-type with CONV. #11.

LIGHT: Clear day, not harsh



FOCUS: 30 ft infinity to 15 ft subject sharpness
12 ft for 9 to 15 ft sharpness

Rollei - 2 1/4" Sq.		Distance	Field Size in Inches
Head	§	2'8" (0.8M)	21x21
Head & Shoulders	†	3'6" (.96M)	28x28
3/4	‡	5 (1.52M) 7 (2.13M)	40x40 56x56
Full body	+	10 (3.05M)	80x80
Rollei - Rolleikin 1x1 1/2" - Vertical			
Child Head	#	2'8"	17x11
Head	§	3'5"	21x14
Head & Shoulders	†	5'	30x20
3/4	‡	7'	42x28
Full body	+	14'	90x60

EFFECT: Release at peak of action or expression.

3" Lens 2 1/4" negative 1/25th	Indoor Film	Guide No.	f/22 2H	one handkerchief f/32	f/22	f/16	f/11	f/8	f/5.6	f/4	f/3.5
	ASA 80	200	‡4'5"	6'4"	9'2"	+12'6"	18'	25'	36'	50'	
#5 25	40	140	§3'	†4'5"	‡6'2"	8'9"	+13'	17'	24'	35'	
	32	110	§2'5"	†3'6"	‡5'4"	6'10"	+10'	13'6"	19'5"	27'6"	
81EF	Ekta-chrome	75	1'6"	§2'4"	†3'4"	‡4'8"	6'8"	9'4"	+13'	18'	25'
UV-16	Ansco Color	75	1'6"	§2'4"	†3'4"	‡4'8"	6'8"	9'4"	+13'	18'	25'
81C 81D	Koda-color	95	2'	†3'	‡4'3"	5'8"	8'7"	+12'	17'	24'	27'
SM SF	ASA 80	110	§2'5"	†3'6"	‡5'4"	6'10"	+10'	13'6"	19'6"	27'6"	
	40	75	1'6"	§2'4"	†3'4"	‡4'8"	6'8"	9'4"	+13'	18'	25'
	32	60	1'3"	2'	§2'8"	†3'8"	‡5'4"	8'6"	+10'8"	15'	17'
81A	Koda-color	56	1'3"	1'8"	§2'6"	†3'6"	‡5'6"	7'	+10'	14'	16'
1/50th 5B 25B	Outdoor Ekta-chrome	48	1'	1'6"	§2'2"	†3'	4'4"	‡6'	8'7"	+12'	
	Koda-color	85	2'	2'7"	†3'10"	‡5'3"	7'8"	+10'	15'	20'	24'
	Ansco color	55	1'3"	1'8"	§2'6"	†3'6"	‡5'6"	7'	+10'	14'	16'

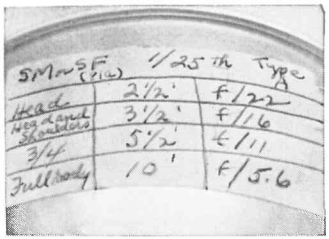
3" Lens with 1x1 1/1" film	ASA	Guide No.	f/45	f/22	22	16	11	8	5.6	4	3.5
1/25th	ASA 80	200	†4'5"	‡6'3"	9'6"	+12'6"	18	25	36	50	
	40	140	§3'	†4'5"	6'2"	‡8'9"	+13	17	24	35	
	32	110	‡2'5"	§3'6"	†5'4"	‡6'10"	10	+13'6"	19'6"	27'6"	
81C 81D	Kodachrome A	90	2'	#2'9"	§4'	†5'7"	‡8"	11"	+16"	22'	25
81C 81D	Kodacolor A	95	2'	#3'	§4'3"	†5'9"	‡8'7"	12'	+17'	24'	27'
UV - 16	Ansco Color Indoor	75	1'6"	#2'4"	§3'4"	†4'8"	‡6'9"	9'4"	+13'	18'	21'
SM SF	ASA 80	110	#2'5"	§3'6"	†5'4"	‡6'10"	10	+13'6"	19'6"	27'6"	
	40	75	1'6"	#2'4"	§3'4"	†4'8"	‡6'9"	9'4"	+13'	18	21
	32	60	1'3"	2'	#2'8"	§3'8"	†5'4"	‡7'6"	10'6"	+15	17
	Kodachrome A	56	1'3"	1'8"	#2'6"	§3'6"	†5'6"	‡7'	10'	+14'	16'
	Kodacolor A	56	1'3"	1'8"	#2'6"	§3'6"	†5'6"	‡7'	10'	+14'	16'
	Ansco Color I	56	1'3"	1'8"	#2'6"	§3'6"	†5'6"	‡7'	10'	+14'	16'
1/50th 5B,25B	Outdoor Kodachrome	48	1'	1'6"	2'2"	#3'	§4'4"	†6'	‡8'7"	12'	+15'
	Ansco Color	85	2'	#2'7"	§3'10"	†5'3"	‡7'8"	10'	+15'	20'	24'
	Kodacolor	55	1'3"	1'8"	#2'6"	§3'6"	†5'6"	‡7'	10'	+14'	16'

- Child's Head
§ - Head
† - Head & Shoulders
‡ - Three quarters
+ - Full body

FLOODLAMP GUIDE—LAMP BESIDE THE CAMERA

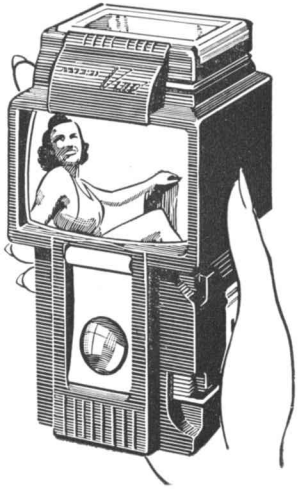
Lamp: Floodlamp 1 in suitable reflector or one RFL2
Film: Indoor Color, Type A

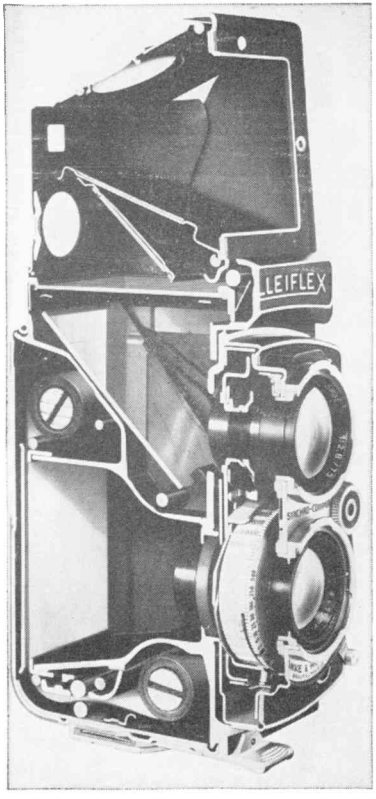
Shutter Speed:	*Opening*	*Lamp-to-Subject Distance*
1/25	f/2.8	4.6 feet
	f/3.5	3.7
	f/4	3.25
	f/5.6	2.3
1/5	f/2.8	10 feet
	f/3.5	8
	f/4	7
	f/5.6	5
	f/8	3.5

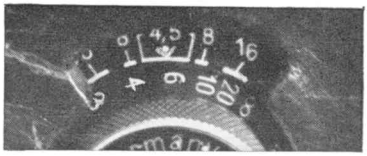


Back of flash reflector

Check your name, address and postage before mailing. The returned picture may be enjoyed by viewing, projection or enlargement.

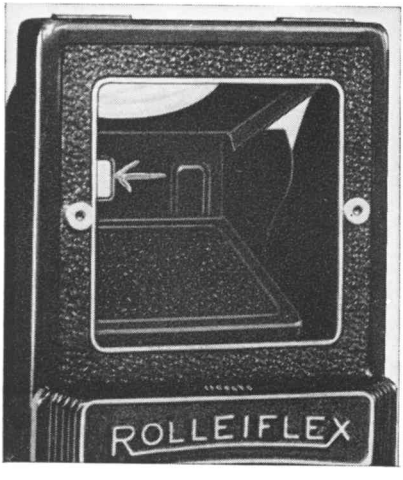




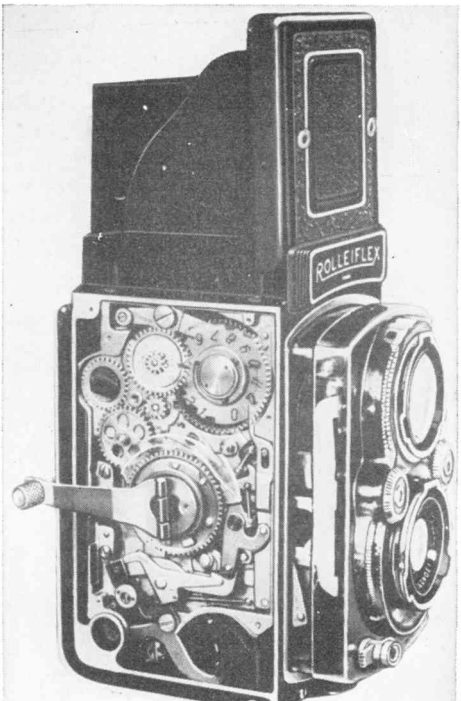


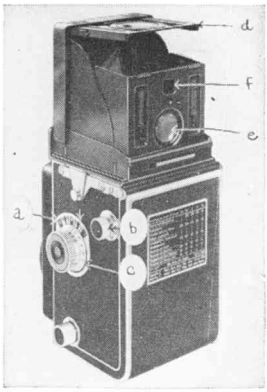
Focusing Scale and Depth-of-Field Table. Depth-of-field is found by reading the focusing scale from similar f/ numbers on either side of the focusing mark, e.g. at f/16, everything will be in focus from 20 meters to approximately 3⅓ meters.

The Twin-Lens Reflex Principle



Sports Finder Open.





a. Depth-of-Field Scale
b. Take-up Spool Knob (may be replaced by permanent Rolleikin Counter).
c. Focusing Scale
d. Wide-field Magnifier
e. Eye-level Mirror-image Magnifier
f. Eye opening for the Sports Finder

The Intricate Inner Mechanism

COMPARISON OF THE ROLLEIFLEX AND ROLLEICORD

	ROLLEIFLEX			ROLLEICORD	
	1951	1952	f/2.8	II	III
1. f/3.5 lens	x	x		x	x
2. f/2.8 lens			x		
3. M-X Shutter		x	x		
4. X-Shutter		x			x
5. Coupled film advance and shutter setting	x	x	x		
6. Separate Shutter setting				x	x
7. Double Exposure prevention	x	x	x		
8. Automatic Film stop for first exposure	x	x	x		x
9. Window to see No.1				x	
10. Accept all accessories	x	x	x	x	x
11. Sports Finder		x	x		x
12. Delayed Action	x	x	x		

CHAPTER 2 / S—THE SHUTTER

The shutter of your camera may be compared to a water faucet. When the faucet is open, water will flow. Similarly, when the shutter is open, light enters your lens. If the shutter remains open a long time, more light will enter through the lens than if the shutter had remained opened for only a short time. The volume of light that is available determines whether it is necessary to leave the shutter open for a long or for a short time. When the light volume is very low, you may be required to leave the shutter open for as long as an hour at a time. On the other hand, for a sports or action shot, a picture may have to be taken in as little as 1/500 second, because of the fast motion of your subject. With the chart, you can choose the correct shutter speed that is needed. As you will find later, if a choice of speeds is available, the slower speed permits the use of a narrow iris opening with a gain in overall sharpness, while a faster speed produces a shallow depth of field. The proper choice of correct iris opening may often be an important point in making or breaking the effect of a picture.

The beginner can easily choose a slow speed for still (inanimate) subjects, while for living (animate) subjects a fast shutter speed of at least 1/50 up to 1/500 second should be used. For sports or action pictures, use the fastest shutter speed available.

However, if you must determine an exact shutter speed for a subject in motion, you can remember what speed to use by knowing the meaning of the series of numbers 25,5,25. This basic number means that for a subject 25 feet away, moving at 5 miles an hour, with a line of motion directly toward and away from the camera position, the shutter speed need be only 1/25 second. With a 45-degree line of motion, the shutter speed is doubled; while with a 90-degree line of motion, the shutter speed is three times the original 1/25 second. If the speed of the subject is increased to 10 miles per hour, then all numbers are doubled in proportion. As all subject speeds are increased, your shutter speeds are also increased in direct proportion. If, on the other hand, the subject distance is increased to 50 feet, all numbers may be doubled. With a 100-foot distance the figures are quadrupled so that a subject moving at 20 miles per hour, 100 feet away, with a line of motion toward the camera will still require a 1/25 shutter speed.

SHUTTER SPEEDS FOR MOVING SUBJECTS

SUBJECT AT 25 FEET	LINE OF MOTION ↑↓	↘	⇆
Walking at 5 miles per hour	1/50	1/100	1/150
Children playing	1/100	1/200	1/300
Street activity	1/100	1/200	1/300
Swimmers, skaters	1/100	1/200	1/300
Vehicles at 20 m.p.h.	1/200	1/400	*1/500
Football, running	1/200	1/400	*1/500
Vehicles at 40 m.p.h.	1/400	1/500	*1/500
Tennis	*1/500	1/500	*1/500
Horse race	*1/500	*1/500	*1/500
Airplanes	*1/500	*1/500	*1/500

N.B. *When your subject is at* 50 *ft., multiply all speeds by* 2(1/100x2 = 1/50).
For 100 *ft. subject distances, multiply all speeds by* 4 (1/100 x 4 = 1/25).
**PAN to stop motion.*

PANNING

If your highest shutter speed cannot stop the motion of a rapidly moving object from a set position, then the subject's motion may be stopped by "panning" your camera. This means that you swing or move the camera in line with the movement of your subject. When you snap your shutter, the object will be stopped in motion and will be sharp, while the background, of necessity, will be blurred. While this is not always the best photography, the resulting sharp subject justifies the compromise.

The shutter speeds of your Rollei "Compur" shutter, depending on the model, generally are T, B, 1, 2, 5, 10, 25, 50, 100, 250, and 500. These numbers refer to fractions of a second. The 50 means 1/50; the 2 means ½, etc. Some older Rollei's have a top speed of 1/300 second.

Do not set your shutter speed at points other than directly opposite the engraved numbers. Delicate mechanisms revolve each time you change the shutter speed. After they have been set, the tension of turning the shutter-setting dial may strain the gears. This is especially true of the 1/50 to 1/500 series of settings.

With a Rolleicord only you may change your speed by first covering your lens with your hand and then releasing your shutter. Now, you can re-set your dial to the new speed before cocking the shutter. One exposure costs approximately four cents, while one broken gear may cost many dollars in repair time and material. With a pre-set shutter, there should be no reason for any last-minute changes.

If your Rollei has only a *B* (bulb), where the shutter remains open only as long as pressure is maintained, you can get a *T* (time) effect with a special locking cable release that has a set-screw to hold the plunger in place.

A large range of shutter speeds, while important for specialized work, is not needed by the beginner. A survey of most salon prize winners showed that their average speed setting had been 1/100 second. With this in mind, the amateur can see that pre-setting his camera for speeds up to 1/100 setting will suffice for most of his picture needs. To set the shutter for any marked time interval, rotate the ring with the time numerals on it until the desired speed is opposite an indicating line (Rolleicord 1A). For other models, the speed setting is made by means of a lever (Rolleicord 2 and 3) or by a dial (all automatic Rolleis). The speed number is observed in the peep window which is conveniently located on top of (automatic) or sides of (Rolleicord 2 and 3) the viewing lens.

Once you have completed setting the shutter to the desired speed, then your Rolleicord models require that the shutter be cocked before it can be released. In the automatic Rolleis the shutter is cocked at the same time as the film is wound.

Once your shutter speed has been chosen and the shutter prepared for release, a question arises whether the exposure shall be made with the camera hand-held or on a tripod. The 1/50 second setting, as a rule, is the dividing line between recommending exposures to be hand held. With slower speeds a tripod-supported camera is desirable. Since you magnify your finished picture by enlarging, projection or viewing, any body vibration or tremor will be transmitted and show on the picture so that the subject will consequently be magnified as a blur. To limit the possibility of blurring your film with a hand-held camera, even at speeds of 1/50 second or faster, brace yourself in this fashion: Place your feet so that your toes are approximately four inches apart, your heels about six inches; hold your camera firmly, take a deep breath, exhale, and shortly after the exhalation, you will note that you are at your steadiest; at this point release the shutter.

When no tripod is available, this method has yielded good pictures even at 1/10 second. But at speeds slower than 1/50 second, it is far safer to use a tripod which provides a sturdy support and minimizes camera movement.

Practice releasing or cocking and releasing the shutter (some release levers depress or must be moved considerably before the shutter is actuated). Practice a number of times until you have the pressure and depth of release just right. Action pictures, baby portraits, etc., require split-second exposures at the peak of action. The shutter must be released immediately, else you may lose in that split second the priceless once-in-a-lifetime expression or rare, never-to-be-repeated action.

Practice releasing your shutter so that the camera will remain steady. No matter how steady you may think you are, you will always tend to twist the camera slightly in the releasing direction. If you learn to release your shutter without vibration, your pictures at even 1/10 second will enlarge cleanly without any blur. The best place to practice is in front of a large mirror. Stand fairly close and look through the ground glass or sports viewfinder as you release the shutter. Any movement that you notice would have occurred had you actually taken a picture. The jerking of the camera would have produced a blurry picture, had you had film in the camera. So, learn to squeeze the release gently to reduce vibration or pushing.

Cable Release

Another important aid for minimizing camera movement is a cable release. When your camera is on a tripod, you must still release your shutter with your finger. Should your finger push against the camera too strongly, some vibration will be transmitted through your hand. With a cable release, your hand is free and clear of the camera so that there is no pressure directly against the camera shutter. A six-inch or longer cable release will suffice for most pictures. Note: The older Rolleicords use a specially thin cable-release tip to fit the shallow well on the side of the shutter.

The cable release must be slack. If it is kept taut, the vibration of the releasing motion of your hand will be transmitted to the camera. If the camera vibrates, you are using your cable release incorrectly.

Delayed Action

If a cable release is not available and you are fearful of vibration, then you can use either the self-timer that is built into the Rollei-

.ex cameras or an auxiliary delayed action attachment which may be purchased for all Rolleicord cameras. Once you set and release the delayed action mechanism, approximately a fifteen-second delay occurs, and the camera shutter is released without any possibility of vibration. The fifteen-second delay, in addition, can give you time for getting into the picture. You can take flash pictures of yourself (later models only) or by posing in any scenic picture, add that necessary human interest that would otherwise not be possible to obtain.

CHAPTER 3 / A—THE APERTURE (IRIS)

While a faucet is open, water will flow through it for any desired length of time. If the faucet opening is narrow, a small amount of water can come through. If the faucet diameter is large, then a greater volume will pour through. The relationship of the diameter of the faucet to the length of time that it remains open is similar photographically to the relationship of the size of the lens opening to the shutter speed. The shutter speed, in turn, is the length of time that the lens will remain open. The diameter of a faucet is measured in inches. Photographically, the diameter of the lens is related to the focal length (lens-to-film distance) at which it forms an infinity image.

This ratio of lens diameter to focal length is usually shown as an f/ number. The f/ number then is the relationship of the size of the lens opening to the distance that the light rays must travel before they form a focused sharp image on the film. A small number indicates a wide opening, whereas a high number indicates a narrow opening. The wider the opening, the greater the amount of light that is admitted at a given interval of time. Conversely, the narrower the opening, the smaller the volume of light that can enter the camera within the same time interval. For equal exposures, you can have a large opening and a short shutter speed or a narrow opening with a long exposure. There are different advantages to be gotten from each combination. A wide opening will permit a short exposure, such as is necessary for action pictures. On the other hand, a narrow opening will produce a deeper area of subject sharpness in the picture. When a sharp image is desirable but not always possible, you compromise by getting what you can with at least your main subject in sharp detail.

The iris diaphragm of a lens regulates the size of the opening which admits light to the camera. It is in many ways similar to the

iris of the eye. Look into a mirror and bring a light close to your eyes. As the light is brought closer, you will see that the iris opening narrows. As the light is moved away, the iris widens. You duplicate this narrowing and widening by moving the indicator or the iris control knob to change your peep window number.

Remember that the narrower the lens opening, the greater is the depth of field. Narrow stops give great depth and wide stops yield a shallow area of subject sharpness.

Rollei lenses narrow generally at full stop intervals to f/32. If intermediate settings are desired, the chart is useful in figuring out what exposure compensation must be made for the time factor.

An inherent quality of a 3-inch lens of short focal length is its remarkable depth of field for its film size. A 3-inch lens at f/4 has

Full-stop marking		Relative light increase, if only the iris is widened
f/1	1	These are full stop openings with a 100% difference in light transmission between two adjoining stops. If the indicator is moved approximately half way between the two markings, the iris is opened ½ stop and the difference in light transmission is increased 50%. Half way between f/5.6 and f/8 produces f/6.3, between f/8 and f/11 is f/9.
f/1.4	2	
f/2	4	
f/2.3	8	
f/4	16	
f/5.6	32	
f/8	64	
f/11	128	
f/16	256	
Half-stop openings		
f/3.5	1	These specific numbers produce a difference in light transmission of 50% from one mark to another.
f/4	1½	
f/4.5	2	
f/5.6	3	
f/6.3	4½	
f/8	6	
f/9	9	
f/11	12	
f/12.5	18	
f/16	24	
f/18	36	
f/22	48	

N.B. *Everything being equal, if the shutter speed is changed from* 1/100 *to* 1/200, *the iris must be widened one stop.*
If the shutter speed is changed from 1/100 *to* 1/50, *the iris is narrowed one stop.*
If the shutter speed is changed from 1/100 *to* 1/75, *the shutter is narrowed by* ½ *stop.*
If the shutter is narrowed from f/8 *to* f/16, *the shutter speed is lengthened four times so that* 1/100 *will be re-set to* 1/25.

the same depth of field as a 6-inch lens at f/8, or a 12-inch lens at f/16. For color, the depth of the 3-inch lens is a valuable point because with a 3-inch lens set at f/4, you will be able to get a picture, whereas at f/16 with a lens of longer focal length, to get the same depth of field, your picture will be hopelessly under-exposed. It is the depth of field of a lens of short focal length and a wide opening, which has made a picture possible. With a fast shutter speed, your lens opening will have to be as wide as possible to admit more light (f/3.5 or even f/2.8, if available). Even when your shutter speeds are slow, you may narrow your lens opening and so still get a greater depth of field than is possible with a lens of longer focal length.

So far you have learned to set your shutter speed and control the variable opening (iris) which admits light to your lens.

CHAPTER 4 / F—FOCUSING

Focusing is the process of insuring the maximum amount of image sharpness. To estimate the correct subject-to-camera distance, you may use either your ground glass, the new Kalart dim-light Focus-Spot acting as a rangefinder, or simply guess the distance. To help you with your guess, you may take advantage of either the depth of field or the hyper-focal distance settings of the lens of short focal length.

Because of the great depth of field of your 3-inch lens, your images will be sharp at infinity to most middle distances without critical focusing. Shorter distances, however, require the use of your ground glass. A ground glass is a piece of glass with one translucent side. The translucency may be formed by either physically grinding the glass with sands of different fineness, or by chemically etching only the side of the glass that faces the camera. The translucent side has the property of making an aerial image formed by your camera lens visible as the lens is moved for focusing. When the visible image produced by the lens is sharp, the camera is in focus. When the image is not sharp, it is out of focus. The beginner may see exactly what is meant by sharp focus if he places a newspaper or other printed material on a wall and then stands approximately four feet from the subject. Now look at the camera's ground glass. If you can read the print clearly, your ground glass shows the subject in focus. If you cannot read the printed material, then make your focusing adjustments (ro-

ROLLEIFLEX

ROLLEI DEPTH OF FIELD TABLE

7.5 CM — 3 INCHES

ROLLEICORD

Calculated for circle of confusion of .003". Figures in the inf. column are hyperfocal distances for indicated diaphragm opening. If lens is focused on hyperfocal distance, all objects from half that distance to infinity will be rendered sufficiently sharp.

	inf.	60'	30'	20'	15'	12'	10'	8'	7'	6'	5'	4'	3½'	3'	2⅔'
f: 3.5	71' 5" to inf.	32' 7½" to 375' 4"	21' 2" to 51' 9"	15' 7½" to 27' 9"	12' 5" to 19'	10' 3" to 14' 5"	8' 9¼" to 11' 7½"	7' 2½" to 9'	6' 4½" to 7' 9"	5' 6½" to 6' 6¾"	4' 8" to 5' 4½"	3' 9½" to 4' 2¾"	3' 4" to 3' 8"	2' 10½" to 3' 1⅝"	2' 6¾" to 2' 9¼"
4	62' 6" to inf.	30' 7½" to 1500'	20' 3" to 57' 9"	15' 2" to 29' 5"	12' 1" to 19' 8½"	10' 1" to 14' 10"	8' 7½" to 11' 10½"	7' 1" to 9' 2"	6' 3½" to 7' 10½"	5' 5¼" to 6' 7½"	4' 7½" to 5' 5¼"	3' 9¼" to 4' 3¼"	3' 3½" to 3' 8½"	2' 10¼" to 3' 1¾"	2' 6⅝" to 2' 9½"
5.6	44' 7" to inf.	25' 6⅔" to inf.	17' 11" to 91' 8"	13' 9½" to 36' 3"	11' 2½" to 22' 7"	9' 5½" to 16' 5"	8' 2" to 12' 11"	6' 9½" to 9' 9"	6' ⅓" to 8' 3½"	5' 3½" to 6' 11¼"	4' 6" to 5' 7½"	3' 8" to 4' 4¾"	3' 3" to 3' 9½"	2' 9¾" to 3' 2⅛"	2' 6½" to 2' 10"
8	31' 3" to inf.	20' 6½" to inf.	15' 3½" to 750'	12' ½" to 55' 6"	10' 1½" to 28' 10"	8' 8" to 19' 6"	7' 7" to 14' 8½"	6' 4½" to 10' 9"	5' 8½" to 9'	5' ½" to 7' 5"	4' 3¾" to 5' 11½"	3' 6½" to 4' 7"	3' 1¾" to 3' 11½"	2' 8⅞" to 3' 3¾"	2' 5¾" to 2' 11"
11	22' 9" to inf.	16' 3" to inf.	12' 11" to inf.	10' 7½" to 165' 6"	9' 1½" to 44'	7' 10½" to 25' 4"	6' 11½" to 17' 10"	5' 11" to 12' 4"	5' 4½" to 10' 1½"	4' 9" to 8' 1¾"	4' 1¼" to 6' 5"	3' 4¾" to 4' 10¼"	3' 1½" to 4' 1½"	2' 7¾" to 3' 5½"	2' 5" to 3' 1¼"
16	15' 7½" to inf.	12' 4¾" to inf.	10' 3½" to inf.	−8' 9½" to inf.	7' 7¾" to 375'	6' 9½" to 51' 8"	6' 1½" to 27' 9"	5' 3½" to 16' 4½"	4' 10" to 12' 8"	4' 4" to 9' 9"	3' 9½" to 7' 4¼"	3' 2¼" to 5' 4½"	2' 10½" to 4' 8"	2' 6¼" to 3' 8½"	2' 3½" to 3' 2½"
22	11' 5" to inf.	9' 6½" to inf.	8' 3½" to inf.	7' 3" to inf.	6' 5¾" to inf.	5' 10½" to inf.	5' 4" to 80' 6"	4' 8½" to 26' 9"	4' 4" to 18' 1½"	3' 11¼" to 12' 8"	3' 5¾" to 8' [illegible]"	2' 11½" to 6' 2"	2' 8" to 5' 3½"	2' 4½" to 4' 4¾"	2' 2" to 3' 6"

If negative is to be greatly enlarged, use next smaller diaphragm opening.

tating the focusing knob) until the print is clear when seen on the ground glass.

The Rollei lenses are mounted together on a single lens board. As this lens board moves in or out, both lenses move as a unit. This co-ordinated movement of both the top viewing and the bottom taking lens insures that the focus of both will always be the same. As your lenses have been matched for focus at the factory with specialized instruments, barring accidents or tampering, the focus of the top viewing lens is exactly the same as that of the bottom lens.

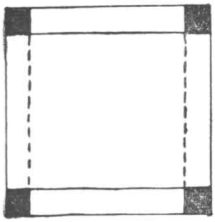
If you must guess your distance because you may not have the time to use the ground glass (as in sports and other action scenes), it is a good idea to know something about the depth of field and the hyper-focal distance. We have said that your lens of short focal length has a great depth of field. This means that very deep subject areas will be sharp without the need of accurate focusing. Sharpness, as you must realize, is a relative term based on the fact that the film image is composed of many, fine silver-grain dots. If the dots are close together so that the eye cannot see them separately, the image appearance is smooth and continuous. If the dots are apart and individually distinguishable, the image will appear granular, sandy and unsharp.

Note: An unsharp image is distinctly different from the granularity produced by high-speed developers or coarse-grained film.

Reading then in your distance table that everything is sharp from 15 feet to infinity, does not mean that your subject abruptly becomes completely blurred at 14 or 12 feet. Rather it means that at a 10-inch viewing distance, the eye would be unable to distinguish a separation of two silver image dots if they are 1/100 inch apart. When you can see the separation between the dots of a film image, the continuous appearance is no longer smooth and united but will be granular or hazy. To the eye a fuzzy image does not appear sharp. To get back to our subject at 15 or 12 feet, you will just begin to see, at the last-mentioned distance, the separation of the dots that form your film image at this distance. At 5 or 4 feet the image dot separation will definitely be coarse and distinct. There is no abrupt dividing line from a sharp to a fuzzy image in your picture; rather, there is a gradual image breakdown depending on lens opening, development, etc.

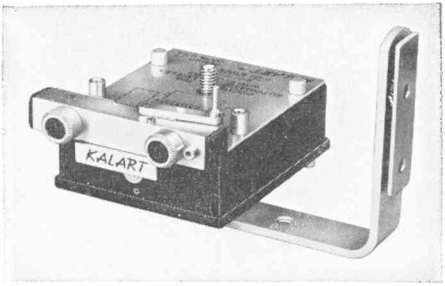
Contact prints from your negatives may be made and will be easy to view if the image of the positive prints within the 1/100 inch allowance. To produce an image for the standard 8x10 inch size, the

Meter to Feet Conversion Knobs



Aid for composing on the ground-glass; inside dotted lines from the outside top edge to the very bottom of the ground-glass for a vertical 8x10, inside horizontal lines from edge to edge of ground-glass for a horizontal 8x10.

Focused in total darkness.



Detachable Kalart Focuspot-Ideal for Dim Light Focusing.

HYPER-FOCAL DISTANCE TABLE

Aperture	*Focus Setting*	*Area of Sharpness*
f/2.8	136′	63′ to ∞
f/4	63′	31 1/2′ to ∞
f/8	31 1/2′	15 3/4′ to ∞
f/16	15 3/4′	7 7/8′ to ∞
f/32	7 7/8′	3 9/10′ to ∞

Converting Your Meter Scale To Feet

METER	FEET	TOTAL INCHES
0.8M	2 2/3′	32″
0.9M	2 11/12′	35″
1.0M	3 1/3′	39″
1.1M	3 1/2′	43″
1.3M	4 1/3′	52″
1.5M	4 5/6′	58″
1.7M	5 2/3′	67″
2.0M	6 1/2′	78″
2.5M	8 1/6′	98″
3.0M	9 5/6′	--
4.0M	13′	--
6.0M	19 2/3′	--
10.0M	39 1/3′	--
20.0M	78 2/3′	--

enlargement must be five times or more. If a film is enlarged to ten times, the 1/100-inch separated dots of a borderline focused image, will be pulled apart and now show as two distinct points 1/10 inch apart (100 divided by 10). Since we can readily distinguish two points 1/10 inch apart, an unsharp image which is generally of little photographic value, will result from the enlargement. As most film is enlarged today, pre-calculate your subject distances and related iris openings to be sure that your picture is as sharp as possible. At close range, you must use your ground glass to focus exactly, because of the shallow depth of field and the need for an ideal film image.

The information relating to size of the image point formation is known as the "circle of confusion". The depth of field tables are calculated for a circle of confusion based on 1/1000 the focal length of your lens. This tolerance (.003 inch) produces excellent image results for the beginner's enlargements and poses few problems for the camera and lens manufacturer.

When you know beforehand that your subject will need projection or enlargement to immense diameters, then stop down (narrow the lens opening) at least one or two stops in addition to secure greater sharpness than the table indicates. The depth of field table can be used if you can either accurately guess your distance or use a measuring tape as an accurate reference guide. Once you have your subject's distance for reference, you may choose the area of surrounding sharpness according to the size of the iris opening.

Related to the depths of field is a table for your hyper-focal distance. When you set your distance (focusing scale) in co-ordination with certain aperture settings, everything will be in focus (sharp) from ½ the scale distance to infinity. This important table minimizes the need for extremely accurate focusing when certain light conditions permit specifically needed iris openings. An easy way to remember the whole table is by the key numbers 3, 4, 63. Tape this number to the side of your camera for ready reference. This number means that your 3 inch lens at f/4, focused for 63 feet will produce an image that is sharp from 31½ feet to infinity. At f/8 the distance setting will be 31½ feet so that everything now will be in focus from 15¾ feet to infinity, etc.

As the table indicates, f/16 with a 15¾-foot setting will yield a suitably sharp image even if your subject is spread from an area of 7½ feet to infinity. It should be easy to see that this depth of field minimizes the need for critical ground glass focusing for a subject anywhere within that range. However, if the subject is placed mostly

at infinity (distant scenes), you may secure a sharper distance image by leaving the focusing scale set at infinity. Since the hyper-focal distance is based on the circle of confusion, you can understand that when your distance is set at 15 feet, your infinity distance will be sharp only within certain optical limits. When you enlarge your film, these limits are rapidly passed so that your image will appear fuzzy (unsharp). If you set your focus on infinity, then your distant image is focused exactly at the far distance focusing point and is not dependent upon the iris opening for its sharpness. It is sharp because of focusing exactness, rather than because of a mathematical calculation.

The Focus-Spot (Kalart)

It is very difficult to focus in dimly lighted interiors because there is, generally, not sufficient illumination to actually see an image on the ground glass. Until now, the only method for taking a picture under these poor conditions was to either guess the distance or to measure it with a tape. Now, a new and unique focusing aid (The Focus-Spot) has been designed to overcome these focusing limitations by means of a photo-optical device which projects two separated beams of light. When the two beams are made to converge and completely overlap on your subject, you are in focus. If the beams are separated, you are out of focus. As the beams are powered from your flashlight battery case, you are no longer dependent upon any light to focus on your ground glass. Instead, you can be aided by the strong, contrasting beams which clearly show you the end point of your focus under even emergency conditions where there may be a total absence of room light. With the Safe-Set Method, the Focus-Spot may be used to advantage for flash. Simply choose the correct subject size from the chart in Chapter 1 and then set the co-ordinated distance, iris, and shutter scales. Look through the sports finder and walk towards your subject, taking care to compensate for parallax. When the beams of your Focus-Spot are together, you are in focus. Your image will be razor sharp even if the room may have been in total darkness.

Parallax

The viewpoint difference between the taking lens and the viewing lens (vertical parallax) assumes great importance only at close distances. Chapter 17, Close-ups and Parallax Control, describes in

detail new methods for minimizing and correcting this often exasperating problem.

Viewfinding and Composing

For better composition, place in each corner of your ground glass, squares of black ¼-inch masking tape. If your composition is vertically placed inside the top and bottom portions of the masking square, then you will have the perfect proportions for an 8x10 vertical enlargement. When your composition is horizontally inside the black masking squares, then the proportions are perfect for a horizontal 8x10. If, in addition, you will divide your ground glass into thirds and place four dots (with India ink) at the intersections, you will have a number of reference points for composing your subject in the square format but in interesting off-center arrangements. While these dots and the masking squares do not interfere with your focusing, they serve as excellent guide points for enhancing composition. Since you can simultaneously focus and compose on your ground glass, you have all the advantages of a combined rangefinder and viewfinder camera. The ground-glass portion acts as a rangefinder while the compositional aids on your ground-glass show you the exact arrangement of the subject for the field of view.

The Rollei ground-glass screen has, in addition, very finely etched parallel lines to help you align any subject possessing either vertical or horizontal lines.

Critical Focusing

Critical focusing with your Rollei is helped by the built-in magnifier. The approximately three-times magnification enlarges your ground-glass image so that the focus can be made razor sharp. In the new models, the magnifier is large enough so that you can see the major portion of your ground glass without squinting.

Out-of-Focus Backgrounds

Portraits often appear best with an out-of-focus background. Since the wide open setting of your top viewing lens permits out-of-focus backgrounds, you can duplicate the results that you see by taking your picture at the same wide opening setting as the top lens. You can see your exact depth of field through your top viewing lens, an advantage that your ground-glass camera has over the regular rangefinder type.

For practice, alter your settings for shutter speed, iris opening,

and distance until these changes become a matter of "second nature". Make every effort to take a sharp picture. A sharp picture may be diffused for a softening effect at any later time, but it is impossible to take an out-of-focus image and make it critically sharp.

Use the pre-focus method by choosing your image size from the chart in Chapter 1, then setting your distance scale, and walking towards or away from your image until it appears sharp on the ground glass. Never touch your focusing knob. I have found in practice that one turn of your focusing dial, usually done when you try to focus rapidly, actually moves your focusing point from infinity to as close as 4½ feet. This can become a source of error. However, if you leave your focusing distance alone, even a slight subject-to-camera distance error, be it as large as six inches, is adequately compensated for by the depth of field with the 3-inch lens of short focal length. Pre-calculate and pre-focus with the safe-set method for perfect sharpness.

Focus for sports and flash photography is possible with the newest Rolleis by the unique combination of the hinged mirror which opens directly above the ground glass to permit focusing at eye level while the open eye-portion of the life-size sports finder is placed immediately above it. With this arrangement, it is a simple matter to check your focus on the ground glass and then shift your eye to the sports finder. This sports finder method is a helpful aid for action pictures because both eyes are open and the subject is seen life size. As the subject is viewed at eye level and at life size, no time is lost in choosing your scene of action and then trying to find your subject.

CHAPTER 5 / E—EXPOSURE

Now that the mechanics of picture taking have been described, all that remains is for you to integrate this knowledge and prepare to take a picture.

You now know how to set your shutter and iris, but you must know which settings are to be used. There are three methods of determining the proper camera settings for normal lighting conditions.

1. Every roll of film is packaged with an instruction sheet. On this sheet, you will find recommendations for shutter and iris settings for different light conditions. If you follow these recommendations, you will definitely get properly exposed pictures. Remember that the manufacturers take great pains to insure the accuracy of their published information.

2. There are always three factors in determining your camera settings: Film, shutter speed and iris. The exposure chart in this chapter standardizes the setting procedure so that the only variable will be your iris opening. And, to make your choice easy, the different iris openings are derived by the use of simple arithmetic. First choose the number for the correct light conditions and multiply it by the suitable subject classification number. The product of the multiplication will be your iris setting. For example, if you are using film with an ASA 50 and a shutter speed of 1/100 second, then when your subject is average (Class 3) and multiplied by hazy sky lighting (Class 2), the result will be 6. If you set your iris at 6.3, your exposure will be "on the button." Practice a number of times for different subjects and lighting conditions until you have mastered the chart. While this chart gives you iris openings for set shutter speeds only, you can change the settings at will since you can increase your shutter speed by opening your iris in proportion so as to maintain the same volume-time relationship of light. The f/number chart of Chapter 3 will show you the different shutter speeds for proportionate iris opening changes. If you know what speed is needed, then you can open and close the iris from the table number and still maintain the correct exposure.

3. The photo-electric meter is an accepted standard for accurate measurements in indicating correct exposure. While a chart may be used for outdoor settings, only the photo-electric meter is recommended for use with artificial lighting or even outdoors where extreme accuracy is needed for color work.

There are two types of photo-electric meters.

a. *The incident light type.* This meter measures the light that is falling on a scene or a subject. The incident type generally has a collecting sphere (like half a table tennis ball), light masks or great teen type hoods which take a reading by pointing these collecting devices at the camera. The collectors are used to integrate any varied strengths of light reaching them so that the readings are very accurate and are set at the mid-point of a gray scale. The sphere also minimizes the possibility of two eye readings when a spotlight or any other intense light source shines directly on the subject.

b. *The reflection type.* The reflection type measures the amount of light reflected from the subject. It is pointed at the subject for an intensity reading. However, a gray card must be used with this type of meter for accurate results. Because gray is a neutral tone, you will automatically photograph your blacks and whites in their correct tonal differences. If a gray card is not used, then you can see that different reflected readings will result from dark or light subjects. Since both readings cannot be correct, you must do some mental calculation to figure out a new middle value that you hope will give the correct result. The only precaution when using a gray card is to be certain that it is large enough for a reading (point the meter at the card from at least a ten-inch distance) and so be assured that only the reflection from the gray card will influence the meter. In addition, be sure that your body is not blocking any light from its source. Bend your body away or take a knee bend so that your hand is holding the meter free and clear. With these precautions your meter readings can yield excellent results.

With both types of meter there is still some judgment required on your part. For dark subjects the iris may be opened a half stop, while with very light subjects the iris may be closed one half stop below the indicated scale readings.

The exposure factors for flashlamp and flashtube are quite differ-

ent from those determined by either of the above-mentioned methods. Every flashlamp or flashtube is supplied with an exposure guide number chart by the manufacturer. This chart provides you with a guide number to be used with certain speed films at definite shutter speeds. Since you know your film and shutter speeds, the only remaining unknown is again the iris opening. The iris opening is found by simply dividing the subject distance into the specific guide number. If, for example, your flashlamp has a guide number of 110 with an ASA 40 film at 1/100 of a second when your subject distance is 10 feet, then you divide 110 by 10 to get an answer of 11. The iris opening of your lens is now set at f/11. If a subject is 20 feet away, then the iris opening will be f/5.5. If your guide number is 56 and your flashlamp-to-subject distance is 6 inches (½ foot), then divide the ½ into the 56 and the indicated opening will be f/112. Since your camera iris generally is narrow only to f/22, then you must use a number of layers of handkerchiefs or white linen cloth to reduce the light intensity of your flash so that it will be correct for your minimum lens opening. This is further explained in Chapter 8.

Standardize with one flashlamp so that you know its characteristics well. With standardization will come a uniformity of results so that you will be able to concentrate on your subject. Finally, I should caution you again to hold your camera firmly and learn to push the shutter release lever gently so that you will not jar the camera

Exposure Rules

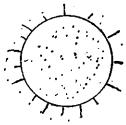
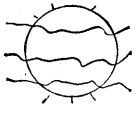
Black and white film: Expose black and white film for the shadows, but develop for the highlights.

Color film: Color film should be exposed for the highlights, but precautions must be taken to assure adequate shadow detail by lighting the shadows with a 3 or 4 to 1 ratio because of the low contrast limitations inherent with most color emulsions.

SIMPLIFIED OUTDOOR EXPOSURE CHART

Film: Outdoor Color—A. S. A. 10 B & W—A. S. A. 50
#85 Filter with Indoor Color Shutter Speed 1/100

Shutter Speed—1/25th

45° Light Angle to Subject	 4—Sunny Strong shadows	 3—Bright Soft shadows	 2—Cloudy	 1—Dull
4 - Wide, clear open spaces	16	12	8	4
3 - People, trees, architecture in outdoor middle distances	12	f/9 or **COLOR Basic recommended setting 1/50th at 6.3**	6	3
2 - Average subjects; open street, near distances	8	6	4	2
1 - Shaded street	4	3	2	1

For normal subjects, normal conditions, normal areas.
Use 1/2 stop wider for dark subjects, etc.
Narrow 1/2 stop for light subjects, etc.

CHAPTER 6 / LOADING AND UNLOADING YOUR CAMERA

Loading the camera means getting the camera ready for picture taking with fresh film. This is a very simple operation with all Rolleis. The film which is to be loaded in the camera is packaged in a standard 120 size which may be purchased almost anywhere in the world. These paper-backed rolls permit camera loading in daylight. While your camera may be loaded in full daylight, I recommend that the loading procedure take place in subdued light. If no subdued light is available, turn your body so that when the camera is in front of you, it will be away from the light source and finish your loading operation in this position. The illustrations demonstrate the loading procedure.

Helpful hints in loading are:

1. When you thread the end of the paper tongue into the take-up spool, be sure that it is evenly placed and secure. Otherwise, your film may slip and your counter spacings will be inaccurate.

2. The important point in loading the Rolleikin (35mm) is to be sure that the perforations engage the sprocket. If this is done the film automatically aligns itself properly onto the take-up spool.

3. If the edge of your paper leader is not perfectly parallel to the inside edges of the spool, your film will wind at an angle. When the fourth or fifth exposure has been made, the resulting side pressure may cause the film to buckle. This can cause an out-of-focus picture. So, start your paper leader correctly. It is disheartening to have a great deal of effort spoiled because of poor loading. The old Rolleicords and old standard Rolleiflexes were loaded from the full spool directly to an empty take-up spool. Then, the back was closed and the take-up winding knob turned while you observed the number on the paper backing through the red window on the bottom of the camera. When the number 1 appeared, the window was closed and the counter-release contact button was pressed down until the counter mechanism revolved to show the numeral 1. After the first exposure, the center locking disc was depressed and the take-up spool turned for one turn. Then the center locking disc was released and the take-up spool knob turned until it stopped. As the film was being wound, the exposure number advanced and when it stopped at the next number, an unexposed film was in place and ready for the next picture.

These older models had a single action release. The shutter was set by first moving the lever to the far right, and then the shutter was released by moving the same lever to the far left.

The set and release method is still used with the Rolleicord ※3.

The Automatic Rolleiflex is the easiest camera to load. Only the new Rolleicord ※3 has the same advanced, engineered, automatic loading features of the Automatic Rolleiflexes. For these cameras, simply place a fresh spool in your camera, hold it with your left forefinger, take the paper tongue and insert the end under and between the two rollers that control your automatic counter, pull your film through and then insert the tip of your leader into the slot in your take-up spool. Wind a few turns on the take-up spool by using your winding lever or winding knob.

Now close the camera back and crank the handle to and fro easily until you feel just a slight resistance to further motion. (Check your counter). Bring the crank back to its normal position and let it drop into its recess in the camera body.

With this simple to-and-fro cranking (Rolleiflex) or turning of the take-up winding knob (Rolleicord ※3) you have set the picture to ※1; actuated your counting mechanism so that it is also at ※1; and with the Automatic Rolleiflex only, cocked your shutter, (the Rolleicord must be cocked separately). The camera is pre-set and ready for your first picture.

Using the suggested safe-set method, you can take twelve pictures with an Automatic Rollei in less than twenty seconds.

Thirteen Exposures with Your Rolleicord

Thirteen exposures may be made with your Rolleicord (except for the ※3 model) by the following procedure:

1. Load your camera.
2. Turn the knob wind of your take-up spool slowly while carefully watching the lettering of the paper backing in the window.
3. Turn slowly until the third dot before the number 1 appears in the exact center of the red window. Take the paper backing from an old spool and locate this dot.
4. Press the counter-setting mechanism so that the number 1 appears.
5. You are ready for your first exposure.
6. After taking your first exposure, press the counter release and wind until the numeral 2 appears.
7. At this point, again press your counter-setting release so that the number 1 reappears in the counter window.
8. Now take your next 12 pictures according to the normal procedure.

Unloading

After all your exposures have been made, continue turning the winding knob of your Rolleicord or cranking the handle of your Rolleiflex until you hear the end of the paper backing brushing against the film mask opening and finally turning freely in the take-up chamber. At this point, open your camera carefully and pull out the take-up spool retaining knob while holding your film between your thumb and forefinger to prevent the spool's unraveling. Gently lift out the fully wound spool, bend the end portion of your paper backing down and under, and then wet the attached adhesive label so that it will firmly seal and prevent your film from unrolling.

If your winding knob or crank handle, at any time, cannot turn to wind your film, *do not force it.* Use a changing bag or go into a dark room to find the reasons for the snag. It is far less expensive to spoil a roll of film than to force a single gear. Another helpful hint is to run your finger along the open film frame mask. If you feel any unevenness, no matter how slight, ask the advice of your camera dealer to eliminate these minute projections which can scratch your film.

Loading and Unloading the Sheet Film Adapter

The accessory plate adapter for the Rollei may well become one of the most useful aids for the amateur and professional user alike. With the plate adapter, you can take only one or a dozen pictures with either one or a dozen different emulsions. This fact is valuable as there is a far greater variety of emulsions available on either plate or sheet film than is available with roll film. With the accessory plate-back you are freed from the limitations of the fewer roll film emulsions and can use any emulsion that is available for either sheet film or glass plate. It may seem strange to mention glass plates in this modern day and age. However, for certain scientific forms of photography, there is as yet no substitute for glass. When film is manufactured from nitrate or acetate materials, a considerable amount of shrinkage or expansion, depending upon temperature, humidity, etc., will occur. This introduces linear errors. With a glass plate your dimensions always remain the same regardless of temperature or weather. As a result, any scientific data secured from glass plates can always be relied upon for the continued correctness of its dimensions.

The plate adapter normally takes only glass plates. By a simple sheet film adapter, available at your local dealer, which is placed

Loading with the Bantam Adapter (have the take-up spool in it's chamber).

Rolleikin (35mm) Kit.

Rolleikin, Plate and Focusing Backs.

The automatic loading feature for Rolleiflex and Rolleicord III (have the take-up spool in the camera).

Plate-Adapter

Designed for: Single 2¼×2¼ inch-exposures on 2½×3½ inch-plates or sheet-film. A desirable facility for the use of special emulsions, immediate or individual processing and such special tasks as studies of portraiture, trick-photography, reproductions, technical tests etc.

The outfit consists of:

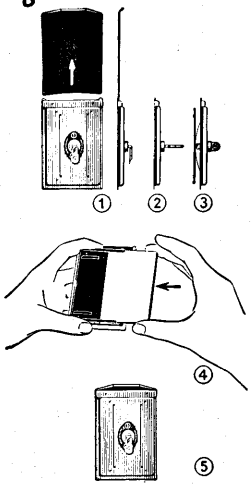
1. Special Adapter Back
2. Single Plate Holders
3. Focusing-Screen Holder

All parts, including cut-film sheaths, are available separately. Focusing is done as usual on the reflex focusing-screen and only in special cases (i. e. when using two Rolleiners combined, or utilizing the picture area to the fullest extent) on the adapter focusing-screen.

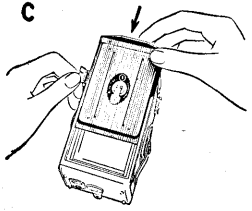
A. Attaching the Adapter Back

1. **Remove take-up spool from camera.**
2. Take off camera back
3. Attach adapter back (without holder!)

B



C



B. Loading the Plate-Holder

1. Withdraw slide.
2. Lift up locking lever on back of holder and
3. let it slip inside after a quarter-turn. Spring action pushes out plate-carrier.
4. Slide plate into carrier.
5. Retract lever, lock by a quarter-turn and fold down (the number remaining visible). Close holder by reinserting slide.

Note: Conserve plush-strip by always removing slide from empty holders before storing away.

C. Inserting the Plate-Holder

Swing catch out of way and slide holder down the lateral grooves of the adapter back. The catch locks holder against unintentional removal.

D. Exposure

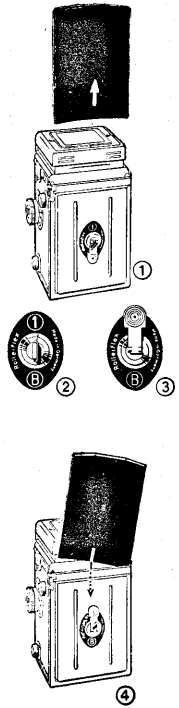
1. Withdraw slide.
2. Lift up lever and let it slip inside after a quarter-turn. The plate moves into the focal plane by spring action.
3. After the exposure, retract lever first, then fold upward after a quarter-turn. The letter "B" indicates that the plate has been exposed.
4. Only now reinsert slide.

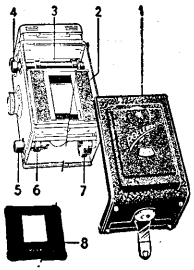
Note: Always keep red window at the bottom of the adapter closed. (It has no function to fulfil.)

E. Focusing-Screen Holder

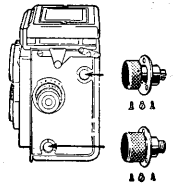
1. Insert the closed holder.
2. Withdraw slide. Spring action presses focusing screen automatically into the focal plane.
3. Reinsert slide first, and then remove holder.

D





A



Rolleikin-Attachment with Rewind

Designed for: Taking up to 36 exposures 1×1½ in. on 35 mm-film. Ideal for series of pictures and color photography on miniature film.

The attachment consists of:

1. Rolleikin Adapter Back
2. Film Guide Frame
3. Take-up Spool
4. Release-Knob
5. Rewind-Knob
6. Extension-Spindle for 5
7. Intermediate-Knob
8. Finder Mask

Available for the Automatic Rolleiflex, New Standard Rolleiflex, Rolleicord II and Rolleicord Ia.

A. Replacing of Film-Knobs

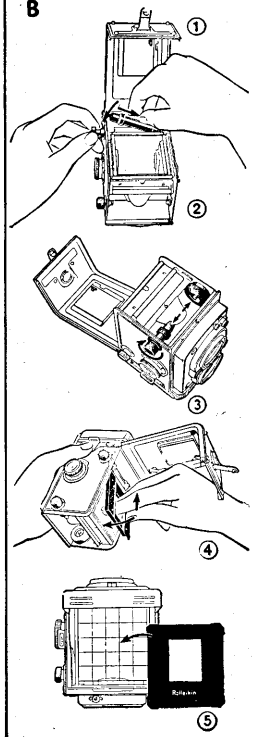
(Necessary only on Rollei-Cameras provided with flat knobs. The new knobs take both 35 mm and 120-(B 2)film).

1. Unscrew the three countersunk screws of each film-knob and remove.
2. Screw release- and rewind-knobs down tightly.

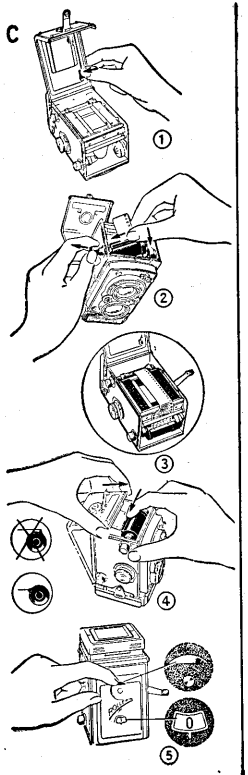
B. To Install Rolleikin-Parts:

1. Disengage locking lever on hinge and replace camera back by Rolleikin adapter back.
2. Pull release-knob, fit-in take-up spool on the right and insert completely.
3. Rewind-Parts: Screw extension-spindle on rewind-knob by rotating the latter. Snap intermediate-knob over opposite spool-bearing-pin.
4. Inserting of film guide frame (lateral slot to lower right): Press spring actuated clamp bar against top of film-gate first, and then insert entire frame by firm downward pressure. Be sure frame is evenly inserted all the way! — To remove: Push frame upward (against spring actuated bar) and lift out.
5. Place finder mask over focusing screen in such a manner that the lettering „Rolleikin" is legible when in use.

B



C



C. Loading

1. Open back, press down locking-lever.
2. Pull rewind-knob, fit-in film cartridge on the left and then insert fully.
3. Introduce film-lead (which — in the Automatic Rolleiflex — first passes through the film feed rollers) into the double-slit of the take-up spool, letting it touch on the right. Tighten up by giving spool a short turn
4. Press mouth of cartridge down and close back.
5. Advance filmtransport crank to the stop, set Rolleikin counter disc to 0 (lateral counter does not apply!).
6. To set counter for the first exposure: Advance counter dial to 1 by actuating crank three times (page 15)

Note: When using film with paper-lead set counter to p (instead of 0) and then advance to number 1 by repeatedly actuating filmtransport crank.

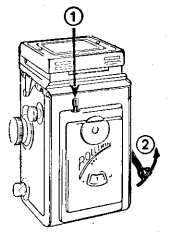
D. Filmtransport

1. Press and release locking-knob on Rolleikin-back before actuating filmtransport.
2. Advance film as usual by turning crank to the stop.

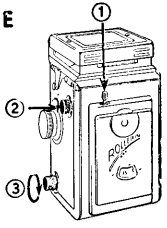
E. Rewinding

1. Press locking-knob.
2. Press release-knob and lock by a quarter-turn.
3. Rotate rewind-knob clockwise and rewind entire film into the cartridge, using the backward moving counter dial as a check.
4. Let release-knob snap back.

D



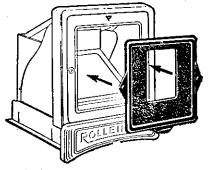
E



Rolleikin
Direct View Finder Mask

Designed for: Reducing the 2¼×2¼ in. direct view finder field to miniature-film-size.

For Use: Snap mask on the two lateral snap-fasteners at the front of the focusing hood.



in the plate holder's chamber, your adapter is made to use sheet film. Caution: A sheet film adapter is inexpensive and must be used to accurately maintain the correct focal point of your film so that your subject will be in correct focus. For certain precise work, where you must see what is happening through the taking lens, an accessory ground-glass screen is available which exactly duplicates your film position and eliminates the need for any parallax compensation because you focus through the taking lens itself.

In loading your plate adapter in a dark room, or in a changing box, always prepare and place everything in the exact order of operation. With plates, read the directions carefully so that you will know on which side the emulsion is placed. You must be right, else your error will ruin your picture.

If you are loading sheet film, first place your sheet film adapter into the plate holder in the light so that it is ready for instant loading. When you have opened your film box, take a sheet of film and hold it so that the long vertical sides are parallel to your left hand and right hand. Run your finger along the right vertical side until it reaches the far end and then proceed to follow the edge along the distant horizontal line to your left. If your finger immediately touches a number of notches, then you will know that the emulsion side is facing you. Bring your film, if it is not in this position, so that the code emulsion notches are in the horizontal portion of the upper right-hand corner. Next insert the film into the two border overlaps of your sheet film adapter and then push until your film can move no further. Pull the plate lever toward you, then turn it 90 degrees and push it down. A number will show. This is your holder number. If you have holders with duplicate numbers, you can differentiate them by using paint or tape of different colors. Now place your safety slide so that the shiny side faces out. Your holder is now ready.

This is the procedure for using the plate adapter on your camera:

1. Remove all your empty spools. If the spools are not removed, your plate cannot be correctly positioned to the proper focal plane and your pictures will be blurred.
2. Replace the roll film back with the plate adapter back.
3. Insert your loaded plate holder until the tab locks the adapter into place. Then remove your safety slide.
4. Lift your plate lever until it is horizontal and then turn it 90 degrees so that it will slide into its slot. This forward motion brings the film or plate forward so that it lies at the correct focal point of your lens.

5. Make your exposure in the same manner as with regular roll film.

6. Pull your plate lever until it can go no further, twist it 90 degrees so that it locks and then push the lever up so that it obscures the plate number. You will now see a *B*. The *B* indicates that an exposure has been made. This is one more safety aid to prevent troublesome double exposures.

7. Pull back the safety tab gently and lift the plate holder above and out of the grooves. Do this gently. Your adapter and holder are made of relatively thin metal and should not be abused.

The 35mm Back (Rolleikin)

There have been a number of roll film (35mm) models made for the progressively different Rollei models. It is best to check with your dealer for the correct Rolleikin by writing him your camera's registration number. The registration number will be found underneath the name plate on the front of the camera. Do not give the lens numbers as they have no significance for choosing the proper Rolleikin model. The Rolleikin II (for later cameras) does not require a new replacement back because the counting mechanism replaces the spool holding knob of the take-up spool and once installed may be permanently left in place.

The Bantam Adapter. A Bantam (828-28x40mm) size adapter is also available. The Bantam size has many advantages over the 35mm film in that your regular film or color spools contain only eight exposures. This film number is often more convenient than the 20 or 36 exposures of the 35mm size. An additional feature is that a completely new back is not necessary. You may use your present roll film back which has a special green window added for correctly locating the Bantam film numbers. One other Bantam film feature of recent vintage is the availability of Kodacolor (color negatives) emulsions. This emulsion produces a color negative and you can secure as many duplicate color prints as you want from one color negative. This is not readily possible with a Kodachrome or Ansco color transparency.

You may forget what film is in the camera. A helpful memory hint is to take the name tag of your film box and place it in your camera carrying case or in your focusing hood. In this way, the tag will serve as a reminder of the film type being used.

Before you take your first picture, practice loading and unloading routine at least three times until you have gotten the "feel" of the camera. When handling the camera becomes a matter of second nature, load your film and you are ready.

This is an age of bottled, packaged, and portable sunshine (flashlamps and flashtubes). It is indeed fortunate that this type of light is available, else most of our indoor or outdoor action pictures whether in black and white or in color could not be taken. Color, especially, requires tremendous amounts of light and the only dependable and readily available source is the flashlamp or the flashtube.

A flashlamp consists of magnesium or magnesium aluminum alloy either in very fine wire form (Class M) or in a pill-paste form (Class F) and may have the conventional house lamp shade or, as recently modified, be condensed to the size of a walnut. When approximately a 4½-volt electrical current as supplied by small batteries courses through the flashlamp the aluminum compound in a bulb flares up for a tiny fraction of a second. Although this flash seems instantaneous to the eye, there is a short time required for the compound to heat up to the flashing point. There are two classes of suitable lamps available with differing flare-up-time delays: Class F and Class M. The Class F lamps are fast acting, the delay being only five milliseconds (1/200 second), and the complete flash peak duration is also 1/200 second. The Class M lamps are medium acting with an ignition delay of twenty milliseconds (1/50 second) and here the full flash peak duration is only 1/50 second.

Since the flashlamp can be used just once, inventors have tried to produce a source of flash light that will yield a large number of flashes without burning out. The result of their experiments is the electronic flashtube. This type of flash consists of a rare gas (bottled under pressure in a glass tube) which glows brightly only when a high voltage current courses through the tube. The duration of the glow is much shorter than in a flashlamp, usually 1/5000 second and the guide numbers are in the low thirties. For these reasons, while most flashtubes produce at least 10,000 flashes without burning out, they are still not too practical. Moreover a flashtube cannot be used at a greater distance than 10 feet for a well lighted, evenly exposed picture; their color balance is difficult to match with an appropriate color film, and the light portable models are too weak, while the powerful units are of the heavy studio type (Kodatron).

The Class F lamps (SM or SF) are ideally balanced for indoor Kodachrome Type A and do not require a light balancing filter.

The Class M lamps burn at 3800 degrees K while your Type A film is balanced for 3400 degrees K. To bring the temperature down

an 81C light balancing filter must be used over your lens to preserve the correct color balance.

The ⅝5B or 25B lamps are balanced for outdoor color and do require a light-balancing corrector filter.

Flashtubes are balanced for outdoor color film. If the tone produced is too cold, the subject's tone may be warmed with the use of a Wratten 2A or 1A filter.

Both the flashtube and the flashlamp require precise timing so that the shutter will be open at the exact instant to completely absorb the peak of the flash. Taking flash pictures with any Rollei is a very simple matter. There are four methods for flash synchronization:

1. *Open Flash.* Your camera is usually set on a tripod. The shutter speed is on Bulb. A cable release is used to actuate and keep the shutter open. The flash is set off and the pressure on the cable release is relaxed so that the shutter closes. Since the maneuverability of the camera is limited, the open flash method is only used for special lighting problems.

2. *Mechanical Flash.* Synchronization takes place by the simultaneous mechanical release of your synchronizing device and shutter release. The design of the synchronizer compensates for the heating time-lag to the ignition point. Typical synchronizers are the Kalart, Service, etc.

3. *Electrical* (*Solenoid*). A solenoid (electro-magnetic effect) releases your shutter and ignites your lamp at the same time. A release button for the solenoid synchronizer is usually placed on the battery case so that it can be hand-held away from the camera and directed to any angle. Lighting angles with a solenoid are more flexible and efficient than with a mechanical type. The installation of the solenoid is possible only by tapping and drilling holes in the camera casing. Part of the shutter release mechanism must also be altered.

4. *Integral Synchronization.* The Rolleis 1951 have built-in synchronization that is based on the following specific information.

The new 1952 Rolleis are fitted with an M-X Compur Shutter which synchronizes with all flashlamps and flashtubes. The older Rolleiflexes and the Rolleicord III have an X-integral shutter.

The author has designed a simple hand holder for use with the new Rolleis so that your lamp can be held at any distance and at any angle with your right hand, while your left hand holds your camera firmly and releases the shutter easily without jarring. This method has all the advantages of a solenoid while eliminating the expense of installation.

In reading a flash guide number table, you may note that the guide number for Class M lamps up to a speed of 1/50 is always the same. The guide number changes after 1/50, for each increase in shutter speed. Similarly, the Class F number is the same for all speeds up to 1/100 seconds and then changes abruptly for each shutter speed increase. Yet, a choice of speed range or synchronization may do much to help your picture. The I-G-A-S formula (Chapter 15) demonstrates the need for balancing your lighting in order to meet the relative contrast insensitivity of your film emulsion. If the amount of light provided by your flashlamp is taken at one unit then your background light must also provide one unit to have a 1:1 ratio. However, your background light of one unit does not necessarily have to be flash; it may be a floodlight. Assuming that it is a floodlight, then the location of your lamp is directly related to the shutter speed. At 1/25 second the floodlight may be placed further away than at 1/100 second. The further back your light is placed, the more even the illumination will be and the heat problem from the glowing floodlamp is not so great. In a similar manner if you are using your flashlamp on the camera as a fill-in for an outdoor picture, the outdoor scene may be perfectly exposed at 1/25 second while at 1/100 even though the flashlamp intensity remains the same, the general scene will be under-exposed. Therefore, even if you are given a choice of speeds for a simple guide number, the selection of the speed to be used should be made on an understanding of the complete lighting problem for the scene rather than for just the one flash factor. The problem of balancing all your lights will be discussed at greater length in Chapter 15.

When any dimly lighted activity is being photographed, flash is a must to stop the action. Presuming that color film is being used, you must realize that at this point of our technical development, color film emulsions are relatively slow and each exposure requires huge amounts of light to secure any fairly rapid exposure such as 1/50 second. Flash is the only source of light that can supply the quantity and swift "wallop" of light necessary to produce short exposures. With a properly synchronized flash unit, your Rollei is independent of any light condition and your present day photography becomes even simpler than with the old time box camera. With flash, you graduate from the old time box camera requirement of waiting for adequate light to the advanced class of carrying your own light for instant use. The simplicity of synchronized flash approaches the dream of both amateur and professional alike for a foolproof, push-button form of photography. For simplicity with color, the beginner should use only

SM or SF lamps with Type A indoor color and #5B or 25B lamps with outdoor color; then no light balancing filters are needed for the camera lens. The color compensating filters for the other flashlamps is detailed in Chapter 19.

Single Lamp Flash for Distances in Depth

When only one lamp is available to cover a great depth, this method is used to compute your exposure:

1. Determine the depth of your subject, e.g., if your subject depth is from 8 to 24 feet, the total subject depth is 16 feet.
2. Estimate your flash exposure for ¾ this distance; ¾ of the 16 foot depth equals 12 feet.
3. Add this ¾ distance to your nearest subject point. 12 plus 8 equals 20 feet. Calculate your guide number for 20 feet. Aim your flash at the 20 foot distance.
4. Focus for ⅓ the subject depth. ⅓ of 16 is approximately five feet. Add this figure once again to your near subject point. 5 plus 8 equals 13 feet.
5. With your factors Safe-Set, approach your subject until a sharp image is seen (this will be your 13-foot subject) and release your shutter at the peak of action. The single flash will cover the subject depth with as evenly exposed lighting as is ever possible with only one lamp.

The beginner and professional must make every picture count. As a definite help for a sure-fire, push-button type of photography, I recommend the safe-set method with the flash unit right on the camera. With this method, there are no variables. You pre-set your distance, pre-set your iris, and pre-set your shutter speed. All you need to do then is to approach your subject, set the focus, compose your subject in the ground glass, and as soon as the peak of expression is anticipated or seen, release the exposure lever. You will get a perfect picture.

Flashlamp and Flashtube Characteristics

Flashtube Adjustments:

X-Shutter

Class X or O-Delay (Bleed type). As electronic tubes have no ignition delay between the flare-up and the light, they flash instantly when a contact is made. Any X-shutter setting can be used. With the X-type shutter, a contact is closed when the shutter is wide open. At

contact, the Strobe discharges completely because the closed circuit causes the condenser charge to bleed through the flash tube.

Non-X-Shutter Settings

Five millisecond delay.

Caution: This type of flashtube adjustment should not be used with an X-setting.

Certain relay operated electronic flash units may be used with shutters which have *F* or *M* settings. The relay is adjusted to fire the flashtube five milliseconds (1/200 second) after the relay is closed.

Twenty millisecond delay.

Caution: This type of flashtube adjustment should not be used with an X-setting.

This 20ms. relay-operated unit is generally used in conjunction with a solenoid. This 1/50 second delay type simultaneously starts the solenoid operating while the flashtube is timed to delay ignition until the shutter blades are open widest. A flashtube twenty millisecond

M-X SHUTTER SYNCHRONIZATION

FLASHLAMPS: M / Class	Name	Type	Lever at: X-Setting	Lever at: M-Setting
F Fast Acting	G.E.	SM	1 second to 1/100	Not recommended
	Sylvania	SF		
M Medium Acting	G.E.	#5,#11,#22	1 second to 1/25	1/50 to 1/500
	Sylvania	#25,Press 40, Press 50		
	Sylvania	#2	1 second to 1/25	1/50 to 1/100
S Slow Acting	G.E.	#50	1 second to 1/10	1/25 to 1/50
	Sylvania	#3		
FLASHTUBE (Electronic Flash): M-X Synchronization				
Lever at: X only Bleed or 0 delay	Zero Delay		1 second to 1/500	Not recommended
5 ms delay for shutter	Use relay for 5 ms delay		1 second to 1/100	Not recommended
20 ms delay for shutter	Use relay for 20 ms delay		1 second to 1/50	Not recommended

X-SHUTTERS ONLY

1/500 sec. - Bleed or Zero delay flashtubes without relays
1/100 sec. - SM or SF (Class F)
1/25 sec. - Class M. (#5, #25, #0, Press 40) 20 ms delay

delay gun may be used with any solenoid that is already adjusted for a Class M flashlamp, without any additional changes of either the solenoid or the twenty millisecond flashtube gun.

Flash Lamps

F—Class F (Fast Acting).

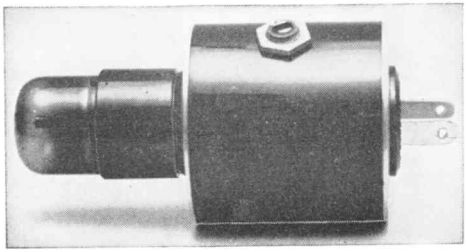
There is a five millisecond (1/200) heat-up delay before this lamp flashes. The G-E SM and the Sylvania SF are typical of this class. The flash itself lasts for 1/200 second and is often used at a slow shutter speed to stop the motion of a subject while permitting background lights to register more fully.

M—Class M (Medium Acting)

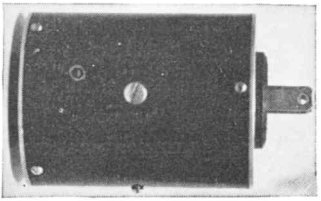
Twenty milliseconds (1/50 second) delay. G-E #5, #11 and #2 and the Sylvania #0, #25, Press 40 and Press 50 as well as the

One-hand pistol-grip holder and shutter release adapter. Ideal for holding the flash away from the camera.

The Flash Flex.



Slave unit for wireless flashtube ignition (Speedlight Center, NY)



Variable Ignition Delay Adjuster for flashtubes to other than X or M-X Shutters.

number 2 are typical examples of this type. The peak of the flash lasts for approximately 1/50 second.

S—Class S (Slow Acting)

There is a 30 millisecond (1/30 second) delay in flashing. The G.E. #50 and the Sylvania #3 represent this most powerful class of flashlamps. The flash lasts for approximately twenty milliseconds.

FP—Class FP (Focal Plane)

The only lamp that can be used with a focal plane shutter. The delay before ignition is twenty milliseconds (1/50 second). The flash peak shaped in a long plateau, however, lasts twenty to forty milliseconds (1/50 to 1/25 seconds). The G-E #6 and the Sylvania FP-26 are recommended for focal plane shutters on cameras up to the 2¼x3¼" size. The #31 and the 2-A are the only lamps recommended for the larger size (3¼"x4¼" and 4"x5") films.

Remember: even at 1/25 second shutter speed, the duration of the flash (which is the important thing) lasts 1/50 with a Class M lamp and 1/200 with a Class F lamp.

CHAPTER 8 / USEFUL ACCESSORIES

The Rolleis are simple cameras. At least 90 percent of your normal picture-taking requirements will be met without adding a thing to the camera in the way of intricate attachments or accessories. However, there are occasions when the Rollei must be adapted to meet specific conditions. As an example, the taking of extreme close-ups necessitates adding a supplementary lens because your Rollei focuses only to 32 inches. If you wish to use glass plates or 35mm film, you may convert your Rollei for this different film form by adapters since the original design of your Rollei was primarily for 120 film.

There are many photographers who make a fetish of purchasing as many accessories as they can carry. But, we seriously wonder whether they realize the fact that most accessories may be used only once, or twice a year at most. Therefore, learn to use what you have, and you'll find that most of the time you can take and will get first-class pictures.

However, in the course of the years, certain stock accessories in addition to the bare camera have become accepted as useful devices for either protection or operational helps. These stand-bys include a lens shade, cable release, and tripod.

If the occasion does arise for using more than one of the many

filters, supplementary lenses, diffusion discs, etc., then it is advisable to know the correct sequence in adding these attachments. With the Rollei, you must decide first of all whether you will use a push-on or bayonet type of adapter. The bayonet type is used with all the newer models because of its advantages in rapidity of placement and reliable parallelism with the film and lens plane. Actually, there are three attachment sizes:

1. The 28.5mm push-on lens type is friction-fit over the outside of the lens barrel.
2. The bayonet-inside type to fit inside the camera bayonet ring, held by three prongs. The bayonet prongs slip into the bayonet ring depressions and when the adapter is turned to the right, the prongs click into a set position.
3. The 33mm bayonet-outside push-on type which fits on the outside of the lens mount bayonet ring.

These mounts may themselves be subdivided into simple and compound. The simple units are self-contained and may be stacked one on top of the other by pushing one over the other or bayoneting one into the next. The compound type consists of a female accepting unit which will hold a filter disc, etc., and which may further be expanded with a retaining ring. The retaining ring, in turn, may accept another disc which will be held in place, once again, by another retaining ring. The Rollei 28 uses a series VI disc, the other Rolleis use a series V.

In choosing your filter holders, be certain that they are perfectly parallel. Any linear deviation may spoil a picture because a prism-distortion effect is produced by a poorly made filter. The "Official" accessories made by the Rollei factory are superbly made and can be purchased with full confidence. Finally, when you have selected your filters and other basic lens accessories, this is the proper sequence for attachment.

1. Rolleinar (Portrait) Lens
2. Duto or Diffusion Disc (※0 or ※1)
3. Filter
4. Polarizing Filter
5. Lens Hood. This unit is independently attached and should be used at all times even if no other accessory is added.

This is the sequence when all items are used, but, you may use only 1, 3 and 5 together; 2, 3 and 5; etc. The simple rule is: Determine the classification of your accessory attachment and then place it in the correct numerical sequence.

You can carry all needed accessories easily by double slitting the flap of the leather carrying case which is supplied with each filter and then passing the carrying strap of your camera through the slit. Make this slit the exact width of your strap to prevent the possibility of dust entering the pouch. Some leather cases already have an added loop sewed to the back of the pouch for this purpose. It would be a good idea to have a loop added to your case.

Exposure with Accessories

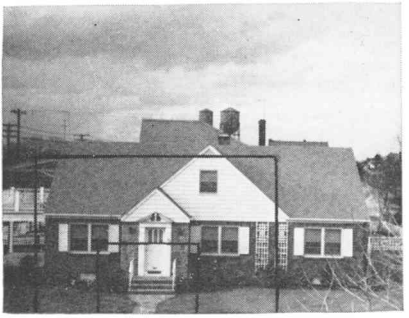
Always Safe-Set your iris and your shutter to compensate for the difference in exposure necessitated by the use of a filter, polarizer, etc. Set your film speed on your exposure meter with the factor of the filter that you will be using. In this way your readings are normal and you do not have to re-calculate your factor each time. For example, if your film speed is an ASA of 50 and you are using it with a K2 (yellow) filter outdoors (2X factor), then set your ASA film speed indicator at 25. If a green (X-1) filter (4X) is required, then you divide the factor of 4X into the original speed and set your dial for 12. But in all cases always check yourself by saying *SAFE*. Shutter—Aperture—Focus—Exposure factors.

Specialized Accessories

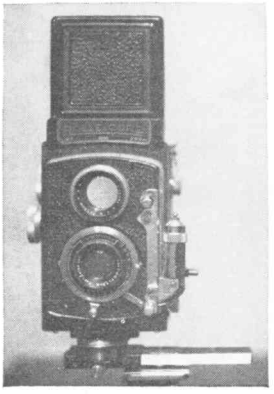
The very large number of Rolleiflex accessories increases the flexibility and extends the usefulness of your Rollei for specialized purposes in a manner that is rarely duplicated by any other twin-lens camera at the moment. The Rolleinar, the Rolleipar, the Rollei filters, the Duto soft-focus lens, the Bernitar, the Special lens hood, the Panorama head, the Stereo slide bar, the Plate adapter, the Rolleikin (35mm) attachment, the Hood extension, the Bantam adapter add immeasurable versatility to an already universal camera. The point to remember with all the Rollei accessories is that their quality is the highest possible as to ruggedness and tolerance while their simplicity keeps intact the elementary picture-taking method of the Rolleis.

Camera Lens Mount Accessories. The bayonet and push-on type mounts are available for the Rollei. The bayonet, as the name implies, has three prongs which engage respective accepting portions of the lens mount and rigidly hold the accessory in place. The push-on type uses friction to slip and keep the accessory over the protruding portion of the prime lens or onto a previous push-on attachment. In actual use, both types work well. A slight preference must be acknowledged for the bayonet type in that the accessory will always be per-

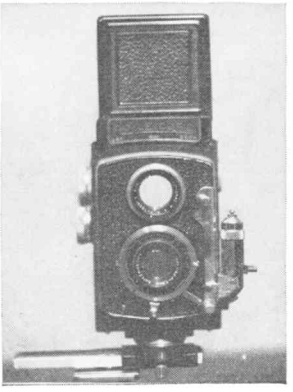
Ever-Ready Case Open



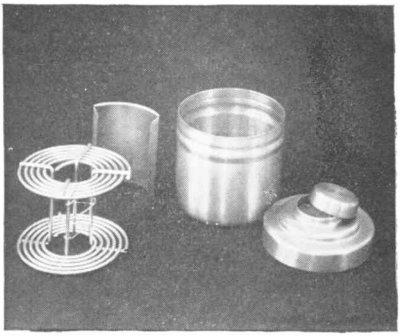
Normal, Duonar & Magnar (smallest)
Fields-of-View



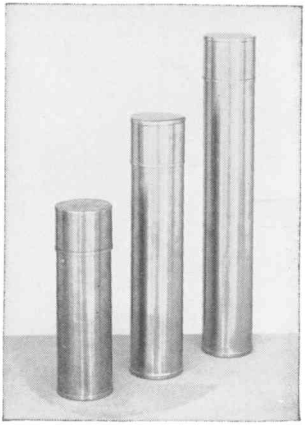
Right hand stereo picture



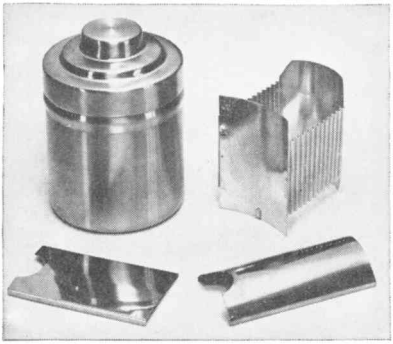
Left hand stereo picture



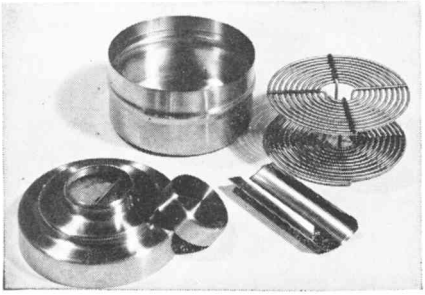
Nikor 120 Developing Tank



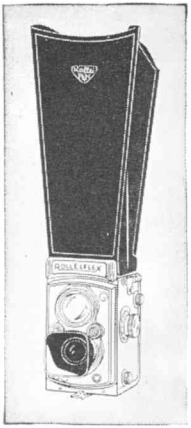
Multiple-roll Developing Tank



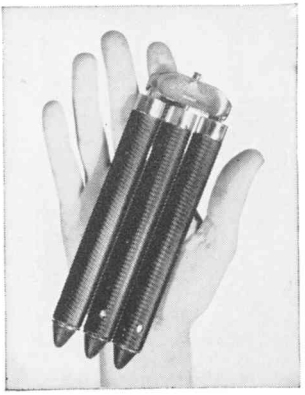
Sheet-Film Developing Tank



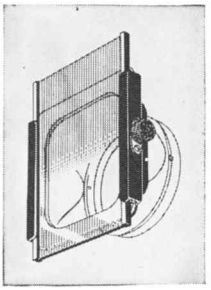
35mm Developing Tank



Glare-reducing Focusing Hood

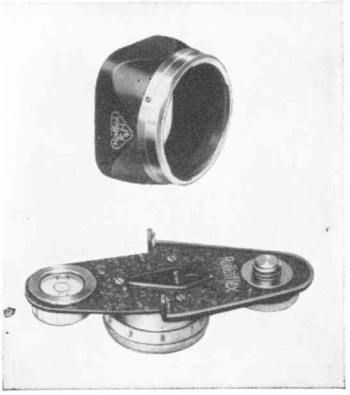


Tourist's Tripod



Graduated Filter and Special Holder

Reflector Lens Cap for Self-Portraits



Special Square Rollei Light Shade, (top) and Panorama Head

fectly parallel with the lens and film plane, while with the push-on type, there is a possibility of a non-parallel setting if the attachment is quickly pushed on the mount from an angle. A push-on mount should be tested from all directions so that you know it is evenly and securely over the lens mount.

Rollei Reflector Lens Cap (double bayonet). An interesting attachment to be used for portrait assignments. One method of use is to have your subject look at his reflection in the top mirror. By doing this, his attention is directed at a height that is correct for good eye modeling and facial expression. Secondly, you release the delayed action mechanism, hurry to your seat to look at yourself in the reflector until your expression has a normal effect. At the same time, you can arrange your head at a suitable angle and relax to a better body arrangement for better composition and a better picture.

Lens Cap. Covers your lens completely and affords protection for your lens from the elements, dust, grime, grit, accidental scratching, etc.

Lens Hood. Minimizes glare from any lights that are pointing toward the camera; also eliminates any stray light which may enter the lens from an angle and bounce around and cause internal flare.

Sports Finder. Without a built-in eye-level finder, older models require an eye-level open-frame type to show the image in full size. This is especially valuable for sports events in that true subject size perspective is seen and maintained. You do not have to look up to the subject, then down to the ground glass to get the direction of motion of your subject. An acceptable model should have provisions for parallax adjustment in feet to the nearest focusing distances.

Duto Diffusion Disc No. 0 (weak) or No. 1 (strong). When a point light source (e.g., direct sunlight) is used, the picture will show sharp detail and deep shadows. With a diffusion disc, the harsh lines of such a portrait are changed to a more pleasing softness as contrasts are lessened. The ※0 must be used at f/4 or wider; the ※1 at f/5.6 or wider. If you narrow your lens opening too much the diffusion effect will be minimized, if not lost. The Duto may also be used on your enlarger.

Rolleinar (Proxar) Close-up Lens. Come in two sets. Set 1 focuses from forty inches to twenty inches and Set 2 focuses from twenty inches to thirteen inches. These are essentially portrait or close-up lenses which change the optical effect of your normal lens to focus as close as thirteen inches with the official sets and may even be used as close as four inches with a Reprox 12 or Apro units.

Rolleipar. Optical wedges-prisms which correct the parallax of your top lens at close-up distances. They must be matched with the specific Rolleinar, etc. Rolleipar I is used with the Rolleinar I's, etc.

Rollei Official Filters. The Rollei filter line includes the sport (very light yellow) to infra-red. The graduated filter supplied with the Rollei will produce the desired gradation effect only with the special filter mount which fits in front of the Rollei lens hood.

Rollei lens hood. In use the lens hood, holding the special mount for the graduated filter, is placed first over the top viewing lens and after filter adjustment, so that the filter effect is exactly as desired, the combination is lowered to the bottom-taking lens for actually taking your picture. By turning the mount on its side, it is possible to balance outdoor and indoor lighting as the darker portion will hold back your daylight so that it will balance in exposure to your indoor light. Balancing your indoor and outdoor light by this method will give you a natural effect. If special graduated filters are not available, you can make them yourself with gelatin foils and a piece of clear glass. Had you used a flash, the whole effect might be lost because of the different light direction. In balancing your outdoor to your indoor lighting, know your outdoor light as well as your indoor light exposure. Then use a suitable filter in addition to the yellow graduated half so that the outdoors is held back to equal the existing indoor light in exposure balance.

Panorama Head. This device is used to take a complete circle of pictures (ten) for a 360-degree view. Each picture overlaps about ¼ inch for easy matching. Match your exposures so that the final print will be uniform in tone.

Rollei Telephoto Lenses

Your regular camera lens is known as a prime lens. In your Rollei both the top and bottom lenses are matched, coordinated and locked in place to prevent their removal and possibly an incorrect replacement. It is, therefore, best to leave your lenses alone, otherwise you may alter the factory precision alignments which guarantee a complete unity of focus.

Although your prime lenses cannot be changed, it is still possible to use an auxiliary compound lens to change the focal length of your regular lens so that it may produce a telephoto effect.

For this effect, a number of Zeiss lenses have been made or are in various stages of engineering. Many years ago, Carl Zeiss produced the "Magnar" telescopic lens which increased the magnification of

your regular Rollei's image four times. In doing so, certain limitations were encountered:

1. The widest opening was f/9.
2. At f/9 only a 1¼″ section of your negative possessed an image with good definition; only at f/22 was the 2¼″ negative adequately covered.
3. The lens was heavy and required a special tripod clip of its own.
4. The long focal length flattened perspective.

It did, however, magnify an image four times and made possible the photographing of many otherwise inaccessible architectural or landscape subjects.

Duonar Lens

The Duonar telephoto lens was designed to meet the need for a telephoto lens which would have greater practicability and usefulness than the Magnar. The Duonar has a focal length of 6″, double the focal length of the prime Rollei lens and the edge definition is better than the Magnar. The aperture is f/5.6; fast enough to permit hand held exposures for color. It will be held in place by means of the reliable bayonet mount. This enables it to be placed instantly onto your lens and removed just as quickly. The combination of the more practical focal length and wider opening makes this lens ideal for portraiture, pets and children, landscapes, etc.

The Duonar can be used in a number of ways:

1. Placing the Duonar in front of the top viewing lens and focusing the camera (tripod recommended) until your ground-glass image is sharp. Remove it then from the top lens and place it onto the bottom taking lens. Make your exposure.
2. Place the Duonar onto the bottom (taking) lens. Then, use the special Duonar mask over your ground glass, or in your sports-finder, to delineate the new field that is covered by the Duonar. Use either a direct depth-of-field or hyperfocal distance setting to assure the sharpest focus.

Since the Duonar doubles the effective camera-to-subject distance for the same size image as your prime lens, you derive a greater freedom of movement because of the added distance. There is less "falling over" your subject. This additional working room shows better portraiture perspective, because a person's nose, hands, etc., are not foreshortened by their nearness to the camera lens.

The Duonar should be a welcome addition to the Rollei family as it will increase the versatility of the camera.

You can Safe-Set your Duonar for color-flash or black-and-white flash. You can guess the focus with sufficient accuracy because your pictures are usually taken at longer distances. You will notice from your depth of field that the greater the subject to camera distance, the larger is the depth of field. Correspondingly the greater the depth of field, the less is the need for extreme accuracy of focusing. With this established knowledge, Safe-Set your distance, aperture and shutter relationship, then use your Duonar mask over the ground glass or in your sportsfinder for your new subject field. As an example, if the head and shoulders of a subject would normally be at 3½ feet, the Duonar's distance will be 7 feet. Set your flash and distance scale for the 7-foot setting; stand approximately 7 feet from your subject; compose the picture with the Duonar's mask in place, and at the peak of action or expression which you will be able to see even though they may be slightly out of focus in the ground glass, take the picture and rewind for the next picture.

Plate Adapter. Single exposures of regular or special emulsions which are available only as sheet film may be used with this useful aid.

Rolleikin (35mm) Attachment. Inexpensive, easily available. 35 mm film may be used. It is supplied in bulk so that you may roll your own cartridges for even greater economy.

Bantam Adapter. Eight-exposure Kodachrome or Kodacolor Bantam size (28x40mm) film may be used. The shorter eight-exposure roll is sometimes more convenient than the twenty or thirty-six exposures of your standard 35mm cartridge.

Never lose sight of the fact that the picture is the most important goal. Any accessory must be only a means toward that end.

When you have learned to use the Rollei by means of the simple Safe-Set Method, you will enjoy the confidence of knowing that you can take good pictures with this world famous camera. At the beginning your results may be stiff and trite, but with sufficient experience, resulting from the information of the remaining sections of this Guide, you can overcome your initial shortcomings of interpretation and gradually grow in maturity of expression. When you have learned to communicate an idea, you will be pleasantly surprised to hear your friends say with increasing frequency, "I wish I had a copy of that picture for my home." This means but one thing—now you are a photographer! Good Luck!

Photographic Dictionary

This brief dictionary has been prepared to serve as a convenient source of reference for the new camera owner.

ABERRATION—Distortion in the lens.
ACID—Chemical used to stop development.
ADAPTER—Converting unit attached to the lens.
ALKALI—Chemical used to accelerate development.
ALUM—Chemical film hardener which prevents softening, reticulation, and scratching.
ANASTIGMAT—Flat, distortionless, straight-line image.
ANGLE OF VIEW—Subject area seen by a lens in all directions.
ANGLE SHOT—Picture from an unusual angle.
ANHYDROUS—Without water.
APERTURE—Lens opening allowing image-forming rays to enter camera.
ARTIFICIAL LIGHT—Light other than sunlight.
A.S.A.—American Standards Association. Systematizes materials, procedures, techniques, etc.
AUXILIARY LENS—Extra lens attachment to change the function of the regular camera lens.
B (BULB)—At this setting, the shutter will remain open as long as pressure is maintained on the shutter release. Shutter closes when pressure is removed.
BETWEEN-THE-LENS SHUTTER—Blades or leaves of the shutter widen to open, then completely close to make an exposure. Located betwen the lens elements.
BLOWUP—An enlargement.
BOUNCE LIGHT—Light method using walls and ceilings to reflect light.
BRIGHTNESS RANGE—Permissible light-to-dark difference posible for subject, negative, or positive.
BULB EJECTOR—Device for removing hot flashlamps.
BULB EXPOSURE—Picture taken with the shutter set at *B*.
BULK FILM WINDER—Economical device for winding your own individual cartridges from larger rolls.

CABLE RELEASE—Wire, shutter-releasing device which enables you to take pictures without touching the camera. Cable releases may be used five or more feet from the camera.

CAMERA—Light-tight box, having sensitive film on the inside and a light-admitting device (lens) at the other end.

CAMERA, PLANAR—Single-lens camera.

CAMERA, STEREOSCOPIC—Double camera, lenses set side by side with a separation of 65 or 70mm. Made so that the apertures and shutters operate simultaneously.

CARTRIDGE, STANDARD—Regular 35mm daylight-loading film-holder which may be purchased anywhere.

CHROMA—Purity of a color mixed with gray.

CIRCLE OF CONFUSION—Area in which two dots appear as one. Two separated dots will appear as one when separated by 1/100 inch at a 10″ reading distance.

CLOSE-UP—Picture taken closer than eight (8) feet from subject.

COATED LENS—Anti-reflection deposit on lens surface to permit more light to pass.

COLOR BLIND—Film sensitive only to blue or violet light.

COLOR CONTRAST—Distinct separation of different colors.

COLOR CORRECTED—Optically balanced to assure similar sharpness of all colors.

COLOR HARMONY—Combination of colors producing a pleasing effect.

COLOR SENSITIVITY—Varying color response of different films.

COLOR TEMPERATURE—The degrees K° refer to the comparative color changes that occur when a black body (iron) is heated. A low number indicates a more reddish color; a higher number, a bluer shade. Most important for natural color film.

COLOR TEMPERATURE METER—Device which measures color temperature, establishes color balance.

COMPLEMENTARY COLORS—Any two combined colors other than the primary.

COMPOSITION—Orderly arrangement of a picture to produce the most pleasing effect.

CONDENSER—Light-concentrating lens.

CONTRAST—Comparison of light to dark.

CONTRASTY—Abrupt difference of light-to-dark tones.

CROPPING—Trimming a picture for the most effective compositon.

CUTTER—Special slicer for cutting film or print with clean or deckled (wavy) edges.

DAYLIGHT TANK—Special developing tank which permits negative processing in full light.

DEFINITION—Sharpness.

DELAYED ACTION—Automatic shutter release mechanism operating after a predetermined interval without human effort. Permits you to photograph yourself.

DENSITOMETER—Measures thickness of exposed and developed film silver deposit.

DEPTH OF FIELD—Area of satisfactory image sharpness. Distances at different apertures are usually supplied in table form.

DEVELOPER—Chemical which blackens only exposed portions of film.

DEVELOPMENT—Complete process of developing, shortstopping, and fixing exposed film.

DIFFUSION—Light which is scattered. Reduces sharpness of image.

DOUBLE EXPOSURE—Taking two pictures on one negative. May be accidental, or intentional for special effects.

EASEL—Paper-holding device for enlarging.

ELEVATOR TRIPOD—Convenient device for lowering or raisng a tripod head without changing the length of the tripod legs.

EMULSION—Gelatin or resin carrier of sensitized silver particles.

EMULSION SPEED—Reaction rate of different films to light.

ENLARGER—Photo-optical device to produce large pictures from small negatives.

ENLARGEMENT—Large print made from a smaller negative.

EXPOSURE—Activation of sensitive silver in the film by light. Admission of light into the camera through the lens.

EXPOSURE COUNTER—Numbering device for counting the exposures in the order that they are made.

EXPOSURE GUIDE—Chart suggesting aperture and shutter settings for differing conditions of light and subject.

EXPOSURE LATITUDE—Film ability to be over- or under-exposed and still yield an excellent picture.

EXPOSURE METER—Light intensity measuring device to indicate correct aperture and shutter settings.

EXTENSION FLASH—Coordinated multiple flash from different locations used to light a picture with greater balance.

FEATHERING—Using only the edge portions of a light in order to avoid a hot spot.

FILL-IN LIGHT—Diffused weak light usually used at the camera position to prevent too dark shadows.

FILTER—A colored glass that fits over lens and separates white light. May admit certain colors (transmission) while preventing other colors from coming through (absorption).

FILTER, GELATIN—Non-permanent filter usually used for experimental purposes.

FILTER, LAMINATED—Gelatin filter cemented between two pieces of glass.

FILTER, NEUTRAL DENSITY—Increases exposure without altering color values.

FILTER, POLARIZING—Transmits light rays of only certain angles. Minimizes glare.

FILTER, FACTOR—Additional exposure necessary because all filters retard some light.

FINE-GRAIN—Controlled small grain needed to produce negatives suitable for huge enlargements.

FIXING—Removing unexposed and undeveloped silver salts from an emulsion.

FIXED FOCUS—Standard camera distance scale setting with a narrow aperture which produces great depth of field and lessens the need for accurate focus. Box cameras are fixed focus.

FLASHGUN—Combined battery and flashlamp holder.

FLASHLAMP—Powerful single-use light source. Flash duration generally 1/50 second.

FLASHTUBE—Powerful multiple-use light source. Flash duration 1/5000 second.

FLAT—Opposite of contrasty; showing little gradation of tone.

FOCAL LENGTH—The infinity (far distance) lens distance position from film.

FOCAL PLANE SHUTTER—Light admitting curtain similar to a window shade with a slit of varying size for different time intervals of exposure.

FOCUSING—Securing camera image sharpness for the lens at different subject distances by moving the lens forward or backward.

FOCUSING SCALE—Measurement chart which shows the required lens from film distance for different subject distances.

FOCAL FRAME—Convenient close-up camera device which eliminates the need for focusing or framing the subject.

GRAIN—Granular image breakdown due to optical or silver clumps formed by improper development.

GRADATION—Tone separation.

GLARE—Unwanted concentrations of light; hot spots.

GUIDE NUMBER—Flashlamp or flashtube reference number used to simplify the calculation of the proper aperture for different subject distances.

HI-LO SWITCH—Electrical device which permits focusing with dim lights and picture taking with brightened lights.

HARDENER—Toughens film or paper.

HOT SPOT—Undesirable concentration of light which over-exposes subject at the point of reflection.

HYPERFOCAL DISTANCE—Related focusing scale and aperture setting at which everything is in focus from half the set distance to infinity.

HYPO—Sodium thiosulfate, used to dissolve undeveloped emulsion on the film.

ILLUMINATION—Light necessary for photography. No illumination, no picture.

IRIS—Variable lens opening which may be adjusted to different sizes.

JIG—Holding device.

KELVIN (K°)—Visual comparison temperature number of a heated body.

LATITUDE—Permissible variation in exposure.

LEAF—One blade of a between-the-lens shutter.

LENS—Light-gathering system, usually of glass.

LENS CAP—Lens protective covering.

LENS HOOD, LENS SHADE—A light shield which prevents stray reflected light from entering the lens.

LENS SPEED, f/ NUMBER—Relationship of lens opening to film distance.

MASK—Shield; outline; cover.

MASK, BORDER—Uniform artistic outline around film or print.

MAIN LIGHT—Predominating light.

MERGER—Indistinct separation of subject or shades.

MICROFILMER—Convenient space-saving device for reproducing documents on 35mm film strips.

MIDGET LAMP ADAPTER—Device permitting the use of a small bayonet flashlamp in a standard size socket.

NEWTON RINGS—Irregular target-type spots resulting from imperfect mounting.

OVER-EXPOSURE—Too much light admitted for an exposure. Distorts tone values.

PANCHROMATIC—Black and white film sensitive to all colors.

PARALLAX—Viewpoint difference of camera lens and viewfinder.

PEAK-OF-ACTION—Apex, height of action.

PEAK-OF-FLASH—Broad plateau portion of the flashglow which makes flash synchronization possible.

PHOTO-ELECTRICITY—Electrical current generated when light strikes certain metals (selenium).

PHOTO-FLOODS—Incandescent lamps which burn brighter than normal because of over-voltage.

PHOTOMICROGRAPH—Picture taken by a camera through a microscope.

PLANAR—Single lens.

RANGEFINDER—Distance-measuring device, split-image or superimposed.

RANGEFINDER, COUPLED—Simultaneously measures the distance and correctly moves the lens focus into position.

READING—Estimate of an exposure by means of a photo-electric meter.

REFLECTOR—Device for directing light rays back to an area. Increases lamp efficiency.

REFLEX—Camera with image focused through a lens and reflected by a mirror onto a ground-glass.

RETAINING RING—Holding ring which keeps filter in filter adapter.

RETICULATION—Uneven wrinkling of the emulsion due to uneven temperature in development.

RETOUCHING—Pencil or brushwork on a negative or positive to improve the picture.

REVERSAL—Process which produces direct positives without a negative.

REWIND KNOB—Key or lever to wind film back into a cartridge.

SAFETY-ZONE FOCUSING—Setting the distance scale at 18′ and aperture at f/8. Large subject areas are in focus at this setting.

SET-SCREW—Screw friction or mechanical device to limit the movement of mechanical parts.

SHORTSTOP—Solution which halts development.

SHUTTER—Device for governing the time interval that a lens remains open, like a water faucet that opens and closes.

SHUTTER RELEASE—Device for opening and closing a shutter.

SILHOUETTE—Subject is dark and outlined against the light background. Made by over-exposing the background while underexposing the foreground.

SINGLE-LENS REFLEX—Reflex which focuses by the same lens that takes the picture.

SLIDES—Mounted transparencies.

SOLENOID—Electro-magnetic shutter-tripping device used to synchronize flashlamps and flashtubes.

SPEEDLIGHT—An intense flash from a radio-type tube, 1/5000 second duration. Also called electronic or speed flash.

SPOTTING—Minimizing or obliterating scratches, spots, emulsion imperfections on the negative or positive.

SPOTLIGHT—Special type of point-source light which produces straight-line rays. Used for crispness, contrast, and sharp outline.

STOP—Opening; full 100% difference in light aperture; full opening of the iris number; from f/4 to f/5.6 is one stop.

STROBE—Speedlight.

SUPPLEMENTARY LENS—An additional lens placed over the regular camera lens used to alter focal length. Rigid cameras (non-bellows) usually use the positive type for close-ups.

SYNCHRONIZER—Mechanical or electrical device used to coordinate the opening of the shutter with the peak-of-flash.

TELEPHOTO LENS—Lens which produces an enlarged image as compared to the size produced with the regular lens, both pictures from the same camera position.

TEXTURE—Detail revealing; 90° angle of light for maximum effect.

TIMER—Measures hours, minutes, or seconds at regular intervals; may be audible when used for enlarging.

TIME EXPOSURE, *T*—Long exposure, requiring set-screw cable release or *T* setting on shutter.

TRIANGULATION—Subject distance measurement by observation from two points of view. Principle of rangefinder operation.

TRIPPING—Releasing the shutter.

TRIPOD—Sturdy, vibrationless camera support.

TRANSPARENCY—Film intended to be viewed by transmitted light.

TWIN-LENS REFLEX—Double camera type, with the top dummy camera used only for focusing.

UNDER-EXPOSURE—Insufficient light admitted for a good picture.

VALUE, COLOR—Relative brilliance (lighter or darker).

VIEWFINDER—Optical device to outline the subject area as seen by the lens.

VIGNETTE—Picture with a different border. Only the desired area is sharp.

WIDE-ANGLE LENS—Has a greater angle-of-view than the normal prime lens.

WINDING KNOB—Handle, lever, or key to move film forward to the next exposure.

35mm BLACK-AND-WHITE FILM

Film	*Color Sensitivity*	*ASA*		*Kodak Developer*	*Time*		*Use*
		D	*T*		*Condenser*	*Diffuser*	
Kodak Plus-X Supreme Superior 2	Pan B	50	40	D-76 Microdol Liquid/DK-20	11 12	13 14	All Around
Kodak Finopan, Superior 1	Pan B	25	20	D-76 Microdol Liquid/DK-20	9 10	11 12	Fine detail, contrast stereo
Kodak-XX; Superior 3; Ultra-Speed Pan	Pan B	100	80	D-76 Microdol Liquid/DK-20	13 15	15 17	Extra speed
Kodak Direct Positive	Pan B	64	50	Home Kit			One-step Slides; stereo
Bulk only Kodak Positive	Blue Sensitive	—	3		7	9	Black-and-White Copying
Kodak Micro-File Micropan, Minipan	Pan B	—	37	D-11	5 min.	6 min.	Finest grain
Kodak Infrared only with Kodak Wratten Filter No. 87 No. 25(A)	Infrared	—	4 3	D-76 Microdol Liquid or DK-20	9 10	11 12	

N.B. Pan B film with a Kodak Wratten Filter (2x) outdoors and a Kodak Wratten X-1 Filter (4x) indoors will duplicate in a gray scale the true color sensitivity of the eye.

Sheet Film	*Type*	*D*	*T*	*Use*
ANSCO				
Triple S Pan	Pan	200	160	Extreme speed
Super Pan Press	Pan	125	80	High speed
Isopan	Pan	50	32	All-around
Super Pan Port.	Pan	50	32	Fine detail
Triple S ortho	Ortho	125	64	Men; speed
Comm. ortho	Ortho	25	12	Fine grain
Comm.	Bl.sens.	25	6	Slow; contrast
Process	Bl.sens.	---	6	High contrast
DEFENDER				
No. 428	Pan	160	125	Dim light
Arrow Pan	Pan	125	80	High speed
X-F Pan	Pan	64	40	General use
F-G Pan	Pan	32	20	Fine grain
Process Pan	Pan	16	10	Colored originals
X-F ortho	Ortho	64	20	Flash
Pentagon	Ortho	32	20	General commercial
Commercial	Bl.sens.	25	6	Slow speed
EASTMAN				
TRI-X	Pan	200	160	Type C-extreme speed
Super Pan Type B	Pan	125	100	High speed
Super - XX	Pan	100	80	General use
Portrait Pan	Pan	50	32	Fine detail
Contrast Process Pan	Pan	20	16	Colored originals
Super ortho	Ortho	100	50	Men; speed
Comm. ortho	Ortho	32	10	Fine grain
Cont. Process ortho	Ortho	20	12	Slow; contrast
Commercial	Bl.sens.	25	6	Fine grain
Comm. matte	Bl.sens.	25	6	Matte finish
Infra-red	Blue Infra-red	---	8	Scientific, No.25A unusual effects

Roll Film	*Type*	*D*	*T*	*Use*
ANSCO				
Super Pan Press	Pan	125	80	Extreme speed
Supreme	Pan	50	32	All-around
Plenachrome	Ortho	50	25	Amateur, contrast
EASTMAN				
Super - XX	Pan	100	80	Extreme speed
Plus - XX	Pan	50	40	All-around
Verichrome	Ortho	50	25	Amateur, contrast