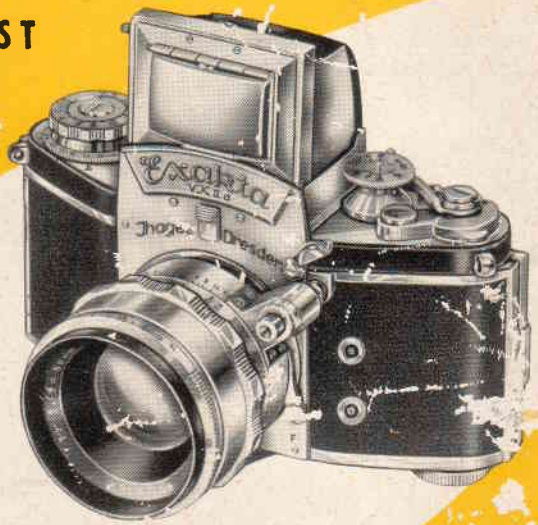
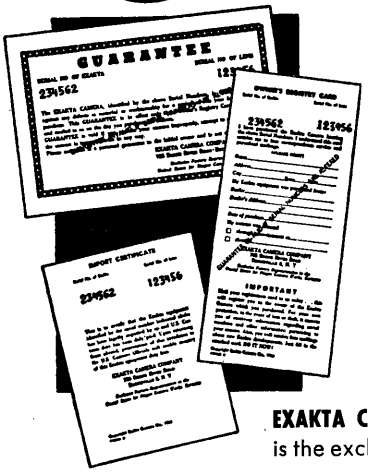
WERNER WURST



Exakta POCKET GUIDE

3 DOCUMENTS—*for your protection!*



THIS IS HOW A BUYER OF AN EXAKTA CAN BE CERTAIN OF GETTING A BRAND NEW EXAKTA CAMERA!

Every Brand New Exakta Camera is shipped with a Guaranteed Certificate, Owner's registry Card and Import Certificate. These papers are issued by Exakta Camera Company, Bronxville, N.Y., and carry the Serial Numbers of the Exakta Camera & Lens.

If these Guarantee & Import Certificates and Registration Card are not included with the Exakta, the camera is second-hand and used.

EXAKTA CAMERA COMPANY · 705 Bronx River Road, Bronxville, N.Y. is the exclusive factory representative in the U.S.A. for Exakta and Exa cameras, and therefore is naturally best equipped to provide you with the very best service obtainable. Should you require advice, assistance, or technical, service, please write to them.

WERNER WURST

EXAKTA POCKET GUIDE

Title of the Original German Edition: "EXAKTA-Tips"
Authorized English translation: Fred. Willy Frerk, London

 Published 1959 by Heering-Verlag GmbH, Seebruck am Chiemsee. Printed by Wilh. Friedr. Mayr, Buchdruckerei, Miesbach/Obb. This book is distributed in the U.S.A. by Exakta Camera Company, 705 Bronx River Road, Bronxville, New York.

PUBLISHED BY HEERING-VERLAG · SEEBRUCK AM CHIEMSEE 1959

Focusing on a screen is the safest way to success

There is no getting away from the fact that the old plate camera with its ground-glass screen had its undeniable merits. When the photographer of that era looked at the ground glass, he had full control over the framing, the definition, and the aesthetic value of the picture he was about to take. The results proved the soundness of this method of photography, and, although the large plate camera is no longer a favorite of photographers because of its size, the ground-glass screen certainly is still popular, probably even more so than ever before.

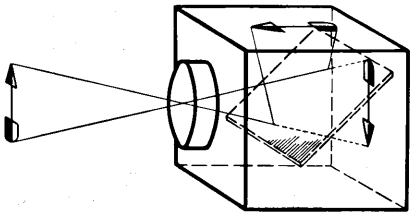
Long before the invention of photography it was known that an image produced by a lens could be viewed on a matted glass plate. The plate camera was the logical development of this discovery, but when the plate holders replaced the ground-glass screen in the camera, a considerable amount of time was lost in changing holders etc., consequently, photography of that time was slow, and people did not show signs of tremendous interest in this medium. In 1936, however, there was a spectacular revival of screen focusing, when the Ihagee Kamerawerk of Dresden introduced the "Kine-Exakta", which, in those days was the only 24 x 36 mm. (35 mm.) miniature camera with a real focusing screen: It was the first single-lens mirror reflex miniature camera in the world and the predecessor of todays "Automatic EXAKTA LIGHT-METER II a".

It is true that the Exakta embodied a streamlined version of the old, well-known reflex principle but it was unique in so far as the reflex principle was used in a tiny miniature camera and, for the first time, made screen focusing possible in this newly awakened field of photography. It was possible now with the Exakta, to focus a miniature image with the accuracy of the old plate camera, but with incomparable greater convenience. With this new single lens reflex camera, the point of focus, the depth of field and the lighting conditions can all be determined before taking a photograph. Even more important, the pictorial content and composition, those vital elements which make a real "picture" can be studied right up to the moment of exposure. The adoption of the reflex principle by many other camera manufacturers is a positive indication that the groundglass screen image was to play a major role in the field of miniature photography.

A new way of seeing and photographing at the same time

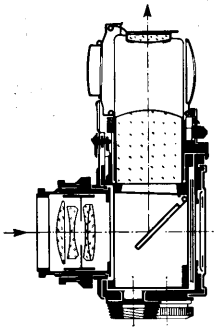
Prior to the introduction of the EXAKTA, photographers had to squint through the usually tiny peephole of the view/rangefinder: now however, they have a life-sized, brilliant image on the ground-glass screen of the EXAKTA. With rangefinder & twin lens reflex cameras, the viewfinder and the taking lens are two units independent of each other, although frequently coupled to one another as far as focusing was concerned. With the EXAKTA, the finder and the taking camera are *one* unit. The very same lens which projects the picture onto the film also serves for viewing. The same lens first produces the image on the screen and then on the film, no matter what lens is used. Viewing the screen image is viewing the future picture, since both are absolutely identical. The diagram below demonstrates the optical reflex principle on which the design of a single-lens reflex camera is based. The lens forms the usual upside-down image of the subject in the focal plane. The path of rays, however, is interrupted by a small pivoted mirror which deflects the image of the subject upwards on to the focusing screen, which is at the same distance from the lens as the focal plane. The resulting screen image appears as an upright, sharply defined picture in its natural colors. The area covered, the relative brightness and the definition will be strictly identical with those of the picture actually exposed on the film.

Focusing with this life-sized image before one's eye means photographing just what appears on the screen and nothing else. There is never the slightest difference between the visual image and the image on the negative: the single-lens reflex camera is perfectly free from parallax. "Parallax" indicates the difference between the view seen in a separate viewfinder and that which will actually be depicted by the taking lens. Parallax is particularly conspicuos in other cameras when used for close-ups. There the final picture is quite different from that seen through the viewfinder. Parallax-errors can arise with any camera, with the exception of a single-lens reflex EXAKTA, where the same lens is used for both, taking the picture and viewfinding. Even in close-ups, photomicrography, telephotophotography, or on other occasions where special lenses are used you are never bothered with parallax.

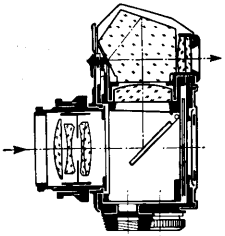


Convertible camera: a new principle

To a certain extent the Automatic Exakta II a is a photographer's dream come true. Enthusiastic photographers have always dreamt of a camera, which, although easy to operate and without too great a host of accessories, can be assembled to suit the requirements of the task at hand. In short, a multi-purpose camera, the most important elements of which can be converted to form a variety of photographic "tools". This dream has been realized in the "dual-system" Exakta II a camera. In the same way as one Exakta lens can be replaced by another, more suitable for the subject to be taken, the focusing system of the Exakta can also be interchanged according to the needs of the moment. The time-honoured reflex finder hood, which necessitates viewing the ground-glass image from above, can be replaced by a penta-prism viewfinder, which permits viewing at eyelevel and gives an upright, laterally correct finder image. You need no longer compromise between a rigid camera-system and your pictorial ambitions. The Exakta II a can be equipped so that it always meets your particular demands and ensures the best results in whatever way you prefer to work. If you don't like the low view-point, unavoidable with the finder hood, you can use the penta-prism viewfinder; if you are mainly concerned with taking children, animals, people sitting, flowers, rowing boats, etc., stick to the finder hood, since the waist-level position gives a more genuine perspective of such subjects than the looking-down of the eye-level position. The important thing is: the Automatic Exakta II a is and remains a single-lens reflex camera with its highly magnified, bright and parallax-free ground-glass screen image. The finder hood can be used by looking into it from above, from the side or from below. The hooded reflex finder image, however, has one little disadvantage: it is upright, but laterally reversed, that is to say, objects on the right in front of the lens appear on the left on the screen, and vice versa. With the penta-prism viewfinder, with which the Exakta II a is used at eye level, the subject will be upright and laterally correct in all cases. Before dealing with a detailed description of the various applications of the two focusing systems, it would be useful first to have a look at the various operational components of the Exakta II a.



Cross section through the Automatic EXAKTA IIa
a) with focusing hood



b) with prism finder

How a penta-prism viewfinder works

The left half of the screen image (when looking through the eyepiece) is reflected from the left-hand portion of the prism-roof (a) on to the right-hand side of the oblique (45°) mirror (c). From the righthand portion of the prism-roof (b) the right-hand half of the screen image is reflected on to the left-hand side of the mirror (c). On the surface of the mirror (c) an upright, laterally correct image will appear.

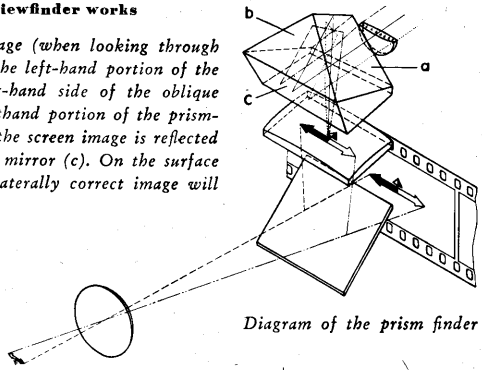
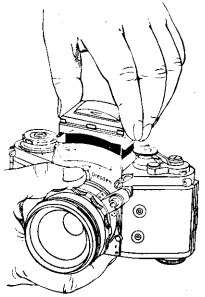


Diagram of the prism finder

Changing the focusing system

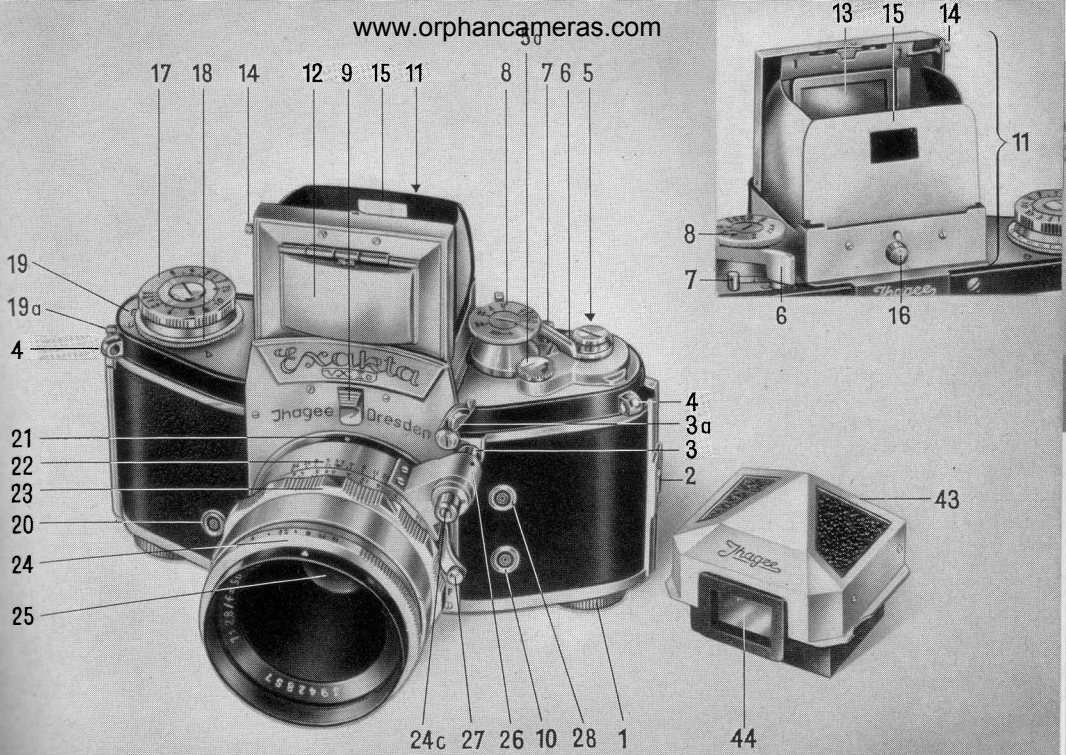
The small catch on the lens panel of the Automatic EXAKTA II a should be pressed downwards and the closed finder hood or penta-prism attachment removed from the camera by lifting it upwards bodily. — Either attachment should be replaced carefully and exactly vertically, without canting. It should be inserted at the correct angle into the camera, where a slight pressure will lock it in position (never use force).



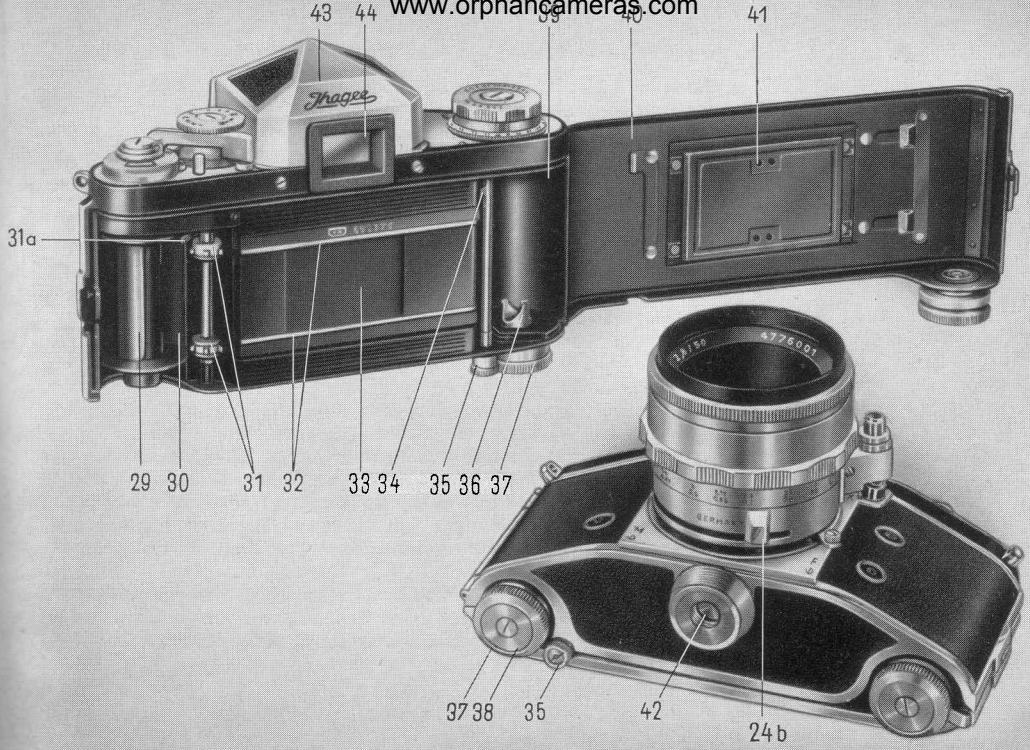
Do you know your Automatic Exakta IIa?

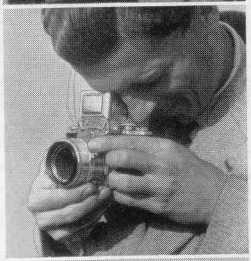
The EXAKTA II a is a camera which will never let you down, but it is of the utmost importance that it should be handled strictly in accordance with the instructions.

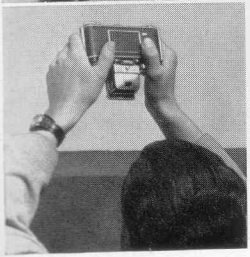
1. Rotary release knob for camera back
2. Camera back lock (operated by knob 1. above)
3. Shutter release knob
3a. Safety lock for shutter release knob
4. Eyelets for carrying strap
5. Frame counter
5a. Frame counter setting knob
6. Film advance and shutter tensioning lever
7. Release pin for film rewind
8. Shutter speed setting knob ($^1/_{25}$ - $^1/_{1000}$, T and B)
9. Release catch for focusing units (finder hood or penta-prism)
10. "F" Flash contact
11. Finder hood
12. Frame finder cover for magnifier 13
13. Magnifier (in swung-down position)
14. Operating knob for collapsible magnifier
15. Back of finder hood (with frame finder eyepiece)
16. Finder hood release button
17. Slow shutter speeds ($^1/_5$ - 12 sec.) setting knob, also for setting delayed action (self-timer)
18. Film type indicator
19. Film advance control disc
19a. Pin-head of back hinge
20. "M" Flash contact
21. Red dot on camera (guide mark for changing lenses)
22. Depth-of-field scale of the lens
23. Distance setting ring with feet or metre scale
24. Diaphragm setting ring with aperture scale
24b. Tensioning lever for automatic spring diaphragm
24c. Release knob for operating the spring diaphragm
25. Lens
26. Red dot on the lens (guide mark for changing lenses)
27. Lens bayonet catch
28. "X" Flash contact



29. Empty take-up spool for exposed film
30. Spool chamber for take-up spool or empty cartridge
31. Film advance sprocket
31a. Holding bracket for cartridge
32. Film guiding rails
33. Shutter curtain
34. Film cutting knife
35. Button for operating 34
36. Fork for engaging spool
37. Rewind knob
38. Centre disc of rewind button 37 (press inwards before rewinding)
39. Chamber for cartridge with unexposed film
40. Hinged camera back (detachable)
41. Film pressure plate
42. Tripod bushing
43. Penta-prism
44. Eyepiece of penta-prism finder







How to use the Automatic EXAKTA IIa with the finder hood

When the reflex waist level finder hood is inserted into the EXAKTA II a, the camera can be used successfully in almost every field of photography, particularly for stationary subjects, such as landscapes, architectural detail, still life, technical photographs, etc. The highly magnified image on the ground-glass screen can be examined easily with both eyes. This screen is actually a plano-convex lens, acting as a powerful magnifier, the lower side of which is finely matted. For critically sharp focusing this magnifying screen is truly an asset; however, to ensure the highest possible definition a second magnifier is built into the camera in the front wall of the finder hood and can be folded up into the viewing position. It is of rectangular shape and allows almost the whole image field to be viewed, providing a high (6x) magnification of the reflected image. Satisfactory horizontal pictures can be obtained by either of the following focusing methods:

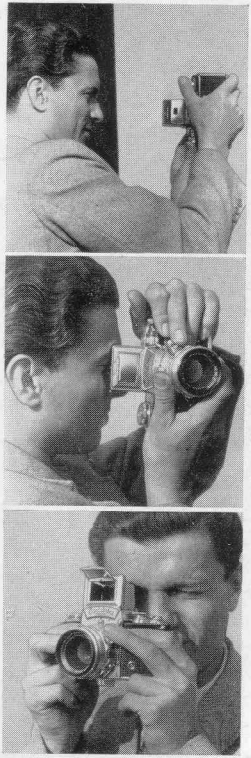
Use the full aperture of the lens (see pages 19-25) and focus to the highest possible definition by using the magnifier. Then return the folding magnifier to its rest position and watch the subject on the focusing screen until the shutter is released, holding the camera at either chest or shoulder level. The diaphragm should be re-set to the aperture required, either shortly before the exposure is made (with lenses with pre-set diaphragm) or simply by releasing the shutter (with lenses with automatic spring-diaphragm, (see page 23).

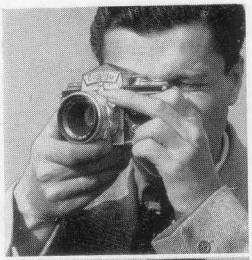
The other way is to hold the camera as near to the eye as possible and to watch the focusing screen by using the magnifier. Naturally, pre-selecting the aperture should precede focusing at full aperture with the aid of the magnifier.

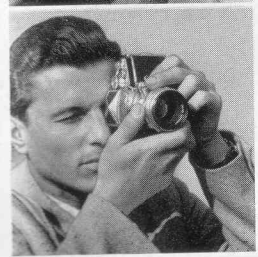
Both these methods can similarly be employed for vertical pictures. In this case the picture is taken "around the corner", so to speak, and this is an ideal method for candid shots. By looking straight in front of you, the actual taking direction is "camouflaged" while the subject is snapped at an angle to the right or left. You may also hide behind a wall or a tree with only the camera sticking out.

The EXAKTA II a with the waist-level reflex finder hood is particularly useful for taking all subjects as flowers, animals, small children at play, etc., and which can easily be photographed with the camera held horizontally. Even subjects at ground level provide no difficulty. The reflected image can also be viewied from below, of course, a great advantage when taking pictures above the heads of a crowd or from behind obstacles, such as walls or hedgerows. In this case the EXAKTA II a is simply held above one's head and the screen image examined from below.

It may happen that at a sports meeting the prism-viewfinder is not at hand. Then the sports frame finder incorporated in the reflex hood will come in very handy. Set the folding magnifier to the working position, fold up the cover cap in the front wall of the finder hood and sight the subject directly by holding the camera at eye level and looking through the peephole in the back wall of the reflex finder hood. The opening in the front wall of the finder hood shows the exact image field covered by the taking lens (that is, with standard lenses of 50 and 58 mm. focal lengths). Before sighting the subject through the frame finder it should be focused correctly. For close-ups at distances of less than 9 feet, the frame finder should not be used on account of parallax. Spectacle wearers using the reflex finder hood (with the magnifier) should focus the subject with the spectacles they normally wear for reading.





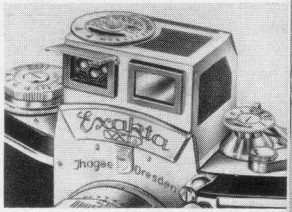


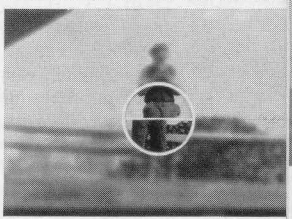
How to use the Automatic EXAKTA IIa with the prism-viewfinder

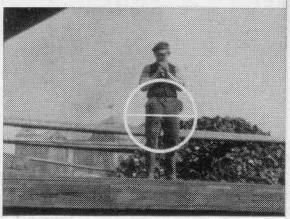
Equipped with the penta-prism, the EXAKTA II a becomes a "rapid-action camera". When the subject is moving rapidly, as in sports events or even in daily life (cars, horses, aeroplanes, etc.), the enormous advantages of the prism-viewfinder will soon be obvious. It ensures a direct eye-level view of the subject, the lines-of-sight of both the eye and the camera are always identical and the image in the finder moves in the same direction as the subject in front of the lens. In addition – the image is upright and laterally correct. All these advantages apply no matter whether horizontal or vertical pictures are taken. A racing car travelling at tremendous speed can easily be sighted even at a considerable distance and kept within the image field up to the last moment. Slowly "swinging" the camera, one follows the car and releases the shutter shortly before it reaches the point on which the lens has been focused beforehand. When using lenses with pre-set diaphragms, the stop required should be set beforehand; with lenses with semi-automatic or automatic diaphragm setting, stopping down to the pre-selected stop is done automatically.

When photographing subjects which call for the fastest possible shutter speed, such as those which have to be taken at right angles to their direction of motion (ski-jumping, car or motorcycle races), it may happen that even the shortest shutter speed of $^1/_{1000}$ second is not fast enough to freeze motion. These are cases when "swinging the camera" is indicated. Get the fast-moving subject in the viewfinder while it is still at a distance and keep it constantly in the centre of the viewfinder by moving the camera slowly but steadily along with the moving subject, as described above.

Using the prism-finder and making the Automatic EXAKTA II a an 'action' camera, however, does not mean that the prism-finder should be used only for action shots at the fastest shutter speed. Whenever it appears more suitable to use the EXAKTA II a at eye level and to focus critically on the laterally correct reflected image, it can and should be done. The dual-focusing system of the EXAKTA II a has been introduced with the definite purpose of replacing the categorical "you must" by the more tolerant "you can". It is quite possible that certain subjects will give a better picture when taken at eye level, because they are habitually seen from the eye-level position (persons, architectural details, technical subjects, etc.). Sometimes a subject cannot be viewed properly by looking from above into the finder hood; well, then, use the prism-viewfinder. The correct application of the two different focusing systems soon becomes a habit – you will select the most suitable method almost automatically. Both horizontal and vertical pictures can be taken without difficulty. Horizontal shots can also be made with the camera upside down which permits the smooth back of the camera to be pressed against the forehead for protection against camera shake.







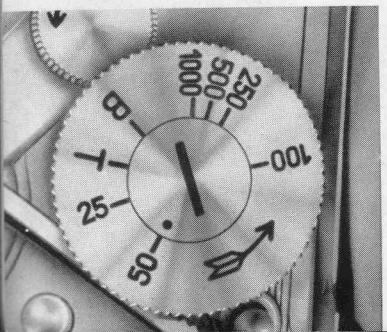
Furthermore, there is eyepiece which can be slipped on the eyepiece of the prism-viewfinder, preventing stray light from both sides entering the eyepiece and making it possible to press the camera firmly against the face. People with defective eyesight can have a corrective glass for distant views fitted to the eyepiece.

The standard ground-glass eyepiece can be replaced by the split-image rangefinder glass. It permits precision focusing by means of its built-in split-image rangefinder and can be used with lenses of all focal lengths For focusing a wide aperture (not under f/5.6) should be used as usual.

Pressing the release knob

starts a chain of interesting events inside the Automatic EXAKTA II a. You should make a careful study of these operations before loading the camera, preferably with the camera open and the lens removed.

When the release knob is depressed the mirror flips upwards and seals off the ground-glass screen, so that the beam of light from the lens can fall on the film in the film gate when the focal plane opens. The focal plane shutter, consisting of two blinds of rubberized cloth, has a slit between the blinds, which is either narrow or wide according to the speed to which the shutter is set. The slit travels along the film from left to right and exposes each portion of film for exactly that exposure time to which the shutter is set. At the same instance the frame counter advances by one stroke. Depressing the release knob once again has no effect at all, since the whole mechanism is no longer tensioned. When the film transport lever is turned until it stops, the shutter will be tensioned once again, the film will be advanced and the mirror will return to its viewing position, that is to say, the screen image will again become visible. Unintentional double exposures are impossible, as the film can be advanced only when the shutter has been released. Even when the transport lever has not been turned as far as it will go but has been left at an intermediate position, the shutter will be locked. For intentional double exposures, see page 47.



How to operate the shutter

The use of the various shutter speeds will be described later.

Small setting knob: Shutter speeds from $^1/_{25}$ to $^1/_{1000}$ second and "B" and "T" are set by this knob. "T" is for time exposures of more than 12 seconds duration. The small setting knob should be lifted slightly before or after tensioning the shutter and turned in the direction of the arrow. The knob

should be allowed to spring back to its rest position when the red marking dot is opposite the shutter speed required. The figures denote fractions of a second, e. g., 100 = 1/100 second. When set to "T" the shutter will open when the release knob is depressed and close only when the knob is depressed a second time. When set to "B" the shutter opens on pressing the release knob and closes when the knob is released.

Large setting knob: Since the handling of this knob is a little complicated these instructions should be adhered to strictly. Large Setting Knob: First wind film advance lever to cock the shutter. Next put the small setting knob on "B" or "T". Then wind the large setting knob as far as it will go in a clockwise direction. Then raise this knob and set it on the speed you want. Then let the knob spring back. The large setting knob is for long exposures from 1/5 sec. to 12 seconds (black figures), and for a delayed action of 13 seconds plus a shutter speed setting from 1/5 sec. to 6 seconds (red figures).

The required shutter speed (in black figures) coincides with the red dot in the centre. Then let the knob spring back. For the actual exposure release the body release knob of the camera as gently as possible.

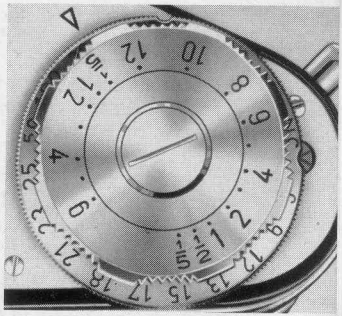
Self-timer exposures (delayed action release 13 seconds after depressing the release knob).

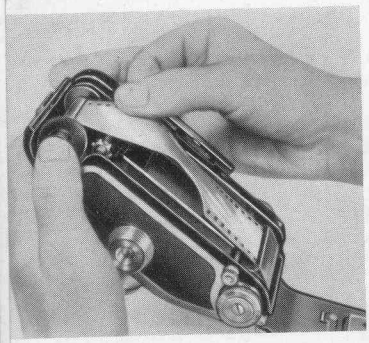
a) *Exposures between 1/5 sec. and 6 seconds (red figures)*

Proceed as before, but set the large setting knob so that the red mark coincides with the *red figures.*

b) *Exposures between 1/25 and 1/1000 second*

Set the small setting knob to the actual exposure time required, proceed with large setting knob as before, but turn it so that the centre mark coincides with *any red figure.*

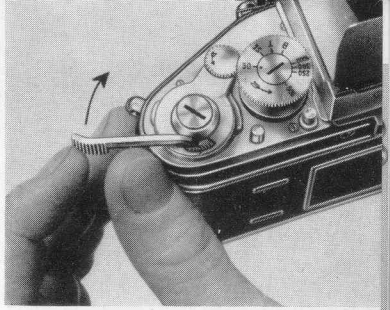




Loading the Automatic EXAKTA IIa

Loading the camera should also be practiced beforehand, using a discarded perforated 35 mm miniature film. A length of a little more than 5 ft (1.60 m.) takes 36 exposures 24 x 36 mm. in size. The film is supplied in light-tight metal or plastic cartridges, and can be inserted into the camera and removed in daylight. Cartridges holding only 20 exposures can also be used.

The cartridge containing the unexposed film should always be inserted into the right-hand film chamber below the large setting knob. Open the camera back by pulling the milled knob on the camera base downwards and turning it. Pull out the rewind knob and insert the cartridge into the right-hand chamber so that the projecting end of the spool points towards downwards and the matt emulsion side of the film faces the lens. Push back the rewind knob but take care that its central disk is not pushed inwards. Pull the beginning of the film across the film gate towards the take-up spool while holding the cartridge in place with the left thumb. Push the free end of the film under the spring tongue of the take-up spool. When re-inserting this spool take care that the prongs of the film advance lever engage the core of the spool. The new wide-diameter take-up spool for faster winding and the new spring-catch spool retainer together with the improved winding mechanism ensure rapid and safe winding. The teeth of the sprocket in front of the take-up spool must accurately engage the holes of the perforations. When the film is lying straight on the guide rails between the two film chambers the camera back can be closed. As the leader of the film has been fogged by handling it in daylight, it must be wound on by tensioning and releasing the shutter twice. Turn the film advance lever until it stops; it returns automatically to its rest position, but it is a good plan to catch it on its return with the thumb to prevent a jerk. Now release the shutter and repeat the procedure once again. After the second "blank" exposure advance the film once again and turn the setting knob of the frame counter in the



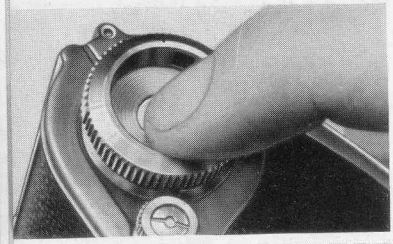
direction of the arrow so that the last dividing stroke before "1" points towards the small black triangle.

The EXAKTA II a is ready for the first shot!

The EXAKTA II a is designed so that the take-up spool usually supplied can be replaced by an empty film cartridge of normal commercial type. The film need not be rewound in this case, but can be removed from the camera together with the take-up cartridge. Since the film is in a light-tight container it is not necessary to expose all 36 frames, it can be removed after any number of exposures (see page 19). It will then be necessary, however, to trim the beginning of the remaining film and to attach it to the centre spool of another take-up cartridge. With respect to trimming, the necessary curved cut should begin between the ninth and tenth hole of the lower perforations. When re-inserting the closed cartridge the prongs of the film transport lever should engage the small bar in the cartridge, and the emulsion side of the film must face the film gate.

The smooth running of the film

and its correct advance can be controlled by watching the film control disk or rotodial in the circular hole on the outer rim of the large shutter speed setting knob: it should rotate when the film is advanced. The film type indicator around the base of the large setting knob (not to be confused with the shutter speed setting ring) should be set to the type of film with which the camera is loaded. The ring underneath the large knob should be turned in an anti-clockwise direction until the type of film in question coincides with the small triangle. The figures denote the speeds of the various black-and-white films (e. g. 23 ASA, 100 ASA etc.). For color films letters are provided as follows: black "C" for daylight color reversal film (as Kodachrome), red "C" for color reversal film for artificial light, black "NC" for daylight color negative film (asta color negative), red "NC" for color negative film for artificial light.



Unloading the Automatic EXAKTA IIa

When 36 or 20 exposures have been made it is usually possible to add two more exposures, before the film advance lever of the EXAKTA II a becomes immovable. The camera should then be unloaded.

When using the take-up spool

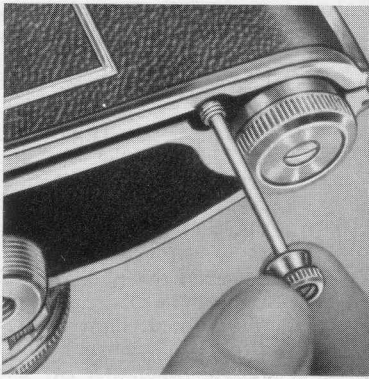
and the film transport lever cannot be moved to its rest position because the end of the film has been reached, the rewind catch or pin (36) should be depressed. The film advance lever can then be returned to its initial position.

To rewind the film, depress the centre disk of the rewind knob. Then hold the camera as shown in the illustration and rewind the film by turning the rewind knob slowly and evenly in a clockwise direction whilst keeping the rewind pin depressed all the time. Rewinding can be controlled easily by observing the control disk on the outer rim of the spindle of the film transport lever (the one with the big screw nick). As soon as this spindle comes to a standstill the film is rewound. When the rewind pin is released it will return to the initial position. The camera can now be opened and the cartridge with the exposed film removed by pulling the rewind knob out as far as it will go. Before closing the camera back the rewind knob should be pushed back in its initial position.

When using a take-up cartridge

rewinding is unnecessary. When the end of the film is reached, making the film transport lever immovable, unscrew the knob

of the film cutting knife (35) by turning it in an anti-clockwise direction and pulling it out from the camera. This will cause the knife at the end of the rod to cut right through the film. Now push back the knife and tighten the screw. In order to wind the film right into the cartridge turn the film transport lever and release the shutter twice. Now open the camera and remove the exposed film.



The engravings around the EXAKTA lenses

indicate the name of the manufacturer, the name and the optical data of the lens in use, and also include various scales. These engravings are of the greatest importance, since the data given provide all the knowledge necessary for using the lens just for the purpose for which it is designed.

There is, for instance, f/2.58 mm. What does this mean?

The light rays reflected from the subject are "collected" by the camera lens (consisting of various high-quality lens components) and made to converge to give a picture of the subject. The light rays coming from a distant point enter the lens in straight lines almost parallel to the optical axis and are brought to a focus behind the lens, in the focal point. The distance between the lens (approximately from the diaphragm plane) to the focal point is called the focal length and denoted as f (=focus) so-and-so, usually expressed in millimetres. So f=58 mm. means a focal length of 58 mm. Subjects which are nearer to the camera are not depicted sharply by the lens in the actual focal plane, however, but behind it. To compensate for this difference the lens must be "focused" on a shorter distance, that is to say, the lens must be moved

forward slightly in order to place the sharp picture correctly in the film plane of the EXAKTA in accordance with the increased lens-image distance. This is done by turning the distance setting ring; the result of this operation can be watched on the ground-glass screen of the EXAKTA II a and read off from the distance scale in feet or metres.

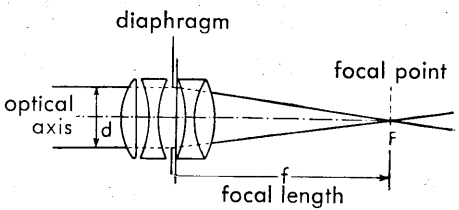
In any lens, the amount of light passing through is limited by the metal circle of the mount. A room with a large window will be brighter than a room of the same size with a small window. It is the same with the camera. Lenses are classified as high-speed, medium-speed, or low-speed, and this highly important factor is denoted by the numerical ratio between the diameter of the largest aperture and the focal length (d : f). Thus a lens of 50 mm. focal length and a maximum aperture of 18 mm. has a speed of 18 : 50, or as it is usually expressed 1 : 2.8 or f/2.8.

However, the high-speed EXAKTA lenses are not always used at this maximum aperture although it is extremely useful for focusing. The EXAKTA lenses have diaphragm setting rings which permit the speed of the lens to be reduced, that is to say, to give the built-in iris diaphragm a smaller aperture. There is a scale on the diaphragm setting ring showing the various f/numbers. The smaller the f/number the larger is the aperture and consequently the quantity of light passed by the lens, the larger the f/number the smaller will be the aperture. An f/4 lens passes half the light passed by an f/2.8 lens. Hence, the smaller the f/number the shorter is the exposure needed, whatever the lighting conditions.

The calibration on the diaphragm setting ring are arranged so that in passing from one f/number to the next the amount of light passed by the lens is halved or doubled. If, for instance, the correct exposure time at f/8 is $^1/_{50}$ second, it will be $^1/_{100}$ second at f/5.6 but $^1/_{25}$ second at f/11. The diaphragm, however, is not intended only to exclude or admit light to a varying extent as required, but is primarily used to increase the depth of field and to improve to a certain extent the overall efficiency of the lens.

Before describing the most important uses of the diaphragm the latest development in improving lenses should be mentioned: the coating. All modern lenses and, of course, all EXAKTA

lenses are coated, that is to say, all lens surfaces have an anti-reflection layer which largely eliminates the surface reflections in a compound lens. These reflections, which are actually a scattering of the light at the glass-to-air surfaces, increase with the number of surfaces, and degrade the image contrast. By coating the surfaces the loss of light and the decrease in contrast have been eliminated to a very high degree; after coating, lenses have proved to have gained in speed and to give greater brilliance and contrast. Coated lenses can be recognized by the bluish-red tinge of the front lens.



The effect of stopping-down a lens

Although modern lenses of large aperture are highly corrected their depth of field is comparatively small. Furthermore, they transmit much more light than is usually needed for modern films and even if the definition can be considered as very good at full aperture, it will be improved when the lens is stopped down. The "resolving power" or "resolution" is the ability of a lens to separate the finest details of the subject. This resolving power is at its maximum at one particular medium stop for each type of lens, usually f/8 (with lenses up to f/2.8) and f/5.6 (with higher speed lenses). The highest speed of a lens or its largest aperture is therefore, usually only used under poor lighting conditions or for rapid-action work, e. g, for car-racing, when the highest shutter speed is needed.

In theory a photographic lens can only provide a critically sharp image of the plane on which it is focused. In actual practice, however, a lens does not only define sharply objects at the accurately focused distance but will also produce a sharp image of objects a certain distance in front of and behind the actual distance focused. This "zone of sharp definition", better known as "the depth of field", is comparatively narrow at full aperture (f/2 or f/2.8) but becomes greater the more the lens is stopped down. With the EXAKTA lenses we need not go into a detailed explanation of this fact; we look into the finder hood and focus at full aperture on an object at a distance of, say, 16 feet. The object in question will be perfectly sharp, but in front of it and behind it all other objects will be more or less unsharp. With the standard lens of 50 or 58 mm. focal length many objects near the one on which we have focused will still be sharp, but with a long focus lens the zone of sharp definition will be smaller the longer the focal length of the lens; conversely, with wide-angle lenses, the depth of field will be greater the shorter the focal length. The depth of field will also be reduced when the taking distance is reduced.

Now, when we reduce the aperture of our standard lens we can observe quite clearly how the depth of field grows the more we decrease the aperture, and how the zone of sharp definition becomes much greater beyond the distance focused on (6 ft) than in front of it. Actually 1/3 of the depth of field lies in front of the plane focused on and 2/3 behind it.

All lenses of the EXAKTA II a have a depth-of-field scale engraved on their mounts. This scale shows the zone of sharp definition at various aperture settings and distances. In the centre the red mark is set to the distance focused on (16 ft). When now the aperture setting to be used is located among the f/numbers to the left and right of the red distance setting mark, the distance values on the distance setting scale opposite the selected f/numbers represent the near and far limits of the depth-of-field zone. For instance: Focus on 16 ft. stop f/8; sharp definition from 10 ft. to 50 ft. (See illustration alongside).

Examining the ground-glass screen while decreasing the aperture will become more difficult because a small aperture does not transmit as much light as a large one. After some experience this darkening of the focusing screen can become quite useful for determining the exposure time.

The full aperture of a lens gives the most brilliant image of the subject in front of the lens, but for the actual exposure the diaphragm must be closed to the stop required. In order to save time the lenses of the Automatic EXAKTA II a have either a fully automatic diaphragm, a semi-automatic diaphragm or, at least, a manually operated ring which can be turned to the pre-set stop just before the exposure, without having to consult a scale. With the latter device the aperture necessary for the exposure should be set before focusing and the focusing done at full aperture. With the semi-automatic diaphragm it is necessary to tension the mechanism beforehand, whilst the automatic diaphragm springs back automatically to the pre-selected stop when the shutter release knob is depressed.

Distance setting to oo: When the focusing scale is set to oo (infinity) all distant subjects will be sharp. The definition in the foreground should be read off from the depth-of-field scale. This setting is recommended only when the subject is at a distance of at least 75 – 80 feet (with an f=50 mm. lens) or about 120 feet (with an f=58 mm. lens) with no foreground whatsoever. If both the foreground and background are to appear sharp the following method is preferable, since it provides the same zone of sharp definition at a larger aperture:

Infinity-near point setting or hyperfocal distance

If the zone of sharp definition is to begin a few feet in front of the camera and extend to infinity, the lens should be focused so that the feet-figure for the shorter distance and the oo – mark on the distance scale coincide with the same f/numbers on the depth-of-field scale to the right and left of the setting mark. For instance: using a 50 mm. lens, sharp definition is required from 16 feet to oo. Set the distance setting ring so that the 16 figure on the left and the oo-mark on the right coincide with the same f/number, which, in this case, is f/5.6. The lens will then be focused at approx. 30 feet and should be stopped-down to f/5.6. The picture will then be sharp from 16 feet in the foreground to infinity to the background, a favourite method of taking landscapes with a definite foreground of people, animals, or buildings.

Snapshot focusing: Candid shots can be made only when the camera is always ready for action. Photographs of this type are usually taken at short distances as it is best "to fill the frame". Normally sharp definition to infinity is not required. The necessary zone of sharp definition is generally limited to a belt from 10 feet in the foreground to 30 feet in the background, or even closer, from 5 feet to 15 feet. With a 50 mm. lens focus at 15 feet and stop the lens down to f/8, then everything between 10 ft. and 30 ft. will be sharp. Or

focus the lens at 10 feet and stop down to f/11. The Zone of sharp definition will then start at 6 feet and end at 25 feet.
Snapshot focusing is a good method of photographing sports events, children at play, street scenes, etc., since the subject can move within the range of sharp definition without getting out of focus.

The lens should never be set, however, to either of the extreme points of the depth-of-field range required; the aperture would become too small and the exposure time too long.

With the hyperfocal-distance or snapshot settings it may happen that the figures of the distance scale do not exactly coincide with the f/numbers, but lie between two figures. In this case set the diaphragm to this intermediate stop or to the next larger or smaller stop.

Focusing "on the dot": When taking pictures where the depth of field is of no special importance the best thing to do is to focus sharply on the chief subject and then to stop down the lens as far as necessary.

It is obvious that stopping-down the lens, that is to say, decreasing the amount of light passing through it, must influence the exposure time.

However, the correct exposure time is not only determined by the diaphragm; it also depends on the lighting conditions prevailing and thus on the season of the year, the time of day and the weather, and, furthermore, on the speed of the film used, the type of developer to be used for developing the negative and on the factor by which the exposure must be increased when a filter is used. If all this were not enough, the shutter speed is also dictated by the speed of moving subjects and their direction of motion relative to the camera.

It goes without saying that a car travelling at high speed cannot be taken at 1/25 second, but if 1/1000 second is indicated it is also obvious that the lens cannot be stopped down at random, just to obtain sufficient depth of field. If the sun is shining the aperture may be reduced a little to increase the depth of field, but if it is raining all the speed of the lens will be needed to obtain a sharp picture of the car. EXAKTA negatives are small, only 24 x 36 mm. in size, and must be enlarged in any case. To obtain a negative which can be enlarged with ease, the exposure must be sufficient to obtain enough detail in the shadows (the dark portion of the subject). Not so long ago miniature films had to be developed with fine-grain or even ultra-fine grain developers which usually called for double the normal exposure time. Modern films, especially the widely used thin-emulsion films, should not be over-exposed. The old method of giving miniature film double the exposure it actually needed is no longer necessary; on the contrary, it is a danger to the film's potential image quality. The old fine-grain developers, containing various silver solvents should no longer be used. Any compensating developer, strongly diluted, will do better than an ultra-fine grain mixture. This means that the beginner would be well advised to use a good exposure meter or a reliable exposure table.

After some experience with the Automatic VX II a, with careful study of the brightness of the image on the focusing screen it will not be too difficult to determine the correct exposure for any shot. This is possible only, however, when the photographer is fully familiar with the exact qualities of his film. It is over-exposure which produces objectionable grain. To avoid both one must know one's film. Every photographer who keeps changing from one film or make of developer to another will produce bad results consistently. Changing films, filters, shutter speeds and aperture with every new cartridge of film is not necessary.

It is a good plan to make notes of the exposure data of the first few films (month, time of day, lighting conditions, film, filter, aperture and shutter speed) and to compare them with the ensuing results. Furthermore, it is a good idea to test one's photo-electric exposure meter by taking one shot at the aperture and shutter speed indicated and two more at the next larger and the next smaller aperture in order to establish whether the speed rating of the exposure

meter coincides with the actual speed rating of the film in use. If, for instance, the shot at the smaller aperture is correctly exposed, it shows that the film can be rated one stop higher than indicated.

What you should know about miniature films

With the Automatic EXAKTA II a, 35 mm. perforated miniature film in commercial cartridges is used. These cartridges contain a length of film sufficient for either 36 exposures or 20 exposures. The empty cartridges can be used over and over again but should be handled with care, especially the velvet-lined mouth. The empty cartridges can be refilled with either *darkroom loading refills, daylight loading refills* or appropiate lengths of *bulk packings of films.* Darkroom loading and daylight loading refills are already trimmed to shape for attachment to the take-up spool. Bulk packings are uncut miniature films in lengths of 16 too 100 feet, from which any desired length can be cut, trimmed and loaded into an empty cartridge. Miniature films are made in many different types and for this reason it is important to know a little more about the material which you intend to use in the Automatic EXAKTA II a.

1. *The overall speed* or the sensitivity of the film is usually printed on the box in which the film is supplied and is given in American Standards Association Exposure Indices: ASA for short. These ratings are proportional to the speed of the film, that is to say, a film of 50 ASA is twice as fast as a film rated at 25 ASA, or in terms of shutter speeds, if $^1/_{100}$ second is correct for the 50 ASA film, the slower 25 ASA film needs $^1/_{50}$ second.

2. *Color sensitivity.* The color sensitivity of a film defines the extent of its photographic response to light of various colors. Actually, plain silver bromide is sensitive only to blue and ultraviolet. To render the films sensitive to other colors sensitizing dyes are incorporated in modern emulsions. There are three general classes of negative material: *ordinary film* which is sensitive to blue and ultraviolet, only and is used only for special purposes. *Orthochromatic film* is sensitive to green and yellow in addition to blue and ultra-violet. *Panchromatic film,* which is sensitive to all visible colors and ultra-violet.

While the ordinary and orthochromatic films are hardly ever used by amateur photographers nowadays, panchromatic film is the material almost exclusively used by all modern photographers. Films have changed considerably in recent years and, therefore, the film you decide to use should be selected with the greatest care since the choice of the film determines the quality of the enlargements you make from your miniature negatives.

3. *The resolving power or resolution* of a film. Resolving power defines the ability of an emulsion to distinguish fine detail. The resolving power depends to a high degree on the size of the silver bromide particles in the emulsion, usually called the "grain" of the film. Originally the slow and contrasty emulsions had the finest grain while high-speed films had a coarse grain. Recent developments have changed these conditions considerably. It has been found that the sharpness of a picture depends not only on the inherent granularity of the emulsion but even more on the thickness of the emulsion layer. The thicker this layer the more irradiation will take place within the emulsion and this will spread out the tiny image points projected through the lens on to the film. Modern films are, therefore, produced with inherently fine grain as well as the quality of "acutance", otherwise known as "contour sharpness".

4. *Gradation or contrast* denotes the ability of a film to reproduce the brightness scale of a scene. Modern films range from those of low inherent contrast, through materials of moderate contrast, to others of high contrast. High speed films are usually said to be of low contrast, while low speed films are of higher contrast, or, in other words, high-speed films have a soft gradation, low speed films a hard one.

5. *Exposure latitude*-Exposure latitude is the ability of a film to render a printable negative even if it is over-exposed to a certain degree. High-speed double-layer films have a wider exposure latitude than thin-layer films, but irradiation in the emulsion of the former causes loss of acutance, which impairs the sharpness of the enlargement.

Which film to use?

Slow film, 10 to 25 ASA, with its extremely fine grain and highest acutance, provides negatives which yield the best possible enlargements. The new film of this type are of medium contrast

and give the best results with a basic exposure about one full stop less than the manufacturers recommendations. When developed in one of the new compensating developers, such as Neofin Blue, these films give brilliant, needlesharp negatives of ultra-fine grain.

Medium-speed film, 40 to 50 ASA, is the general-purpose film for the EXAKTA man, as it has sufficient speed, fine grain, excellent color sensitivity. This is the best film for average subjects, and can be developed in any good developer. When developed in fine-grain developer a certain amount of its inherent speed has to be sacrificed.

High-speed films, 100 to 250 ASA, modern short-exposure films, which have a much finer grain than earlier high-speed films, but it is coarser, of course, than that of the medium-speed films. They are highly sensitive to red and thus particularly suitable for shots by artifical light, portraits, children at play, etc., as well as for daylight photos under poor lighting conditions (sports events, stage photography, candid shots).

Slow Films: Adox KB 14, Gevaert Microgram 27, Kodak Panatomic-X Ilford Pan-F Perutz Pergrano, Agfa Isopan FF.
Medium-speed films: Adox KB 17, Agfa Isopan-F, Gevapan 27, Ilford FP 3, Kodak Plus-X Perutz Perpantic, etc.

High-speed Films: Adox KB 21, Agfa Isopan-Ultra Gevapan 33 and 36, Kodak Tri-X, Perutz Peromnia 23 and Peromnia 25.

NATURE PHOTOGRAPHY WITH HIGH-SPEED FLASH

by Walter van Riper, Robert J. Niedrach and Alfred M. Bailey High-speed flash has opened a new field to the nature photographer. This information-packed booklet tells how to use high-speed flash with the 35-mm.

9" x 6", 64 pp., 57 photos $ .50

Available at your dealer or EXAKTA PUBLICATIONS, Box 97, Bronxville, New York

Following Kodak Films are recommended for subjects indicated:

SUBJECT	35 mm. Film
ACTION Outdoors	Plus-X Tri-X
Indoors or Extremely Poor Lighting	Tri-X
ARCHITECTURE Exteriors	Panatomic-X Plus-X
Interiors or Night	Plus-X Tri-X
NEWS "Candid"	Plus-X Tri-X
PORTRAITURE	Plus-X Tri-X
LANDSCAPES Atmospheric Effects	Plus-X with C-5 Filter
Cloudscapes, Marine Views, Snowcapes	Plus-X
Extreme Distance Spectacular Effects	Infrared
NATURE PHOTOGRAPHY	Plus-X Tri-X
STILL LIFE Table-Top Photography	Panatomic-X Plus-X
BLACK-&-WHITE NEGATIVES FROM COLOR TRANSPARENCIES	Panatomic-X Plus-X

SUBJECT	35 mm. Film
COPIES Line-Black-and-White	Micro-File
Line-Color	Micro-File
COPIES Continuous-Tone-B. & W.	Fine Grain Positive Panatomic-X Plus-X
Color	Panatomic-X Plus-X
DUPLICATES By Means of Intermediate Negatives or Positives	Fine Grain Positive Panatomic-X
LANTERN SLIDES	Fine Grain Positive Micro-File
MEDICAL PHOTOGRAPHY Predominantly Red Subjects	Plus-X Tri-X
Surgery, etc.	Plus-X Tri-X
Pale Red Areas (To Reproduce Darker)	Plus-X with # 58 Filter
Sub-Surface, Veins, etc.	Infrared
PHOTOMICROGRAPHY General Use	Plus-X Panatomic-X
Metallurgy	Micro-File Panatomic-X
	Panatomic-X, # 58 Filter
ASTRONOMY and Spectroscopy	Tri-X

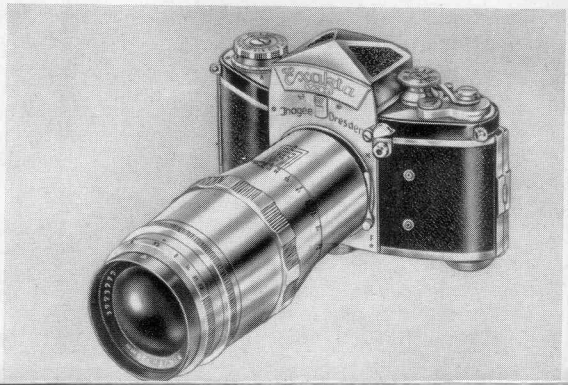
Special requirements — special lenses

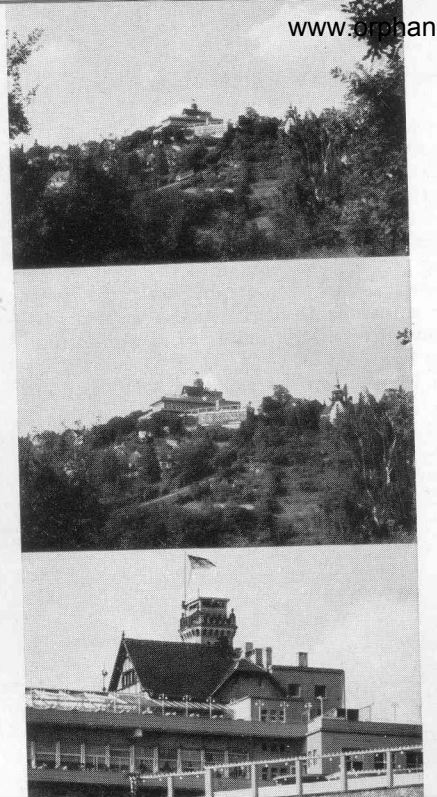
The EXAKTA II a is designed so that the standard lens of 50 mm. or 58 mm. focal length can be exchanged for another lens of longer or shorter focal length or different speed. Whatever lens is employed in the EXAKTA II a, however, accurate focusing and the correct framing of the picture is obtained by the reflected image on the focusing screen.

Wide-Angle lenses have a shorter focal length than the standard lens but a wide-angle of view, that is to say, a wide-angle lens will reproduce a greater portion of the subject from the same camera position than a standard lens, but everything will also be reduced in size. Wide-angle lenses are particularly useful, since they open up new fields of photography, especially under cramped conditions when it is impossible to cover a reasonable field with a standard lens. This may occur when photographing interiors, narrow streets, high buildings or architectural detail where the restriction of space is most strongly felt.

Long focus or telephoto-lenses have a longer focal length than the standard lens. They are either normal long focus lenses or genuine telephoto lenses (which have a shorter mount) and have a considerable smaller angle of view.

From the same camera position and at the same distance between the subject and the camera, the image of the subject on the focusing screen will be the larger the longer the focal length of the lens used. Lenses of this type, of medium focal length between 80 mm. and 135 mm., are particularly useful for all sorts of photographs when it is not possible to fill the frame with the standard lens. These lenses yield framefilling pictures





without those all-too familiar perspective distortions (too big a nose and too small ears in a portrait, etc.).

The Ultra-high speed C. Z. Jena Biotar "night-lens" of f/1.5, 75 mm. is the fastest aperature EXAKTA lens and is particularly useful under poor lighting conditions. The newest EXAKTA lenses include a complete set of fully automatic Steinheil lenses: the Auto-Quinon, f/1.9, 55 mm., the standard lens, the Auto-Quinaron f/2,8, 35 mm. wide-angle lens, the Auto-Tele-Quinar f/3.5, 135 mm. or the Auto-Tele-Quinar, f/2.8, 135 mm. It should be mentioned here that the exposure need not be increased when working with a tele-lens.

Only those lenses which meet all the optical specifications and are considered perfect are offered by EXAKTA Camera Company, 705 Bronx River Road, Bronxville, New York. Therefore, before purchasing a lens be sure it is recommended and listed in the EXAKTA Catalog, the "Official Directory" of guaranteed EXAKTA equipment.

Left: Three photos taken from the same standpoint:
a) with f/2.8, 35 mm. wide-angle lens,
b) with f/2.8, 50 mm. standard lens,
c) with f/4, 300 mm. long focus lens.

LENSES RECOMMENDED FOR EXAKTA CAMERAS

AUTOMATIC LENSES

f/1.9, 50-mm. Schneider Xenon, fully automatic lens

f/1.9, 55-mm. Steinheil Auto-Quinon, fully automatic lens

f/2.0, 50-mm. Westagon, fully automatic lens

f/2.8, 50-mm. Westanar, fully automatic lens

f/2.8, 50-mm. Zeiss Tessar, fully automatic lens

f/2.0, 58-mm. Zeiss Biotar, fully automatic lens

f/3.5, 50-mm. Meyer Primotar, fully automatic lens

HIGH SPEED LENSES

f/1.5, 50-mm. Angenieux (S21) pre-set diaphragm

f/1.5, 75-mm. Zeiss Biotar, pre-set diaphragm

f/1.9, 75-mm. Hugo Meyer Goerlitz Primoplan, pre-set diaphragm

f/1.8, 90-mm. Angenieux (P1)

WIDE-ANGLE LENSES

f/2.8, 35-mm. Zeiss Flektagon, fully automatic diaphragm

f/3.5, 28-mm. Angenieux Retrofocus

f/2.5, 35-mm. Angenieux Retrofocus

f/4.5, 35-mm. Hugo Meyer Goerlitz Primagon

f/4.5, 40-mm. Hugo Meyer Goerlitz Helioplan

f/3.5, 40-mm. Steinheil Cassaron

TELEPHOTO LENSES

f/2.8, 80-mm. Zeiss Tessar

f/3.5, 80-mm. Hugo Meyer Goerlitz Primotar

f/1.8, 90 mm. Angenieux (P1)

f/2.5, 90-mm. Angenieux (Y1)

f/2.8, 100-mm. Hugo Meyer Goerlitz Trioplan

f/2.8, 135-mm. Steinheil Quinar, fully automatic, w/sunshade and case

f/2.8, 135-mm. Steinheil Quinar, pre-set, w/sunshade and case

f/3.5, 135-mm. Hugo Meyer Goerlitz Primotar

f/4.0, 135-mm. Zeiss Triotar, pre-set diaphragm

f/3.5, 180-mm. Hugo Meyer Goerlitz Primotar

f/4.5, 200-mm. Steinheil Quinar, pre-set, w/sunshade and case

f/5.5, 150-mm. Hugo Meyer Goerlitz Tele-Megor

f/5.5, 180-mm. Hugo Meyer Goerlitz Tele-Megor

f/5.5, 250-mm. Hugo Meyer Goerlitz Tele-Megor

f/4.5, 300-mm. Hugo Meyer Goerlitz Tele-Megor

f/5.5, 400-mm. Hugo Meyer Goerlitz Tele-Megor

In the few short years since their introduction, fully automatic diaphragm lenses have made an enormous impact in the field of 35-mm. single lens reflex photography. Fully automatic lenses provide for the operation of closing the lens to the desired aperture after focusing and is combined with the release of the shutter in a single simultaneous motion-the simple pressure of one button! This ingenious device greatly increases the versatility of even the most versatile camera, the EXAKTA, thus making it a faster, more efficient instrument than ever. Zeiss, Steinheil, Schneider, Meyer, Isco-the honor roll of lensdom will be found on the list of manufacturers who have worked with EXAKTA's experts to evolve the many automatic lenses now available to EXAKTA owners. Some of these new automatic lenses are:

f/1.9, 50-mm. Schneider Xenon, fully automatic lens
f/1.9, 55-mm. Steinheil Auto-Quinon, fully automatic lens
f/2.0, 50-mm. Westagon, fully automatic lens
f/2.8, 50-mm. Westanar, fully automatic lens
f/2.8, 50-mm. Zeiss Tessar, fully automatic lens
f/2.0, 58 mm. Zeiss Biotar, fully automatic lens
f/3.5, 50-mm. Meyer Primotar, fully automatic lens

A word should be mentioned here about Prism Finders for the EXAKTA camera. Only the genuine Ihagee Prism Finder will give you the perfection you'd expect from a precision Prism Finder. The genuine Ihagee Prism Finder can be identified by the manufacturer's name, Ihagee, Dresden, and the engraved serial number on the front left side of the Penta Prism. An engraved VX and Germany also appear on this finder. Prism Finders that are *not* genuine are not only cheap imitations, but lack in brilliance and are out of focus with the camera.

Why light filters?

Although the panchromatic films are sensitive to all colors of the visible spectrum their sensitivity to blue still exceeds those of other colors. The satisfactory representation of color in terms of the grey tones of varying densities has been one of the basic problems of photography since its beginning. Colors on a print should be represented in terms of their apparent brightness to the eye, blue as a dark grey and yellow as a light tone and so on. Now our panchromatic films yield an approximately correct representation of all colors except blue and violet to which they are somewhat oversensitive, and, therefore, these colors appear too light in the print. Light filters are used to give a more accurate representation of the visual brightness of color. These filters are called correcting filters. If filters are employed to emphasize or subdue particular colors they are called contrast filters. Recently introduced panchromatic films need no longer any correction filter at all or perhaps a light yellow filter at the utmost. The use of filters is not essential to good photographic work, but one or two skilfully used can make all the difference. The most suitable filter for use with panchromatic materials is a medium yellow filter or, if there is much green in the subject, a medium yellow-green one. The latter filter is particularly useful for landscapes with a wide expanse of sky, which then appears dark, making the white clouds stand out boldly from it, while the green foliage, the yellow of the ripe corn and the bright red roofs become sufficiently bright to be easily distinguishable from each other. In all cases, however, over-exposure should be avoided, since it will largely nullify the effect of a filter.

Illumination:	*Panchromatic film:*
Daylight (early morning or towards dusk)	Light yellow, yellow-green filter or no filter
Daylight	light yellow or yellow-green filter
Artificial light	no filter

Orange and red filters can also be used to obtain certain definite effects. A blue sky with heavy white clouds, for instance, can be "dramatized" so as to give the effect of a menacing thunder-

storm, since these filters necessarily falsify the tone rendering of all colors to some extent. On the other hand, orange and red filters can be extremely useful when photographing distant landscapes in which they clarify distant details. With these filters it is even possible to improve night- and moonlight pictures by giving short exposures in bright sunshine.

The use of any filter, however, involves increasing the exposure time to an extent depending on the color sensitivity of the film and the density of the filter, since filters prevent some of the light rays from reaching the film. The following "filter factors" by which the exposure time should be multiplied, are of the greatest importance for the correct use of filters: light yellow x 2, medium yellow x 2.5, deep yellow x 3, medium yellow-green x 2, orange x 5, red x 8 - 10.

In the mountains at altitudes over 4500 feet and in sunshine on the beach, a colorless ultra-violet or haze filter is extremely useful. To eliminate reflections on highly polished surfaces a polarizing filter often proves an asset. The polarizing filter is placed in front of the lens and slowly turned while studying the finder image until the disturbing glare of the reflections is sufficiently subdued or completely eliminated. While the haze filter can be used without increasing the exposure time, the polarizing filter needs an increase of about 2 to 3 times. Incidently, it should be noted that some filters are coated like lenses.
