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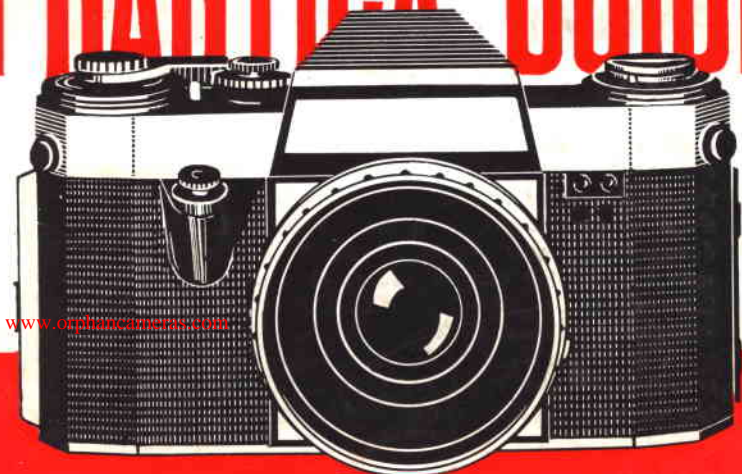
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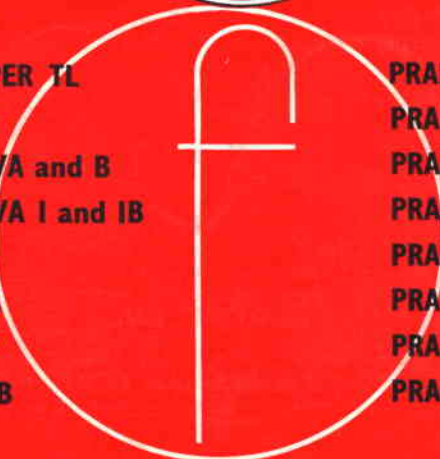
PRAKTICAMAT

PRAKTICA GUIDE



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PRAKTICA SUPER TL
PRAKTICAMAT
PRAKTICA NOVA and B
PRAKTICA NOVA I and IB
PRAKTICA VF
PRAKTICA VFB
PRAKTICA IVF
PRAKTICA IVFB
PRAKTICA IV



PRAKTICA IVB
PRAKTICA IVBM
PRAKTICA IVM
PRAKTICA FX3
PRAKTICA FX2
PRAKTICA FX
PRAKTICA
PRAKTIFLEX

THE PRAKTIKA SYSTEM

The modern Praktica is a 35 mm. single lens reflex camera with a viewing system designed for accurate focusing and exact viewing.

The die-cast body has a hinged-on back and is covered in black material with exposed metal parts black anodised or satin chrome finished. The camera yields up to 36 negatives $1 \times 1\frac{1}{2}$ in. (24×36 mm.) on perforated 35 mm. film.

It has an eye-level reflex finder which shows the image in natural size. The built-in pentaprism produces an upright and right-way-round view. The centre of the reflex finder area contains a micropism or split image rangefinder focusing and this is surrounded by a ground glass ring. The image is brilliant and evenly illuminated right into the corners with the aid of a fresnel field lens. An indicator appears in the top left hand corner of the viewfinder of models with instant-return mirror to show when the shutter has not been set. Early models are fitted with a chest-level-reflex finder with folding hood and built-in magnifier.

The taking lens itself is used to form the finder image; in consequence the finder shows exactly the same field as will be obtained on the film without any parallax. The reflex image remains fully correct at any distance with any lens including close up supplementary lenses, extension bellows, extension tubes and other attachments.

The screw-mounted standard lens is interchangeable and a wide range of tele and wide angle lenses is available. Lenses designed for some other cameras will also fit the Praktica camera.

Most Praktica lenses have an automatic preset diaphragm. An internal link between the shutter release and the lens mount couples with lenses in such a way that the aperture is stopped down only during the actual exposure. At other times, it is fully open to permit viewing with maximum brilliance of the reflex screen and minimum depth of field for greatest accuracy.

The lens mount carries a depth of field indicator and a

focusing scale in both feet and metres as well as an infra-red mark. Focusing is effected by a helical movement which is part of the lens mount. Some of the most recent automatic-iris lenses are equipped with a depth-of-field preview device.

Models from VF (1964) onwards have an instant-return mirror, avoiding the image blackout of the early Prakticas.

The shutter of the Praktica is a focal plane type travelling across the film from right to left. With this type of shutter, lenses can be changed while the camera is loaded.

The shutter is synchronized for flash bulbs and electronic flash with standard co-axial outlets on the camera body.

The camera takes standard 35 mm. cassettes. The film runs from the cassette to the take-up spool and is rewound after exposure. The film transport is effected by a lever movement through 210°; one swing advances the film and the film counter arranged around the centre shaft of the transport lever.

A film-speed indicator is located on the rewind knob, which is also marked to indicate the number of exposures of the film inserted into the camera. A film type indicator is shown in the centre of the transport lever.

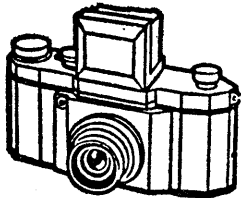
The shutter release is conveniently set at an upwards angle into the front of the body and reduces the danger of camera shake. It can be locked against accidental depression and has a cable release thread in its centre. A tripod bush is placed in the camera's base, slightly off centre.

The Prakticamat and the Praktica Super TL feature a through-the-lens internal light-measuring system with a CdS meter which is coupled to shutter speed and aperture. It works semi-automatically with the lens at the shooting aperture. Either the shutter speed or the aperture can be pre-set.

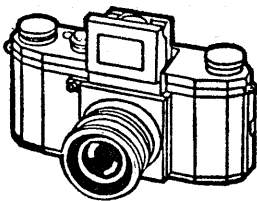
Praktica Models

PRAKTIFLEX. The original camera in this series was introduced in 1938. It conformed generally with the basic description given above but the back was completely removable and the mirror returned to the viewing position only when the film was wound on. It had shutter

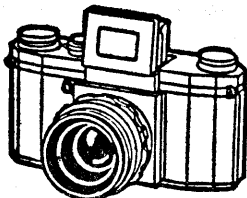
PRAKTICA EVOLUTION



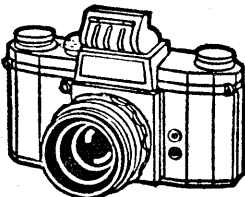
The original Praktica with the smaller diameter lens mount.



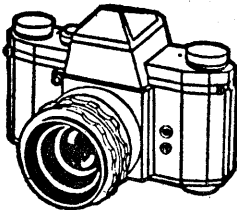
The 1952 Praktica with improved shutter and condenser type screen.



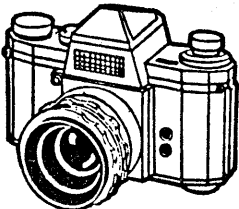
The FX model of which there were four versions with different types of flash contacts.



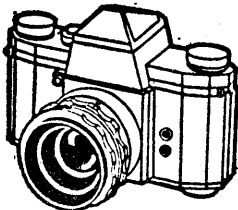
Praktica FX2 permitted the attachment of a pentaprism and had semi-automatic aperture setting. Later versions had fully automatic iris control.



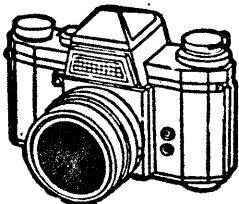
Praktica IV with fixed pentaprism. The IVM had a rangefinder centre in the screen. The IVF had a fresnel screen with rangefinder centre.



Praktica IVB with built-in exposure meter. The IVM and IVF models were also fitted with exposure meters as IVBM and IVFB.



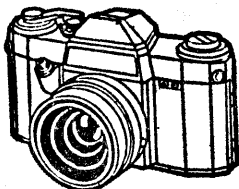
Praktica VF introduced the instant-return mirror and the modern shutter-speed range.



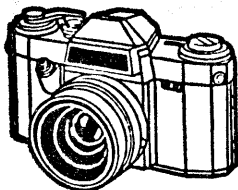
Praktica VFB was a Praktica VF with built-in exposure meter.

PRAKTICA EVOLUTION

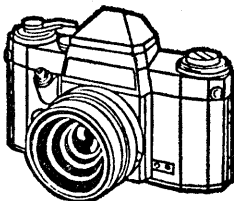
Praktica Nova is an improved VF with hinged-on back, lever wind on top, angled shutter release and self-zeroing exposure counter.



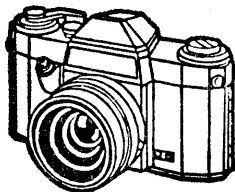
Praktica Nova B is a Praktica Nova with built-in exposure meter.



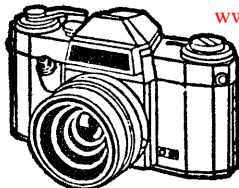
Prakticamat is similar to Praktica Nova but has through-the-lens automatic exposure control.



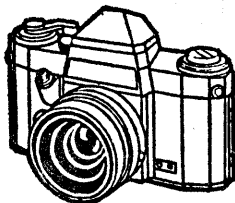
Praktica Nova I has all shutter speeds on one dial and a quick-load take-up spool.



Praktica Nova IB is a Nova B with additional features of Nova I.



Praktica Super TL is a simplified Prakticamat with no 1/1000 sec. and with quick-load take-up spool.



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speeds from 1/25 to 1/500 sec. and B. The lens was interchangeable but the lens mount thread was smaller than the later cameras in this series, namely 40 mm. in diameter. Therefore, lenses designed for the current Praktica cameras cannot be used on this model. It was fitted with a chest-level reflex finder with ground glass.

PRAKTICA (1952) had an improved focal plane shutter, $\frac{1}{2}$ —1/500 sec. It also had the larger screw thread (42 mm.) for interchangeable lenses which has remained unchanged for all successive Praktica models. In place of the flat ground glass screen, a condenser type screen was introduced into the reflex finder, giving improved brightness in the corners of the finder picture. The latest version of this Praktica had a slightly modified body shape.

PRAKTICA FX (1955) was fitted with pre-select iris lenses and was FX synchronized. It should be noted, however, that the F of those days represented about 10 ms. delay for the then available GE No. 6 flash bulbs. The flash contact was situated on the base of the camera. Later models of the Praktica FX had the flash contacts on the camera front. The last version was X synchronized only with the standard 3 mm. co-axial plug.

PRAKTICA FX2 (1956) allowed a pentaprism to be inserted into the reflex finder hood for eye level viewing. This model introduced semi-automatic aperture setting and the latest version had fully automatic iris control. This latter was offered in some countries as the Praktica FX3. The latest version of the Praktica F·X2 (dot between the F and X!) had, in addition to X synchronization, also the now international standard F synchronization for flash bulbs.

PRAKTICA IV (1959) introduced, in place of the chest-level reflex finder, a permanently fixed pentaprism. This model was also the first Praktica with quick film-wind lever, which was in the base plate of the camera, in addition to the transport knob on the camera top. The rewind knob was in two parts, the top part swinging out to act as a rewind crank, and incorporated a film type indicator disc. The rewind release button stayed in the pressed-in position automatically while winding and sprang back automatically when the shutter release was operated. It also featured a little foot acting as a counterpoise.

PRAKTICA IVB (1959) was a Praktica IV but with built-in, uncoupled photo-electric meter. This same model was introduced in 1962 with a rangefinder centre in the reflex image as model IVM for the camera without exposure meter and model IVBM for the camera with built-in exposure meter. In the last version of the Praktica IV series, the condenser reflex finder lens was replaced by a fresnel lens with wedge rangefinder and ground glass focusing ring with an optical system above it to produce the maximum of even illumination right into the corners of the finder image. These last versions were called IVF for the model without exposure meter and IVFB for the model with exposure meter.

PRAKTICA VF (1964) was the first Praktica with the now standard

geometrically-arranged shutter speeds, an instant-return mirror and a red signal indicator in the finder to show whether or not the film is wound on. The shutter speeds ran in the usual progression from 1/500 to $\frac{1}{2}$ sec. but there was no setting for 1/15 sec.

PRAKTICA VFB was a Praktica VF with the built-in uncoupled photo-electric exposure meter.

PRAKTICA NOVA (1965) is basically a Praktica VF but slightly smaller. The lever transport has been transferred to the top of the camera and a fold-out crank permits the quick rewinding of the film. The camera back is hinged on, the exposure counter is self-zeroing and the shutter release is angled to the camera front and can be locked against unintentional releasing. Shutter speeds as on Praktica VF.

PRAKTICA NOVA B (1965) is similar to the Praktica Nova but with built-in photo-electric exposure meter, as in Praktica IVB.

PRAKTICA NOVA I (1967) is basically a Praktica Nova with all shutter speeds on one dial (incorporating also 1/15 sec.), a quick load take up spool and improved styling.

PRAKTICA NOVA IB (1967) is basically a Praktica Nova B with the additional features of the Praktica Nova I.

PRAKTICAMAT (1965) is similar to the Prakticanova with built-in coupled CdS meter with automatic exposure system measuring the light through the lens in a novel and extremely efficient way. The focal plane shutter is fully speeded from 1—1/1000 sec. The shutter speeds are around the rewind knob. The pentaprism has a micro-screen circle around the central rangefinder wedge. With lenses which have no depth-of-field preview device, depth of field can be checked before shooting by depressing the meter switch-on button.

PRAKTICA SUPER TL (1968) differs from the Prakticamat by having no 1/1000 sec. It uses a one-cell CdS meter with light concentrator. Focusing is by micro focusing centre with ground glass surround and fresnel rings. It has a quick-load take-up spool.

HANDLING THE PRAKTIKA

In order to simplify the description and handling of the Praktika camera without being confused by different features of individual models, this guide is divided into a general section which applies to all Praktika models, while the individual requirements and different handling of each model are found on pages 27-40. To avoid bulk and confusion slight variations in manipulation on earlier models which become self evident have not been included.

For convenience, a symbolic reference system is also used in the general section. Wherever the sign ■ appears, further details will be found in the camera pages.

Holding

It is obvious that the camera should be held as steady as possible as the slightest shake, even if not seen in the negative, will become visible in the enlargement.

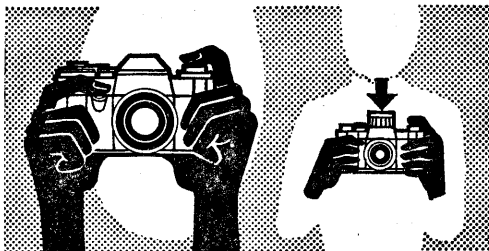
FOR HORIZONTAL PHOTOGRAPHS hold the camera in the palm of both hands, the fingers gripping the front of the body, the thumbs against the back. Use thumb and middle finger of the left hand to move the lens focusing mount, and the index finger of the right hand to operate the release button. Keep the elbows pressed against the body. Either the right or the left eye may be used on the finder.

Always stand with your legs apart.

FOR VERTICAL PHOTOGRAPHS turn the camera through 90° so that the left hand presses the camera against your forehead from above. Use the thumb and the index finger to move the focusing mount. The right hand holds the camera from below with the index finger on the release button. It is of no consequence if the position of the hands is reversed; you can suit your own convenience.

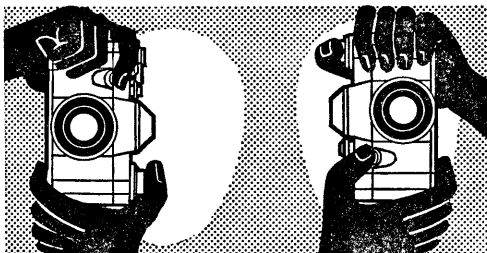
To release the shutter, press the release button with the ball of the finger. Use finger pressure only, and keep the hand and its grip on the camera steady. The actual pressing

HOLDING



For horizontal shots (*above*) hold the camera in the palm of both hands, the fingers gripping the front of the body, and the thumbs against the back. Focus the lens with the thumb of the left hand.

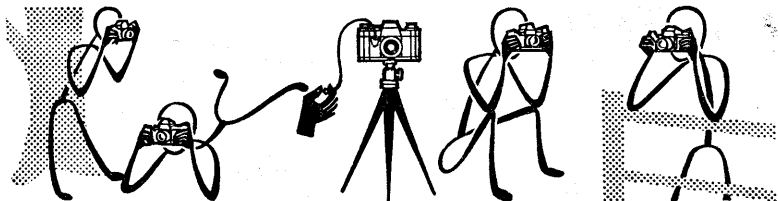
For upright shots (*below*) turn the camera through 90° so that the left hand supports it from underneath. Alternatively, turn it round in the other direction, so that the left hand presses the camera against the forehead from above. In this case the thumb of the right hand presses on the release button, while the palm of the right hand supports the weight of the camera.



Press the elbows close to the body,

always stand with your legs well apart,

and hold quite still while you release.



Above: With the Praktica it is specially important to keep the camera really steady during the exposure and for a fraction of a second after pressing the release button. Whenever possible support your body against something solid, such as a tree or wall or prop up your hands against your knees or a table, particularly with slow speeds. Use a cable release for time exposures from a tripod (page 12).

down will have to be done slowly and smoothly. The slower the exposure time, the smoother must be the release.

For slow exposures in the hand, it is advisable to rest the elbows or at least to lean the body against some support in order to avoid shake. In this way, even 1/8 sec. can be risked without incurring camera shake.

Such a support is also desirable for faster exposures, as quite a lot of movement takes place inside the camera after pressing the release button. A slightly unsteady hold may thus easily lead to blurred pictures.

The use of a tripod is necessary when taking time exposures and it is also recommended for speeds slower than 1/30 sec. For upright photographs from the tripod use a ball-and-socket head to allow changing from horizontal to vertical position.

Carrying

To be ready for quick action, it is best to carry the camera on a short strap round the neck so that it lies on your chest. Lifting it up to the eye is then a matter of a split second.

For convenience and protection, the Praktica should always be carried in its ever-ready case. This case is designed to hold the camera ready for use. The flap of the case is removable when the camera is in continuous use to enable quicker working.

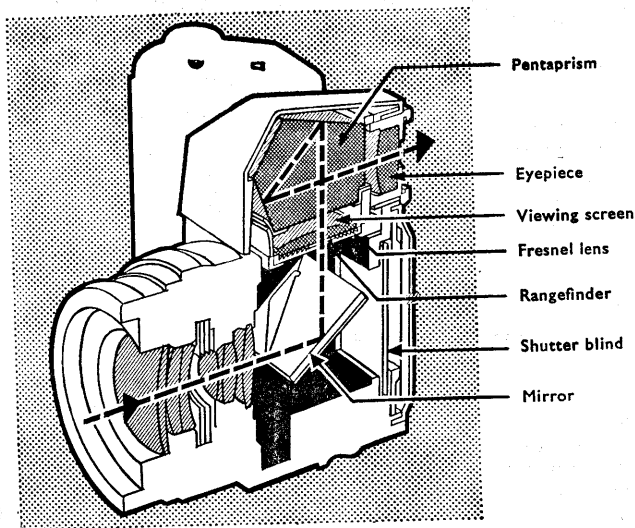
Viewing and Focusing

The image reflected by the lens on to the screen is always visible except during the actual exposure. The image of the earlier Praktica models is only visible after the film has been wound on. It disappears immediately the shutter is released.

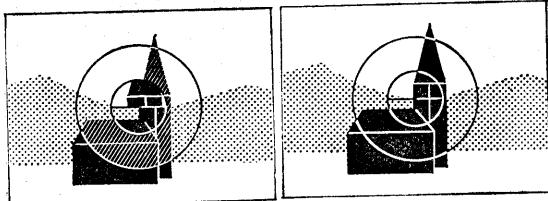
The brilliant image appears in natural size, free from parallax. A fresnel lens ensures even illumination into the very corners. A viewing pentaprism shows the image upright and right way round at eye level.

The picture should be viewed with fully opened aperture

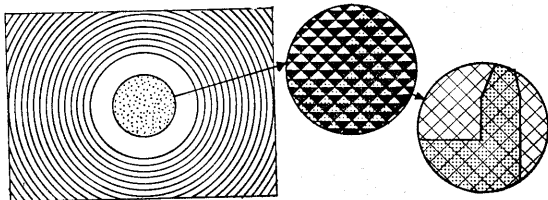
VIEWING



Above: The viewing system of the models from Praktica IV onwards presents a right-way-up, right-way-round image at the viewfinder eyepiece. This sectional view shows the light path through the lens via the angled mirror and the pentaprism to the eyepiece.



Right: The split image rangefinder in the centre of the viewing screen shows discontinuous images (top) when the lens is not properly focused. These images are brought into coincidence when correct focus is attained. The microprism (bottom) show a shimmering image when the lens is not properly focused, steadying to a clear image when correct focus is attained.



to ensure brightest reflex image. This is automatically the case with the automatic pre-set diaphragm lenses.

The best way to arrive at critical definition is to turn the focusing mount of the lens slowly to and fro while observing on the ground glass ring in the centre of the reflex image the subject to be focused. As you turn the mount, the image becomes more and more sharp up to a certain point, beyond which it will again lose definition. At this "beyond" stage turn the mount back again, narrowing down the degree of movement until you arrive at the point of best definition. The whole reflex image should not be used for visual focusing as it might be not fully accurate—depending on the user's eyesight.

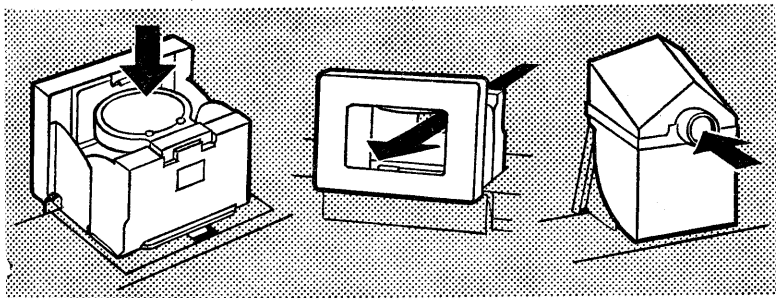
The later models have a microprism centre showing fuzzy outlines while the lens is not accurately focused becoming clear on setting the lens correctly. Some of the earlier models have a split-image centre. Two small prisms are mounted in a clear spot in the centre of the screen, and the image in that spot appears split in the middle. On turning the lens focusing mount the two halves are brought into line so that one continuous image is seen. In this position the lens is correctly focused.

Early Praktica models up to FX3 were fitted with a chest-level reflex finder. The folding hood of these models is opened up, permitting observation of the ground glass screen image up to the moment of exposure. The screen in the later versions is actually one side of a plano-convex lens, the lower side of which forms a ground-glass screen; the lens also acts as a magnifier. Therefore, the reflex image seen in the finder hood is bigger than the actual image on the negative, while the outlines and definition remain identical. For even more critical focusing a built-in magnifier may be employed. The magnifier is normally folded away and moved into position for use.

The reflex finder image seen is the picture produced by the camera lens and reflected by the mirror on to the screen.

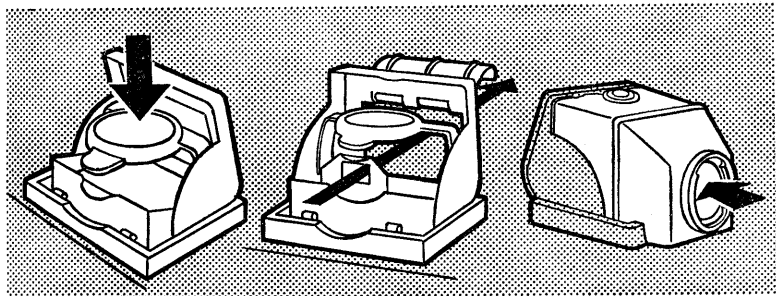
The image of all earlier models up to and including the Praktica IV is only visible after the film has been wound on. It disappears immediately the shutter is released.

VIEWING SYSTEMS



Original Praktiflex, Praktica and Praktica FX systems.

Left: Chest-level viewing and focusing arrangement with magnifier to aid critical focusing. *Centre:* The chest-level viewer adapted for use as frame finder. This does not permit focusing. *Right:* Pentaprism attached to focusing hood to permit eye-level focusing and viewing.



Praktica FX2 and FX3 systems.

Left: Chest-level viewing and focusing arrangement with magnifier to aid critical focusing. *Centre:* Front opened outwards to provide frame finder facilities. *Right:* The later version of the pentaprism to permit eye-level focusing and viewing.

On the Praktica V, the Praktica Nova and Prakticamat the image is visible all the time except for the actual instant of release.

The orthodox way of focusing with the ground glass or rangefinder may be adopted for taking photographs of subjects that are fairly stationary. A different method of focusing is required when taking subjects in motion. Set the lens to a distance at which the subject will be in a given moment, or focus at some spot which it actually has to pass, and press the release button when the subject is reaching the pre-focused point.

With subjects liable to react self-consciously (e.g. children) set the lens to a suitable distance, and then approach the subject, exposing as soon as the image appears sharp.

Alternatively, focus at some object which is at the same distance from the camera as the subject, but in a different direction. When you have found the range swing round to press the release button as soon as the victim slips into the field of view of the finder.

Pre-Viewing the Depth of Field

You can examine the precise depth of field you get with the pre-selected aperture on some of the latest lenses with automatic diaphragm before taking the picture. Press down the depth of field preview key on the base of the lens mount of the automatic pre-set aperture lenses, and the aperture closes to the selected opening. The image will of course become darker but you can see the extent of sharpness to the foreground and the background from the subject you have focused on. On Prakticamat the iris diaphragm can be closed down to the chosen value for previewing also on lenses not equipped with this device simply by pressing the meter switch-on button. See also "Aperture and Depth of Field", page 56.

Infra Red Film Indicator

When infra red film is used, focus in the ordinary way. Then read off the distance on the lens mount scale and turn

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Infra Red Film Indicator

When infra red film is used, focus in the ordinary way. Then read off the distance on the lens mount scale and turn

this to the red dot engraved on the distance scale somewhat to the right of the distance marker. For example, if the focusing scale points to 30 ft., turn the focusing ring so that the 30 ft. mark comes to lie opposite the red dot.

Film Plane Indicator

If extremely critical focusing with a tape measure is necessary (not required for general photography) you can measure the distance from the subject to the film plane, which is indicated by a line through a circle \ominus engraved on top of the camera body of the Prakticamat beside the pentaprism.

On all other models measure from 3 mm. inside the rear edge of the top plate of the camera.

Shooting ■

Practise the following operations first with an empty camera until you can do them practically automatically.

- 1. Work the film transport.** This advances the film and film counter and tensions the shutter ready for the next exposure.
- 2. Set the exposure.** Adjust the shutter for the right amount of light for the subject conditions (p. 49).
- 3. Select the aperture,** smaller aperture for greater depth of field (p. 56).
- 4. Focus** and determine the picture area to obtain a sharp picture and the view you want.
- 5. Release the shutter** gently.

LOADING AND UNLOADING

The Praktica uses standard perforated cine film, 35 mm. wide, as used in the majority of other 35 mm. miniature cameras. It is available in various packings (see also p. 23), the most convenient being standard daylight cassettes. These are light-tight containers with a ready cut and trimmed length of film for 36 to 20 exposures and are loaded into the camera in daylight.

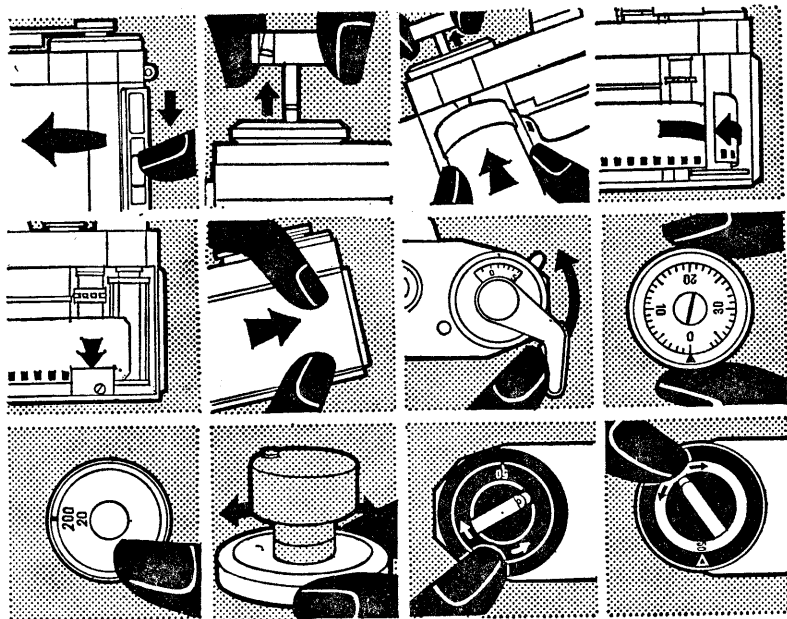
Avoid loading or unloading the camera in brilliant sunlight, though; choose a shady spot or do it in the shadow of your own body if nothing better is available.

Loading

- 1. Open the camera back** by pulling down the sliding catch at the side of the camera body.
- 2. Pull up the rewind knob** as far as it will go, then place a loaded film cassette into the empty film chamber (below the rewind knob) with its hollow part towards rewind key. The mouth of the cassette with the film end must point towards the take-up spool. Push the rewind knob fully back.
- 3. Attach the film leader to the take-up spool.** Hold the cassette in position with the left thumb, while pulling with the right hand 4 to 4½ in. (10 to 11 cm.) of film from it. Push the free end of the film into the slot in the take-up spool of the camera. The take-up spool can be turned on its axis to bring a slot into the most convenient position for inserting the film. Turn the flange of the take-up spool in a clockwise direction (as the film is wound inside out on the take-up spool) until the film slack is taken up. Before closing the camera back, make sure that the perforations of the film engage in the teeth of the film transport sprockets.

With quick-load take-up spool (Nova I and Super TL), push the beginning of the film underneath the support piece and over the transport sprockets so that the film

LOADING



Top, left to right: Open the camera back (1, All Praktica except L range. 2, Opening back of L range); pull up the rewind knob, insert the cassette and push the rewind knob back; attach film to take-up spool, so that it winds emulsion out on all models since Praktica IV. Models from Nova I onward have quick-load take-up spools.

Middle, left to right: On models since Nova I insert film leader under guide below take-up spool; close camera back; transport film twice; set film counter on models before Praktica Nova.

Bottom: Set film speed on models with built-in exposure meter.

rests on the core of the take-up spool (wire bracket must *not* stand upwards) as far as the green marking point.

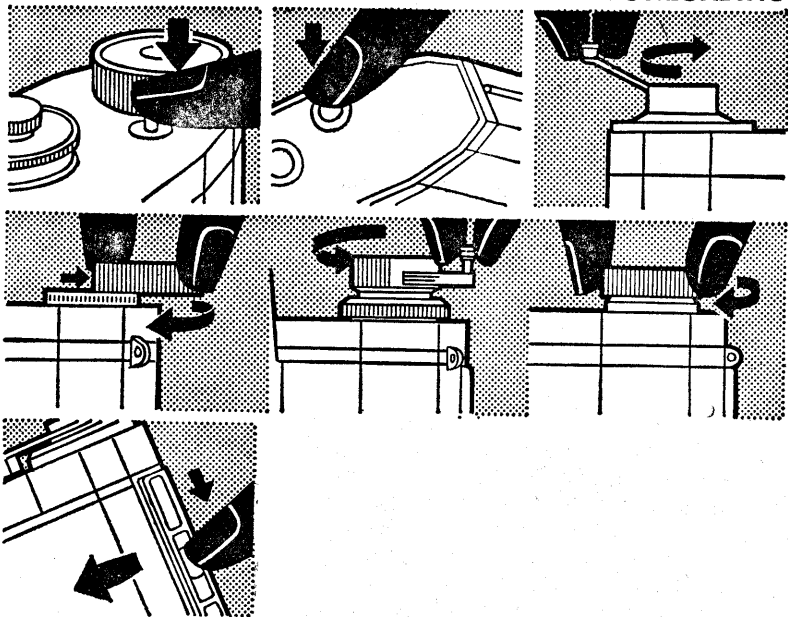
4. **Close the camera back** by pressing the hinged back on to the body; the locking latch will automatically engage to secure it in this position.
5. **Wind on the film and release the shutter twice.** This advances the first two frames which have been exposed to the light while inserting the film into the camera. These two wasted leader frames do not count as part of the number of exposures on the film.
6. **Set the film counter** (on earlier models) by turning the disc in the direction of the engraved arrow until the pointer shows to O. Now wind the transport once more and the first film frame is ready.

The exposure counter of the latest Praktica models is self setting and will automatically point to No. 1 after having made the two blind exposures and cocked for the first exposure.

When inserting the film, check it is properly loaded by observing the rewind knob (at the opposite end of the camera to the transport). When you advance the film, the rewind knob should turn in an anti-clockwise direction. This proves that the film is being pulled out of the cassette on to the take-up spool. In the case of films shorter than 36 exposures, it is advisable to take up the possible film slack in the cassette by first turning the rewind knob in a clockwise direction until a resistance is felt.

7. **Set film type reminder** on the disc set into camera transport lever. The symbols stand for black and white film, colour transparency film (daylight and artificial light types) and colour negative film (daylight and artificial light types).
8. **Set film speed** on models with built-in exposure meter by turning the appropriate speed of the film in ASA or DIN opposite the indicator. On the Praktica Nova the speed is set against one of the numerals 36, 20 or 12 to indicate at the same time the length of film inserted.

UNLOADING



Top, left: Depress rewind button on camera top plate on all models except Prakticamat.
Top, centre: On L models and Prakticamat depress rewind button in camera base plate. *Top, right:* On Prakticamat, Praktica Nova, fold over rewind crank and rewind film.

Middle row: Rewind arrangements on Praktica IV and V (*left*), VB (*centre*), and earlier models (*right*).

Bottom: Open camera back and remove cassette. *Left:* All Praktica models.

Unloading

After all exposures have been made (the number of the exposures taken is automatically shown on the film counter disc), unload the camera.

1. **Set for rewinding.** Depress reversing button in top plate of camera and, on Praktica FX3 and earlier models, keep it depressed while rewinding.
2. **Rewind the film.** Rewind the film into its original cassette by turning the rewind knob clockwise. Later models have a fold-out crank to facilitate rewinding. Winding becomes distinctly easier the moment the film is fully wound back.
3. **Open the camera back** (see Loading No. 1), remove the cassette, then close the camera back (Loading, No. 4) or reload with a new film.

Cutting off Exposed Lengths

If a film which is only partly exposed has to be processed, set the shutter for the next exposure and in the darkroom or in complete darkness cut off with a pair of scissors the frame which lies in the film aperture. Retrim the remainder of the film (see p. 24), fix it again on the take-up spool, and close the camera.

It is ready for the next exposure once the film counter has been set three numbers forward (the amount of film lost through cutting and re-loading). This cannot be done with the self-zeroing counter on the latest models. A note has to be made of the number of exposures remaining.

The re-inserting can be done in daylight. In this case a total of about 6 frames are lost, for, after inserting and closing, two blind exposures have to be made.

Some makes of colour film which are returned to the manufacturers for processing are for technical reasons only accepted in their full length and should, therefore, not be cut.

Changing Partly-exposed Films

To replace a partly-exposed film by another one, for

instance if you want to take a few colour photographs in between some black-and-white shots, proceed as follows:

1. **Check the number of exposed frames** on the film counter.
2. **Rewind the film** but stop immediately you feel a slight resistance. This resistance comes from pulling the film end from the take-up spool. If the film is to be reloaded again, you must not pull the whole film into the cassette, otherwise the film end would have to be extracted by opening the cassette in the darkroom.
3. **Unload the re-wound film** and note the number of exposures taken on the beginning of the film. Now you can load the camera with any other type of film.

When reloading, load the partly exposed film in the usual way (p.18.), cover the lens with a lens cap (or hold some opaque material against the lens) and, where possible as additional precaution stop fully down.

Wind and release until the film counter has advanced by the number of frames already exposed. To be on the safe side it is advisable to allow one more frame to pass.

The rest of the film can now be exposed in the usual way.

Film Packings for the Praktica

Black-and-white 35 mm. film is also available in various loose packings for loading into cassettes. This is a cheaper way of using film as you do not have to buy a new cassette every time with the film. The following packings are available.

DARKROOM REFILLS are lengths cut and trimmed for 36 exposures and have to be loaded into a cassette in total darkness (e.g. in a darkroom, a really well darkened room or a light-tight changing bag).

BULK FILM is supplied in lengths of 18 to 200 ft., and is the most economical way of using film. A suitable length is cut off to be loaded into a cassette in total darkness. Working in total darkness for loading darkroom refills or bulk film is not difficult. It is, however, advisable to practise filling with a dummy film first in daylight before starting the darkroom work.

Handling, Winding and Trimming the Film

When handling the actual film, particular care must be taken not to touch its emulsion (matt) side. Always handle it and wind on to the centre spool of the cassette by holding the film by either side of its edge, preferably between thumb and index finger. At the same time, it is of no less importance that the spot on which the loading is done should be perfectly dry, clean and dust free.

When using bulk film in loading cassettes, the edge of the workbench can be marked with notches or drawing-pins to indicate various

distances, let us say for 12, 24, 36 exposures of film. This considerably simplifies the measuring of film lengths in the darkroom.

The film ends need trimming. At the beginning of the roll of film make either a straight or wedge-shaped cut for the centre spool of the cassette and measure off the required length of film (see table below). At the end of this make the curved cut for the take-up spool. The curved cut should start between the fifth and sixth bottom perforation—when emulsion is towards you—and must not go through a perforation hole.

LENGTH OF FILM REQUIRED FOR ANY NUMBER OF EXPOSURES

Number of Exposures	Length of Film Required		Number of Exposures	Length of Film Required		Number of Exposures	Length of Film Required	
	in.	cm.		in.	cm.		in.	cm.
1	11 $\frac{3}{8}$	30	14	31 $\frac{3}{8}$	80	27	51	130
2	13 $\frac{1}{8}$	34	15	33	84	28	52 $\frac{1}{2}$	133
3	15	38	16	34 $\frac{1}{2}$	88	29	54	137
4	16 $\frac{1}{2}$	41	17	36 $\frac{1}{2}$	92	30	55 $\frac{1}{2}$	141
5	17 $\frac{3}{4}$	45	18	37 $\frac{3}{4}$	96	31	57	145
6	19 $\frac{1}{4}$	49	19	39 $\frac{1}{2}$	100	32	58 $\frac{1}{2}$	148
7	20 $\frac{3}{4}$	53	20	40 $\frac{1}{2}$	103	33	60	152
8	22	56	21	42	107	34	61 $\frac{1}{2}$	156
9	23 $\frac{1}{2}$	60	22	43 $\frac{3}{4}$	111	35	63	160
10	25 $\frac{1}{2}$	64	23	45	114	36	64 $\frac{1}{2}$	164
11	26 $\frac{3}{4}$	68	24	46 $\frac{1}{2}$	118	37	66	167
12	28 $\frac{1}{2}$	72	25	48	122	38	67 $\frac{1}{2}$	171
13	30	76	26	49 $\frac{1}{2}$	126	Including trimming		

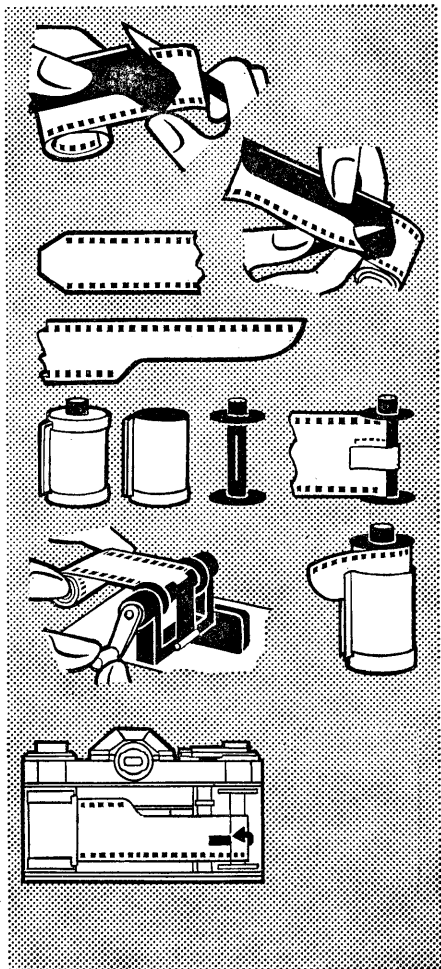
The ready-cut film is now spooled on the centre spool of the cartridge or cassette. While winding on, hold the film only by its edges.

Also, take care not to press too hard on the film, and don't squeeze the film-ends when drawing through the hand. Failure to take the first precaution may result in fogging, while neglect of the latter precaution may give rise to peculiar kinds of exposure effects known as "lightning flashes". These are due to electrical discharges, and appear as dark, zigzag lines running from the edge of the film towards the centre of the picture.

Loading Standard Cassettes

The majority of cassettes consist of a centre spool which is in a shell with top and bottom cover. The film leaves the shell by a light-trapped slot. The centre spool can be removed from the shell by removing either top or bottom of the cassette, according to the construction of the particular container.

TRIMMING AND WINDING FILMS



Top: The standard trims of film end and leader with trimming template. The full trim need not be made for the Praktica. A small trim of the leader is, however, necessary to enable it to be inserted in the take-up spool.

Centre: The parts of the film cassette and a recommended method of attaching the end of the film to the spool before winding the film on either by hand or with a mechanical winder. The film is inserted into the cassette with the leader protruding.

Most cassettes are actually intended by their makers to be used once only, and with the film originally supplied in it. However, provided they are reasonably robustly made, and the light-trapping velvet slot is in good condition, these cassettes *can* be reloaded many times, and will give perfectly satisfactory results—*if handled carefully*.

Loading with Bulk Film or Darkroom Refills

Work in total darkness and prepare the film as described (p. 24).

- 1. Open the cassette.**
- 2. Fix the film to the centre spool.** If the centre spool is fitted with a film catch, thread the tapered end of the film into it. In cases where the centre spool is fitted with a spring, thread the end under it and fold it sharply back. If the centre spool is without any suitable fitting to hold the film, it has been proved best to wind a $1\frac{1}{2}$ in. (4 cm.) piece of cellulose tape round the centre spool, so that on either side about $\frac{1}{2}$ in. tape is used to secure the film.
- 3. Wind the film on the centre spool.**
- 4. Insert the centre spool into shell,** leaving the first 2 in. of film protruding through the light-trap.
- 5. Close the cassette.** Where top and bottom are originally fastened by the outside label, fix the top and bottom cover to the shell, preferably with a length of cellulose tape.

THE PRAKTICA, MODEL BY MODEL

The following pages deal with the individual Praktica models in detail.

Self-contained sections for each model cover points of loading, unloading, shooting and specific controls.

For a fuller explanation of aspects common to all Praktica cameras, compare these sections with the same headings in the main text.

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THE PRAKTICAMAT AND PRAKTICA SUPER TL

These have all the features as described on pages 4 and 6.

The shutter has a speed range from 1 sec. to 1/1000 sec. (Super TL, 1/500) and B in geometrical progression (i.e. 1/30, 1/60, 1/125 sec.). On Prakticamat the speeds are set on a disc surrounding the rewind knob. On Super TL the speeds are set on the shutter speed knob. The Prakticamat and Super TL shutters are XF flash synchronized.

All models have an eye-level pentaprism with built-in split-image rangefinder (microprism in Super TL) surrounded by a focusing screen (microgrid) circle. A fresnel lens combined with an additional image field lens ensures an even light distribution of the brilliant reflex image which appears almost normal size. The exposure meter needle is seen in the finder (see below) also a warning signal, indicating when the film has not been transported.

The reflex mirror is of the instant-return type and permits constant viewing before and after exposure. The viewing image is only blacked out for an instant during the actual exposure.

The film transport is by quick wind lever, rewinding by swing-out re-wind crank. The rewind button remains depressed during rewinding and returns to the locking position when the shutter release is operated. The exposure counter is self-setting.

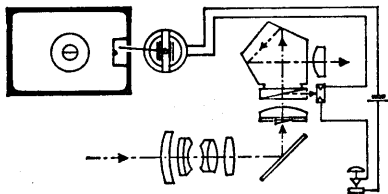
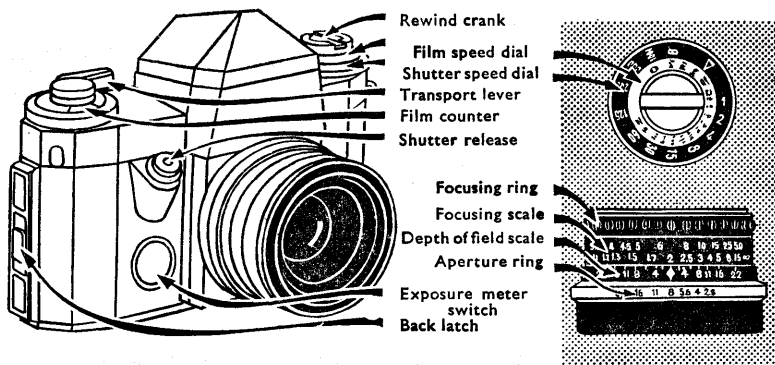
The camera body has a hinged-on back and a built-in release mechanism for use of automatic diaphragm lenses. The shutter release is fitted obliquely on the front of the camera body and can be locked against accidental release. The film runs from the cassette under the take-up spool and winds emulsion outwards. The TL has a quick load take-up spool.

The outstanding feature of these models is the built-in through the lens CdS metering system, which in case of Prakticamat covers the whole viewing field and on TL has centre of image emphasis. The reading is correct whether a wide angle, normal or telephoto lens is used, and even when a filter, extension tubes, extension bellows or the photo-micrographic attachment is employed. The film speed is adjustable from 6 to 3200 ASA (1600 ASA on TL). The stop down metering is coupled to both aperture and shutter speeds; either can be pre-set for exposure measuring by turning a needle visible in the viewfinder to a fixed position.

THE STANDARD LENSES for these models are the

Oreston 50 mm. *f* 1.8,
Pancolor 50 mm. *f* 2,
Tessar 50 mm. *f* 2.8,
Domiplan 50 mm. *f* 2.8

PRAKTICAMAT AND PRAKTICA SUPER TL



The Prakticamat and Praktica Super TL have through-the-lens exposure meter systems illustrated diagrammatically above. The exposure meter switch is on the front of the camera. Film transport is by lever wind and the rewind knob has a fold-out crank. The shutter release is angled and the flash contacts (not shown) are on the camera front opposite the meter switch. The camera back is hinged on and is secured by a back latch at the side of the camera.



Shooting with the Prakticamat and Praktica Super TL. Left to right: Transport film and tension shutter with the rapid wind lever; set shutter; focus image on screen, switch on meter and pre-select correct aperture by lining up meter needle; press shutter release smoothly and gently. Alternatively, set aperture first and turn shutter speed dial until meter needle is lined up.

INTERCHANGEABLE LENSES from 20 to 1,000 mm. are available see page 62.

OTHER ACCESSORIES include extension tubes and extension bellows for close up work, angle viewfinder, focusing magnifier, accessory clip, photomicrography attachment, copying stand, lens hood, filters.

Loading (see page 18)

1. Open camera back.
2. Insert film.
3. Attach film leader to the take up spool.
4. Close camera back.
5. Wind on film and release the shutter twice.
6. Set film type indicator.
7. Set film speed.

Unloading (see page 22)

1. Set for rewind.
2. Rewind film.
3. Open camera back.

Shooting

1. Transport film if the red warning signal on left hand side near the top in the viewfinder is visible. If not, that indicates the film has been wound on.
2. Pre-set the shutter speed required by rotating the speed dial until the required shutter speed (engraved figures represent fractions of seconds—i.e. $4=1/4$, $8=1/8$, $15=1/15$, $30=1/30$. . . $500=1/500$, $1000=1/1000$ sec.) is opposite the triangular mark of the top plate of the camera body. See page 49.
3. Select aperture by light measuring. Depress the switch-on key and turn lens aperture ring until the meter needle in the right hand side of the viewfinder points to the index line. Release the switch key (see p. 56).

The procedure 2, 3 can be changed if it is required to pre-set the aperture. In this case the shutter speed ring is turned to bring needle to point to the index line in the viewfinder. When using lenses without automatic aperture control see "Using meter without automatic diaphragm lenses", on page 31.

If the needle will not centre this could mean that insufficient light (needle below mark) or too much light (needle above mark) is available for correct exposure with the selected pre-set speed (or aperture) which has to be adjusted accordingly.

Should the needle refuse to move altogether, test battery, see "Testing and exchanging battery" below.

In strong side light it is feasible that false light falls through the eyepiece on to the meter causing incorrect reading. To avoid this on Prakticamat and STL a black plastic conical cap with small rectangular aperture is provided with the camera to push into the eyepiece.

4. Focus and determine picture area. See also "Viewing and Focusing", page 12.
5. Release the shutter gently.

Special Controls

FOR TIME EXPOSURES set the speed ring to B. The shutter will stay open as long as the release is kept pressed down. A cable release screws into the centre of the release button.

RELEASE LOCK. The shutter release can be locked against accidental depressing by turning the milled top of the release button until its red dot is opposite the red dot on the base of the release tube.

FLASH. The Prakticamat and Super TL have two flash contacts F, X in the camera front plate.

Using Camera and Meter without Automatic Diaphragm Lenses

When using lenses without automatic diaphragm control on the Prakticamat only, the automatic mechanism in the camera has to be disconnected. After removing the lens lift up the instant return mirror carefully by its frame. Do NOT touch the mirror surface itself. Slide the protruding knob inside the base of the camera body with a red dot in its centre to the right as far as it will go and let the mirror swing back.

To bring the automatic mechanism back into action move the protruding knob to the left.

Should the mirror be pushed up too far while the shutter is cocked it will stay up and one has to release the shutter to get it into position again—losing a film frame in the process.

Some older lenses not designed specifically for this camera do not permit depressing the meter switch-on key at all. In this case depress the shutter release—as deep as it goes freely—to first pressure point and take the meter reading in this position.

Testing and Changing Battery

These Praktica models use a type PX625 Mallory button battery cell, the average life of which in the camera is two years.

To replace battery, unscrew the cover plate in the bottom plate of the camera, remove old battery and replace by new one with the + sign towards the screw cover which should be replaced tightly.

THE PRAKTIKA NOVA, PRAKTIKA V AND IV SERIES

These models have the features as described on pages 4 and 6. The shutter has a speed range from $\frac{1}{2}$ sec. to 1/500 sec. and B. It is XF flash synchronized. An eye level pentaprism is built in. The film transport is by quick-wind lever and by transport knob. The rewind is by crank action, the rewind button remaining depressed during rewinding. An actuating mechanism for use of automatic diaphragm lenses is built into the camera body. The film winds itself inside out on to the take-up spool.

Praktika IV has in its pentaprism a condenser screen for even light distribution. The camera back is removable.

Praktika IVB is a Praktika IV but has a built-in uncoupled exposure meter.

Praktika IVM is a Praktika IV but has a split image rangefinder built into the finder.

Praktika IVBM is a Praktika IVB with a split image rangefinder into the finder.

Praktika IVF is a Praktika IV with a fresnel screen and split image rangefinder in place of the condenser screen.

Praktika IVFB is a Praktika IVF with built-in uncoupled exposure meter.

Praktika VF has its shutter speeds geometrically arranged. The eye level pentaprism viewfinder is equipped with fresnel screen with split image rangefinder. It also has an instant return mirror which permits constant viewing before and after the exposure. The finder image is only blacked out for an instant during the actual exposure. The camera back is detachable.

Praktika VFB is a Praktika VF with built-in uncoupled exposure meter.

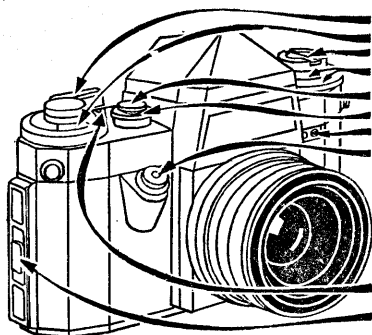
Praktika Nova is a more streamlined-body version of the Praktika V. The transport knob has been omitted and an improved quick wind lever is situated on the camera top. The rewind knob has an improved fold-out crank. The exposure counter is self setting. The camera back is hinged on. The shutter release has been arranged oblique on the camera front and is fitted with a locking device against accidental exposure.

Praktika Nova B is a Praktika Nova with built-in uncoupled exposure meter.

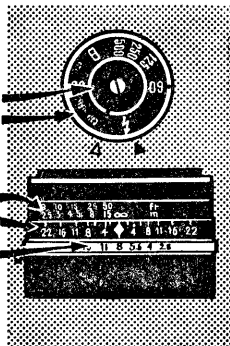
Praktika Nova I is a Praktika Nova, with shutter speeds from 1 to 1/500 sec. (including 1/15 sec.) on a single dial, quick-load take-up spool and improved styling.

Praktika Nova IB is a Praktika Nova B with the addition of Praktika Nova I features.

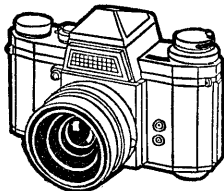
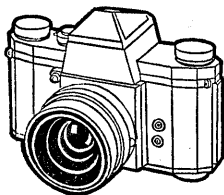
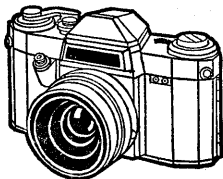
PRAKTICA NOVA, PRAKTICA V, IV



Transport lever
Film counter
Rewind crank
Film speed indicator
Slow speed setting
Shutter speed dial
Flash contacts
Shutter release

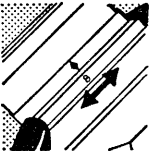
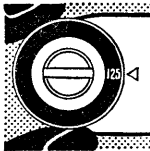
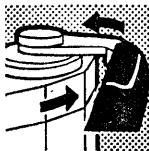


Focusing scale
Depth of field scale
Aperture ring
Rewind button
Back latch



The Praktica Nova has its *transport lever* on top instead of in the base plate as on the Praktica IV and V. It has a fold-out *rewind crank* and angled *shutter release*. The *flash contacts* are on the camera front. The *shutter speed dial* bears the modern standard speed figures, with the exception of 1/15 sec. The back is hinged on. In the earlier models it was removable.

The larger illustration above is of the Praktica Nova. The smaller illustrations (left to right) are of the Praktica Nova B, Praktica VF, (and IV, IVM, IVF) and Praktica VFB (and IVBM, IVFB).



Shooting with the Praktica Nova. From left to right: Transport film and tension shutter with the rapid wind lever; set the shutter speed; focus the image on the screen; pre-select the aperture; press the shutter release smoothly and gently.

THE STANDARD LENSES for the Praktica Nova, Praktica V, IV are

Oreston 50 mm. *f*1.8

Tessar 50 mm. *f*2.8

Domiplan 50 mm. *f*2.8

for the LLC and VLC

the Pentacon (electric) 50 mm. *f*1.8

INTERCHANGEABLE LENSES from 20 to 1000 mm. are available (see p. 64).

OTHER ACCESSORIES include extension tubes and extension bellows for close up work, angle finder, focusing magnifier, accessory clip, photomicrography attachment, copying stand, lens hood, filters.

Loading (see page 18)

1. Open camera back.
2. Insert film.
3. Attach film leader to the take-up spool.
4. Close camera back.
5. Wind on film and release the shutter twice.
6. Set the film counter. (This is not required on the Praktica Nova models which have self-zeroing counters.)
7. Set film type indicator.
8. Set film speed on models B (with built-in exposure meter). See "Handling the built-in exposure meter" on page 36.

Unloading (see page 22)

1. Set for rewind.
2. Rewind film.
3. Open camera back.

Shooting

1. Transport the film.
2. Set the shutter speed knob until the speed required points to the orange triangle on the camera top plate. On all other models lift the outer ring on the shutter speed dial until the red mark points to the required shutter speed. The outer ring will spring back on letting it go. The speed figures engraved represent fractions of seconds, e.g. 30=1/30, 60=1/60 sec. etc. (25=1/25, 50=1/50 sec.). The black figures (on Prakticanova=white figures) 30 (25) to 500, indicate instantaneous speeds while the red figures 2= $\frac{1}{2}$ to 8=1/8 sec. represent slow speed figures.

The mark on the centre disc of the speed dial has to be set opposite the red or black (Praktica Nova=white) triangle on camera top plate behind the shutter speed dial according to the shutter speed range one wants to select from. The speed can be set before or

after the shutter has been transported. On Praktica Nova I and IB, turn shutter speed dial until engraved speed figure points to red triangle on camera body.

The \neq flash symbol between the shutter speeds is required for use of electronic flash (see p. 60).

3. Focus the image on the reflex screen or with the central focusing aid (not on models IV, IVB). See also "Viewing and Focusing" on page 12.
4. Select aperture with the aid of either the built-in meter (where applicable, see below "Handling the built-in exposure meter") or a separate exposure meter or exposure table (see p. 49).
5. Release the shutter gently.

Special Controls

FOR TIME EXPOSURES set the speed ring to B. The shutter will stay open as long as the release is being kept pressed down. A cable release screws into the centre of the release button.

RELEASE LOCK. Praktica Nova models have a release which can be locked against accidental depression by turning the milled top of the release button with its red dot opposite the red dot on the base of the release tube.

Using Camera without Automatic Diaphragm Lenses

When using lenses without automatic diaphragm control, the automatic mechanism in the camera has to be disconnected. On Praktica Nova and Praktica V (after removing the lens) lift up the instant return mirror carefully by its frame. Do NOT touch the mirror surface itself. Slide the protruding knob inside the base of the camera body with a red dot in its centre to the right as far as it will go and let the mirror swing back.

To bring the automatic mechanism back into action move the protruding knob to the left.

Should the mirror be pushed up too far while the shutter is cocked it will stay up and one has to release the shutter to get it into position again—losing a film frame in the process.

On Praktica IV series disengage automatic mechanism as described above, while the mirror is up, that is, after the shutter has been released.

Handling the Built-in Exposure Meter of the Nova and Earlier Models

The Praktica Nova B and IB, Praktica VFB, IVFB, IVBM and IVB have built-in exposure meters.

Handling is as follows:

1. **Set film speed** on Nova B by turning the disc around the rewind knob until the speed of the film used (in ASA or DIN) appears in the window of the disc. On models VFB, IVFB, IVBM and IVB pull up the rewind knob fully, turn the disc with the aperture values engraved on it, to bring the marker of the window to point to the speed of the film (in ASA or DIN) used. Push the rewind knob back again.
2. **Point camera to object.** See also page 38.
3. **Turn meter setting ring** to match the follow pointer with the needle position in the light meter window.
4. **Read off the correct aperture** opposite the shutter speed value you want to use (see p. 49 Exposure) and transfer both to the camera. In practice one will pre-set the required shutter speed, read off the corresponding aperture and transfer this to the lens.

On Praktica VFB, IVFB, IVBM and IVB the red and black numbers correspond to the red and black figures on the shutter speed scale while the blue numerals on the dial represent full seconds which have to be used with B setting.

THE PRAKTIKA FX2, 3, F·X2, PRAKTIKA AND PRAKTIFLEX

Note: In some countries the Praktika FX was supplied under the name of Praktiflex FX.

These models have the basic features as described on pages 4 and 5. In place of the eye level pentaprism finder they are fitted with a chest-level reflex finder with folding light hood and built-in magnifier also incorporating an eye level frame finder for direct vision of the subject. The reflex finder is equipped with a condenser screen for even light distribution and magnified image, except original Praktiflex which has a ground glass screen.

The shutter speeds range from $\frac{1}{2}$ sec. to 1/500 sec. (original Praktiflex from 1/25 sec.) and B. The film transport is by a transport knob and rewinding by a rewind knob. The camera back is detachable. The film winds itself over the take-up spool.

The original Praktiflex has a smaller diameter lens screw thread (40 mm.) and does not accept the Praktika lenses or attachments made for the Praktika cameras and screwing into the lens mount.

Praktika FX is, in addition, flash synchronized. Originally it had three non-standard contacts, one X without built-in delay, the second one F with a delay of 10 ms. before commencement of running down of the shutter, the third acted as earthing pin. This was followed on later models with two non-standard contacts for X synchronization only. Finally, the last FX models were fitted with the by then introduced standard, the 3 mm. co-axial plug for X synchronization only.

Praktika FX2, FX3, F·X2 have, in addition, an actuating mechanism for use of automatic diaphragm lenses. The flash synchronization consists of two non-standard contacts—F and X as described above for Praktika FX. The last version indicated by a dot between F and X=F·X2 has two standard contacts and is FX synchronized. The F synchronization has a delay of 10 ms. before complete opening of the film field.

Praktika FX3 is a model FX2 characterized by being fitted with an automatic diaphragm lens.

THE STANDARD LENSES for original Praktiflex and Praktika FX were fitted with normal or pre-set diaphragm lenses. FX2 models could be supplied with semi automatic or fully automatic diaphragm lenses. The standard lenses are:

Zeiss Biotar 58 mm. *f*2
Zeiss Tessar 50 mm. *f*2.8
Zeiss Tessar 50 mm. *f*3.5
Meyer Primoplan 58 mm. *f*1.9
Meyer Primotar 50 mm. *f*3.5
Meritar 50 mm. *f*2.9

INTERCHANGEABLE LENSES from 20 to 1000 mm. are available, except for original Praktiflex.

OTHER ACCESSORIES include extension tubes and extension bellows for close up work, a pentaprism for eye level focusing and viewing (there are separate models for Praktica and Praktica FX series), photomicrography attachment, copying stand, lens hood and filters.

Loading (see page 18)

1. Open camera back.
2. Insert film.
3. Attach film leader to the take-up spool.
4. Close camera back.
5. Wind on film and release the shutter twice.
6. Set film counter.

Unloading (see page 22)

1. Set for rewind by depressing the small stud beside the film transport knob and keep it depressed while rewinding.
2. Rewind film.
3. Open camera back.

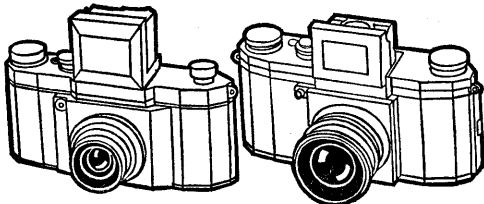
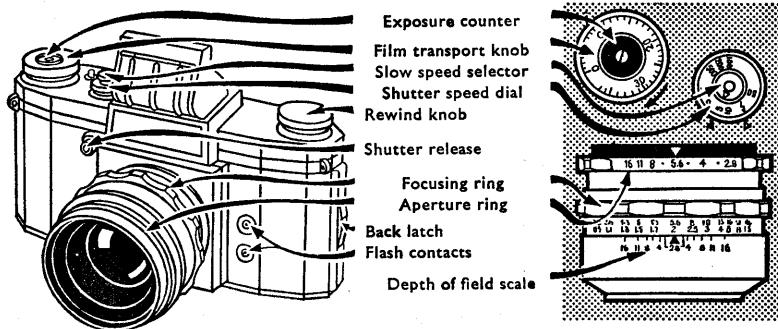
Shooting

1. Transport the film.
2. Set the shutter speed by lifting the outer ring on the shutter speed dial until the red mark points to the required shutter speed. The outer ring will spring back on letting it go. The speed figures engraved represent fractions of seconds, e.g. 25=1/25, 50=1/50 sec. The black figures 25 to 500 indicate instantaneous speeds while the red figures 2= $\frac{1}{2}$, 10=1/10 sec. represent slow speed figures. The mark on the centre disc of the speed dial has to be set opposite the red or black triangle on camera top plate behind the shutter speed dial according to the shutter speed range one wants to select from. The speed can be set before or after the shutter has been transported. The $\frac{1}{4}$ flash symbol on FX2, 3 on the shutter speed disc represents 1/40 sec. setting. It is required for use of electronic flash (see p. 60).
3. Focus the image on the reflex screen (see p. 12).
4. Select aperture with the aid of an exposure meter or exposure table (see p. 49).
5. Release the shutter gently.

Special Controls

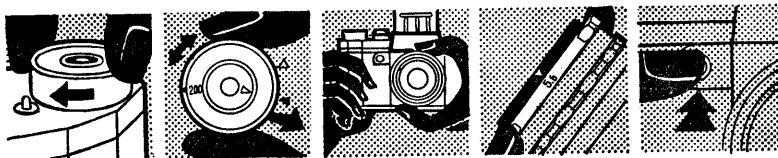
FOR TIME EXPOSURES set the speed ring to B. The shutter will stay open as long as the release is kept pressed down. A cable release screws into the centre of the release button.

PRAKTIFLEX, PRAKTICA, PRAKTICA FX, 2,3



The early Prakticas, except the Prakticaflex, had a *slow speed selector* on the *shutter speed dial*, a *rewind knob* with no crank and a *shutter release* close in to the back plate of the lens mount. *Flash contacts* were in the base on some early models but were later moved to the camera front. The back was completely removable and was fastened by a *back latch*.

The larger illustration is of the Praktica FX2. Below are the Prakticaflex (left) and the first Praktica model (right).



Shooting with the earlier Praktica models. *From left to right*: Transport film and tension shutter; set shutter speed; focus picture on reflex screen; select aperture; press shutter release smoothly and gently.

Using Praktica FX2, FX3 with Lenses having no Automatic Diaphragm Control

When using lenses without automatic diaphragm control, the automatic mechanism in the camera has to be disconnected. After removing the lens and while the shutter is released and the mirror therefore up against the reflex screen, slide the protruding knob inside the base of the camera body with a red dot in its centre to the right as far as it will go. This disengages the diaphragm release mechanism.

To bring the automatic mechanism back into action, move the protruding knob to the left.

FILMS AND FILTERS

There are two kinds of films available for the Praktica camera: black-and-white and colour.

Black-and-White Film

This produces a negative on which the colours and brightness range of the subject are translated into black and white. From it, prints or enlargements on paper or black-and-white transparencies can be made.

The black-and-white film used normally is panchromatic, that means that it is sensitive to all colours. There is a choice of several types differing mainly in sensitivity as well as certain other characteristics.

SLOW FILMS are of low sensitivity requiring comparatively great exposure. Their main advantage is the extremely fine grain, permitting a high degree of enlargement without its granular structure becoming unpleasantly visible. Such films also yield images of the greatest sharpness. On the other hand, these slow films are not very suitable for coping with fast movement in other than exceptionally good lighting, nor for general work in poor light. Such films are rated at 40–80 ASA or 17–20 DIN.

MEDIUM SPEED FILMS still yield a reasonably fine grain with good gradation. They are the most suitable material for all-round photography, other than in poor light. These films are rated at 80–160 ASA or 20–23 DIN.

FAST FILMS with somewhat coarser grain (still acceptable for reasonable degrees of enlargement) will cope with most light conditions including poor light and interiors in favourable conditions. This is the right film for the photographer who wants to be prepared for the unusual, to arrest fast movement with high shutter speeds, as well as shots in poor light. The ratings are 200–400 ASA or 24–27 DIN.

ULTRA FAST FILMS are primarily intended for high-speed sports shots in dull weather, interior snapshots in poor light, night photography and ill-lit stage pictures. These films are specialist types for conditions where normal

materials are totally inadequate. They should not be used for general photography.

The high speed is achieved at some cost in definition and graininess. Speed ratings range from 500-1600 ASA or 28-33 DIN.

The ASA and DIN figures mean nothing in themselves. They are simply a convenient expression of the relative sensitivities of various films. They do not give an absolute value of sensitivity and are usually described by the film manufacturers as "recommended meter settings". If you use your meter in the normal way and process the film according to the manufacturer's instructions, you will obtain correctly exposed results from a normal subject by using his film speed figure.

It naturally follows that you can use a different figure for subjects that are strongly backlit or contain an uneven tonal distribution. Or you may prefer a denser or less dense negative, which you can obtain by adjusting either the development time, or the film speed rating. Yet again, you may use a different developer or processing technique, which may also affect the recommended meter setting.

The manufacturer's figure is simply a guide. You do not have to follow it slavishly.

There is a wide range of different makes of films in all speeds on the market. Their characteristics, apart from speed, vary slightly from make to make. It is safe to say that all well-known brands are reliable and good. The best film is the one you are used to.

Professional photographers and advanced amateurs may find one or the other characteristics of a particular make, i.e. its gradation, granular structure, acutance, etc., of particular value for specific jobs.

Colour Film

These films produce an image in colour after appropriate processing, corresponding directly or indirectly to the natural colours of the subject.

Colour film is as easy to use as black-and-white film, but needs a little more care in exposure.

Processing is more complex and is often carried out by the film maker or specially appointed processing laboratories.

There are two basic types of colour film: reversal and negative.

Colour Reversal Film

This produces a colour transparency on the actual film exposed in the camera. This transparency, when held up to the light, shows a positive image with all parts of the subject in their original colours. It can be viewed in a suitable transparency viewer with a magnifier, or it can be projected in a slide projector to give a large and brilliant picture on a screen. The film is also known as colour slide film.

Although the colour transparency is an end product, it can still be used to make:

- (a) duplicate positive colour transparencies;
- (b) a black-and-white negative which can then be used to produce black-and-white prints or enlargements;
- (c) a colour negative for making colour prints and enlargements, as from colour negative film (described below);
- (d) direct colour enlargements on colour reversal paper.

For correct colour rendering, colour reversal films have to be carefully matched to the light by which they are to be exposed. Accordingly, some makes are available in the following types:

- (a) daylight colour film, which will give correct colour reproduction in daylight, with blue-tinted flash bulbs and with electronic flash.
- (b) artificial light type colour film, which will give correct rendering by photoflood illumination, or high-power tungsten light.

Colour films made for one kind of light may be used under different light conditions with the aid of a conversion filter as recommended by the manufacturer.

Different makes of colour film may yield transparencies of a slightly different characteristic colour quality, colour

saturation and colour contrast. Which you prefer is very much a matter of personal taste, and you can only be recommended to try various makes to find the one which suits you best.

Colour Negative Film

On processing, this produces a colour negative which shows a negative image of the subject in its complementary colours, e.g. blue appears yellow, red appears blue-green and so on. These colours may sometimes be hidden under an overall orange or reddish tint.

The film is also known as colour print film.

The main purpose of the colour negative is the production of colour prints on paper. The quality is generally somewhat higher than that obtained from a positive transparency.

From the colour negatives you can make:

- (a) any number of colour prints in varying sizes,
- (b) direct black-and-white prints or enlargements, in the same way as from a black-and white negative,
- (c) positive colour transparencies for viewing or projection.

Most colour negative films are suitable for exposure by any type of light, e.g. daylight, flash or photofloods. The necessary adjustment of the colour rendering is carried out during the printing stage. Manufacturers sometimes recommend conversion filters even with colour negative films. These mainly serve to simplify the subsequent correction needed in printing.

Colour Film Speeds

The majority of colour films, reversal and negative, are rated between 25 and 80 ASA or 15 and 20 DIN, corresponding to a slow to medium speed for black-and-white material. A few films go up to 500 ASA or more for poor light conditions.

As with black-and-white films, the slower types tend to yield improved image detail, especially with negative colour film, while the fastest emulsions may show slightly reduced colour saturation and image sharpness.

The Choice of Colour Film

Making your choice between colour reversal or negative film (in spite of the various uses that can be made of either type of material) remains an individual question.

First, there is the way you want to see the result, as a colour print or as a colour transparency. The print has no doubt much to commend itself. It is easily shown, stored and carried about. The transparency calls for the aid of a viewer or projector.

Next, the all-in cost of a colour print is about three times that of the transparency. This may at times be mitigated by the fact that from unsuitable negatives no colour prints need or can be made. The transparency user, however, has additional outlay in the form of a viewer or projector with screen (in most cases both).

A final point to consider is the quality. The transparency will record each colour and its brilliance in full. Held to the light or projected on a screen, the brightness range, which may be 100 : 1, is fully or almost fully retained. It shows colours brilliant with great depth and realism. The colour print can at its best only reflect four-fifths of the light falling on it and even the darkest tones reflect about one-twentieth to one-tenth, so that the full range is no more than 16 : 1. While the colour print is, by necessity, duller than the transparency, it is only fair to say that the eye soon adjusts itself to the reduced brightness range, and subjects without great contrasts will be very satisfying.

From the point of view of convenience, reversal film has the advantage that it directly gives finished colour pictures of high quality and is still capable of producing colour prints as well. For the maximum versatility and control in print making, however, negative film is superior.

Filters for Black-and-White Film

By its nature, a black-and-white film can only translate colour values of the subject into tones of lighter or darker grey. Mostly these correspond fairly closely to the *brightness*

of the colours, but do not of course differentiate between them. In certain cases the difference between the brightness of two colours may be so slight, that both record in almost the same tone of grey.

There a filter helps by modifying the depth of one or the other colour, and so making it show up lighter or darker than it would normally.

The commonest example is the blue sky with white clouds in a landscape. The blue is so brilliant (and the film is often excessively sensitive to it), that the clouds do not show up against it. By putting a yellow filter in front of the camera lens we can subdue or "hold back" the blue, and so making it record darker in the final print.

We can even go further and over-emphasize the effect progressively with an orange or red filter; these darken the blue so much that the sky looks almost black for a really dramatic effect.

The same considerations hold for other filter effects. For instance, the film renders a red rose in the same tone of grey as the leaves of the rose bush. With the colour contrast gone, the rose disappears in its surroundings. A green filter makes the rose darker and the leaves lighter; conversely a red filter will show up the rose as light against dark foliage. Scientifically, both filters falsify the tone rendering, but produce a more acceptable pictorial result.

In all these cases a filter *lightens objects of its own colour, and darkens objects of its complementary colour*. Apart from isolated instances in pictorial photography, such contrast control is very valuable in copying and scientific work (e.g. photomicrography).

All filters cut out some part of the light and thus, as a compensation, an increase in exposure time is necessary when using them. This is stated on most filters in the form of a filter factor indicating by how much (e.g. 2 times, 3 times) the exposure must be increased with that filter. The factors are approximate for they depend not only on the nature of the filter but also on the exact colour sensitivity of the film and on the colour of the prevailing light. The

Praktica models with built-in TTL meter allow automatically for the factor of any filter placed over the lens.

Filters for Colour Film

The normal yellow, orange and other filters for black-and-white film must never be used with colour films, as they would give the colour picture a strong over-all colour tint.

In daylight and with daylight type film, only two filters are ever required. One is a haze filter, almost colourless but for a slight straw tinge. It is usefully employed on hazy days and in high altitudes to avoid excessive bluishness of the colour picture, especially with distant landscapes, seascapes and near water. This filter does not call for any change in exposure. On dull days, a skylight filter compensates for the excessive coldness of the colour rendering.

Either filter is also useful for colour photography with electronic flash, as it produces somewhat warmer tones.

CONVERSION FILTERS are used if a colour film balanced for one type of light should be used in another type of light. The film manufacturers give specific recommendations, generally in the instructions with the film.

The Polarizing Screen

There are times when the judicious use of reflections will enhance the pictorial effect of the picture, but they are also frequently obtrusive and undesirable. Thus highly-polished subjects are difficult to illuminate successfully so as to obtain a true photographic rendering, since they will reflect too much light and so spoil the reproduction with a glare which obscures the detail. This difficulty can be overcome by the use of the polarizing screen.

It has the special property of suppressing so-called "polarized" light. Light reflections from glass, china, enamel, polished wooden surfaces, water, are to a large extent polarized and can, therefore, be almost extinguished by placing the polarizing filter in the proper position over the lens. This screen will prove particularly useful when taking shop-windows, furniture, photography of wet objects, etc.,

when the shot can be taken at an angle of about 35 deg. to the plane of the subject containing the reflection. At other angles, reflections can be only partially reduced.

The filter must be rotated to find out its best position on the lens. The Praktica is ideal for this observation. The filter is simply held in front of the lens, and then by slowly rotating the filter one can find the best or desired result on the reflex-focusing screen, and push the filter on to the lens in the position selected. As the polarizing filter is slightly tinted, the exposure time should be increased, the factor being about three times.

The polarizing screen is in addition particularly useful in colour photography where it acts similarly to the yellow filter in black-and-white photography, i.e. it darkens a "milky" blue sky. The bluish colour cast obtained with diffused sky light is removed or at least appreciably reduced with the polarizing filter. The reduction or elimination of reflections through this filter is of course just as useful in colour pictures as it is in black-and-white.

EXPOSURE

Exposure means—to expose the film in your camera to light. The dose of light any film needs to produce the right sort of image depends on how sensitive that film is to light. A fast film is more sensitive than a slow film.

Once your choice of film is settled, the basic condition of exposure is settled with it. You are now left with the problem of scaling the light you find in front of your camera to the amount your film needs.

Your job is to judge the light reflected from the subject you are about to photograph. Your grandfather, as an amateur photographer, used to take into account his geographical position, the time of the year, the hour of the day, the state of the sky as well as the tone of the subject itself, and by so adding one thing to another size up the light reflected from the subject. The experienced professional, of course, hardly ever worked that way. He just had a look and he knew.

Today a light meter or exposure meter does the same for any photographer. It takes a look, it measures the light and it lets you know.

In fact, it does more than that. It translates the light measured straight into terms of photographic exposure. It does so by presenting you with the choice of aperture numbers and shutter speeds, sorting them out in pairs.

Aperture and Speed

The aperture number or *f*-stop controls the *amount of light* allowed to enter through the lens. These numbers run in a series: 1.4–2–2.8–4–5.6–8–11–16–22; each higher stop number lets through half the light of the next lower number (next larger stop).

The shutter speed controls the *length of time* for which the lens is kept open to light. Shutter speed figures represent fractions of a second: 2= $\frac{1}{2}$ second, 4= $\frac{1}{4}$ second . . . 500=1/500 second.

The actual exposure is a product of these two: “how

much" and "how long". A large amount of light striking the film for a short time may produce an image similar to that produced by a small amount of light striking the film for a long time. Hence the free choice from a series of balanced aperture-shutter combinations offered by your exposure meter: more or less open apertures paired with more or less quick shutter speeds and more or less stopped down apertures paired with more or less slow shutter speeds.

Choosing the Combination

Even though the built-in meter measures for you the correct exposure you still have one decision to face: which aperture-shutter combination to choose for any given shot. Paradoxically enough they all are right and yet one is better than the other.

Why should it be so?

Because both the aperture and the shutter also have secondary functions and effects.

The aperture not only controls the amount of light that is allowed to pass the lens—it also has a bearing on how much of the image will be sharp.

The shutter in controlling the length of time for which the light strikes the film, will inevitably record any movement during that time as a slight or greater blur.

So you are left with three things to think of:

How fast is the action you want to catch?

How much of the scene in front of the lens has to be sharp?

Is the light good enough for either?

If there is fast action you have to choose and pre-set an appropriately fast shutter speed (p. 54) and then pair it with the stop which is right by your meter.

If the scene is to be sharp from a point close to the lens to some other point well away from it, you should choose the stop that will yield the necessary depth of field (p. 56) and then pair it with the shutter speed agreed by your meter for correct exposure.

If the light is very poor, the chances are that you may not

be able to cope with either extremely fast or particularly deep subjects.

Yet your choice in putting shutter speed or depth of field first should still be governed by what you value most about the picture you propose to take.

Exposure nowadays is no problem at all. But to hit it off in such a way that it will produce the picture *you* want is still a matter of intelligent judgment.

Time Exposures

When the light is very weak, especially when you have to use a small stop, even the slowest shutter speed of 1 sec. may be too short. In that case, you need time exposures. Set the shutter to B and press the release button. The shutter now remains open for any length of time until you let go of the release button.

For such time exposures, the camera must be mounted on firm support such as a tripod. It is safest to release the shutter with the help of a cable release to avoid shaking the camera. This release screws into the centre of the release button on the camera.

For long time exposures, where the shutter is to remain open for longer than you can conveniently keep the release depressed, use a cable release with a lock. To make the exposure set the shutter to B, press the cable release plunger with the locking plate lifted. The shutter will now remain open until the locking plate is depressed. On cable releases with locking screws, tighten the screw on pressing the plunger and undo the screw to close the shutter.

Using an Exposure Meter

To get the best results the exposure meter has to be used intelligently. This may look like a contradiction, since we have already said that it is an accurate light measuring instrument. But light from all parts of the subject—highlights, shadows and middle tones—falls on the meter, so the reading it gives us is an average one for the whole subject area.

Meters are scaled to suit typically average subjects—i.e., subjects with average areas of light, dark and middle tones. So if you point the meter at a subject of this kind, the exposure reading will be correct.

But if the subject is not average—if there are large high-light areas and little shadow, or large shadow areas with few highlights—then you have to modify the exposure reading to obtain the best results.

So there is more to using a meter than just pointing it at the subject and accepting without question the reading indicated.

Even with the models with built in meter which measures only the field actually reproduced on the film one might want to make an individual allowance in cases where the main subject is very much darker than all its surroundings.

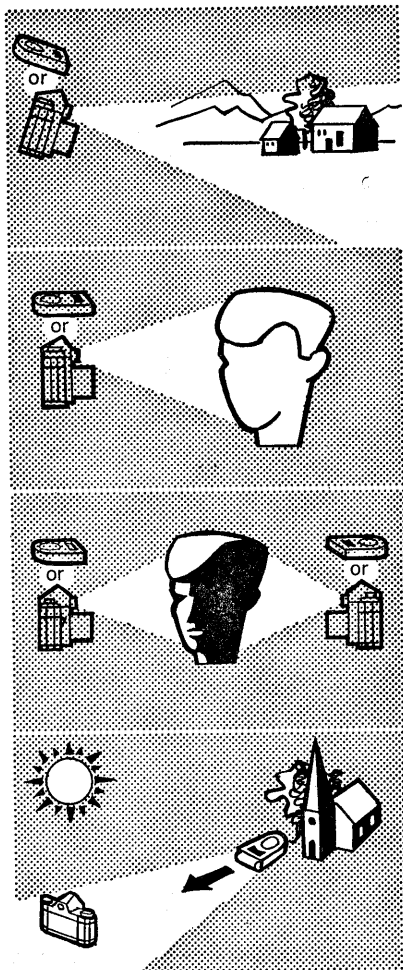
The usual method of using a meter is to point it directly at the subject. This gives the correct exposure reading provided the subject has an average mixture of highlights, shadows and middle tones. But if there is a large bright area, or a large dark area, the best method is to go near to the main subject and take a close-up reading. For example, if the subject is a figure against a white or dark background, by going closer you will reduce the amount of background affecting the meter and therefore get a reading in terms of a more average subject, which is what you want.

For some subjects you can take a reading from really close up, aiming the meter at the part of the subject that you want to make sure has optimum exposure. For instance, many photographers take a close-up reading of the sitter's face in portraiture; out-of-doors you can take the reading from the back of your hand instead of going up to the subject.

If you cannot go close up to a subject that needs a close-up reading, then try to find something near at hand that is similar in tone to the subject, and on which the light falls from the same direction and take a reading from that.

When taking readings of general scenes including a good deal of sky, you have to tilt the meter down slightly to

USING AN EXPOSURE METER



For normal readings point the exposure meter cell (or the camera if it has a built-in meter) towards the subject. Where the sky is included point the meter cell slightly downwards.

For more accurate readings of principal subjects, especially where backgrounds are excessively light or dark, approach the subject closely to take direct readings from the most important parts.

With contrast subjects containing both bright highlights and deep shadows, take separate close-up readings of each. The correct exposure is a mean between the two readings.

If the meter has an incident-light attachment, point it towards the camera from the subject position. If the subject is excessively light or dark, adjust the reading accordingly.

reduce the area of sky "seen" by the meter. The sky is a bright highlight, and by tipping the meter down to exclude some of it, the subject becomes "average" in tone range.

Open views, such as distant landscapes, usually have very light shadows, so you can give a shorter exposure than the meter indicates. It is usual to give half the exposure—i.e., use double the shutter speed, or use one stop smaller.

AGAINST THE LIGHT subjects are extreme cases of non-average tone range. The main lighting becomes a very bright highlight in the field of view, so if you point the meter straight at the subject it will indicate too short an exposure and give you a silhouette effect in the final picture.

This is all right if you want a silhouette. But if you want correct exposure for the subject, you should either take a close-up reading, or take a reading from the camera position and give four to eight times the exposure indicated.

COLOUR FILMS have little exposure latitude, so particularly careful reading is advisable. The meter is used in the same way as for black-and-white films.

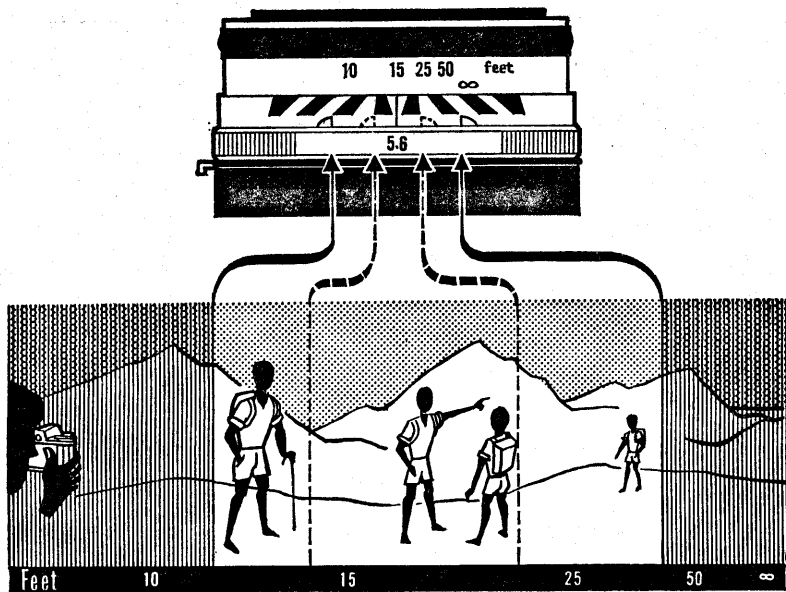
Because of the importance of the highlights, if you are using a meter from the camera position for an against-the-light shot, it is best to only double the reading, and not multiply it four to eight times as recommended for black-and-white negative films.

Shutter Speeds and Movement

The actual shutter speed you need within a series of available aperture-speed combinations is governed by considerations of camera steadiness as well as of subject movement.

An unsteady camera hold results in camera shake, to which a small and light instrument such as the Praktica is particularly liable. Even the slightest shake will result in inferior definition of the image. Practical experience goes to show that 1/125 sec. is safe, while you have to hold the camera particularly steady when using 1/60 or 1/30 sec. Where lighting conditions make even longer exposure times essential and there is no subject movement, either support

DEPTH OF FIELD



The Praktica carries a depth of field indicator on the lens mount. Markers move together or apart according to aperture set and focused distance. Thus, at 15 ft. and $f/5.6$ the markers indicate a depth of field from about 10 ft. to 50 ft. At larger apertures the markers move together, as shown by the dotted lines, to indicate a reduced depth of field.

the camera on a tripod, or look round for extra support for your elbows and hands—e.g. a wall, railing, etc.

The shutter speed required to arrest movement depends of course primarily on the speed with which the subject moves. Remember, however, that parts of the subject (e.g. the legs of a runner) may move faster than the subjects as a whole; you may sometimes have to compromise and show such parts slightly unsharp. Often that is not a serious fault, as slight blurring—provided the main part of the subject is sharp—helps to emphasize the impression of movement. Other factors to consider are the distance of the subject—the farther away, the less noticeable the movement blur; the focal length of the lens—a long-focus lens in effect brings the subject nearer; and the direction of the movement. Objects moving across your field of view blur more than if they are approaching or receding.

Aperture and Depth of Field

When you focus the Praktica on a given object, the image of that object will be really sharp on the film. Things nearer or farther away will be gradually less and less sharp, until they are noticeably blurred. The range of distances over which objects are still acceptably sharp, before you do notice the loss of definition, is known as the depth of field.

You can control the extent of this sharp zone by the lens aperture. As you stop down the lens, the zone of sharpness grows in both directions; as you open up the lens, its depth decreases.

You can obtain the actual zone of sharpness at various apertures and distances from tables, but in practice, the most convenient way is to use the depth of field indicator on each lens.

This is a special scale of aperture numbers marked opposite the distance scale. There are two sets of such numbers from the largest stop ($f1.8$, $f2$, or $f2.8$) to the smallest ($f22$) on each side of the focusing index (the mark that indicates the distance to which you have set the lens).

At any distance setting, the distance figures opposite each pair of aperture numbers on the depth of field scale give the near and far limits of sharpness. For example, at 10 ft. you may find the two stop values 8 on the scale ($f8$) opposite about 7 and 17 ft.—so you have a sharp zone from 7 to 17 ft. At $f4$, the distances opposite the stop values 4 may be 8 and 13 ft. respectively; at $f16$ you might get a sharp zone from 6 ft. to 40 ft. You will also notice that the depth of field is greater at far distances than near ones.

Two more points on depth of field:

Firstly, the depth obtained depends also on the focal length of the lens. Short focus lenses yield more depth and tele lenses less depth.

Secondly, the sharp zones obtained by the indicator are based on a somewhat arbitrary assumption of how much blurring is acceptable. So depth of field data for different cameras with the same lens may not always agree, and you are also quite safe in rounding off figures obtained from such data. To make really big enlargements from your negatives, you can use stricter standards of sharpness by stopping down further. (For previewing of depth of field on cameras with automatic diaphragm see page 16).

Zone Focusing

With action subjects and similar occasions where you want to shoot quickly, determining sharp zones even with the depth of field indicator wastes too much time. There you need prepared settings covering given near and medium distance ranges that you can easily memorize and set on the camera. The focusing zone table (p. 72) gives such settings; then you only have to worry about keeping the subject within that zone while you shoot.

With landscapes and views, you sometimes need depth from infinity to the nearest possible point. Thus, by stopping down to $f8$ and focusing on 25 ft. you get a really extended zone from infinity down to about 13 ft. But don't use this "hyperfocal distance" setting for maximum sharpness in the far distance; in that case focus on infinity (∞).

FLASH WITH THE PRAKTICA

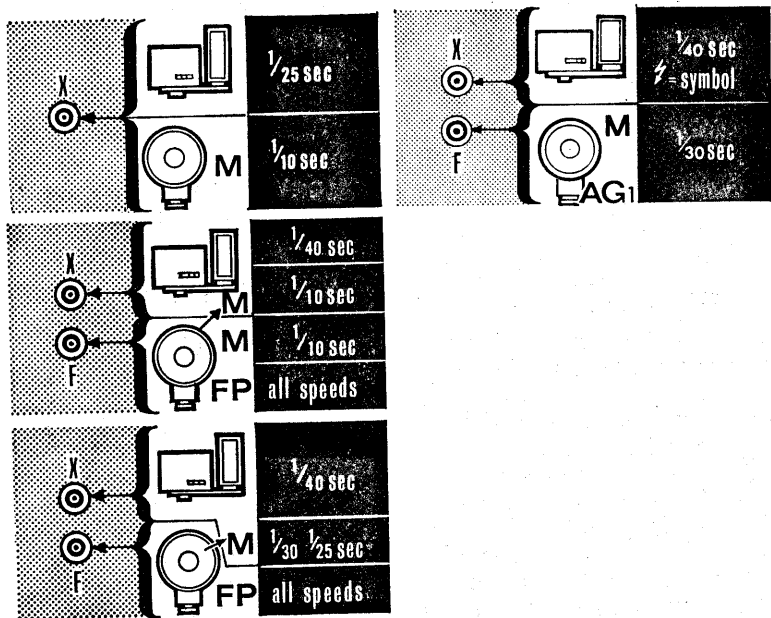
Flash is an efficient light source where no or insufficient daylight is available such as at night, indoors, etc., and also to fill in deep shadows in daylight. In the flashlight you carry your own private "sun" with which you can illuminate your subject or scene at any time and place.

THE FLASH BULB is similar to a minute electric bulb. However, when current passes through it, it lights up in an intense flash lasting usually about 1/40 to 1/60 sec. Each bulb will flash only once and has to be discarded afterwards.

The flash bulb is inserted in a flash gun and the current of the battery fires the bulb, while a reflector fixed behind the bulb makes sure that all the light is directed towards the subject. Most flash guns incorporate a capacitor unit which increases the reliability of firing, even when the battery is nearly exhausted. The shutter speed, provided it is slower than 1/25 sec., has no effect on exposure since the flash is shorter than the exposure time. Where the focal plane shutter travels across the film and does not expose it all simultaneously except at certain speeds, the special instructions on page 60 have to be followed.

Popular-size flash bulbs are now being made only in the blue-tinted variety. These can be used for black-and-white or colour (negative or reversal) photography, either as the sole light source or as fill-in lighting by daylight. Clear glass bulbs used to be recommended for negative colour films but this is no longer the case.

ELECTRONIC FLASH UNITS utilize the discharge of a high-tension capacitor through a flash tube. The power is derived from an accumulator or battery (there are also models working from the mains electricity supply). The electronic flash outfit is somewhat bigger and heavier than the flash bulb outfit, its comparative light output equals an average flash bulb and its initial cost is higher. On the other hand, anything from 10,000 to 25,000 flashes are obtained from one tube. The flash duration is extremely short



Top left: The standard co-axial socket was first used on the fourth series Praktica FX, giving synchronization for electronic flash and bulbs. Earlier models had non-standard sockets.

Middle left: The Praktica FX2 and FX3 introduced the now standard F synchronization for focal plane bulbs together with normal X synchronization.

Bottom, left: On the Praktica FX2, Praktica IV and later models, the two standard sockets give X and FP synchronization as before but make slightly faster shutter speeds possible with bulbs.

Top, right: On the Praktica NOVA I and IB the X synchro contact is for electronic flash, the F socket for ordinary M type and AG 1 type flash bulbs.

(1/700 to 1/2000 sec.) and will arrest the fastest movements. The cost of an individual exposure is negligible.

Electronic flash is universally suitable for black-and-white, negative colour and also for daylight type reversal colour films. It can be used for fill-in lighting by daylight.

How to use Flash with the Praktica

The Prakticas from model FX on are synchronized for flash. The early versions of this model have a non-standard contact while the last versions of the Praktica FX were fitted with the standard co-axial plug which is X synchronized. Later models carry two standard flash plugs, one marked X and the other F.

F setting works so that electrical contact is made before the first shutter blind begins to uncover the film. This setting is used for flash bulbs only. For the ordinary M class bulbs the shutter speed should be set to 1/30 or 1/25 sec. With the special FP bulbs, faster speeds depending on type of FP bulbs can be used on models prior to Nova only.

X setting works so that electrical contact is delayed until the first shutter blind has completely uncovered the film. It is used with electronic flash. The shutter should be set to 1/40 sec. (z=flash sign on shutter). 'L' series see below.

No faster shutter speed must be used, otherwise only part of the negative would be exposed, because the second blind would already be moving across the film. At the same time, the illumination time with electronic flash is so extremely short (1/700 to 1/2000 sec.) that even with 1/40 sec. fast-moving objects will be "arrested".

The electrical contacts of the Praktica up to and including model V are closed while the shutter is untensioned. Thus, an electronic flash unit can only be plugged into the flash socket or a bulb inserted into the connected battery capacitor gun *after* the shutter has been wound on. This breaks the contact, which is made again when the shutter is released and remains made until the shutter is again wound on.

It is advisable to make practical tests with focal plane

bulbs to establish correct working, as variations are possible, particularly on earlier Praktica models.

Exposure Guide Numbers

There is a convenient way of working out exposures with flash, and this is by means of a guide number. When you buy flash bulbs you will always find the guide number for any speed of film printed on the packet.

To find the correct aperture to use, divide the guide number by the distance between the flash and the subject. For instance, suppose you find that the guide number of the bulb with the film in use is 160. If you then want to take a photograph at a distance of 10 ft. from the subject, divide 160 by 10=16. Therefore, the correct aperture to use is *f* 16. Alternatively, if you want to use an aperture of *f* 8 for any reason, then the correct flash distance is $160 \div 8 = 20$. So the flash must be 20 ft. from the subject.

Synchro-Sunlight

If you want to use flash in conjunction with daylight, e.g. to lighten deep shadows, the exposure time is taken for the sunlit side of the subject and the aperture used according to this reading. Now take the flash guide number for the shutter speed pre-selected, double it and divide it by the aperture to be used. The result is the flash-to-subject distance for a normal fill-in light. With daylight colour film, use only blue flash bulbs or electronic flash.

Example: Exposure meter reading at 1/30 sec.—*f* 16.

Guide number for the flash at 1/30 sec.—120.

The guide number doubled is 240. Divide 240 by 16—15.

That means that the flashgun should be 15 ft. from the subject. It is advisable to use an extension cable between camera and flashgun. This enables you to place the flash farther away from or closer to the subject than the camera.

USING ALTERNATIVE LENSES

The field of view covered by the standard lens is ideal for the majority of subjects. Occasionally, however, a greater or reduced field of view has distinct advantages. The Praktica camera has an interchangeable lens mount permitting use of alternative focal length lenses for such occasions.

Wide-Angle Lens

A wide-angle lens is a lens of shorter focal length. It sees and reproduces more of the subject in front of the camera than does the standard lens.

Such a wide-angle lens has definite advantages in cases where the practicable distance between camera and subject is limited and the standard lens cannot record the whole of the subject. The wide-angle lens is, therefore, primarily used for architectural photography and interiors.

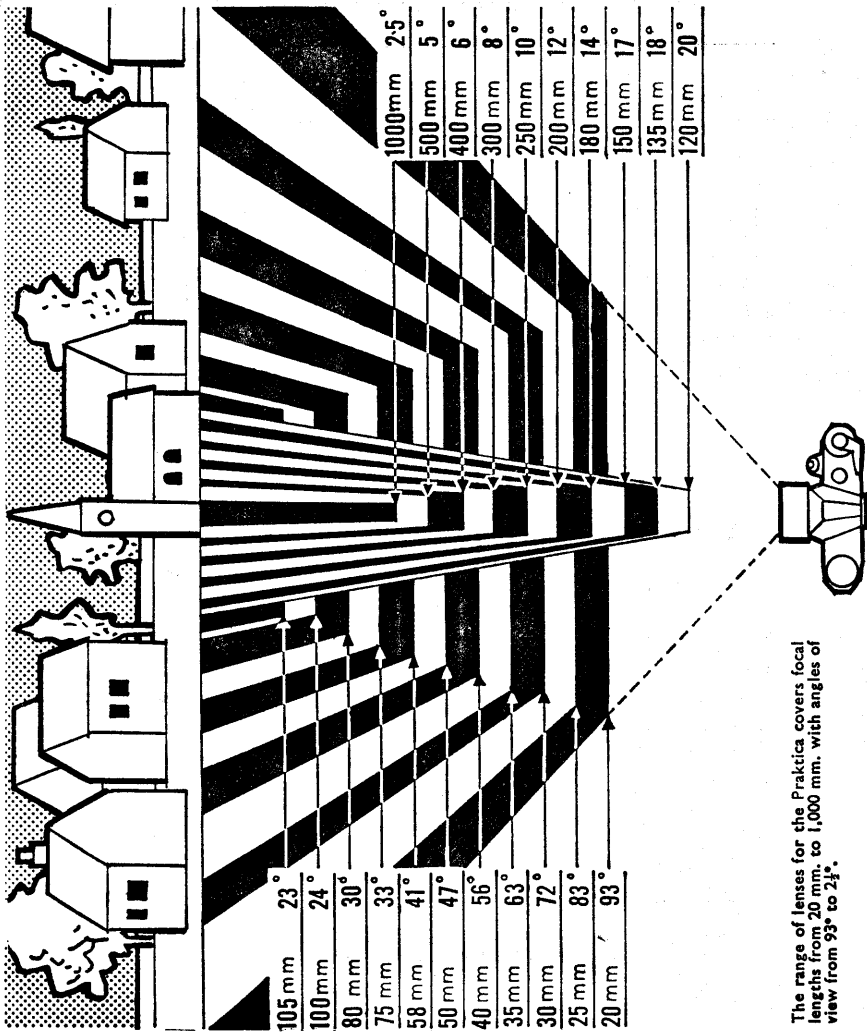
In view of its short focal length, the depth of field covers a particularly wide zone, even at full aperture. It can, therefore, be employed with advantage as a quick-shooting lens for general purposes where accurate focusing or distance-setting would be inconvenient (e.g. through insufficient time).

To get a large image, even of a near subject, you have to go really close to it. Near objects then tend to dwarf more distant ones, and the resulting picture shows pronounced perspective effects. In this way, the wide-angle lens can be used to emphasize perspective.

Wide-angle lenses made for the Praktica camera are listed in the lens table on page 64. Wide-angle lenses made for the Asahi Pentax, Edixa Reflex and any other single lens reflex camera with the standard 42×1 mm. thread will fit the Praktica, too.

Telephotography

A tele lens on the other hand has a smaller angle of view than the standard lens. It is of longer focal length, and reproduces less of the subject in front of the camera than the standard lens does, but on a larger scale.



The range of lenses for the Praktica covers focal lengths from 20 mm. to 1,000 mm. with angles of view from 93° to 2½°.

SOME PRAKTIKA LENSES

Name	Focal Length	Aperture	No. of Elements	Angle of View	Closest Focusing Distance	Diaphragm Type
Flektogon	20 mm.	f4	10	93°	6½ in.	FA**
Prakticar	24 mm.	f2.8	10	84°	15 in.	FA
● Flektogon	25 mm.	f4	7	82°	8 in.	FA
Prakticar	28 mm.	f2.8	7	74°	15 in.	FA
Pentacon	29 mm.	f2.8	7	73°	10 in.	FA*
● Lydith	30 mm.	f3.5	5	72°	13 in.	PS
Pentacon	30 mm.	f3.5	5	71°	13 in.	PS**
● Primagon	35 mm.	f4.5	4	63°	16 in.	PS
Flektogon	35 mm.	f2.8	6	62°	7 in.	FA**
Prakticar	35 mm.	f2.8	6	63°	19½ in.	FA
● Helioplan	40 mm.	f4.5	4	56°	—	N, PS
● Primotar E	50 mm.	f3.5	4	47°	20 in.	FA
● Primotar	50 mm.	f2.8	4	47°	24 in.	PS
● Trioplan	50 mm.	f2.9	3	47°	24 in.	C
Domiplan	50 mm.	f2.8	3	47°	30 in.	FA
Oreston	50 mm.	f1.8	6	47°	13 in.	FA
Tessar	50 mm.	f2.8	4	45°	14 in.	N, PS, FA
Pentacon	50 mm.	f1.8	6	47°	13 in.	FA*
Pancolar	50 mm.	f1.8	6	46°	14 in.	FA*
Pancolar	55 mm.	f1.4	7	42.5°	15.5 in.	FA*
● Primoplan	58 mm.	f1.9	5	41°	24 in.	N, PS
● Primoplan	75 mm.	f1.9	5	32°	—	N, PS
Pancolar	75 mm.	f1.4	7	33°	25.5 in.	FA
● Trioplan	100 mm.	f2.8	3	24°	43 in.	N, PS
Pentacon	100 mm.	f2.8	5	24°	3 ft. 6 in.	FA*
● Primotar	135 mm.	f3.5	4	18°	63 in.	N, PS
Pentacon	135 mm.	f2.8	5	18°	4 ft. 11 in.	PS**
Pentacon	135 mm.	f2.8	5	18°	4 ft. 11 in.	FA
Zeiss-S	135 mm.	f2.8	4	18°	4 ft. 11 in.	FA
Zeiss-S	135 mm.	f3.5	4	18°	3 ft. 0 in.	FA**
● Telemegor	150 mm.	f5.5	4	17°	—	N, PS
● Primotar	180 mm.	f3.5	4	14°	7 ft. 3 in.	N, PS
● Telemegor	180 mm.	f5.5	4	14°	6 ft. 7 in.	N, PS
Zeiss-S	180 mm.	f2.8	5	14°	7 ft. 0 in.	FA†**
Pentacon	200 mm.	f4	5	12°	10 ft. 0 in.	PS**
Prakticar	200 mm.	f3.5	6	10°	10 ft. 0 in.	FA
Prakticar	200 mm.	f2.8	6	10°	11 ft. 9 in.	FA
● Telemegor	250 mm.	f5.5	4	10°	10 ft. 9 in.	N, PS
Pentacon	300 mm.	f4	5	8°	12 ft. 0 in.	PS**
● Telemegor	300 mm.	f4.5	4	8°	10 ft. 9 in.	N, PS
Prakticar	300 mm.	f4	6	8°	13 ft. 8 in.	FA
Zeiss Jena S	300 mm.	f4	6	8°	13 ft. 0 in.	FA†**
● Telemegor	400 mm.	f5.5	4	6°	19 ft. 8½ in.	N, PS
Zeiss Mirror lens	1000 mm.	f5.6	4	2.5°	50 ft. 0 in.	—**

Diaphragm type: Fully automatic=FA; Preselect=PS; Normal=N; Clickstop=C.

* Lenses suitable for Praktika LLC and VLC Electric for full aperture measurement.

** For LLC and VLC with working aperture light measurement, non electric.

† With automatic aperture correction for close-up photography.

● Discontinued.

Such a lens is particularly suitable for subjects that are difficult to approach closely, such as animals, children, architectural detail, sports events, etc. In photographing distant views without near foreground, it brings the subject nearer. It also permits a greater camera-to-subject distance in portraiture, producing a more pleasing and subdued perspective.

At the same time, its lesser depth of field concentrates definition on the portrait, avoiding a sharp background which would detract from the main object.

Long focus lenses made for the Praktica camera are listed in the lens table below. Tele lenses made for the Asahi Pentax, Edixa Reflex and any other single lens reflex camera with the standard 42×1 mm. thread will fit the Praktica, too.

Lens Changing

To remove a lens, simply unscrew it from the body. To insert a lens, screw it into the lens aperture of the camera body until it comes to a definite stop without using force.

Lenses which automatically couple internally with the pre-selector mechanism *must* have the protruding coupling pin protected from damage by use of a rear lens cover.

Focusing and Depth of Field

Focusing with a wide angle or telephoto lens is the same as when using a standard lens. The reflex screen enables the image to be focused accurately. At the same time, the reflex screen shows the exact field of view of the particular lens used. There is no parallax error, nor are supplementary finders required.

The alternative lenses have their own depth of field indicator. This works in the same way as with the standard lens.

Aperture Control Systems

Most lenses for the Praktica camera are either fitted with the automatic pre-set aperture or a pre-set aperture which has to be actuated by hand.

Automatic pre-set aperture. You pre-set the required aperture on the rear ring of the lens mount by turning the aperture selected to the index mark. The aperture remains fully open for focusing and viewing so as to obtain minimum depth of field and maximum brightness. When you release the shutter, the aperture stops down to the pre-set figure and re-opens automatically to full aperture immediately after the exposure. See also pre-view of depth of field on page 16.

Semi automatic pre-set aperture, on earlier lenses, works similarly to the automatic pre-set aperture described above except that the aperture has to be opened up again by hand after exposure, by means of a cocking ring or lever.

The pre-set aperture system consists of two control rings. The front ring pre-sets the required aperture, but does not stop down the lens. You therefore focus and view the image at full aperture. Immediately before the exposure you turn the rear ring as far as it will go to stop down the lens to its pre-set aperture. This you can do by touch alone without taking the eye from the finder. After the exposure, simply turn the rear ring back again to open the lens to full aperture.

Aperture selection without any speed up or simplifying mechanism is found on the earlier lenses and some in-expensively mounted later ones. Here one focuses best with full aperture and afterwards one stops down the lens normally to the diaphragm opening required.

PRAKTIKA ACCESSORIES

Close-ups

The single lens reflex camera is particularly suited for close up photography. When working with supplementary lenses or extension tubes, the actual image covered, as well as the exact definition, can be controlled on the reflex screen.

Supplementary Lenses

The Praktika camera lenses can be focused down to at least 3 ft. The closest focusing distance varies according to the lens employed. Some permit focusing down to 12 inches, for these latter, supplementary lenses are not normally required.

The field covered at 3 ft. with a 2 in. (5 cm.) lens is $25\frac{1}{2} \times 17$ in. To photograph at closer range for table top, copying and similar work, supplementary lenses can be used. A range of three lenses, giving a scope which can reasonably be described as covering all practical needs, are a +1 diopter, a +2 diopter and a +3 diopter. It is convenient to get these lenses of suitable diameter to fit into an interchangeable filter mount, so that one mount only is required and a lens can be inserted in accordance with the distance at which one has to work.

The distances covered by these supplementary lenses are:

<i>Supplementary lens</i>	<i>Distance covered</i>
+1 dioptre	from $39\frac{3}{4}$ to 19 in. (100 to 50 cm.)
+2 dioptre	from $19\frac{3}{4}$ to 13 in. (50 to 33 cm.)
+3 dioptre	from $13\frac{3}{8}$ to $9\frac{1}{2}$ in. (33 to 25 cm.)

The field covered, the distance at which the lens has to be set, as well as definition can be observed on the reflex ground glass. The table on page 68 giving these figures is intended mainly for general information.

No change in exposure time is required when working with these close up lenses. To obtain perfect definition it is advisable to use a medium aperture.

Extension Tubes

For very close-range work extension tubes can be used. These tubes can be screwed between lens and camera, giving an approximate ratio of reproduction from 1/10 natural size to natural size. A set consists of three rings, one of 7 mm., one of 14 mm., and one of 28 mm. lengths. They can be used individually or combined (See table on page 73).

The simple extension tube set is intended for use in connection with lenses with manual diaphragm control.

The extension tube set with plunger has on each ring a plunger transmission to connect to and actuate the automatic diaphragm mechanism of the lenses so equipped.

Extension ring with double cable will act on the shutter release and lens diaphragm simultaneously. This is useful when carrying out close-up work with the reversing ring (see below) or with extension bellows.

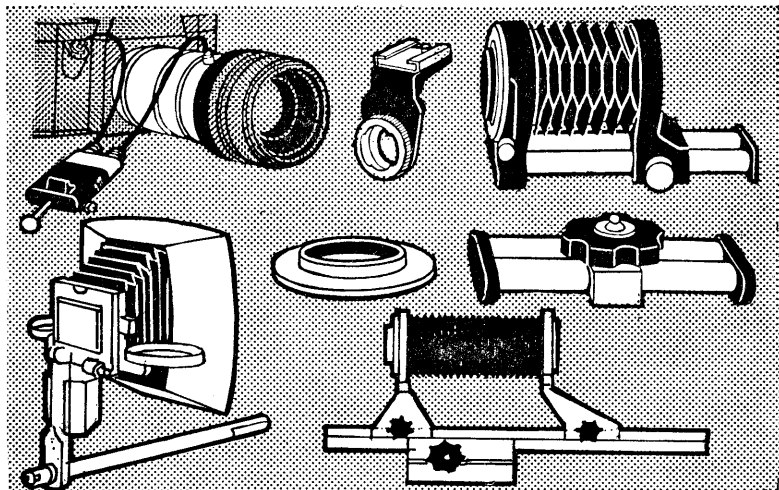
Reversing Ring

To obtain critical definition when magnifying the subject directly 1.5 times or more on the film, the Praktica lens should be used reversed (front to back). The lenses have been specially designed and corrected for use in reversed position for ultra close-up work. To use the lens with its front pointing to the film a reversing ring is available which screws into the filter thread of the lens for connection to the extension rings or bellows attachment. The extension ring with double cable should be used at the same time to permit use of the automatic lens diaphragm control.

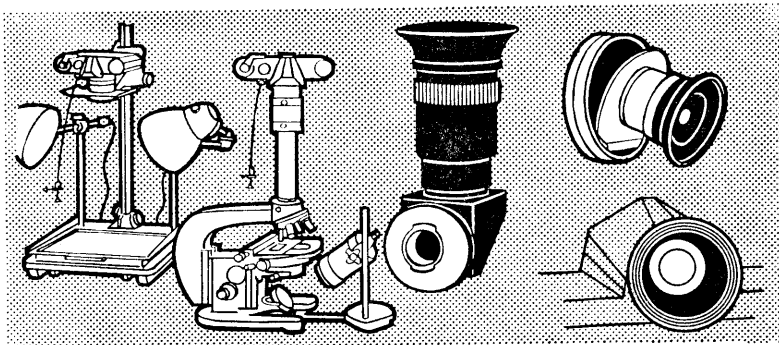
Bellows Attachment

The bellows attachment offers a continuously variable extension from 35 mm. to 125 mm. It is connected between Praktica body and lens. The extension ring with double cable should be attached to the lens to permit use of the automatic lens diaphragm control.

A larger close-up bellows attachment gives extensions from 35 mm. to 220 mm. and is particularly designed for close up and macro photography.



Top, left: Extension tubes and extension ring used with double cable release. Top, centre: Accessory shoe. Top, right: Extension bellows attachment. Centre: Lens reversing ring. Centre, right: Focusing slide. Bottom, left: Slide copying attachment for large bellows. Bottom, right, Large bellows attachment.



Left: Copying stand. Middle, left: Photomicrography attachment. Middle, right: Angular finder attachment. Top, right: Focusing magnifier. Bottom, right: Rubber eye cup.

A Transparency Copying attachment is available for connection to the larger close-up bellows for copying negatives and transparencies.

Focusing Slide

The focusing slide allows critical control by continuous adjustment of the camera-to-subject distance mainly in conjunction with the bellows unit. It greatly facilitates the extremely fine focusing necessary with ultra close-up work and the retaining of the precise picture ratio.

Photomicrography

An intermediate piece for photomicrography has been designed connecting to the Praktica body on one end and to the microscope eyepiece at the other. The taking lens is removed. The image of the microscope lens is visible on the camera reflex screen for focusing and exposure.

Praktica Copying Stand

This baseboard with column and holding arm for the camera is equipped with two adjustable light reflectors and frame to accept flat or three dimensional objects up to approximately 12 in. \times 8 in. for easy and quick copying.

Accessory Clip

The accessory clip is attached to the eyepiece of the viewfinder and is intended to accept a flash gun. Suitable for all Prakticas from model IV on.

Angular Viewfinder

This attachment, fitting to the Praktica eyepiece permits viewing at low level such as photographing children, general low angle shots, close-ups and photomicrography. It can be rotated so that it is equally useful in horizontal and vertical positions of the camera.

It can also be helpful in obtaining unobserved shots by holding the camera at right angles to one's own standing

position. The angular viewfinder is suitable for all Prakticas from model IV on.

Focusing Telescope

This 2.7X magnifying telescope is fitted to the camera eyepiece and permits extremely critical focusing of any section of the finder image. Suitable for all Prakticas from the model IV on.

Rubber Eye Cup

To exclude unwanted side light and facilitate viewfinding a rubber eyecup can be fitted to the eyepiece of the pentaprism of the Praktica, on all models from Praktica IV on.

Correction Lens Mount

A mount accepting a correction lens to compensate for a users' faulty eyesight can be fitted to the viewing eyepiece. Suitable for all Prakticas from model IV on.

Pentaprism

For the Praktica camera models FX2 and FX3 with chest level reflex finder a pentaprism has been made which clips into the reflex hood and permits viewing of eye level and upright and laterally correct image. A similar attachment has also been provided for the earlier Praktica model, here the pentaprism is fixed above the reflex hood.

Lens Hood

A lens hood is recommended to prevent stray light from outside the picture area entering the lens. This could produce glare and reflections and thus reduce the brilliancy of the image. A lens hood is supplied with some telephoto lenses, while for the wide angle and standard lenses of the Praktica, lens hoods are available in screw-in or push-on mount.

FACTS AND FIGURES

This section gives the more important exposure, close-up, zone focusing, film, etc., data for the Praktica camera in handy tabular form for easy reference.

CONVERSION OF FEET AND INCHES INTO METRIC UNITS

Many cameras are marked only in either the metric or British system, while most of the tables in this book are also given in only one system. The table below shows at a glance equivalent lengths.

British to Metric		Metric to British	
$\frac{1}{8}$ in.	0.32 cm.	0.5 cm.	$\frac{3}{16}$ in.
$\frac{1}{4}$ in.	0.64 cm.	1 cm.	$\frac{1}{2}$ in.
$\frac{3}{8}$ in.	1.27 cm.	2 cm.	$\frac{3}{4}$ in.
1 in.	2.54 cm.	3 cm.	1 $\frac{1}{8}$ in.
2 in.	5.08 cm.	4 cm.	1 $\frac{1}{4}$ in.
3 in.	7.62 cm.	5 cm.	1 $\frac{3}{8}$ in.
4 in.	10.2 cm.	6 cm.	2 $\frac{1}{4}$ in.
5 in.	12.7 cm.	7 cm.	2 $\frac{3}{8}$ in.
6 in.	15.2 cm.	8 cm.	3 $\frac{1}{8}$ in.
7 in.	17.8 cm.	9 cm.	3 $\frac{3}{8}$ in.
8 in.	20.3 cm.	10 cm.	3 $\frac{7}{8}$ in.
9 in.	22.9 cm.	12 cm.	4 $\frac{1}{2}$ in.
10 in.	25.4 cm.	15 cm.	5 $\frac{7}{8}$ in.
11 in.	27.9 cm.	20 cm.	7 $\frac{7}{8}$ in.
1 ft.	30.5 cm.	25 cm.	9 $\frac{3}{4}$ in.
2 ft.	61.0 cm.	30 cm.	11 $\frac{1}{2}$ in.
3 ft.	91.4 cm.	40 cm.	15 $\frac{3}{4}$ in.
4 ft.	1.22 m.	50 cm.	19 $\frac{3}{4}$ in.
5 ft.	1.52 m.	60 cm.	23 $\frac{3}{4}$ in.
6 ft.	1.83 m.	80 cm.	31 $\frac{1}{2}$ in.
7 ft.	2.13 m.	100 cm.	39 $\frac{1}{2}$ in.
8 ft.	2.44 m.	1.5 m.	4 ft. 11 in.
9 ft.	2.74 m.	2 m.	6 ft. 7 in.
10 ft.	3.05 m.	2.5 m.	8 ft. 3 in.
15 ft.	4.57 m.	3 m.	9 ft. 10 in.
20 ft.	6.10 m.	4 m.	13 ft. 2 in.
30 ft.	9.14 m.	5 m.	16 ft. 5 in.
40 ft.	12.20 m.	10 m.	33 ft. 0 in.
50 ft.	15.24 m.	15 m.	49 ft. 2 in.
100 ft.	30.48 m.	20 m.	66 ft. 0 in.

QUICK FOCUSING ZONES WITH THE STANDARD 50 mm. LENS

Zone	Focus on	Aperture	Extent of Zone
Near	7.5 ft.	f8	6-10 ft.
Medium	10 ft.	f11	7-20 ft.
Far	25 ft.	f8	13-infinity

CLOSE-UPS WITH EXTENSION TUBES ON 50 mm. LENS

Extension tube No.	Length (in mm.)	Ratio of reproduction	Subject area (mm.)	Lens-to-subject distance (mm.)	Exposure factor
1	7	0.13 to 0.27	179×270 to 90×134	403 to 206	1.45
2	14	0.27 to 0.4	90×134 to 60×90	206 to 142	1.75
1+2	21	0.4 to 0.53	60×90 to 45×67	142 to 110	2.15
3	28	0.53 to 0.67	45×67 to 36×54	110 to 90	2.55
1+3	35	0.67 to 0.8	36×54 to 30×45	90 to 77	3
2+3	42	0.8 to 0.94	30×45 to 26×38	77 to 68	3.5
1+2+3	49	0.94 to 1.07	26×38 to 22×34	68 to 61	4.0

FOCUSING WITH CLOSE-UP LENSES

Set distance on focusing mount to ft.	The distance from front of lens to subject is		Approx. field size	
	With +1 lens in.	With +2 lens in.	With +1 lens in.	With +2 lens in.
∞	39½	19½	21 × 32	10½ × 15½
20	33½	18	18 × 27	10 × 15
10	29½	17	16 × 24	9 × 14
6	25½	15½	13 × 20	8 × 12
4	21	13½	11½ × 17	7½ × 11
3	18½	12½	9½ × 14	7 × 10½

SUBJECT SIZE AND DEPTH OF FIELD WITH CLOSE-UP LENSES

Subject Distance in.	Scale approx.	Total Depth of Field (in.) at*			
		f 5.6	f 8	f 11	f 16
38	1 : 20	6	9	12	17
30	1 : 15	3½	4½	6½	10
24	1 : 12	2½	3½	4	6
20	1 : 10	1½	2½	3½	4
16	1 : 8	1½	1½	2½	3½
12	1 : 6	¾	¾	1½	1½

*This is the total depth in front of and behind the plane of maximum sharpness. Where this range is less than about 4 in., it is safe to assume it to be equally distributed in front of and behind the focused distance. When the depth range is greater, it covers somewhat more behind the subject than in front (for instance, at 38 in. and f 16, the depth might be 7 in. in front and some 10 in. behind the sharpest point).

DAYLIGHT EXPOSURE VALUES

For Praktica models without exposure meter add up the respective figures in tables 1, 2 and 3. The result is the exposure value to be set. On models without exposure value scale use table 4 to get aperture-speed combinations (set the shutter to nearest marked speeds if necessary—e.g. 1/25 sec. for 1/30 sec.).

1. Subject and weather

	Clear sun	Cloudy light	Cloudy med.	Cloudy dull
Distant land or seascape without foreground	13	12	11	10
—with light foreground	12	11	10	9
Open streets, squares, light buildings	11	10	9	8
Figures, groups in open, near objects without heavy shade	10	9	8	7
—in shade	9	8	7	6
Average interiors, diffused light ...	3	2	1	0

2. Month and time

	May June July	Aug. April	Sept. March	Oct. Feb.	Nov. Dec. Jan.
11 a.m. to 2 p.m.	3	3	3	2	2
9 a.m. to 11 a.m. 2 p.m. to 4 p.m. } 3	3	3	2	2	1
4 p.m. to 6 p.m.	2	2	1	1	0

3. Film Speed

BS ... 21°	23-24°	25-26°	28-29°	31-32°	34-35°
ASA ... 10	16-20	25-32	50-64	100-125	200-250
	-2½	-1½	-1	0	+1
				+1	+2

4. Exposure Values and Aperture-Speed Combinations

Exp. Value	f 2.8	f 4	f 5.6	f 8	f 11	16	f 22
3 ...	1	2s	4s	8s	15s	30s	60s
4 ...	1/2	1	2s	4s	8s	15s	30s
5 ...	1/4	1/2	1	2s	4s	8s	15s
6 ...	1/8	1/4	1/2	1	2s	4s	8s
7 ...	1/15	1/8	1/4	1/2	1	2s	4s
8 ...	1/30	1/15	1/8	1/4	1/2	1	2s
9 ...	1/60	1/30	1/15	1/8	1/4	1/2	1
10 ...	1/125	1/60	1/30	1/15	1/8	1/4	1/2
11 ...	1/250	1/125	1/60	1/30	1/15	1/8	1/4
12 ...	1/500	1/250	1/125	1/60	1/30	1/15	1/8
13 ...	—	1/500	1/250	1/125	1/60	1/30	1/15
14 ...	—	—	1/500	1/250	1/125	1/60	1/30
15 ...	—	—	—	1/500	1/250	1/125	1/60
16 ...	—	—	—	—	1/500	1/250	1/125

CONVERSION OF SPEED SYSTEMS

ASA & BS Arith. (New) *	ASA Log (New)	DIN	BS Log
3		6	16°
6	1°	9	19°
12	2°	12	22°
25	3°	15	25°
50	4°	18	28°
100	5°	21	31°
200	6°	24	34°
400	7°	27	37°
800	8°	30	40°
1600	9°	33	43°

*Also Weston Master III, IV and V meters.

SHUTTER SPEEDS TO ARREST MOVEMENT

Subject	Distance between Camera and Object					
	10 ft. 3 m.	17 ft. 5 m.	25 ft. 7.5 m.	42 ft. 12.5 m.	83 ft. 25 m.	165 ft. 50 m.
Swimmer	1/60	1/30	1/25	1/15	1/10	1/5
Walker	1/100	1/60	1/40	1/25	1/10	1/5
Runner	1/300	1/200	1/155	1/75	1/60	1/30
Cyclist	1/500	1/300	1/200	1/100	1/75	1/40
Skater	1/1000	1/500	1/400	1/250	1/125	1/60
Horse galloping	1/500	1/300	1/200	1/100	1/75	1/40
" trotting	1/300	1/200	1/125	1/75	1/60	1/30
" walking	1/125	1/75	1/50	1/30	1/15	1/10
Racehorse	1/1000	1/500	1/400	1/250	1/125	1/60
Waves	1/500	1/300	1/200	1/100	1/75	1/40
Heavy waves	—	1/1000	1/500	1/300	1/150	1/75
Boats making 10 knots	1/300	1/200	1/125	1/75	1/60	1/30
" 20 knots	1/500	1/300	1/200	1/100	1/75	1/40
Tramcar	1/300	1/200	1/125	1/75	1/60	1/30
Motor car on road	—	1/1000	1/500	1/300	1/500	1/75
Slow train	1/500	1/300	1/200	1/100	1/75	1/40
Fast train	—	—	1/1000	1/500	1/250	1/100
Aeroplane	—	—	—	1/1000	1/400	1/200

The shutter speeds as listed above are applicable to motion which cuts right across the direction in which the lens is pointing, and are correct for the standard lens.

If the motion photographed is at an acute angle with the direction in which the lens points the exposure time can be longer, say 1/30 sec. instead of 1/60.

If the subject moves directly towards the lens (or for that matter away from it) the exposure time can be three or four times longer, say 1/8 sec. instead of 1/30.

Where the above table shows speeds not marked on the shutter use the next faster speed.

DEPTH OF FIELD WITH THE STANDARD 50 mm. LENSES

Unit: foot

Aperture	Focus setting									
	2	3	4	6	8	12	30	∞		
1.4	1.98	2.96	3.93	5.83	7.69	11.31	25.97	187.12		
	~2.02	∞3.04	~4.08	~6.18	~8.33	~12.78	~35.51	~∞		
1.8	1.98	2.95	3.91	5.78	7.61	11.13	25.02	146.31		
	~2.02	~3.05	~4.10	~6.23	~8.43	~13.01	~37.47	~∞		
2	1.98	2.94	3.90	5.76	7.57	11.05	24.57	131.88		
	~2.02	~3.06	~4.11	~6.26	~8.48	~13.14	~38.54	~∞		
2.8	1.97	3.86	3.86	5.67	7.41	10.71	22.91	94.60		
	~2.03	~3.08	~4.15	~6.37	~8.69	~13.66	~43.50	~∞		
4	1.96	2.89	3.80	5.54	7.19	10.23	20.81	66.45		
	~2.05	~3.12	~4.22	~6.54	~9.02	~14.51	~53.91	~∞		
5.6	1.94	2.85	3.72	5.38	6.91	9.67	18.54	47.60		
	~2.07	~3.17	~4.32	~6.79	~9.51	~15.85	~79.26	~∞		
8	1.91	2.79	3.62	5.15	6.53	8.93	15.95	33.41		
	~2.10	~3.25	~4.48	~7.20	~10.35	~18.38	~70.28	~∞		
11	1.88	2.72	3.49	4.89	5.11	8.15	13.58	23.36		
	~2.13	~2.35	~4.69	~7.79	~11.64	~23.00	~∞	~∞		
16	1.83	2.61	3.31	4.52	5.53	7.12	10.98	16.80		
	~2.20	~3.51	~5.09	~9.02	~14.70	~39.68	~∞	~∞		

DEPTH OF FIELD WITH THE STANDARD 50 mm. LENSES

Unit: metre

Aperture	Focus setting									
	0.45	0.5	0.7	1	1.5	2	3	5	10	∞
1.4	0.45 ~0.45	0.50 ~0.50	0.69 ~0.71	0.99 ~1.02	1.47 ~1.54	1.94 ~2.07	2.86 ~3.16	4.51 ~5.46	8.55 ~12.05	57.78 ~∞
1.8	0.45 ~0.45	0.50 ~0.50	0.69 ~0.71	0.98 ~1.02	1.46 ~1.55	1.92 ~2.09	2.82 ~3.20	4.52 ~5.60	8.21 ~12.79	45.05 ~∞
2	0.45 ~0.45	0.50 ~0.50	0.69 ~0.71	0.98 ~1.02	1.45 ~1.55	1.91 ~2.10	2.80 ~3.23	4.47 ~5.68	8.05 ~13.20	40.57 ~∞
2.8	0.45 ~0.45	0.49 ~0.51	0.69 ~0.71	0.97 ~1.03	1.43 ~1.57	1.88 ~2.14	2.73 ~3.33	4.28 ~6.01	7.47 ~15.15	29.02 ~∞
4	0.44 ~0.46	0.49 ~0.51	0.69 ~0.72	0.96 ~1.04	1.41 ~1.61	1.83 ~2.20	2.63 ~3.49	4.04 ~6.57	6.74 ~19.44	20.35 ~∞
5.6	0.44 ~0.46	0.49 ~0.51	0.67 ~0.73	0.94 ~1.06	1.37 ~1.66	1.77 ~2.29	2.51 ~3.74	3.75 ~7.52	5.96 ~31.31	14.5 ~∞
8	0.44 ~0.46	0.48 ~0.52	0.66 ~0.74	0.92 ~1.09	1.32 ~1.73	1.69 ~2.45	2.34 ~4.18	3.39 ~9.61	5.09 ~378.10	10.21 ~∞
11	0.43 ~0.47	0.48 ~0.53	0.65 ~0.73	0.90 ~1.13	1.27 ~1.84	1.60 ~2.68	2.17 ~4.91	3.02 ~14.74	4.30 ~∞	7.44 ~∞
16	0.43 ~0.48	0.47 ~0.54	0.63 ~0.79	0.86 ~1.20	1.19 ~2.05	1.47 ~3.17	1.93 ~6.93	2.57 ~138.43	3.42 ~∞	5.13 ~∞