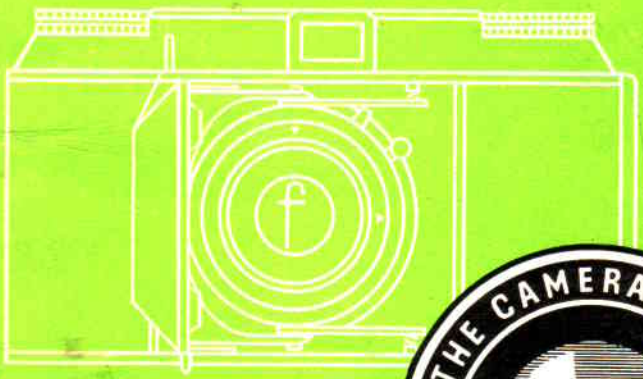
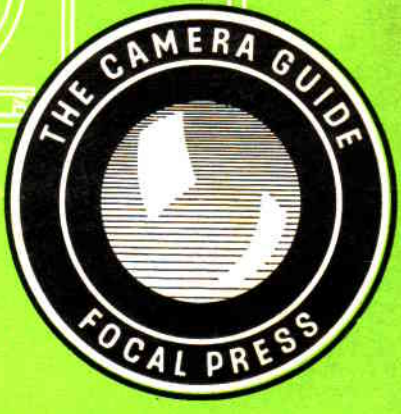
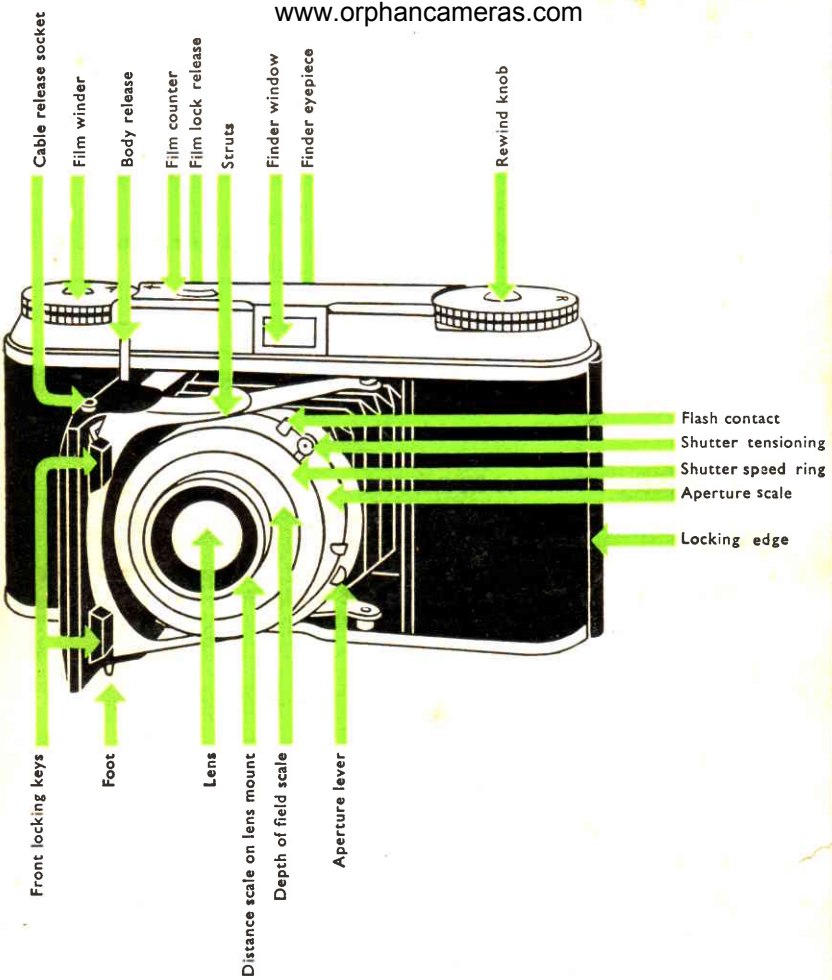
VITO GUIDE







- *How to load: page 9*
- *How to shoot: page 14*
- *How to unload: page 18*
- *How to choose the film: page 25*
- *How to choose exposures: page 43*
- *How to use flash: page 54*

FOR FULL REFERENCE SEE PAGE 4

THE VITO

The Vito, one of the latest 35 mm. cameras which followed in the wake of the famous Leica, belongs to the group of cameras which, like Retina, Baldina, Welti, etc., are designed as convenient, small instruments, easy to carry, quick to shoot with, inexpensive in use and good in performance.

The Vito was originally designed for a new *un*perforated 35 mm. film, which was on the point of being introduced with the idea of giving a larger picture size of 30×40 mm. Shortly before production started, the war broke out and the manufacture of unperforated 35 mm. film was dropped. For this reason the Vito when first marketed in 1940 was equipped with a feeler shaft but fitted with a 24×36 mm. picture aperture. When it became apparent after the war that no unperforated 35 mm. film should be produced the camera was redesigned with a sprocket wheel for film transport.

The Vito is small, "grippy", takes 35 mm. film, yields 36 exposures in one load. It is fitted with good lenses which give exceedingly sharp, crisp negatives and which on account of their short focal length make for easy focusing and quick shooting. The shutters incorporate a wide range of speeds and (in later models) are internally synchronised for flash. The lens is connected to the camera back by the more conservative bellows, making it possible to offer full protection to the lens when the instrument is closed.

The Vito relies on the approximative method of focusing with the exception of Vito III which has a built-in rangefinder. But this latter model has been produced for the German home market only, while another 35 mm. camera, the Vitessa with built-in rangefinder and ultra fast *f* 2 lens, different in construction from the Vito, is being placed on the world market.

The Vito camera is a fine mechanical precision instrument which should be handled with care, a gentle touch and in accordance with the instructions. In return it will offer years of reliable service.

The Vito is a miniature camera producing $1 \times 1\frac{1}{2}$ in. (24×36 mm.) negatives, 35 mm. standard cine film is employed as negative material. Up to 36 exposures can be taken in a single load of film in standard cartridges. The film can be loaded and changed in daylight.

The Vito body is of drawn ductile material and covered with leather. The dimensions of the Vito I and II are $1\frac{5}{8} \times 2\frac{3}{4} \times 4\frac{5}{16}$ in. ($4 \times 7.2 \times 12.5$ cm.) weighing complete with lens and shutter $14\frac{1}{2}$ oz. The Vito III is slightly larger and heavier.

Vito I and II are fitted with a Prontor S, SV, Compur, Compur-Rapid or Synchro-Compur shutter, Vito III with Compur-Rapid or Synchro-Compur shutter. The shutter speeds of the Prontor S and SV range from 1 sec. to 1/300 sec. with a built-in delayed action release. Later models of the Vito I as well as all Vito II models have a built-in flash contact. The Compur shutter speeds range from 1 sec. to 1/300 sec. and the Compur-Rapid shutter from 1 sec. to 1/500 sec. Again the later models of Vito I as well as all Vito II and III models have built-in flash contacts.

Lens and shutter are fixed to the front base by collapsible struts and connected to the camera back by means of short, square, light-tight leather bellows. When closed, the camera base-board protects lens and shutter. An optical direct-vision finder is built into the long side of the camera body.

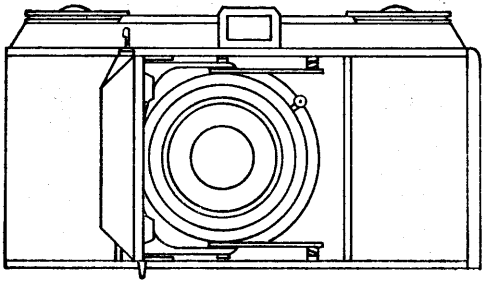
Vito III has a built-in rangefinder combined in one eye-piece with the viewfinder.

A depth of field calculator is engraved on Vito I and II on the front of the shutter, on Vito III on the focusing knob.

A built-in film counter registers automatically the number of exposures made.

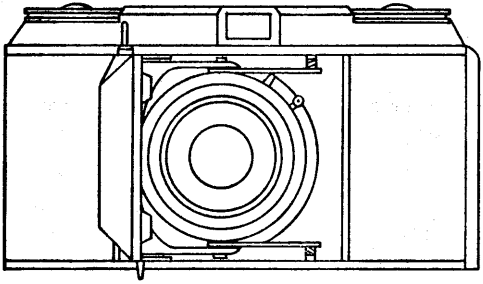
A body release with automatic double exposure prevention device is fitted. Furthermore, the film cannot be wound on without the previous picture having been exposed.

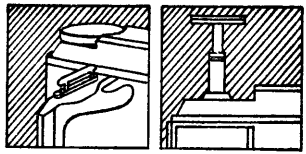
The distance in Vito I and II is set by rotating the front lens, in Vito III by turning the focusing knob which moves the complete lens.



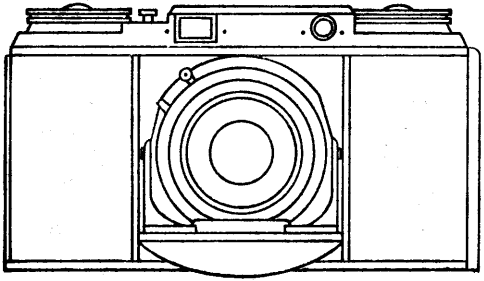
THE VITO MODELS (p. 8)

The Vito I has an *f* 3.5 Skopar lens in a Prontor S, or Compur, or Compur Rapid shutter. It has a body release bar.





The Vito II has a coated *f* 3.5 Color Skopar in a Compur Rapid or Prontor S shutter with flash contacts. It has a body release plunger. Earlier models have a body release bar (*above left*), on the latest models the rewind knob has a telescopic axis (*above right*).



The Vito III has a coated *f* 2 Ultron lens in Compur Rapid shutter, and coupled rangefinder.

The Vito Models

VITO I (1940) is fitted with the Skopar *f* 3.5 in a Prontor S or Compur or Compur-Rapid shutter. It is equipped with a feeler shaft for film transport, body release bar and hinged-on filter mount which was discontinued in later models.

VITO II (1949) is fitted with the coated Color Skopar *f* 3.5 in a Prontor S or Compur-Rapid shutter with built-in flash contacts. It has a sprocket wheel shaft for film transport, and body release bar, but no hinged-on filter mount.

VITO II (1950) is fitted as above but the body release bar has been replaced by a body release plunger. A holder for a clip-on finder shoe is fitted.

VITO II (1951) is similar to the previous model but has a fixed film take-up spool and the rewind knob has a telescopic axis.

VITO II (1954) is similar but has an accessory shoe and is available with the Synchro-Compur shutter.

VITO III (1950) is fitted with the 5 cm. Ultron *f* 2 coated lens, in a Compur-Rapid shutter with built-in flash contact. It has a coupled rangefinder in one eyepiece with the viewfinder.

The Vito Lenses

SKOPAR 5 cm. *f* 3.5 is a four component anastigmat of the Tessar type, a lens which shows crisp, clear definition.

COLOR SKOPAR 5 cm. *f* 3.5 is basically of similar construction to the Skopar, but shows appreciable improvements regarding definition, brilliance and colour reproduction, and can be rated as of outstanding performance. The Color Skopar is coated. All uncemented surfaces are covered with a very thin (about 0.0001 mm.) anti-reflection film to suppress reflections, increase brilliance and practical aperture. The coating is hard enough for ordinary cleaning methods.

ULTRON 5 cm. *f* 2 is an ultra-fast lens for photographs in poorest light conditions, indoors or of fast moving objects. It is of similar performance to the Color Skopar (see above) and is also coated.

All lenses built into the Vitos cover an angle of 47°, can be focused down to 3½ ft., and stop down to *f* 16. The scale of reproduction at the shortest distance is 1 : 18 where it covers a subject field of approximately 18×27 in.

The treatment and care of the lens is a matter of importance. On account of its chemical composition, optical glass of the highest quality is susceptible to the influences of moisture, and for this reason touching the glass with the fingers should be avoided. The lens surface of both coated and uncoated lenses should be cleaned occasionally with a clean, soft chamois leather.

HANDLING THE VITO

To start with we take it for granted that we have the Vito together with a daylight loading film in front of us. Our first task is to load the camera with film. This should be done in subdued daylight.

Loading the Vito

1. **Open camera back.**
2. **Pull out rewind knob.**
3. **Insert cartridge in film chamber.**
4. **Push back rewind knob.**
5. **Thread film end into slit of take-up spool.**
6. **Turn winding knob until it locks.**
7. **Close camera back.**
8. **Lift up release lever for film lock.**
9. **Turn film counter index opposite "F" and let film lock lever fall back.**
10. **Turn winding knob to stop.**
11. **Lift up film lock lever once more and let it fall back.**
12. **Turn winding knob once more to a stop. The film counter will now show No. 1.**

1. Open camera back by lifting up the locking ledge.
2. Pull out milled knob, marked "R" above the film chamber as far as it will go. In Vito III press the milled stud on top of the rewind knob to allow the rewind key to spring up and pull it up.
3. Insert the film cartridge so that the projecting spool peg lies in the guide recess in the bottom of the spool chamber.
5. Pull out about 3½ in. of film from the cartridge and thread the end of the film into the wide slot of the take-up spool.
6. Turn the winding knob until it comes to a stop, making sure that the film runs in its groove and the film perforation engages the sprocket of the counting shaft (except in early Vitos which have no sprockets). In Vito III give the film key one full turn to ensure that film is wound tightly on to the take-up spool. If the winding knob of the Vito III locks prematurely, press the interlock release to free the film transport.
7. Close camera back by pressing the hinged back cover to the main

body and let the locking ledge engage by applying slight pressure with the thumb.

8. Lift the release lever for the film lock by placing the thumb over the roughened end of the lever and swinging it up by 90°. Hold it in this position.
9. Turn the milled wheel appearing below the lifted up film counter release lever in the direction of the arrow above the wheel until the letter "F" comes to lie opposite the index in the film window. Now let film counter release lever swing back. In the Vito III pull up the film key and turn the counting drum until "F" comes to lie opposite the index mark.
10. In early Vito models the winding knob will be locked in this position. Open the camera front and cock and release the shutter by the body release in order to wind on.
11. In early Vito models instead of lifting up the film lock lever repeat the procedure as given under 10. In the Vito III press on transport locking lever to be able to turn the film winding key.
12. If in the Vito III the index does not show to I but to the red dot, press the transport locking lever once more and turn the film winder to a definite stop.

Holding the Vito

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

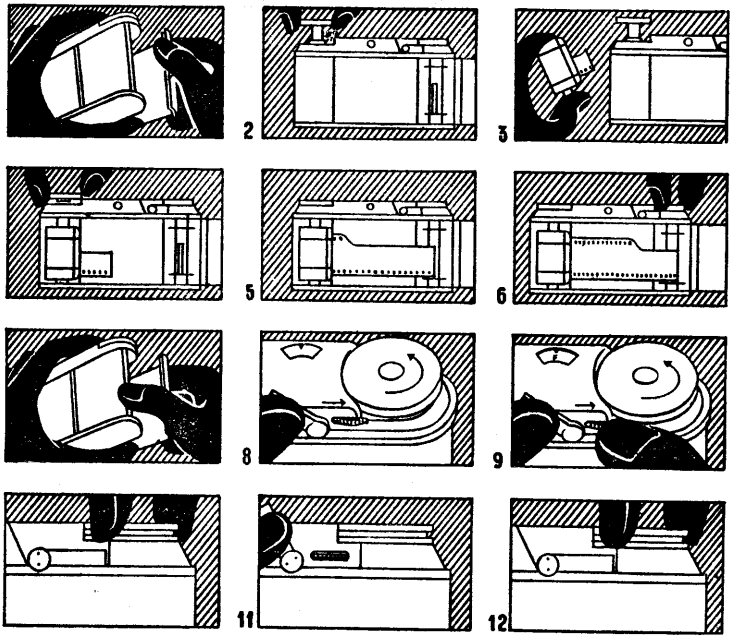
A particularly steady hold of the camera is necessary when working with speeds below 1/100 sec.

Always stand with your legs apart. Press the Vito against the nose for horizontal pictures and against forehead and nose for vertical ones.

For horizontal photographs: Rest camera horizontally against nose while the eye looks through the finder. Keep both elbows close to the body, pressing the right thumb against the camera back, right index finger stretching over the film winding key to the body release while the right middle finger bent downwards presses at camera front. The left hand grasps the camera body on its left side. On the Vito III place the left thumb and index finger on the focusing wheel.

For vertical photographs: Rest camera upright against forehead and nose, grasping the top of the camera with the

LOADING (p. 9)



1. Open camera back.
2. Pull out rewind knob.
3. Insert cartridge in film chamber.
4. Push back rewind knob.
5. Thread film end into slit of take-up spool.
6. Turn winding knob until it locks.
7. Close camera back.
8. Lift up film lock release lever.
9. Turn film counter index opposite the letter "F" and let the film lock lever fall back.
10. Turn winding knob to the stop.
11. Lift up film lock release lever once more and let it fall back.
12. Turn winding knob to the stop again. The film counter will now show No. 1.

left hand, left thumb pressed against the camera back. On the Vito III the left index finger rubs against focusing wheel. The right hand holds Vito from below, right thumb on body release, the camera resting in the palm of the right hand.

To release, use finger pressure only. Keep the hand and its grip on the camera steady. The actual pressing 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 1/5 sec. and with a very steady hand 1/2 sec. can be exposed without noticeable camera shake.

Use a tripod when taking time exposures and also for speeds from 1/10 to 1 sec. A rigid tripod with ball and socket head should be employed to allow quick changing from horizontal to vertical position. The tripod or ball and socket head top screw has to be screwed into the tripod bush in the bottom plate of the Vito.

For time exposures and speeds slower than 1/10 sec., when working from a tripod, use a cable release. This screws into the cable release socket which is situated on Vito I and II at the front end of the body release socket, and on Vito III immediately behind the body release plunger.

Carrying the Vito

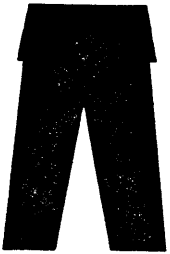
However elegant it may be to carry the camera on a long strap hanging from the shoulder, this position is quite unsuitable for quick action. Many a good shot has been lost in this way. A better method is to carry the Vito on a strap round the neck, so that it lies on the chest. Opening the front and lifting the camera up to the eye is then a matter of a split second.

A special ever-ready case has been constructed, which allows you to use the camera without removing it from the case by simply opening the front flap, which frees all working parts. A holding screw goes through the bottom of the

HOLDING THE VITO (p. 10)

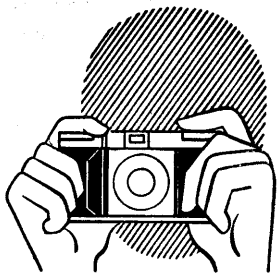
Hold camera firmly in both hands,

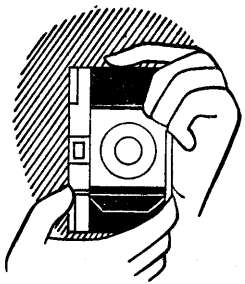
with elbows pressed into body,



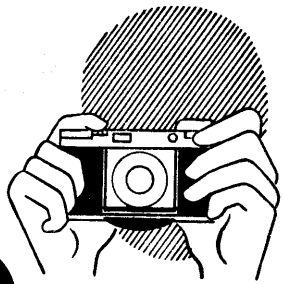
and stand with legs well apart.

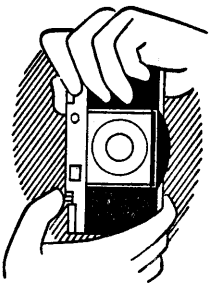
Hold quite still while releasing the shutter.



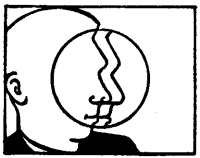


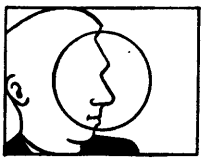
How to hold the Vito I and II for horizontal photographs (*left*) and vertical shots (*right*).





How to hold the Vito III for horizontal (*left*) and vertical (*right*) pictures. The left thumb and index finger turn the focusing wheel.





THE RANGEFINDER OF THE VITO III (p. 16)

Look through the eyepiece and watch the double image of the subject in the circle in the centre of the rangefinder frame (*left*). Turn the focusing wheel until the two images fuse into one sharp image (*right*). The camera lens is then accurately focused

case into the camera tripod bush and prevents the camera from accidentally falling out of the open case.

Shooting with the Vito

Practice the manipulations described here until in time they become practically automatic.

1. **Open camera front.**
2. **Check that film has been transported.**
3. **Set shutter.**
4. **Set stop.**
5. **Set distance.**
6. **Determine picture in viewfinder.**
7. **Release.**
8. **Close camera or wind transport for next exposure.**

1. To open the camera front press the knob on the underside of the camera body. Then grip the base board on either side and pull it downwards until the two side struts engage. *Make quite certain NOT to press the release bar of Vito I while opening the camera, as this would invariably lead to damage to the camera.*
After the film has been inserted and film counter set to No. 1, as instructed on page 10 the camera is ready for the first exposure. After each following exposure the transport-lock is automatically disengaged and the film transport key can be wound on to a definite stop. If therefore when checking the film transport the winder does not turn, this is a clear indication that the film has been wound on after the last exposure and a new frame is in position. If the transport knob can be turned, this tells you the film has not been wound yet. Turn the knob to a definite stop to bring a new piece of unexposed film behind the lens.

3. There are two actions involved when setting the shutter: (*a*) setting the shutter to the exposure time required; (*b*) setting the shutter tensioning lever (=cocking the shutter).
The shutters built into the Vito I and II are the Prontor S or SV, Compur, Compur-Rapid, or Synchro-Compur, while the Vito III has a Compur-Rapid or Synchro-Compur shutter. The Prontor S and Compur give speeds of 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100 and 1/300 sec., and B, while the Compur-Rapid or Synchro-Compur shutter has speeds of 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250 and 1/500 sec. and B.
To set the shutter speed turn the outside milled ring so that one of the engraved speeds comes opposite the index mark. The values

given: 1, 2, 5, etc., are fractions of seconds and stand therefore for 1 second, 1/2 second, 1/5 second, etc. The shutter requires cocking for all speeds including B, by pulling the cocking lever in a clockwise direction in the Compur and anticlockwise in the Prontor shutter, as far as it will go. On the Compur shutter the speeds from 1 to 1/100 sec. range continuously and may be set to any immediate value, i.e. a setting between 50 and 100 gives 1/75 sec. On the other hand, neither intermediate speeds between 1 sec. and B nor between 1/100 sec. and the faster speeds can be set. When turning the outside milled ring from 1/100 to 1/300 sec. in the Compur, and from 1/250 to 1/500 in the Compur-Rapid or Synchro-Compur, a marked resistance is felt. This is quite in order as an additional tensioning spring is brought into action to achieve these faster speeds.

At B (short time exposure) the shutter opens on pressing the release and will close again on letting it go. For long time exposures a cable release with locking device is employed. Screw the cable into the cable release thread, set the shutter to B and on releasing, engage the cable locking device. The shutter will now remain open until the locking device is disengaged. This method is only employed when the shutter has to remain open for a long time when it would be inconvenient or impracticable to keep the release lever pressed down all the time.

The Vito I has, in addition, a locking lever built in front of the strut nearest to the body release bar. If, on releasing with B setting, this milled locking lever is pushed inward, the shutter will remain open until the lever is pulled out again.

A delayed action release is built into the Prontor Shutter (but not into the Compur). This allows the photographer to appear in the picture himself, provided the camera has been placed on a firm support (tripod, table, etc.). See p. 55 for the synchronizing settings.

After setting the shutter in the normal way, push the small lever with red dot near the lower strut downwards. When the shutter is now released the delay mechanism will take about 10 sec. to run down. This allows you to get into position in front of the camera. An audible click indicates that the shutter has gone off. The delayed action cannot be used on the B setting, the lever is then blocked.

4. Adjust the iris diaphragm by turning the stop lever until the indicator points to the stop required.

The aim of the diaphragm is to adjust the effective opening of the lens. The smaller this opening (the more the lens is *stopped down*) the less light can pass through the lens in any given time. The exposure must therefore be correspondingly longer (p. 43). On the other hand the smaller the aperture, the greater will be the depth of field (p. 32).

5. On the Vito I and II the distance is set by turning the front cell of the lens until the required distance figure (which is engraved either in feet or metres) is opposite the engraved black arrow head on the

front plate of the shutter. On the Vito III the distance is determined with the built-in rangefinder which is coupled with the lens. So at the same time as you set the rangefinder, the camera lens is automatically focused.

To use the rangefinder of the Vito III hold up the camera to the eye. On looking through the viewfinder a second slightly yellowish circular image will be visible in the centre of the finder. As long as the distance setting is incorrect the subject will appear double. On turning the milled focusing ring on top, left of the camera, the two images can be brought to coincide. They slowly move on top of each other, and when they fuse into one, and only one clear sharp image is to be seen, then the camera is correctly focused for the subject. The focusing knob carries an engraved distance scale with an index which permits reading the distance to which the camera has been set.

This orthodox way of focusing, by looking through the rangefinder eyepiece while turning the lens focusing mount until the two images in the eyepiece coincide, may be adopted for taking photographs of subjects that are fairly stationary. A different method of focusing is necessary when taking moving subjects. Set the rangefinder to a distance at which the subject will be at a given moment, or focus at some spot which it actually has to pass, and press the release button when the subject reaches the pre-focused point.

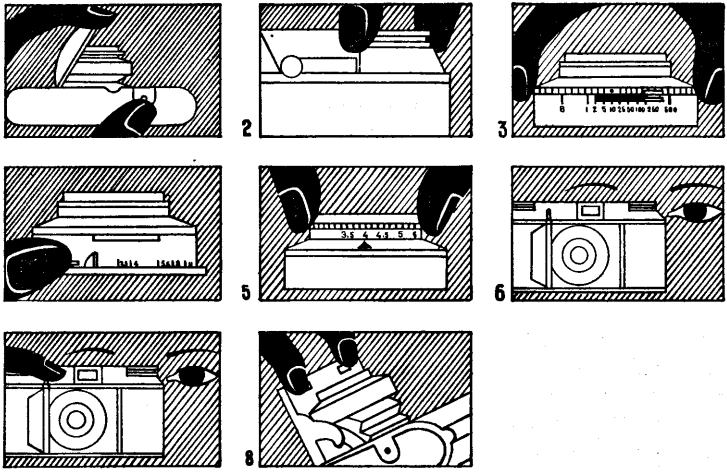
With subjects who are liable to react self-consciously (e.g. children) set the lens to a suitable distance, and then approach the subject quickly, exposing as soon as the two images in the rangefinder coincide. Alternatively, focus at some object which is at the same distance from the camera as the real subject, but in a different direction. Then swing round and press the release button as soon as the victim comes into the field of view of the finder.

See also page 36 for quick shooting with zone focusing methods.

6. The viewfinder is of the direct vision type. Hold it close to the eye. Do not attempt to turn the camera to the right or left away from the eye, and do not move the eye from the centre of the eyepiece to find the limitation of the field of view. This "spying round the corner" is deceptive, as only that section seen in the finder, which is visible when holding the eye close to and in the centre of the eyepiece while looking straight ahead, will appear on the negative. The field of view given is exact for photographs taken at 9 to 12 ft. distance. At infinity a trifle more appears on the negative than is seen through the finder, and at 3½ to 6 ft. a shade less.

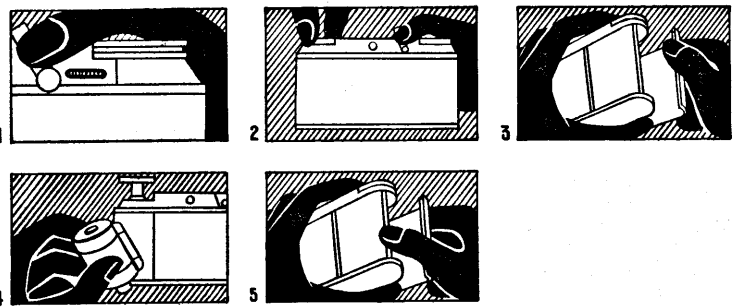
7. To release the shutter, gently press the body release lever of the Vito. Speeds from 1/25 to 1/300 sec. on the Prontor and Compur and 1/500 sec. on the Compur-Rapid respectively are fast enough for the pictures to be taken with the camera held in the hand. It is however advisable to use 1/25 sec. as sparingly as possible from the hand, as there is some danger of jerking the camera. Even a slight

SHOOTING (p. 14)



1. Open camera front. **2.** Check that film has been transported. **3.** Set shutter speed. **4.** Set stop. **5.** Set distance. **6.** Determine picture in viewfinder. **7.** Release. **8.** Close camera.

UNLOADING (p. 18)



1. Lift up film lock release lever for rewinding. **2.** Rewind film into cartridge. **3.** Open camera back. **4.** Pull out film cartridge. **5.** Close camera back or reload.

jerk, six or eight times enlarged, results in unsatisfactory definition. On the other hand, with a steady hand and a chance of leaning against a wall or—even better—supporting the camera on something solid, our exposure of not only 1/25 sec. but also of 1/10 and even 1/5 sec. can, with care, often be taken without shaking.

Time exposures should be made with the cable release, which screws into the cable release thread of the camera.

8. To close the Vito I and II press down the two black roughened keys in front of the lens. This will release the side struts and enable the front to be folded up. On the Vito III press with two fingers on the wide bar on the camera front and fold the front backwards. The fingers should remain on the bar until they are automatically pushed away by the lens carrier.

Unloading the Vito

After having taken all the 36 exposures (the number of exposures taken is automatically counted on the film counter) the film has to be rewound into the cartridge in order to remove it from the camera and replace it by a new film. Both these operations should be done in subdued daylight.

1. Set camera for rewinding.
2. Rewind film into cartridge.
3. Open camera back.
4. Pull out film cartridge.
5. Close camera back or insert new film.

1. On the Vito I and II set the camera for rewinding by lifting up the release lever for the film lock. Hold it in this position. On the Vito III press the rewind knob on the top plate behind the body release. It is marked with the letter R. Keep it in this position.
2. Wind the rewind key on camera top (marked with the letter R) in the direction of the engraved arrow until all the film has been wound back and the film transport key stops turning.

   In the latest Vito II the rewinding is facilitated by pulling up the rewind key to the first engaging click-stop. On the Vito III swing up the grip of the rewind key but do not pull out the key itself.
3. See p. 9, No. 1.
4. To remove the film cartridge, first pull out the rewind knob to its fullest extent.

Changing Partly Exposed Films

A partly exposed film (e.g. if the camera is loaded with black and white film and you want to take colour pictures) may be removed from the camera and exchanged against another one without using a darkroom as follows:

1. Rewind the partly exposed film into the cartridge as described on p. 18. Be careful when rewinding to stop when the increased resistance is felt which is due to pulling the beginning of the film from its anchorage at the take-up spool. This prevents the beginning of the film from slipping back into the cartridge. If this should inadvertently happen the cartridge would have to be opened in the darkroom to extricate the beginning of the film so that it can be re-inserted into the camera at a later date. Mark the number of frames exposed in pencil on the start of the film emulsion side.
2. Insert the new type of film into the camera as described on p. 9.
3. To re-insert a partly exposed film proceed as when inserting a new one. Once the camera back is closed and the film counter is set to No. 1, pull up the transport locking lever (Vito I and II) and keep it in this position. Turn the film winding knob until the noted picture number appears opposite the index of the exposure counting disc. Now let the locking lever swing back. After having cocked the shutter the camera is ready for the next exposure. With the Vito III the procedure is the same, except that the interlock release is depressed and not pulled up as in the Vito I and II.

Cutting off Exposed Film Lengths

If a film which is only partly exposed has to be processed, it can be cut off in the darkroom or in complete darkness.

After the last exposure wind the film transport knob once more. Then in the dark, open the camera back and cut the film about $\frac{1}{2}$ in. away from the cartridge. To remove the exposed part on the take-up spool lift up film transport lock lever (on the Vito III depress it). Wind the film from the take-up spool and wrap it up in black paper.

The remaining film in the cartridge can now be reinserted, attached to the take-up spool, and the camera closed. If the reinserting has been done in the darkroom no further blind exposure is necessary. If the film has been reinserted in daylight, make two blind exposures (p. 10). Advance the exposure counter by two to allow for the loss of film in cutting and reinserting.

VITO FILMS

The Vito takes standard perforated cine film of 35 mm. width, as used in the majority of other 35 mm. cameras, e.g., Leica, Contax, etc. It may be obtained as:—

DAYLIGHT CARTRIDGES are the simplest form of Vito film packages. The ready cut and trimmed films for 36 exposures are supplied in cartridges (also called cassettes or patrones), which can be loaded in daylight into the camera (see p. 9).

DARKROOM REFILLS are lengths cut and trimmed for 36 exposures and have to be loaded into a cartridge in the darkroom (see p. 24).

DAYLIGHT REFILLS are cut and trimmed for 36 exposures which are wound on to a centre spool (as used in the cartridge) and covered with a black paper leader strip to allow loading of a cartridge in daylight (see p. 24).

BULK FILM is film in 18 ft. to 200 ft. lengths, where a suitable length has to be cut off to be loaded into a cartridge in the darkroom (see p. 24).

Safelight

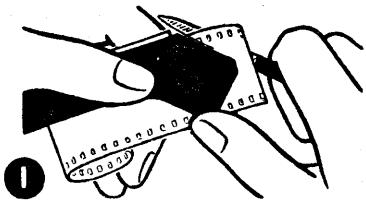
The loading of cartridges with darkroom refills or from bulk film has to be carried out in the darkroom.

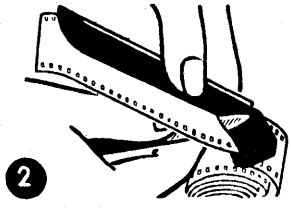
In the case of panchromatic films (see p. 25) a dark green safelight may be used, but it is always safer to work in complete darkness. This is not difficult. It is, however, advisable to practice filling with a dummy film first in daylight before starting the darkroom work.

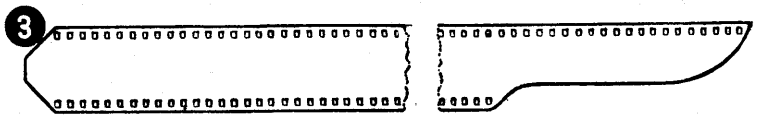
In the case of positive film (see p. 25) amber light will do.

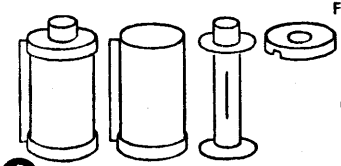
Handling, Winding and Trimming the Film

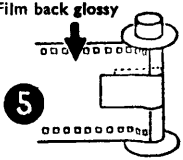
When handling the actual film, particular care must be taken not to touch its emulsion (matt) side. It should only





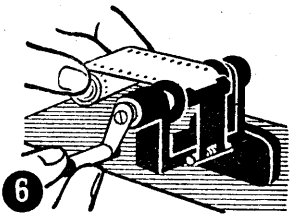


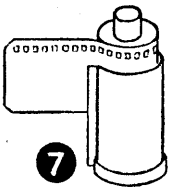


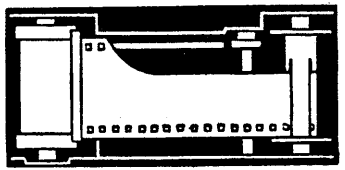


WINDING & TRIMMING FILMS (pp. 20, 22)

1: The correct trimming of the wedge-shaped end (which is fitted to the centre spool of the cartridge) with a standard trimming template. **2:** Trimming of the curved cut with a standard trimming template. **3:** The appearance of the trimmed film, left wedge, right curved cut. **4:** The film cartridge, its outer shell, centre spool and separate top. **5:** How to fix the film to the centre spool of the cartridge. **6:** Winding the film with the mechanical film winder to the centre spool. **7:** Assembling the cartridge. **8:** Loading film into camera.







be handled and wound on to the centre spool of the cartridge 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 place in which the loading is done should be perfectly dry, clean, and free from dust. Only a clean, spotless negative will produce clean prints.

When using bulk film for loading cartridges, the edge of the work-bench 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 measuring film lengths in the darkroom.

Film ends are best trimmed with the aid of a special film trimming template. At the beginning of the roll of film make the wedge-shaped cut for the centre spool and measure off the required length of film. At the end of this make the curved cut for the take-up spool. The curved cut must not go through a perforation hole.

When doing this job with a good template it leaves at the same time the correct cut for the take-up spool on the remaining film on the roll, so that about 4 in. of film are saved on every strip. When trimming film without a template it is sufficient to start the curved cut between the tenth and eleventh bottom hole from the end, facing the emulsion side of the film. As it is not essential to have the full standard cut when working with the Vito, a 2 in. (5 cm.) cut will serve the purpose quite well.

The ready cut film is now wound on to the centre spool of the cartridges as described on p. 24. Make sure, while winding on, to hold the film only by its edges.

This task can be simplified by the use of a special hand winder, a milled metal rod with a slit on one end to fit into the cross pin fitting of the spool. A mechanical winder may be obtained to serve the same purpose. It can be attached to the edge of the work-bench, 12 full turns with this will wind sufficient film for about 12 exposures, 18 turns = 19 exposures; 32 turns = full length for 36 exposures.

When winding the film on and off, take care not to put too great pressure on the film. The film edges must not be squeezed 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 static electrical discharges, and appear as dark, zig-zag lines running from the edge of the film towards the centre of the picture.

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.	c.m.		in.	cm.		in.	cm.
1	11¾	30	14	31¾	80	27	51	130
2	13½	34	15	33	84	28	52½	133
3	15	38	16	34½	88	29	54	137
4	16¼	41	17	36¼	92	30	55½	141
5	17¾	45	18	37¾	96	31	57	145
6	19¼	49	19	39¼	100	32	58½	148
7	20¾	53	20	40½	103	33	60	152
8	22	56	21	42	107	34	61½	156
9	23¾	60	22	43¾	111	35	63	160
10	25¼	64	23	45	114	36	64½	164
11	26¾	68	24	46½	118	37	66	167
12	28½	72	25	48	122	38	67½	171
13	30	76	26	49½	126	Including trimming		

Loading Vito Cartridges

The cartridge consists of a flanged centre spool which is in a one-piece shell; the film leaves the shell by a light-trapped slot. The centre spool can be removed from the shell by lifting either the top or bottom of the cartridge according to the construction of the particular make of cartridge. While the containers of the daylight loading films are intended by their makers to be used once only, it is an established fact that they can be safely re-used several times, particularly if care is taken to keep the plush lining free from dust and grit.

Reloading cartridges help to reduce the running expenses appreciably.

How to Load Cartridges with Darkroom Film

1. **Work in darkroom in appropriate safelight.**
2. **Prepare film.**
3. **Open cartridge.**
4. **Fix film on centre spool.**
5. **Wind film on centre spool.**
6. **Insert centre spool into shell: the first 2 in. of film must protrude from light trap.**
7. **Close cartridge.**

2. In the case of bulk film prepare the length to be used as described on p. 22. When using a darkroom refill remove its wrappings. It is useful to fold the first ½ in. (1 cm.) of the beginning of the film slightly backwards. This prevents it from slipping back into the cartridge.
4. If the centre spool is fitted with a film catch, thread the tapered end of the film into it. 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, wind a 1½ in. (4 cm.) piece of adhesive tape (for example, Cellophane, lantern slide binding tape) round the camera spool so that on either side about ½ in. of tape is used to secure the film (see p. 21).
5. Wind the film on the centre spool moderately tightly. Do not touch the emulsion with the fingers; handle the film only by the edges.
7. When using cartridges on which the top or bottom cover are originally held in position by the gummed label, refix the top or bottom cover to the shell with a length of cellophane adhesive tape.

How to Load Cartridges with Daylight Refills

1. **No darkroom is necessary.**
2. **Remove wrapping and label of refill.**
3. **Open cartridge.**
4. **Introduce refill into shell of cartridge; the first 2 in. of paper-leader have to protrude from light trap.**
5. **Close cartridge.**
6. **Pull out paper-leader and 2 in. of film.**
7. **Cut off paper-leader.**

4. The original centre spool of the cartridge is not needed and may be kept separately.
7. When using cartridges on which the top or bottom cover are originally held in position by the gummed label, refix the top or bottom cover to the shell, preferably with a length of adhesive Cellophane tape.

The Choice of Material

There is no such thing as a "best" film for any or every kind of picture. Each type of film has certain characteristics, especially with regard to colour sensitivity, speed, gradation, latitude, and, more particularly, grain.

COLOUR SENSITIVITY. The ordinary silver bromide photographic emulsion is only sensitive to violet and blue light, and therefore bound to give an untrue black and white rendering when taking photographs of subjects containing yellow, green and/or red (as practically all objects do). Modern miniature films are panchromatic and have been made sensitive not only to violet, blue, yellow and green, but also to red. Some particularly fast panchromatic films are over-sensitive to red and will render this colour too light.

INFRA-RED FILM. Infra-red film is a negative material which is made sensitive to infra-red rays not visible to the human eye. Special applications of this material are photography in the dark, long distance shots, haze or mist penetration, scientific copying and research work.

ORDINARY FILM. For copying black and white objects (books, ledgers, etc.) a *positive film* of 3 to 10° Scheiner can be recommended. Besides its qualities of fine grain and high brilliancy, it possesses the advantage that it can be handled in an amber darkroom light.

SPEED. The sensitivity of film materials to light in general is measured in *Exposure Index* numbers or various systems of degrees. Scientists and manufacturers all agree that none of the methods employed to determine the speed of films is entirely satisfactory, and continue giving preference to one or the other of them. In any case, although speed is a very obvious asset, it is also a quality which must be paid for by possible disadvantages of the material in some other respects.

To call the fastest film the best would be just as foolish as to select a racing car for daily motoring.

While a scientifically correct conversion of one speed rating system to another cannot be made owing to their different principles, the following list gives some guidance as to their practical relationship.

CONVERSION TABLE OF DIFFERENT SPEED SYSTEMS

European Scheiner	*BS & ASA Exposure Index*	*BS & ASA Index (Logar.)*	*Weston Speed*	*G.E. Speed*	*DIN*	*H. & D.*
14°	1.5	13°	1.2	2	4/10°	60
17°	3	16°	2.5	4	7/10°	120
20°	6	19°	5	8	10/10°	250
23°	12	22°	10	16	13/10°	500
26°	25	25°	20	32	16/10°	1000
29°	50	28°	40	64	19/10°	2000
32°	100	31°	80	125	22/10°	4000

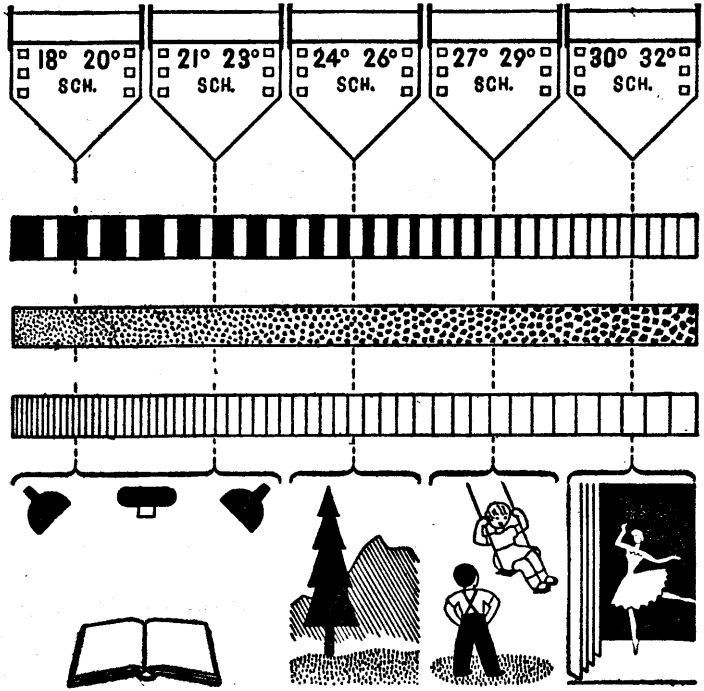
In this table each value represents twice as fast a film speed as the one immediately above it. In some systems this doubling of film speed means increasing the speed number by 3° each time (Scheiner, BS log. Index, DIN), while in others the film speed itself is directly proportional to the speed number, and therefore inversely proportional to the exposure required (BS Arithmetical Exposure Index, Weston, G.E., H. & D.).

Slow films of less than about 23° Sch. can be usefully employed for scientific photography, copying and architectural details. Their main advantage is in their extremely fine grain, making special development unnecessary. Their disadvantages are in their inability to cope with live subjects in other than exceptionally favourable lighting conditions, lack of latitude and mostly hard gradation.

Medium films of 26–29° Sch. are the right material for the beginner, and can be well employed for any of the average subjects. Their advantages are: reasonably fine grain without the use of too complicated methods of development, correct tone rendering, good resolving power. Disadvantage: further loss of speed if fine grain development has to be employed for the sake of big enlargements.

Fast films of 31° Sch. and over are used for high speed sports shots, interiors, stage pictures and night photography. Advantages: increased sensitivity to red (artificial light), use of smaller apertures (depth of field) which in turn facilitates focusing under adverse conditions of lighting (focusing without rangefinder). Disadvantages: graininess

FILM SPEED, CONTRAST, GRAIN, RESOLVING POWER



Generally speaking, low speed goes with greatest contrast, finest grain and highest resolving power and vice-versa. The film speed in *the top row* points to the corresponding contrast, grain and resolving power. The contrast row shows (*from left to right*) how high contrast becomes medium and low as speed grows. The grain row shows (*from left to right*) how fine grain turns into medium grain with growing speed and finally the resolving power row shows the decrease of resolving power (number of lines) with increase of film speed. The *bottom row* indicates the type of subjects for which films of the various speeds are best.

which, however, can be improved by special methods of developing (at some cost of speed) and somewhat uneven tone rendering (reds too light).

GRAIN. Silver grains themselves form the picture in the emulsion. To the naked eye they form a compact, dark mass, but under the magnifying glass or microscope the separate clumps of grains are visible. Obviously, if the grain of our Vito film is coarse, it will soon become visible on moderate enlarging. The finer the structure of grain, the more enlarging it will allow without showing any unpleasant granular effect in the print. As a rule, the grain size is more or less in direct relation to the speed of the film (p. 25). The faster the film, the coarser the grain and vice-versa. It may be pointed out at the same time that the grain can, to a certain extent, be influenced by development (hence fine grain development) correct exposure, choice of paper, etc.

GRADATION. Each film has an ability of its own to reproduce various degrees of brightness on its emulsion. If the ability of a film is confined to only a small number of black-grey-white-tones, we speak of a high contrast or *hard* negative material. If it is able to reproduce many delicate shades of grey between black and white, it is known as a low contrast, or *soft* film. Generally speaking, low speed films of fine grain possess a higher contrast than fast films, which are softer.

LATITUDE. Latitude is the ability of the film to yield usable negatives, even with a certain amount of under- or (more often) overexposure. Films praised for particularly wide latitude may facilitate exposure, but are likely to have less *resolving power*, causing loss of definition which in big enlargements is just as unpleasant as graininess.

Our negative material has a number of additional properties which help towards good results. There is a special protective coating—a hardened gelatine layer on top of the actual sensitive layer which protects against scratches. The base is coloured, as a rule grey, in order to avoid reflection of the light coming through the emulsion on the film-back and thus causing halation.

CHARACTERISTICS OF SOME 35 MM. FILMS

Make	Type	Speed in Scheiner	Grain	Gradation
Adox—				
KB 14	P.	25°	ef.	n.
KB 17	P.	28°	fg.	n.
KB 21	Pr.	32°	mg.	n/s.
Agfa—				
Isopan F	P.	27°	ef.	n.
Isopan FF	P.	24°	uf.	v.
Isopan ISS	Pr.	31°	fg.	n/s.
Ferrania—				
P.3	P.	27°	ef.	n.
S.2	P.	31°	mg.	n/s.
Gevaert—				
Gevapan 27	P.	27°	ef.	n.
Gevapan 30	P.	30°	mg.	n/s.
Gevapan 33	Pr.	33°	mg.	n/s.
Ilford—				
Pan F	P.	24°	uf.	v.
F.P. 3	P.	29°	ef.	n.
H.P. 3	Pr.	32°	mg.	n/s.
Kodak—				
Panatomic X	P.	27°	ef.	n.
Plus X	P.	29°	fg.	n.
Super XX	P.	32°	mg.	n/s.
Perutz—				
Peromnia	Pr.	32°	mg.	n.
Perpantic	P.	27°	ef.	n.

TYPE: P=panchromatic; Pr.=panchromatic with increased red sensitivity.
GRAIN: uf.=ultra fine grain; ef.=extra fine grain; fg.=fine grain; mg.=medium grain
GRADATION: n.=normal; n/s.=normal tending to soft; s.=soft; v.=vigorous.

Colour Film

Besides the films mentioned which reproduce the world around us in black and white, colour films have been introduced which enable us to photograph in natural colours.

THE PRINCIPLE. There are two types of colour film. The first is represented by *Kodachrome*, *Ansco Color*, *Agfacolor Reversal*, and *Ilford Colour*. These films have three emulsion layers. The top layer records the blue part of the image,

the middle the green, and the lowest red. It is this combination of the three images which reproduces the picture in natural colours.

The exposed material, after processing, produces not the usual negative but a positive transparency in natural colours, which is called the colour transparency.

The second type of colour film, on the same principles, is represented by *Agfacolor Negative*, *Gevacolor Neg.-Pos.*, and *Pakolor* films, which are developed into colour negatives. Here each subject colour appears in its complementary colour.

The colour negatives are then printed on a colour paper to give colour prints or enlargements. You can also make black-and-white prints from them in the usual way.

35 mm. COLOUR FILMS ON THE MARKET

Film	*Type*	*Speed in Scheiner*	*Processing*	*Conversion filter*	*Speed Sch.° with conversion filter*
Agfacolor Neg.	Daylight (Type T)	22°	Maker	—	—
Agfacolor Neg.	Tungsten (Type K)	22°	Maker	—	—
Agfacolor Rev.	Daylight (Type T)	23°	Maker, user	—	—
Agfacolor Rev.	Artificial light (Type K)	23°	Maker, user	—	—
Ansco Color	Daylight	24°	Dealer, user	Ansco 10*	18°
Ansco Color	Tungsten	24°	Dealer, user	Ansco 11†	23°
Ferraniacolor	Daylight	22°	Dealer, user	—	—
Gevacolor Rev.	Daylight	23°	Maker	—	—
Gevacolor Rev.	Photoflood	23°	Maker	—	—
Gevacolor Neg.	Daylight	23°	Maker	—	—
Ilford Colour	Daylight (Type D)	23°	Maker only	Ilford 351*	17°
Ilford Colour	Artificial light (Type A)	23°	Maker only	Ilford 151†	22°
Kodachrome	Daylight	21°	Maker only	Wratten 80*	15°
Kodachrome	Artificial light (Type A)	23°	Maker only	Wratten 85†	21°
Pakolor Neg.	Daylight (Type D)	23°	Maker, user	—	—
Pakolor Neg.	Artificial Light (Type A)	23°	Maker, user	—	—

*Conversion filter to correct daylight film for use in artificial light, or (†) artificial light film for use in daylight.

By printing colour negatives on to colour positive film you can make transparencies for projection.

Both kinds of film are available in two types, balanced for either daylight or artificial light.

EXPOSING COLOUR FILM. The exposure latitude of colour film is very small. It is therefore important to ascertain the exposure time accurately with a reliable photo-electric meter. Underexposed and overexposed films not only produce dense or weak transparencies but also the colour values are distorted. Overexposure produces pale, diluted colours, underexposure gives hard, deep colours.

Avoid great contrast such as deep shadows. Objects should be taken with front lighting (sun behind the camera). For photographs in daylight the daylight type film has to be used, while the artificial light film (Tungsten, or Type A) is for indoor photographs in the light of high-power electric bulbs, or Photofloods.

Daylight film may be used in artificial light and vice versa with the special conversion filter recommended by the makers as indicated in the table above.

DISPLAYING THE COLOUR PICTURE. The colour transparency can be viewed in a variety of transparency viewers. The simplest consist of a magnifying glass set in a frame into which the picture can be inserted. If the viewer is held against a lighted background, the picture appears enlarged and well illuminated. More elaborate viewers have an artificial light source of their own.

Besides viewing, the transparency can be projected in a projector which will throw a large picture onto a projection screen. Finally, colour enlargements can be made from transparencies either by firms who specialise in this service, or one can make one's own colour prints at home. This, however, is a comparatively complicated process.

From the colour negative, prints can be made directly either in colour (and at relatively low cost) or in black and white just as from an ordinary black and white negative. For projection or viewing purposes a colour transparency has to be made.

THE TECHNIQUE OF FOCUS

The lens is focused at some definite distance. That means that its position relative to the film is adjusted in such a way that whatever is exactly at the focused distance will be represented by a sharp image on the film. Everything else—everything nearer to the camera or farther from it—will be, strictly speaking, unsharp.

In practice the decline of definition is gradual. Thus there is a zone—stretching from somewhere in front of the focused distance to somewhere behind it—which will appear sufficiently sharp to the human eye. This is called *depth of field.*

Now, what should or should not be accepted as sufficiently sharp is debatable. Certain standards, however, have been agreed upon. It is agreed that any pin point represented on a 35 mm. negative by a "dot", the diameter of which does not exceed 1/30 mm. should be regarded as sharp. The technical term of that "dot" is *circle of confusion.*

The limits defined by the circle of confusion are reached more quickly with one type of lens than with some others. The results also vary with the conditions under which one definite type of lens is used.

Short focus lenses yield more depth of field than long focus lenses.

Small apertures yield more depth of field than large apertures.

Far focusing distances yield more depth of field near focusing distances.

Control of Depth of Field

The depth of field—dependent on the distance actually focused at, the aperture employed and the focal length of the lens—has to be ascertained from case to case. The Vito lens is not interchangeable, so we do not need to consider the focal length. There remains the interplay of aperture and focusing distance. Their effect can be read off a depth of field indicator fitted to the Vito.

The distance figures are engraved around the rotating front rim of the lens of the Vito I and II (on Vito III the same arrangement is round the focusing wheel):—

∞ 60, 20, 15, 12, 10, 8, 7, 6, 5, 4½, 4, 3½ feet.

(Some Vito models have a slightly different calibration.)

Opposite, on the shutter front, is an arrowhead ▼ with its pointed end towards these distance figures. To the right and left of the arrowhead the aperture figures are repeated:—

16, 11, 8, 5.6, 3.5 ▼ 3.5, 5.6, 8, 11, 16.

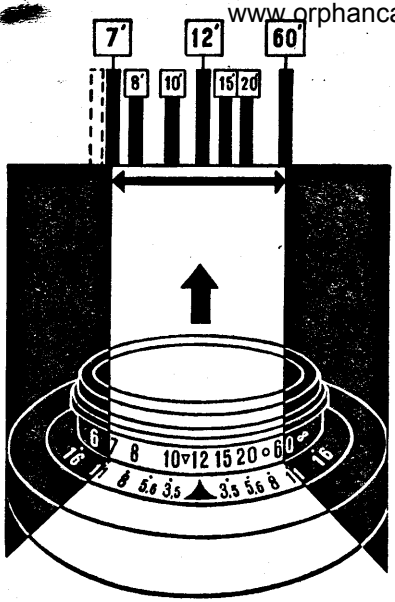
After setting the distance figure to the distance index mark (▼) the depth of field can be read off opposite the aperture figures chosen.

If, for example, the lens is focused at 12 ft., the aperture marks *f* 11 are opposite 60 ft. on one side and opposite 7 ft. at the other. Consequently at a distance setting of 12 ft. and aperture *f* 11 the depth of field extends from 7 ft. to 60 ft. When working at the same distance of 12 ft., but at an aperture of *f* 3.5, the range of sharpness extends only from 10 ft. to approximately 18 ft. Note how we can vary the area of sharpness by playing with the stop and without changing the setting of the distance: the smaller the stop the greater the depth.

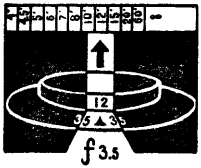
So the stop (aperture) is one of the variables by which a convenient zone of sharpness can be obtained. The other one is, of course, the distance setting. Let us watch the index lines leading from, say, aperture *f* 5.6 while we set the distance indicator ▼ first at 4 ft., then at 7 ft., and last at 60 ft. We learn that in the first case the depth of field stretches from 3½ to 4½ ft., in the second case from 5½ to 9 ft. and in the last case from 18 ft. to ∞. So the depth of field grows as we set the lens to distances farther and farther away from the camera—and incidentally we conclude that the depth of field in front of the focused distance is always more limited than the depth gained behind it.

The comparative shallowness of the depth of field in

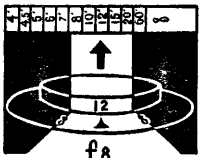
THE DEPTH OF FIELD SCALE (p. 33)



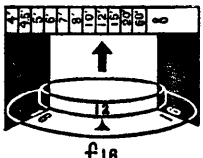
The depth of field scale engraved on the front plate of the shutter of the Vito I and II (or on the focusing wheel of the Vito III) shows at a glance the depth of field at any aperture and distance setting. Here the camera lens is focused at 12 ft. To get the depth of field at *f* 11, we simply read off the distances opposite the two figures 11 on the scale, in this case 7 and 60. Therefore everything will be reasonably sharp between 7 and 60 ft.



f 3.5

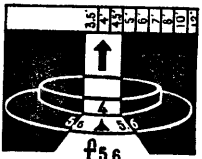


f 8

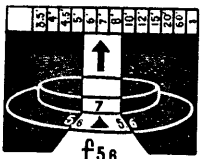


f 16

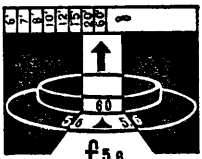
Depth of field increases the more we stop down the lens. It is smallest at *f* 3.5 (*left*), greater at *f* 8 (*centre*), and greater still at *f* 16 (*right*).



f 5.6

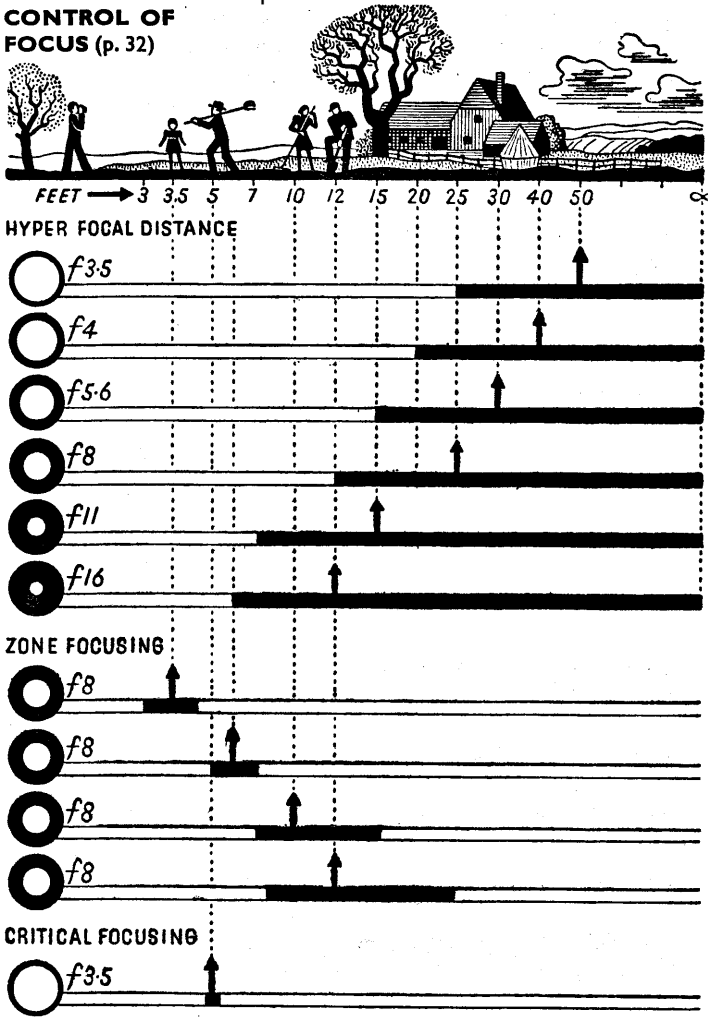


f 5.6



f 5.6

Depth of field is greater with far away subjects than with near ones. At 4 ft. we only have a total depth of field of about 1 ft. (*left*), at 7 ft. the depth takes in a range of about 3½ ft. (*centre*), while at 60 ft. it stretches from about 18 ft. to infinity (*right*).



The extent of depth of field for Hyperfocal Distance settings (p. 37), Zone Focusing (p. 37), and Critical Focusing. The vertical arrows indicate the distance focused at, the heavy horizontal line giving the extent of depth of field for the aperture shown at the left.

front of the focused distance will sometimes make it necessary—e.g. in landscape photography, where the subject may have to include much foreground—to set the lens nearer than the main point of interest, in order to gain additional sharpness towards the foreground while covering the main point of interest by the depth of field behind the focused distance. This trick, however, must be used with moderation. It should be recalled that the widely held idea that everything is equally sharp within the depth of field area and completely unsharp outside its limits is quite wrong. There is a gradual decline of sharpness even within the depth of field area. Critical pin-point definition can be expected only in the plane actually focused. So care should be taken to place the focus as near as possible to the spot on which the greatest sharpness is required. Thus in the case of distant landscapes use should not be made of the hyperfocal distance (described below) if the sharpness is required in the far distance; focusing at the far distance will give better results.

When a lens is focused on such a distance that the depth of field just reaches the far distance (infinity) then the lens is focused on the "infinity-near-point" or *hyperfocal distance*. This adjustment of focus is advisable when it is desired to secure adequate sharpness from the farthest distance to as far as possible in the foreground, rather than extreme sharpness in the far distance only.

Quick Focusing

The Vito user will often aim at snapshots by seizing a situation as he comes across it without many preliminaries, certainly without setting up a tripod, and mostly with the least possible loss of time. To attain this he will have to know his camera not only inside out but he also needs a ready-for-shooting lens setting (such as zone focusing), which will yield a sharp picture every time. Here the relatively short focal length of the Vito lens scores; it has the advantage of a comparatively large depth of satisfactory definition even at the larger apertures.

 From what was said about depth of field on p. 33, it is

clear that the stop is used to regulate the definition of our picture across the depth (both towards foreground and background) from the point at which the lens is actually focused. Now, the idea could occur to the beginner to try to use the smallest stop every time to make sure of sharp pictures. That, however, would mean that in the majority of cases he would not arrive at a practicable exposure time. While small stops mean greater depth of field, they also need longer exposure times (see p. 43).

In consequence, the best zone focusing is the compromise between a well-selected medium stop with a suitable distance setting, yielding a fairly extensive zone of definition and still allowing for a reasonably short exposure.

The most useful zone focusing settings are marked on the distance scale of the Vito camera by a circle (O) between 20 and 60 ft. indicating a far focusing zone, and a triangle (△) between 10 and 12 ft. indicating a near focusing zone. At aperture *f* 5.6 the far focusing zone extends from 15 ft. to ∞, the near focusing zone from 8 ft. to 18 ft.

HYPERFOCAL DISTANCE
(For conversion into metric units, see p. 57)

Stop	*Distance setting*	*Depth of field*	
		from	*to*
2	80 ft.	∞	40 ft.
3.5	50 ft.	∞	25 ft.
4.5	40 ft.	∞	20 ft.
5.6	30 ft.	∞	15 ft.
8	24 ft.	∞	12 ft.
11	15 ft.	∞	7 ft.
16	12 ft.	∞	6 ft.

The Depth of Field Table

This table has been included in this book, in spite of the fact that the Vitos are fitted with a depth of field calculator, in order to supply perfectly accurate figures which cannot be obtained with the calculator. The distance scale is not calibrated in sufficient detail for that, and the calculator is computed for a more tolerant circle of confusion than we like to take as standard for miniature camera work.

DEPTH OF FIELD TABLE FOR 5 cm. VITO LENSES

(For conversion into metric units, see p. 57)

f2	3–5 3½ 3–7	3–11 4 4–1	4–4½ 4½ 4–7½	4–10 5 5–2	5–9 6 6–3	6–8 7 7–5	7–7 8 8–6	9–4 10 10–10	11–0 12 13–2½	13–6 15 16–11	17–5 20 23–6	91–6 60 110	133 ∞
f2.8	3–4½ 3½ 3–7½	3–10½ 4 4–1½	4–3½ 4½ 4–8½	4–9½ 5 5–3	5–8 6 6–4½	6–6½ 7 7–6	7–5 8 8–8	9–1 10 11–1	10–7½ 12 13–8	13 15 17–8	16–6 20 25–4	36–9 60 162	95 ∞
f3.5	3–4½ 3½ 3–7½	3–10 4 4–2½	4–3½ 4½ 4–9	4–8½ 5 5–3½	5–7 6 6–5½	6–5½ 7 7–8	7–3½ 8 8–11	8–11 10 11–5	10–4 12 14–3	12–7 15 18–7	15–10 20 27–2	33–6 60 285	76 ∞
f4	3–4½ 3½ 3–8	3–9½ 4 4–2½	4–3 4½ 4–9½	4–8½ 5 5–4½	5–6½ 6 5–5½	6–4 7 7–9	7–2 8 9	8–9 10 11–8	10–2 12 14–7	12–4 15 19–2	15–5 20 28–6	31–3 60 ∞	67 ∞
f5.6	3–3½ 3½ 3–9	3–8½ 4 4–3½	4–1½ 4½ 4–11	4–6½ 5 5–6½	5–4½ 6 6–9½	6–2 7 8–1	6–11 8 9–6	8–4 10 12–6	9–7½ 12 16–0	11–6 15 21–7	14–2 20 34–4	26–9 60 ∞	48 ∞
f8	3–2½ 3½ 3–10½	3–7½ 4 4–5½	4–0½ 4½ 5–1½	4–5 5 5–9½	5–2 6 7–2	5–10 7 8–9	6–6 8 10–4	7–9 10 14	8–9 12 18–10	10–6 15 26–8	12–5 20 50–9	21–4 60 ∞	33 ∞
f11	3–1½ 3½ 4	3–6 4 4–8½	3–10½ 4½ 5–5	4–2½ 5 6–2	4–11 6 7–9	5–6 7 9–7	6–1 8 11–8	7–2 10 16–6	8–0 12 24–0	9–5 15 37–10	10–11 20 120	17–2 60 ∞	24 ∞
16	2–11½ 3½ 4–3½	3–3½ 4 5–1	3–8 4½ 5–11	3–11 5 6–11	4–6 6 9	5–1 7 10–7	5–6 8 14–8	6–5 10 23–7	5–3 12 41–0	8–1 15 125	9–2½ 20 ∞	13–3 60 ∞	17 ∞

The table is computed on the assumption that the circle of confusion is of 1/30 mm. diameter. The figures on the left of the table relate to the setting of the lens stop. The bold (middle) figures in each group indicate the distance (in feet) to which the lens is to be set on the focusing scale. The corresponding figure above then gives the distance of the near limit (in feet and inches) and the figures below gives the distance of the far (distant) limit (in feet and inches) of the depth of field.

Close-up Work with the Vito

While the Vito normally focuses down to 3½ ft. one can work at still shorter distances with the aid of the Focar close-up lenses. Two different lenses are made.

Focar Lens No. 1 for distances between 31½ and 18 in., covering subject sizes between approximately 13 × 20 in. and 7½ × 11½ in. The scale of reproduction ranges from 1 : 14.5 to 1 : 8.

Focar Lens No. 2 for distances between 17½ and 12½ in., covering subject sizes between approximately 7½ × 11½ in. and 5¼ × 7⅞ in. The scale of reproduction ranges from 1 : 8 to 1 : 5½.

These auxiliary lenses are pushed on to the front of the camera lens. The distance should be measured from the front of the auxiliary lens to the subject. No increase in exposure time is called for, but it is advisable to stop down to *f* 5.6 when using them. For combination with filter and lens hood see p. 50.

These close-up lenses can be applied to all types of near distance photography, such as plants, *objets d'art*, small creatures, table-top work, copying of books, documents, etc.

Where the original Vito Focar close-up lenses are not available, any photographic dealer or optician will be in a position to supply a range of meniscus type lenses of suitable size, to be put into a fitting filter mount. The lenses suggested are + 1 diopter, + 2 diopters and + 3 diopters. These do not coincide with the Vito Focar lenses.

The + 1 Diopter Lens: covers distances from 39½ in. to

CLOSE-UP FOCUSING WITH VITO FOCAR LENSES

(For conversion into metric units, see p. 57)

Set distance on focusing mount to	The distance from front of lens to subject is	
	With Focar No. 1	With Focar No. 2
∞	31½ in.	17½ in.
60 ft.	30 in.	17 in.
O	29¼ in.	16¾ in.
20 ft.	27½ in.	16¼ in.
15 ft.	26½ in.	16 in.
12 ft.	25¾ in.	15½ in.
▼	25½ in.	15¼ in.
10 ft.	25 in.	15¼ in.
8 ft.	23¾ in.	14¾ in.
6 ft.	22 in.	14 in.
5 ft.	20¾ in.	13½ in.
3½ ft.	18 in.	12½ in.

CLOSE-UP FOCUSING WITH +1, +2, +3, DIOPTER LENSES

(For conversion into metric units, see p. 57)

Set distance on focusing mount to:	With +1 diopter lens, the distance from front of lens to subject is:	With +2 diopter lens, the distance from front of lens to subject is:	With +3 diopter lens, the distance from front of lens to subject is:
∞	39.4 in.	19.7 in.	13.1 in.
60 ft.	37.5 in.	19.2 in.	12.9 in.
20 ft.	33.8 in.	18.2 in.	12.4 in.
15 ft.	32.4 in.	17.8 in.	12.2 in.
12 ft.	30.9 in.	17.3 in.	12 in.
10 ft.	29.7 in.	16.9 in.	11.8 in.
8 ft.	28 in.	16.7 in.	11.7 in.
6 ft.	25.5 in.	15.5 in.	11.1 in.
5 ft.	23.8 in.	14.9 in.	10.8 in.
3.5 ft.	20.5 in.	13 in.	10 in.

The depth of field when working at close range with the supplementary lenses is obviously rather limited. The table on p. 41 gives the extent of depth of field for close-up work. These are firm indications of the depth of field to be expected when working at such short lens-subject distances. The figure on the left of the groups is the aperture, the bold middle figure gives the distance from front of lens to subject according to the tables above, while the top figure above it gives the near limit, the row below the far limit of the depth of field. It is applicable to work with either series of auxiliary lenses.

CLOSE UP DEPTH OF FIELD

(For conversion into metric units, see p. 57)

	37¾	33¾	29	25 5/16	20½	19 1/16	15⅝	11⅞	10 13/16
f 3.5	**39½**	**35**	**30**	**26**	**21**	**19½**	**16**	**12**	**11**
	41⅜	36½	31¼	26 13/16	21 9/16	20	16¼	12¼	11 3/16
	36 9/16	32⅝	28 1/16	24⅝	20⅛	18¾	15⅜	11¾	10 11/16
f 5.6	**39½**	**35**	**30**	**26**	**21**	**19½**	**16**	**12**	**11**
	42 15/16	37 9/16	31⅝	27 5/16	22	20⅜	16½	12 7/16	11 5/16
	35 7/16	31 1/16	27⅜	24 1/16	19¾	18 7/16	15 3/16	11 9/16	10 9/16
f 8	**39½**	**35**	**30**	**26**	**21**	**19½**	**16**	**12**	**11**
	44⅝	38⅞	32 9/16	28	22½	20 13/16	16¾	12⅜	11 7/16
	32⅛	29 1/16	25⅜	22½	18⅝	17 7/16	14½	11⅛	10 3/16
f 16	**39½**	**35**	**30**	**26**	**21**	**19½**	**16**	**12**	**11**
	51¼	43¾	35 13/16	30 7/16	24 3/16	22 3/16	17 11/16	13 3/16	12

20½ in. The approximate field covered at ∞ setting of the Vito lens is 18⅝×28 in.; at the 3½ ft., 9⅜×14 in.

The + 2 Diopter Lens: for distances from 20 in. to 13 in. The field covered at ∞ setting is 9⅜×14 in.; at 3½ ft., 6⅛×9¼ in.

The + 3 Diopter Lens: for distances from 13 to 10 in. The field covered at ∞ is 6¼×9⅜ in.; at 3½ ft., 4½×6⅞ in.

THE TECHNIQUE OF EXPOSURE

The correct exposure time depends on two sets of circumstances:—

(1) The amount and colour of light reflected from the object to be photographed. This, in its turn, depends on the season of the year, the time of day, situation, weather, etc.

(2) The speed of film, the kind of filter used, the lens aperture employed and possibly an allowance for an increase in exposure in the case of special fine grain development.

The correct exposure time can be ascertained with the help of:—

EXPOSURE TABLES. These are based on mathematical calculations and practical experience. They tabulate all or most of the factors given above, and, if used with discretion will give an exposure figure which lies within the latitude of the film. Such an exposure table is given on p. 44. The *Focal Exposure Chart* represents the most up-to-date quick working version of an exposure table.

OPTICAL EXPOSURE METERS, also called *visual* or *extinction type* meters. They measure with the aid of the eye, the amount of light reflected. Their main advantage lies in the fact that they can be used under particularly poor light conditions—indoors, for example. Their accuracy suffers from the fact that the sensitivity of the eye to light varies considerably according to individuals. If used consistently and with care, however, they will give exposed figures well within the latitude of the film.

PHOTO-ELECTRIC EXPOSURE METERS. They are the most accurate and dependable means available for arriving at the right exposure time. They consist of a photo-electric cell which converts light energy into electricity, which in turn moves an indicator over a table of light values.

As the field covered by most electric exposure meters is wider than that covered by a Vito, the measurement should be taken from a point nearer to the subject than the one

EXPOSURE TABLE FOR DAYLIGHT

Add the respective figures in the Tables 1, 2 and 3; the correct exposure time can be taken from Table 4.

1. *Subject and Light value*

	Clear sun	*Cloudy light*	*Cloudy med.*	*Cloudy dull*
Distant land or seascape without foreground	0	1	2	3
—with light foreground ...	1	2	3	4
Open streets, squares, light buildings	2	3	4	5
Figures, groups in open, near objects without heavy shade...	3	4	5	6
—in shade	4	5	6	7
Average interiors, diffused light	10	11	12	13

2. *Month and time*

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

3. *Film speed and aperture*

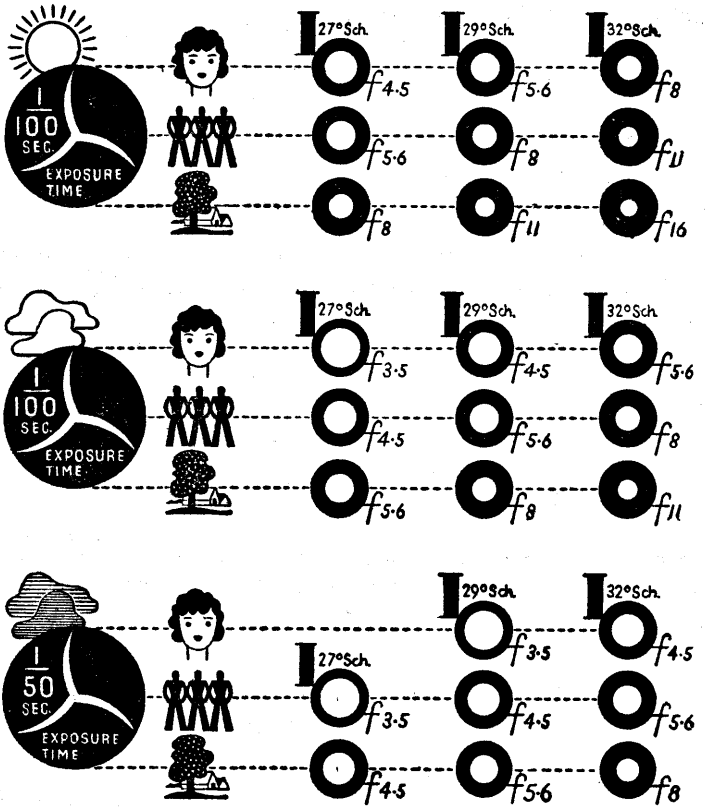
Film speed Scheiner	*Stop f 2*	*Stop f 2.8*	*Stop f 4*	*Stop f 5.6*	*Stop f 8*	*Stop f 11*	*Stop f 16*
32°	0	1	2	3	4	5	6
29°	1	2	3	4	5	6	7
26°	2	3	4	5	6	7	8

4. *Result (sum of Tables 1 + 2 + 3 = "Value")*

Value	6	7	8	9	10	11	12	13	14
Seconds	**1/500**	**1/250**	**1/100**	**1/50**	**1/25**	**1/10**	**1/5**	**1/2**	**1**

Value	15	16	17	18	19	20	Value	21	22	23	24
Seconds	**2**	**4**	**8**	**16**	**30**	**60**	**Minutes**	**2**	**4**	**8**	**16**

QUICK EXPOSURE PILOT



To get at a glance the exposure time for the most popular outdoor subjects choose, according to the prevailing light conditions, the *top group* in direct sunshine, the *middle group* in cloudy bright weather, the *bottom group* when the weather is cloudy dull. Set the suggested shutter speed on your camera and trace along the type of your subject—close-up, group (medium distance) or landscape—to the aperture figure below the speed of the film in your camera. This stop set on your camera will give a well-exposed negative.

from which the photograph is actually going to be taken so that the field covered by the meter is reduced.

As any meter measures the light value of dark and light objects within its field, it will be necessary to point the instrument towards the darkest object within the area to be photographed (provided that no deliberate underexposure of the shadows is intended as may be the case with particularly contrasty subjects).

Exposure in Practice

The Vito photographer who shoots haphazardly, relying on the latitude of modern films, just like a snapshotter with a box camera, does not deserve and will not get better pictures than the man with the thirty-five shilling instrument.

The employment of some exposure help is strongly recommended in order to secure negatives suitable for enlarging. Vito negatives must be sharp, have fine grain and show a well balanced gradation between black and white.

The beginner will be particularly well advised to use the exact time of exposure indicated by his chart or meter and to employ straightforward methods of development; that is to say, a developer giving reasonably fine grain without loss of emulsion speed. In this way he will obtain negatives with the best definition for a moderate degree of enlargement. The grain, provided he was using film of medium speed (26°–29° Sch.), will not show unpleasantly.

It should be borne in mind that the latitude towards underexposure of any film is very small indeed. At the same time the popular rule rather to overexposure does *not* hold good for miniature negatives either, as an overexposed negative will usually show more grain with appreciable loss of definition, making such a negative unsuitable for good enlargements. So accurate exposure is important.

While keeping all this in mind every attempt should be made to keep the shutter speed short. This is important to overcome the danger of camera shake, to which a small

and light instrument such as the Vito is particularly liable. Even the slightest shake will result in inferior definition of the negative. Practical experience goes to show that 1/100 sec. is safe, while one has to hold the camera particularly steady when using 1/50 sec. or 1/25 sec. (see also p. 12). Short shutter speeds are also desirable, of course, to arrest movement of the object to be photographed (see p. 48).

Remembering that the next bigger aperture (smaller number) on the Vito allows one to halve the shutter speed should make it easy to arrive at a suitable compromise between a stop yielding sufficient depth of field (see p. 32) and a shutter speed sufficiently short to avoid camera shake and to arrest the movement of the subject. If, for example, one has found 1/25 sec. at *f* 8 to be the correct exposure time then *f* 5.6 will permit using 1/50 sec.; and *f* 4, 1/100 sec.

The advanced worker who aims at particularly fine grained negatives and so intends to use extra fine grain developers, must be aware of the loss of speed caused by them and has, therefore, to compensate for that by increasing the exposure time. He will have, however, the satisfaction of obtaining negatives which will stand a high degree of enlargement without showing unpleasant grain.

The Use of Filters

The photographic film, even when panchromatic, fails to render colours in their true black and white tone values, so that the photograph often gives quite a false impression of the real scene. The following is the explanation of this discrepancy.

Scientifically speaking, to the human eye yellow appears to be approximately over ten times as bright as blue, three times as bright as red, and one and a half times as bright as green. The average panchromatic film (p. 25) however, registers blue with a brilliance of about four-fifths that of yellow, green with one-third, and red with two-thirds of the brightness of yellow.

It is, therefore, evident that in order to obtain a colour

rendering which will correspond with some degree o accuracy to impression of colours as perceived by the eye the photographic sensitivity of the various colours compared with each other will have to be corrected. This can be achieved by the use of filters.

Filters are intended to control the varying degrees of brightness on the negative material. They lighten objects of their own colour and darken those of their complementary colour (e.g. a yellow filter will darken the blue of the sky). They may be used to obtain a colour rendering in the picture which corresponds more closely to the impression made upon the eye by the object: so we speak of *correction filters.*

Filters may also be employed to emphasise certain effects regardless of whether such emphasis is scientifically correct or not. For instance, a picture can be made to show heavy clouds against a particularly dark sky, whereas the actual landscape revealed only light clouds in a blue sky. Filters used for such ends are termed *effect filters.*

All filters cut out some part of the light and thus an increase in exposure time is necessary to compensate when using them. Exact figures can only be given for each particular case, for the exposure ratio depends not only on the nature of the filter but also on the colour sensitivity of the film and on the colour of the prevailing light.

The first Vito I cameras had a filter mount hinged on to the front of the lens mount, accepting special filter glasses in a metal rim. The later models of this series were without this hinged-on mount and have a lens mount diameter of 31 mm. The latest Vito I and all Vito II cameras have a lens mount diameter of 29 mm. to accept filters (also close-up lenses and lens hood) of 29 mm. diameter. The Vito III has a lens mount diameter of 32 mm. for filter mounts of this size. Filters, Focar lenses and lens hood can be combined with each other. The Focar lens (see p. 39) is pushed on to the lens-mount, the filter *into* the mount of the Focar lens and the lens hood again *into* the mount of the filter. If all three accessories are used together it is necessary to stop

down somewhat to avoid cut off at the corners. When using only two of these accessories no cut off is experienced even at full aperture.

The following list gives a summary of the filters recommended and a short explanation of their use. The *Focal Filter Chart* gives all filter data fully and at a glance.

FILTER FACTORS

Filter	*Pan films correct* Day Light	*Pan films correct* Artificial Light	*Pan films oversensitive to red* Day Light	*Pan films oversensitive to red* Artificial Light
Light yellow ...	1.5	1.5	1.5	1.5
Medium yellow ...	2	1.5	2	1.5
Deep yellow ...	3	2	2.5	2
Orange	5	2	4	2
Light red ...	7	3	4	2
Deep red ...	16	8	8	4
Yellow green ...	2	1.5	2.5	1.5
Green	4	3	4	3
Dark green ...	5	5	6	6
Light blue ...	—	1.5	—	1.5

The filter factor is the number by which the exposure time indicated by an exposure chart or meter should be multiplied when a particular filter is used in conjunction with a particular type of film. The above factors will be found sufficiently correct for all practical purposes. Other publications may insist on more exacting values—e.g. 1.4, 1.7. Such factors are of little use to the practical worker. Even if he is a good enough mathematician to play with odd fractions he will probably find that the shutter speeds so arrived at do not exist on most cameras. Besides the effect of a difference of 0.1 or 0.2 in the factor is quite negligible—considering that photographic exposure and development are hardly ever scientifically controlled processes even in the hands of very careful workers.

YELLOW FILTERS mainly reduce the actinic effect of blue, rendering it darker and are, therefore, particularly suitable for landscape photography in order to obtain clearly defined cloud effects on a normal blue sky. In the case of a very light blue sky, use a darker filter and vice versa.

GREEN FILTERS have a similar effect to that of yellow filters, but

they also hold back red (render it darker) to which some panchromatic films are comparatively over-sensitive (photographing it too light).

ULTRA-VIOLET FILTERS are only to be employed at heights of 6,500 ft. (2,000 m.) above sea level and over to avoid an unduly dark sky, such as would be obtained by using a yellow filter. At the same time they absorb the ultra-violet rays of high altitudes for which the lens is not corrected and which would reduce the definition.

ORANGE FILTERS give over-correction, and serve, therefore, as effect filters for depicting heavy clouds against a dark sky, and very clear distances in landscapes, eliminating light haze, etc.

RED FILTERS give a still stronger effect than the orange filter, for extreme contrast, creating black sky with brilliant clouds, faking sunshine into moonlight effects, etc.

DARK RED FILTERS to be used only with infra-red film. Chiefly employed for scientific purposes, they penetrate mist in long distance photography.

BLUE FILTERS are for panchromatic film in artificial light. They absorb part of the red sensitivity. This results in better skin-tones and darker red (lips).

Polarising Filter

There are times when the judicious use of reflections will enhance the pictorial effect of the picture, but they are also frequently obstrusive and undesirable. Highly polished subjects can be very 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.

To overcome this difficulty the polarising filter has been introduced. It consists of a layer of herapathite, cemented between two optical flat glasses. It suppresses light reflections from glass, china, enamel, polished wooden surfaces, water. These can be almost extinguished by placing the polarising filter in proper position over the lens. The filter will prove particularly useful when taking shop windows, furniture, photography of wet objects, etc.

The filter has to be rotated in front of the eye to find out its best position on the lens, put on the camera lens in this position. As the polarising filters are tinted, the exposure time should be increased, the factor being about three times.

FLASH WITH THE VITO

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

The flash bulb is similar to a small electric bulb. However, when current passes through it, it lights up in an intense flash lasting usually about 1/25 or 1/50 sec. Each bulb will flash only once and has to be discarded afterwards.

The flash bulb is inserted in a battery case, the current of the battery is used to set off the bulb, a reflector behind the bulb makes sure that all the light is directed towards the subject. The light is strong enough to allow medium to small aperture to be used for the exposure. The shutter speed—provided it is slower than 1/25–1/50 sec.—has no effect on exposure since the flash is shorter than the exposure time. A diffusion screen which should be placed in front of the bulb has a two-fold action: it softens the light and acts as safety shield in the very rare event of a bulb bursting.

How to Use Flash with the Vito

Both the Prontor and the Compur shutter of the Vito II and III as well as the Prontor shutter of Vito I are internally synchronised for flash. The flash contact socket protrudes on the flange of the shutter. An electrical cable is connected from the battery case (with flash bulb and reflector) to the flash contact socket (by means of a special plug). On releasing the shutter an electric circuit is automatically closed through the flash contact when the shutter is fully open, setting off the flash bulb at this very moment. The technical term for this is "X" synchronisation.

With internal "X" synchronisation shutter speeds up to 1/50 and 1/100 sec. can be used if flash bulbs are employed which need only a short time to come to the peak of their light output, that is some 4–7 milli-seconds. Such bulbs are, for example, the *Speed Midget* types. With other bulbs the delay is generally some 17–20 milli-seconds; they should be

used with the 1/25 sec. setting to ensure that the full illumination coincides with the full opening of the shutter.

The Synchro-Compur and Prontor SV shutters—supplied since 1951—are speed-synchronised and show two settings. One is marked "X" (red on Prontor SV) for instantaneous firing with electronic flash at any shutter speed, and the other is marked "M" (yellow on Prontor SV) for flash bulbs with some 17–20 milli-seconds firing delay.

At the "M" setting, pressing the shutter release fires the flash 17 milli-seconds before the shutter begins to open. This delay is achieved by the built-in delayed action mechanism and allows the flash to reach its maximum brilliance by the time the shutter is fully open. The "M" setting thus allows synchronisation of most flash bulbs at any shutter speed.

To set the shutter for either "X" or "M" synchronisation, simply push the synchronising lever next to the flash socket to the appropriate marking. On the Prontor SV shutter the delayed action lever also has to be pulled up until the pointer indicates "M". This must be done every time the shutter is released at the "M" setting.

Older types of the Prontor SV shutter also have an "F" setting, obtained by pulling the delayed action lever only to the marking "F". This delays the shutter opening by only 5 milli-seconds, and is used for synchronising Speed Midget (SM) type bulbs at any shutter speed. Otherwise Speed Midget bulbs can only be synchronised at the "X" setting, with shutter speeds of 1/25 sec. or slower.

The table on p. 56 shows the shutter speeds possible with various types of flash.

The shutters of Vito I cameras which are not originally internally synchronised can be so converted, or a mechanical synchroniser can be employed, which screws into the cable release socket of the Vito. Depressing the plunger of this flash release will simultaneously release shutter and flash bulb.

The Correct Aperture

Page 56 gives the apertures to use for some of the more common flash bulbs if used in an efficient reflector, in a

room of average brightness and with shutter speeds up to 1/25 sec. They are correct for a film of 30–32° Sch.

APERTURES WITH FLASH BULBS

Distance	*Mazda or G.E.C.: SM, No. 3 Philips: PF 3*	*Philips: PF 14*	*Mazda or G.E.C.: No. 5 Philips: PF 25*	*Philips: PF 38*	*Philips: PF 60. Mazda or G.E.C.: No. 22*
6 ft. (2 m.)	f 16	f 16	—	—	—
8 ft. (2.5 m.)	f 12.5	f 16	—	—	—
10 ft. (3 m.)	f 10	f 12.5	f 16	—	—
12 ft. (3.6 m.)	f 8	f 11	f 16	f 16	—
15 ft. (4.5 m.)	f 6.3	f 9	f 11	f 12.5	f 16
20 ft. (6 m.)	f 4.5	f 6.3	f 8	f 10	f 12.5
25 ft. (7.5 m.)	f 4	f 5.6	f 6.3	f 8	f 11
30 ft. (9 m.)	f 3.5	f 4.5	f 5.6	f 6.3	f 9

In bright rooms (kitchen, bathroom) or with films faster than 32° Sch., use next smaller aperture. In very large rooms, at night outdoors, or with slow 27°–29° Sch. film use next larger aperture.

The Focal Flash Disc is a simple and convenient ready means of reading off the correct aperture to use for any flash bulb at any distance, shutter setting and film speed.

SYNCHRONISING SETTINGS

Flash bulb		*Synchro-lever set to X**	*Synchro-lever set to M*
G.E.C., Mazda Westinghouse ...	SM	1 to 1/100	Not suitable
Sylvania	SF	1 to 1/100	Not suitable
G.E.C., Westinghouse, Mazda	No. 5, 11, 22	1 to 1/25	1/50–1/500†
Philips...	P.F. 3, 14, 25, 38, 60	1 to 1/25	1/50–1/500†
Sylvania	Press 25, 40, No. 3	1 to 1/25	1/50–1/500†
Philips...	P.F. 100	1 to 1/10	1/25–1/50
G.E., Westinghouse ...	No. 50	1 to 1/10	1/25–1/50
Sylvania	No. 3	1 to 1/10	1/25–1/50
Electronic flash		1 to 1/500	Not suitable
Electronic flash with relay firing (5 milliseconds delay)		1 to 1/100	Not suitable

*These values also apply to the shutters with non-adjustable flash contact. †To 1/300 on Prontor SV.