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THE CAMERA GUIDE

FOCAL PRESS

THE CONTINA SERIES

The Contina is a 35 mm. camera. It was first called the 35 mm. Ikonta, then renamed Contina, and later produced in three versions, Contina I without built-in accessories, Contina II with uncoupled rangefinder, and Contessa with photoelectric meter and coupled rangefinder.

In 1954 these models were replaced by the Contina Ia and IIa. The makers reasoned that the short-focus lenses used give, even at full aperture, sufficient depth of field to make out-of-focus photographs unlikely. On the other hand the wider use of colour-films demands greater exposure accuracy. Consequently the Contina IIa has a photoelectric meter instead of a rangefinder, Otherwise models Ia and IIa differ from their predecessors in their bellowless rigid construction and combined rapid film-wind and shutter-tensioning.

In 1956 a third model, the Contina III, was added. This is very similar to the Contina IIa but fitted with the convertible Pantar lens permitting tele-photo, wide-angle and stereo attachments to be used.

At the same time the Ia and IIa models were renamed and are now simply called I and II.

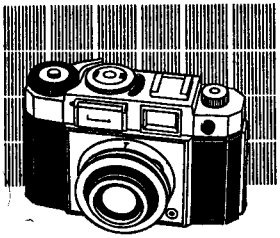
35 mm. IKONTA and OLD CONTINA I (discontinued). This is a streamlined handy miniature camera for 35 mm. film in standard cassettes for up to 36 exposures 1 × 1½ in. (24 × 36 mm.). It is particularly small: 1⅝ × 2⅞ × 4¾ in. (4.2 × 7.2 × 12 cm.) and weighs 15½ oz. (450 g.). The all-metal body is covered with leather, metal parts being either chrome finished or black enamelled. The lens panel with shutter is connected to the body by short square bellows, and when closed these are protected by the hinged baseboard. Double exposures are automatically prevented, as are blank frames.

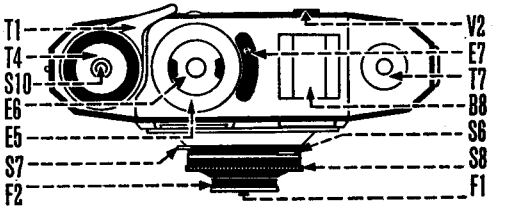
For viewing an optical direct vision finder is built into the camera body. The lens is provided with "red dot" zone focus settings. Mounted in a convenient position is the shutter release and the film wind, located on the base of the camera, allows exposures in quick succession. All settings, distance, aperture and exposure, can be seen from the top of the camera at a glance. Depth of field scale, automatic exposure counter, tripod bush, accessory shoe, film indicator and eyelets for carrying strap are provided.

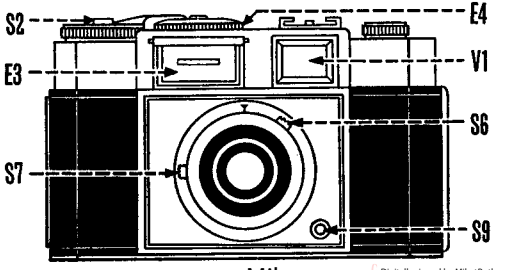
Either the 1¾ in. (4.5 cm.) coated Novar *f* 3.5 in Prontor SV shutter or the 1¾ in. (4.5 cm.) coated Zeiss Tessar *f* 2.8 in Compur shutter is fitted.

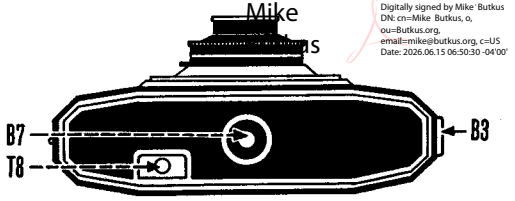
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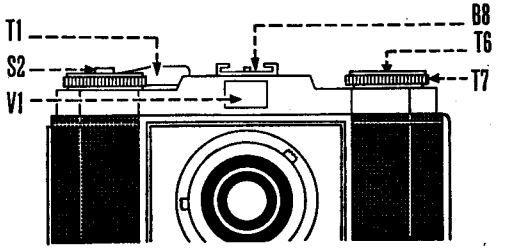
1954 CONTINA I AND II FEATURES











Above: The Contina II shown against a 1 in. scale grid to indicate its approximate size.

Top left: Top view of the Contina II, showing the main controls.

Upper centre left: Front view of the Contina II with exposure meter.

Lower centre left: Bottom view.

Bottom left: Front view of the Contina I.

The features and controls shown are:

Focusing: F1, front cell focusing mount; F2, distance scale.

Shutter: S2, release button; S6, light value setting; S7, synchronizing lever; S8, shutter speed ring; S9, flash socket; S10, cable release socket (in release button).

Viewfinder: V1, finder window; V2, eyepiece.

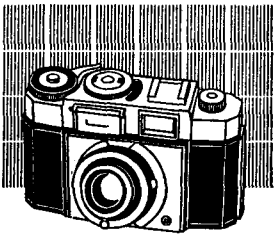
Exposure meter (Contina II only): E3, cell cover; E4, setting ring; E5, light value scale; E6, film speed scale; E7, pointer.

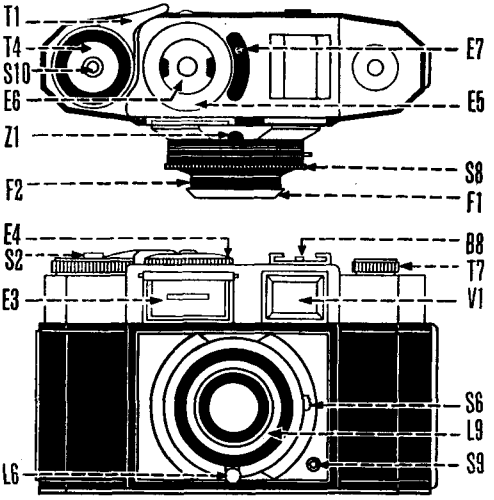
Film and transport: T1, rapid winding lever; T4, film counter; T6, film indicator (on Contina I); T7, rewind knob; T8, reversing button.

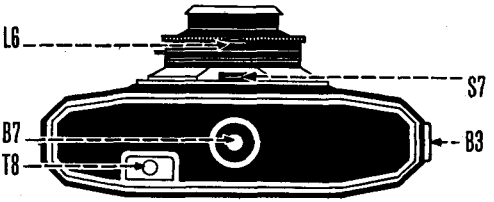
Body: B3, back lock; B7, tripod bush; B8, accessory shoe.

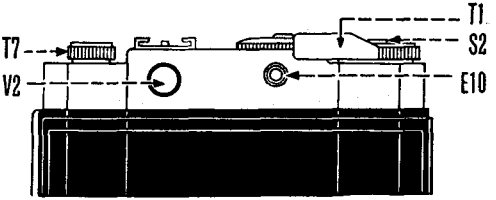
Mike
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1956 CONTINA III FEATURES









Above: The 1956 Contina III shown against a 1 in. scale grid to indicate its approximate size.

Top right: Top view with the main controls.

Upper centre right: Front view.

Lower centre right: Bottom view.

Bottom right: Rear view of top part.

The features and controls shown are:

Lens: L6, lens changing catch; L9, interchangeable front component.

Focusing: F1, front cell focusing mount; F2, distance scale.

Shutter: S2, release button; S6, light value setting; S7, synchronizing lever S8, shutter speed ring; S9, flash socket; S10, cable release socket (in release button).

Viewfinder: V1, finder window; V2, eyepiece.

Exposure meter: E3, cell cover; E4, setting ring; E5, light value scale; E6, film speed scale; E7, pointer; E10, zero setting screw.

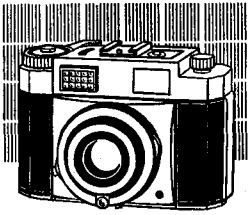
Film and transport: T1, rapid winding lever; T4, film counter; T7, rewind knob; T8, reversing button.

Body: B3, back lock; B7, tripod bush; B8, accessory shoe.

Special: Z1, window showing synchronizing settings.

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1959 CONTINA I, II AND III FEATURES



Above: The Contina III shown against a 1 in. scale grid .

Top right: Top view of Contina II and III with main controls.

Upper centre right: Front view of Contina III (Contina II is almost identical except for the absence of the lens changing catch).

Lower centre right: Bottom view of Contina II and III (Contina I is identical except for the coupled aperture setting control).

Bottom right: Front view of top part of Contina I.

The features and controls shown are:

Lens: L3,aperture control (linked with exposure meter setting on models II and III); L4, aperture scale; L6, lens changing catch (on model III only).

Focusing: front-cell focusing mount F3, depth of field scale.

Shutter: S2, release button; S4, shutter speed scale; S6, light value setting (model I only); S7, synchronizing and self-timer lever; S8, shutter speed ring; S9, flash socket; S10, cable release socket in release button.

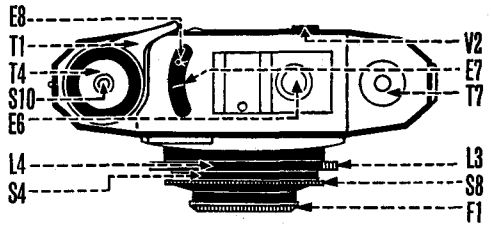
Exposure meter (on models II and III): E2, meter cell; E6, film speed setting; E7, meter needle; E8, setting marker.

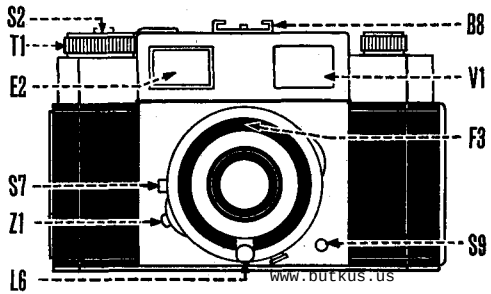
Viewfinder: V1, finder window; V2, eyepiece.

Film and transport: T1, rapid winding lever; T4, film counter; T6, film indicator (model I only); T7, rewind knob; T8, reversing button.

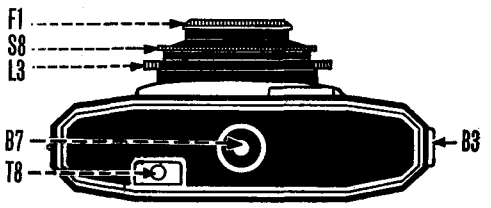
Body: B3, back lock; B7, tripod bush; B8, accessory shoe.

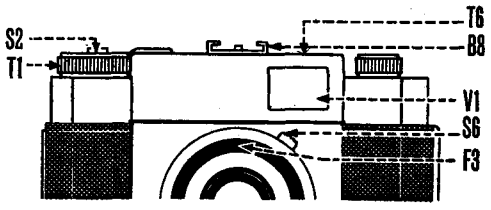
Special: Z1, release lock for exposure setting.





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When first issued the 35 mm. Ikonta was available with uncoated lens, the Prontor S shutter and also with a 1¾ in. (4.5 cm.) Xenar *f* 2.8 lens.

After Autumn 1953 the 35 mm. Ikonta was known as the Contina I. Both cameras are, of course, handled in the same way and we shall therefore refer in this guide to it as the Old Contina I only.

CONTINA I, introduced in 1954 as the Contina Ia to replace the Old Contina I, shows a departure in body design from its predecessor. The lens is fitted in a short rigid tube stolidly to the front of the body doing away with bellows and the necessity to open up the camera. A rapid film winder transports the film by one frame and also automatically advances the exposure counter and tensions the shutter. Double exposures as well as blank frames are impossible.

An optical direct vision finder is built into the top of the camera body, the lens has red-dot zone focus settings. Other features are a body release, depth of field indicator, tripod bush, accessory shoe, and film indicator.

The lens is the coated 1¾ in. (4.5 cm.) Novar *f* 3.5 in a Prontor SVS shutter. The complete Contina measures 2½×3×5 in. (5.8×7.5×12.5 cm.), weight 17 oz. (470 g.).

An alternative model, introduced in 1958, is similar to the model above, but has the 1¾ in. (4.5 cm.) Novicar *f* 2.8 lens in Prontor SVS shutter with light value scale.

Late in 1958 an improved Contina I was introduced, with bright-line finder, 45 mm. Pantar *f* 2.8 and top-plate with film-type indicator.

THE OLD CONTINA II (originally just the Contina, now discontinued) incorporates all features of the old Contina I, and in addition has a rangefinder built into the top of the camera. This measures, in a matter of a few seconds, the exact distance from the subject to which the lens has then to be set. The camera measures 1¾×3⅝×4¾ in. (4.5×9.2×12 cm.) and its weight is 20½ oz. (580 g.). The same lenses and shutters are fitted to this model as to the 35 mm. Ikonta and Contina I.

CONTINA II, introduced in 1954 as the Contina IIa to replace the old Contina II, is of the same construction as the Contina I (see above), but has a photo-electric exposure meter built into the camera top. The lens is the coated 1¾ in. (4.5 cm.) Novar *f* 3.5 or Novicar *f* 2.8 in a Prontor SVS shutter. The dimensions are 2½×3¼×5 in. (5.8×8.1×12.5 cm.). Weight 18½ oz. (530 g.).

Late in 1958 an improved Contina II was introduced, with bright-line finder, 45 mm. Pantar *f* 2.8 and exposure meter coupled to aperture setting.

CONTINA III, introduced in 1956, is of the same construction as the Contina II (see above). The lens is the convertible 1¾ in. (4.5 cm.) Pantar *f* 2.8, the front element of which can be removed and replaced by a telephoto or a wide-angle unit, or the stereo attachment. The shutter is a Prontor SVS with light value scale. The dimensions are 2 7/16×3 5/16× 5 in. (6.4×8.5×12.8 cm.). Weight 22 oz. (640 g.).

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Late in 1958 an improved Contina III was introduced, with bright-line finder and exposure meter coupled to aperture setting.

CONTESSA. This model (discontinued) incorporates all the features of the 35 mm. Ikonta and has a built-in rangefinder which is coupled to the lens. When measuring the distance to the subject with the rangefinder the lens is automatically set to this distance. A photo-electric exposure meter is also incorporated into the camera body, indicating the correct exposure time required for any class of subject.

The Contessa measures $1\frac{3}{4} \times 3\frac{1}{16} \times 4\frac{1}{2}$ in. (4.5×7.7×12 cm.) and weighs $18\frac{1}{2}$ oz. (530 g.). A coated $1\frac{3}{4}$ in. (4.5 cm.) Zeiss Tessar *f* 2.8 lens is fitted in a Synchro-Compur shutter.

Models supplied up to 1952 were fitted with a Compur shutter with flash contact.

The Lenses

The lenses of the Contina I and II and Contessa are not interchangeable and consequently neither telephoto nor wide angle lenses can be used. The only optical supplementary equipment available consists of converging meniscus lenses which allow the camera to be set to nearer distances than would be possible with the unaided lens (see page 68).

THE $1\frac{3}{4}$ in. (4.5 cm.) NOVAR *f* 3.5 is a three-lens air-spaced anastigmat. It has a good standard of definition over the entire negative field even at full aperture, and is gradually improved when stopped down to *f* 8. It is suitable for all general work and, because of its wide aperture, it can be usefully employed for taking photographs of fast moving subjects in poor light.

THE $1\frac{3}{4}$ in. (4.5 cm.) NOVICAR *f* 2.8 is a three-lens air spaced anastigmat. In spite of its wide aperture (particularly for a three-component lens) it offers a good standard of definition even at full aperture and gradually improves when stopped down to *f* 8. It is suitable for all general work and also, on account of its very wide aperture, for photographs in very poor light or unfavourable conditions.

THE $1\frac{3}{4}$ in. (4.5 cm.) TESSAR *f* 2.8 is a four-lens anastigmat with the front component air-spaced, while the back component is cemented. The Tessar is accepted throughout the world as perfect optical equipment. Its definition is very good even at full aperture, covering the negative fully and evenly illuminating to the corners; the lens yields images of great brilliance. The best performance of the Tessar is given around *f* 5.6; the correction remains undiminished at smaller apertures. The Tessar is particularly well corrected for colour. At *f* 2.8 it passes 50 per cent. more light than the Novar *f* 3.5. While its field of application is similar to that of the Novar, its speed permits instantaneous exposures in very poor light, indoors and in artificial light.

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THE 1¾ in. (4.5 cm.) XENAR *f* 2.8 built into some earlier 35 mm. Ikonta cameras, is of the same construction and performance as the Tessar *f* 2.8.

The 1¾ in. (4.5 cm.) PANTAR *f* 2.8 is standard on the latest Continas I, II and III. It is a three-element anastigmat giving good definition over the whole negative, reaching maximum sharpness at *f* 8. It is suitable for general work, while its speed is useful in poor light.

On the Contina III it is convertible; the rear part is built into the shutter, the front element is interchangeable with special units converting it to a tele-, wide-angle or stereo lens (page 53 and 56).

All these lenses cover an angle of approx. 50° and can be focused down to 3 ft. (Contina III 4 ft., some 35 mm. Ikontas to 2 ft. 6 in.). The aperture can be stopped down to *f* 22 and the scale of reproduction, at the shortest distance, is 1 : 15.

The Contina and Contessa lens mount accepts 27 mm. screw-in filters (page 82) and close-up lenses (page 69), produced by the makers.

Coated Lenses

The latest development in improving the performance of photographic lenses is a process generally called coating or blooming. It consists of the application of a microscopically fine coat of inorganic substance on the glass surfaces. This considerably reduces the light reflection at glass-air surfaces in the lens. The gain will be fully appreciated if it is understood that, for example in a Tessar, the loss of light due to surface reflection is in the region of about 35 per cent., a figure which can be reduced to about 5 per cent by coating.

Apart from a gain in the speed of the lens, which may in actual practice be 50 per cent. (half a stop), its main importance lies in the elimination of the scattered light which impairs the contrast of the image. This results in a more brilliant negative, especially in the shadow regions where the tones are most subdued and so brilliance and contrast are most needed.

The Contina, Contessa and latest 35 mm. Ikonta have factory-coated lenses. With the older 35 mm. Ikonta cameras, which may have untreated lenses, the coating can be undertaken by reliable optical manufacturers through most photographic dealers. The fact that a lens is coated can be recognized by observing in the lens the reflection of, let us say, a lamp. This will appear distinctly coloured, as a rule a rather deep blue with a tinge of red.

Lenses which were coated originally by the factory used to be marked with a red T next to the manufacturer's name on the lens; this marking has now been discontinued.

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The Care of Lenses

The treatment and care of lenses is a matter of importance. Due to its chemical composition, optical glass of high quality is susceptible to the influence of moisture, and for this reason touching the glass with the fingers should be avoided. Since complete protection is impossible, the lens surface should be cleaned occasionally with a clean, soft chamois leather. Coated lenses should be cleaned with a fine camel hair brush gently used, or by carefully wiping them with a piece of cotton wool moistened with spirit.

The Lens Hood

This is a tube, as a rule made from metal, placed over the front of the lens to protect it from light coming from outside the actual picture area. There is no picture which could not be improved in clarity and brilliance by the use of a lens hood. The wider the aperture of the lens the more important is the use of the lens hood. The light coming from objects outside the actual picture area will touch the lens and reduce the brilliance of the picture considerably. This applies not only to photographs taken against the light—when the lens hood becomes indispensable—but also to sunshine in general.

The lens hood for Contina and Contessa is a 28.5 mm. push-on type hood and can also be slipped over a filter or close-up lens when fitted on the camera lens. The 3 in. (7.5 cm.) Pantar uses a 60 mm. screw-in lens hood. No lens hood can be used with the 1¼ in. (3 cm.) wide-angle Pantar.

The Shutters

The latest Contina II and III employ Prontor SLK shutters, coupled to the exposure meter; preceding models and the latest Contina I have SVS shutters with light value scale. Other Continas have the earlier SVS, and the old models I and II, the Prontor SV or Synchro-Compur shutters. Early 35 mm. Ikontas were fitted with Prontor S shutters. Contessas originally had a Compur with flash contact and later, a Synchro-Compur.

The shutter requires tensioning in the old Contina I, II and Contessa before exposure while those of the current Contina I and II and of the Contina III are automatically tensioned on advancing the film with the rapid winding lever.

The shutter release of all models is actuated by the easily accessible shutter release knob.

All shutters are synchronized for flash photography; on the Prontor SLK, SVS, SV and Synchro-Compur the flash synchronization can be adjusted to work even with fastest speeds (see page 86).

THE PRONTOR SVS, SV AND S SHUTTERS have eight speeds: 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100 and 1/300 sec., and a B setting for time exposures, as well as a built-in delayed action release.

Operating the shutter requires these actions; setting the speed, tensioning the shutter (on the old Contina I, II and Contessa), and releasing it.

To set the shutter, turn the outside milled ring until the red index mark on the rim points to the speed required. The engraved figures 1, 2, 5, 10, 25, 50, 100 and 300 stand for 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100 and 1/300 sec. respectively.

To tension the shutter, pull the tensioning lever, immediately behind the milled setting ring of the shutter, anti-clockwise as far as it will go. On Contina I and II the shutter is automatically tensioned on transporting the film.

To release the shutter, press the large protruding release knob gently downward.

A delayed action release (also called self-timer) is built into the Prontor shutter which permits the photographer to appear in the photograph himself. To use the delayed action release, set the camera in the usual way and mount it on a rigid support, preferably a tripod. On the Prontor SVS set the synchronizing lever to V, on the SV shutter press down the delayed action setting lever as far as it will go. This is the lever with a red dot in its centre on the lower part of the shutter rim. On pressing the shutter release, the shutter opens after a delay of approximately 8 seconds, giving the photographer time to take his place in the picture.

On the Prontor SV the synchronizing lever (see page 87) must be set to X when the self-timer is used.

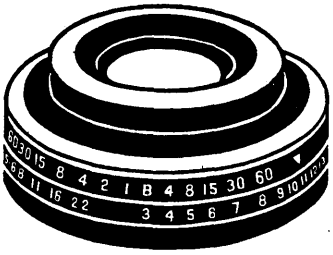
THE PRONTOR SVS WITH LIGHT VALUE SCALE of earlier Continas II and III and latest Contina I has 9 speeds: 1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125 and 1/300 sec., as well as a B setting.

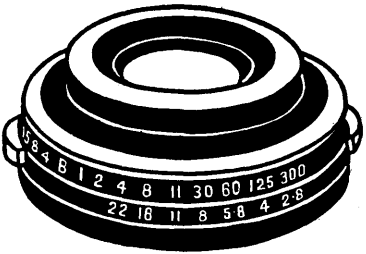
LIGHT VALUES. On the side of the shutter rim a range of numbers is engraved in red from 3 to 18 which represent light values for correct exposure. Each light value corresponds to a range of shutter speed-aperture combinations, but is covered by a single setting. The built-in exposure meter of the Contina III is also calibrated in light values; the reading can thus be transferred directly to the shutter.

To set the shutter to the measured light value, press in the small serrated projection on the diaphragm ring and hold it securely in this

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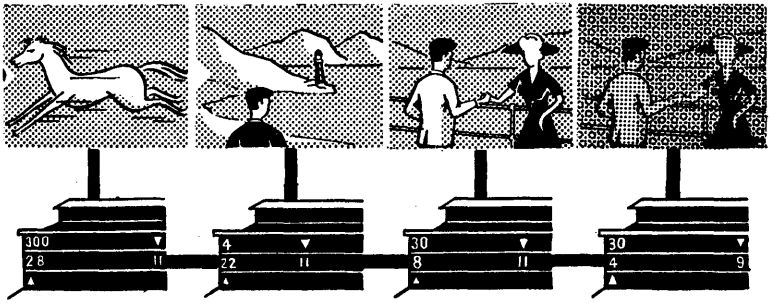
THE LIGHT VALUE SHUTTER





On Prontor SVS (left), set the light value found with the meter opposite the right hand arrow. On Prontor SLK (right), set film speed (ASA or DIN) on the underside of the rear ring against the appropriate arrow (or filter factor) on the middle ring. This is coupled to the exposure meter. Align the meter needles by turning the middle ring.

This setting, and the light value on the SVS corresponds to a range of shutter speed—aperture combinations. The one in use is shown against the left-hand arrow on the SVS and the red mark on the speed ring of the SLK shutter.



With a given light value (e.g. 11), setting a fast speed automatically opens the aperture, while stopping down automatically sets a slow speed to keep the exposure constant. To alter the exposure for different light conditions simply change the light value settings (extreme right). See also page 12.

position. Then rotate the milled shutter speed ring with the other hand until the required light value on the red scale comes opposite the red triangular mark.

It should be noted that light values and stops may be set to the intermediate half-way positions, but *not* shutter speeds. This latter situation may arise if you reach the beginning or end of the aperture scale while changing the shutter speed, and must be avoided. The interval between 1/125 and 1/300 sec. represents $1\frac{1}{2}$ stops.

To set the shutter speed and stop independently, without using the light value, depress the serrated projection for both aperture and speed setting.

On the shutter speed ring there are three separate scales:

Red figures: This is the light value scale, running from 3 to 18. To set the light value on the Prontor SVS shutter, proceed as already explained.

Silver figures: These are the shutter speeds, with the revised timings already explained, viz. 1, 2, 4, 8, 15, 30, 60, 125, etc. These values represent fractions of a second, e.g. 2=1/2 sec., 60=1/60 sec.

Green figures: This is not a setting scale, but is used for calculating time exposures. With the shutter speed ring set to B, and the light value scale to one of the lower values 3 to 6, the green figure indicates the length in seconds of the exposure required, and what stop to use.

If for example the light value is set to 3, any of the following combinations may be used: 4 sec. at *f* 5.6, 8 sec. at *f* 8, 15 sec. at *f* 11, or 30 sec. at *f* 16.

The shutter has a built-in delayed action release which does not require tensioning. To use it, set the synchronising lever to V by moving the black lever on the underside of the shutter and observing the cut-out window behind the aperture/speed indicator on top of the shutter.

THE PRONTOR SLK SPECIAL shutter on the latest Contina II and III has the same speed range as the Prontor SVS. In addition, it has a film speed indicator (see page 73) with allowance for filter factors (see page 83).

To set shutter speed and aperture: first turn the film speed ring until the correct speed is against the appropriate index mark (marked in DIN and ASA). The aperture ring is coupled to the built-in exposure meter and is set as described on page 74. Aperture and shutter speed are now interlocked as with the Prontor SVS. All you need do to set any shutter speed, is to turn the shutter speed ring until the desired speed is opposite the red index mark. The aperture will adjust itself to the corresponding correct lens opening.

An auto-lock device prevents movement of the combination beyond the limits of poorest and brightest light in which pictures can be taken.

The green figures (4 to 60 secs.) are not exposures timed by the shutter. They are intended for calculating the exposure time when the shutter ring is set to B, as with the Prontor SVS shutter with light value scale (above).

The shutter has built-in delayed action which works like that in the Prontor SVS.

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THE SYNCHRO-COMPUR and COMPUR-RAPID shutters have nine speeds: 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250 and 1/500 sec., as well as a B setting for time exposures. (Some shutters had 1/300 instead of 1/250 sec.)

The Synchro-Compur and recent Compur-Rapid shutters differ only in their flash synchronization (see page 88).

Again three actions are necessary; setting the required speed, tensioning the shutter, and releasing it.

To set the shutter, turn the outside milled ring until the arrow head points to the speed required. The engraved figures 1, 2, 5, 10, 25, 50, 100, 250, and 500 stand for 1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250, and 1/500 sec. respectively.

To tension the shutter, pull the tensioning lever on top of the shutter in a clockwise direction as far as it will go.

To release the shutter, press the large protruding release knob gently downward.

The speeds from 1 to 1/10 and 1/25 to 1/250 sec. range continuously and may be set to any in-between value, i.e. a setting between 50 and 100 gives an exposure of 1/75 sec. On the other hand no intermediate speeds between 1 sec. and B nor between 1/10 and 1/25 or between 1/250 and 1/500 sec. can be set.

When turning the outside milled ring of the shutter from 1/250 to 1/500 sec. a resistance is felt which is due to the additional spring fitted to achieve this fastest speed.

FOR TIME EXPOSURES with any of the shutters described, set the shutter speed ring to B (brief time). The shutter of the old Contina I, II and Contessa requires tensioning in the usual way. On releasing, the shutter will remain open as long as the release button is pressed down and closes as soon as the pressure on the release is removed. For such time exposures the camera must be mounted on a firm support such as a tripod. It is usually safest to release the shutter with the help of a cable release to avoid shaking the camera. This release is screwed into the cable release socket of the shutter.

To give long time exposures—where the shutter is to remain open for longer than one can conveniently keep the release depressed—a cable release with locking screw should be employed. To make the exposure set the shutter to B, depress the cable release plunger, and tighten its fixing screw. The shutter will now remain open until the fixing screw is unlocked.

HANDLING THE CAMERA

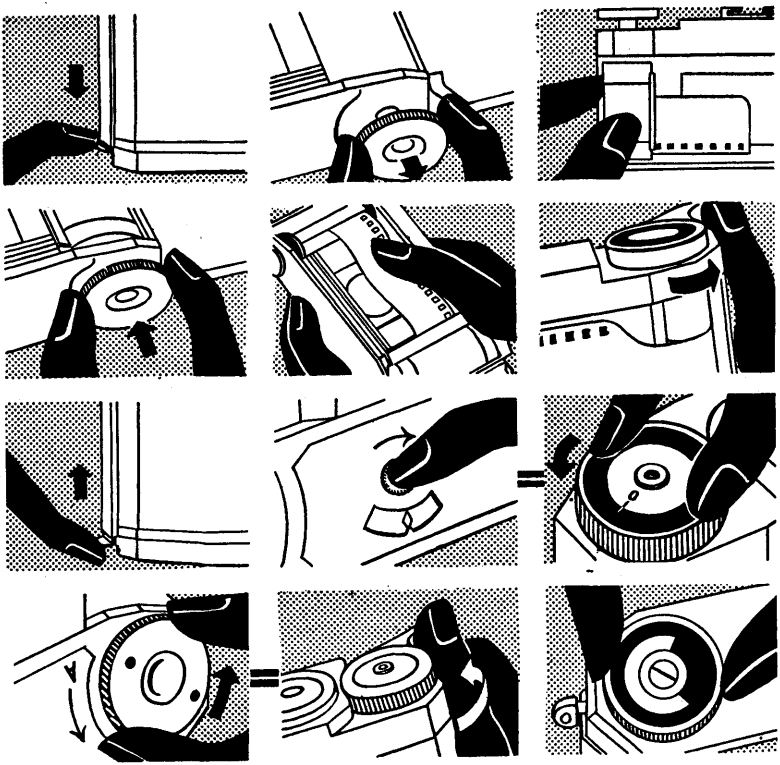
Loading

Let us take it for granted that we have a 35 mm. film in a daylight cassette. Our first task is then to load the camera with film. This should be done in subdued daylight, or at least in the shadow of one's own body.

1. **Open back.**
2. **Pull out rewind knob.**
3. **Insert cassette with film into film chamber.**
4. **Push back rewind knob.**
5. **Fix film end to take-up spool.**
6. **Turn film transport knob until perforation engages in film transport sprockets.**
7. **Close camera back.**
8. **Turn exposure counter disc until the diamond mark shows to pointer.**
9. **Wind film transport knob to No. 1.**
10. **Set film indicator disc.**

1. Pull down the closing catch, and the back can be swung open on its hinges.
2. Pull out the milled rewind knob, located outside the empty film chamber.
3. Insert the cassette with the film into the empty chamber with the beginning of the film pointing towards the take-up spool.
4. Push back the rewind knob so that its pronged end engages in the slotted hole of the cassette centre spool.
5. First, turn the take-up spool in the opposite chamber until its flat spring with a black tooth lies uppermost. Then pull the film end across the picture frame and fix it by pushing it under the spring and hooking the second perforation hole into the small black tooth.
6. Turn the film winding knob until the perforation engages in both sprockets.
7. Close the camera back and push up the closing catch to secure it.
8. Press the index finger on the milled knob next to the exposure counter window and turn it in the direction of the engraved arrow until the index mark is opposite the second division before No. 0 on the Contina I, II and III. With the older models turn to set the diamond mark in the window opposite the pointer on the window segment.

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Top row: Open camera back (*left*), pull out rewind knob (*centre*), insert cassette (*right*).

Second row: Push back rewind knob (*left*), fix film to take up spool (*centre*), wind film transport (*right*).

Third row: Close camera back (*left*), set film counter: on Contina I, II and III (*right*), on older models (*centre*).

Bottom row: Wind film transport on old Contina I, II, Contessa (*left*), or on Contina I, II (*centre*), set film indicator (*right*).

CONT—B

9. On Continas I, II and III before 1958, operate winding lever (winding film, advancing exposure counter and tensioning shutter) and press the release twice. On older models wind the transport knob until it stops. You are now ready to wind on for the first picture.

10. To remind you of the type and speed of film loaded, set film type indicator disc so that the speed of either black-and-white or daylight colour (=colour on white) or artificial light colour (=colour on black) is indicated.

On models II and III the film speed adjustment of the exposure meter replaces the film indicator (see page 74).

On the Continas with SLK shutters, film speed should be set on the shutter at this stage (see page 72).

Holding

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 below 1/125 sec. (see also page 22).

To take horizontal pictures the camera is securely held in the palm of the right hand. The right thumb is placed on the back of the camera. The right index finger rests on the shutter release. The left hand grips the left hand side of the camera body. In the case of the Contessa, the left index finger actuates the milled rangefinder setting mechanism.

The elbows should be slightly pressed to the body during exposure to secure greater steadiness.

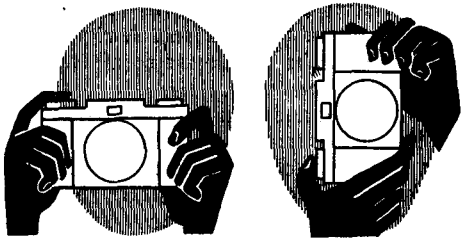
To take upright pictures, the camera is rotated by 90° from its horizontal position, the right hand gripping the camera from above with the right index finger on the release while the lower part rests in the left hand. In the case of the Contessa, the left index finger actuates the rangefinder setting mechanism.

When releasing the shutter, use finger pressure only; keep the hand and its grip on the camera steady. The actual pressing down must be done slowly and smoothly.

For hand held slow exposures, rest the elbows or at least lean the body against some support in order to avoid shake.

 In an emergency 1/8 sec., and with a very steady hand 1/4 sec.,

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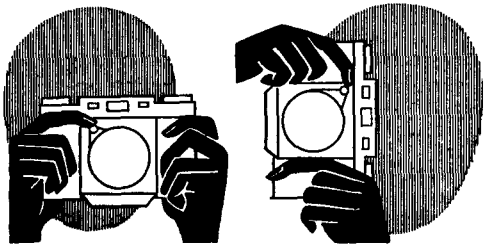
Holding the Contina, I—also II and III—(*above*), and the old Contina I and II (*below*).



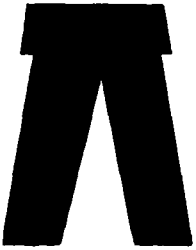
Press camera firmly against forehead,



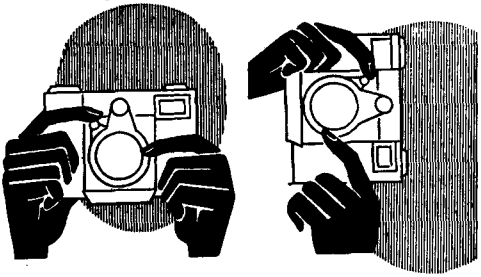
tuck both elbows well into your side



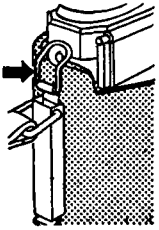
Holding the Contessa (*below*) ready for focusing and releasing.



and stand with your feet slightly apart.



Right: The old Contina I, II, and Contessa are held the ever-ready case by spring-loaded hooks.



can be exposed in this way without noticeable camera shake.

A tripod is necessary when taking time exposures and it is also recommended for speeds from 1/8 to 1 sec. A rigid tripod with ball-and-socket head can be employed to allow changing from horizontal to vertical position.

The tripod bush on the Contina I, II and III is in the camera bottom, on old Continas I, II and Contessa it is let into the baseboard and covered by a screw which must be removed before a tripod can be screwed in. The tripod bush on the 35 mm. Ikonta is let into the camera top plate opposite the film indicator disc and also protected by a slotted screw. The camera thus goes on the tripod upside down. This, of course, is of no consequence.

Carrying

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. A better method is to carry it on a short strap around the neck, so that it lies on the chest. Opening the case and lifting the camera up to the eye is then a matter of seconds.

The ever-ready case carries the camera ready for use; it does not have to be removed when taking the photograph. It is secured to the Contina I, II, and III by a retaining screw in the tripod bush. The other models have a spring tensioned hook fitted to either side of the case. Lifting these hooks and passing them over the eyelets on the camera secures the case to the camera body. At the same time turn the film winding knob on the case until its two prongs engage into the winding knob of the camera.

The very first 35 mm. Ikonta cameras are not suitable for this particular type of ever-ready case; the film transport knob has no holes to accept the prongs of the film winding knob of this case.

Shooting

The manipulations described here should be practised so that in time they will become practically automatic. After

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the camera has been loaded with film, as instructed on pages 16 to 18, proceed to:

1. **Open camera front (old Contina I, II and Contessa only).**
2. **Set exposure time.**
3. **Set aperture.**
4. **Set distance.**
5. **Sight subject through viewfinder.**
6. **Release.**
7. **Transport film for next exposure.**
8. **Close camera (old Contina I, II and Contessa only).**

1. On the old Contina I, II, and Contessa only: To open the camera front push the front opening button, on top of the baseboard, downwards and pull the hinged-on baseboard down until the opening mechanism clicks into place.
2. Set the exposure time according to the shutter fitted to your camera. Full details on pages 11–14.
3. To set the aperture (or "stop") on early models turn the serrated rim behind the upper part of the shutter until the indicator points to the aperture required on the rear part of the scale on top of the shutter. See page 12 for details of aperture setting on SVS shutters, and page 74 for SLK shutters.

   The purpose of the aperture is to adjust the effective diameter of the lens. The aperture scale carries numbers such as 2.8, 3.5, 4, 5.6, 8, 11, 16, 22. Changing the aperture from any number to the next higher one halves the amount of light passed (and thus requires twice as long an exposure time, other things being equal; except the step 3.5 to 4). Similarly, going to the next lower aperture number doubles the light passed each time. In addition, the smaller the opening (i.e. when the lens is stopped down) the greater the depth of field (page 57).
4. Set the distance from camera to subject by turning the front rim of the camera lens, which has the distance figures (in feet or metres) engraved on it, to the indicator on the camera front plate. In the case of the Contina I, II and III, the distance has to be estimated or can be measured with the aid of a separate rangefinder (see page 66), which may be attached to the camera accessory shoe.

   With the old Contina II the distance is measured with the built-in rangefinder (see page 66) and the lens then set to that distance.

   With the Contessa the distance is measured with the built-in rangefinder which automatically sets the lens (see pages 65–66).

5. The latest Continas have a direct optical finder with bright line frame which appears projected on the subject field, outlining its area, The Contina III has an inner frame indicated by small angles showing the field of the 75 mm. Telephoto Pantar *f* 4 (see page 53)
   To view the subject, hold the eyepiece close to the eye. Do not try to find the limits of the field of view by turning the camera sideways away from the eye, which must be central at the eyepiece. Only the view seen straight ahead through the centre of the eyepiece, appears on the negative. The field is exact at distances of 9–12 ft. At infinity, slightly more appears on the negative than in the finder, at 3–6 ft. a shade less.

6. To release the shutter, gently press the release button. Speeds from 1/30 to 1/500 sec. are "instantaneous" and can be taken with the camera held in the hand. It is advisable to use the slower speeds of 1/30 sec. and even 1/60 sec. as sparingly as possible, as there is some danger of jerking the camera, and even a slight jerk, six or eight diameters enlarged, results in unsatisfactory definition.

7. Wind the film transport. On the old Contina I, II, and Contessa turn the knob in the direction of the engraved arrow as far as it will go.

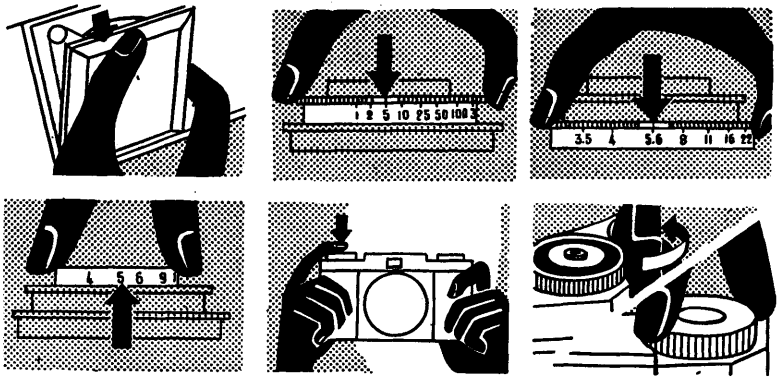
8. On the old Contina I, II, and Contessa only: Close the camera by pressing the two milled strut plates inward at the same time pressing the baseboard upwards until it clicks into place.
   The underside of the distance setting ring of some Contina models carries a second scale, calibrated in metres on cameras with a feet scale, and in feet on cameras with a metric focusing scale. This second scale should always be ignored: it is intended to change over the calibration of the camera, but needs an expert mechanic with special tools to do it.

Unloading

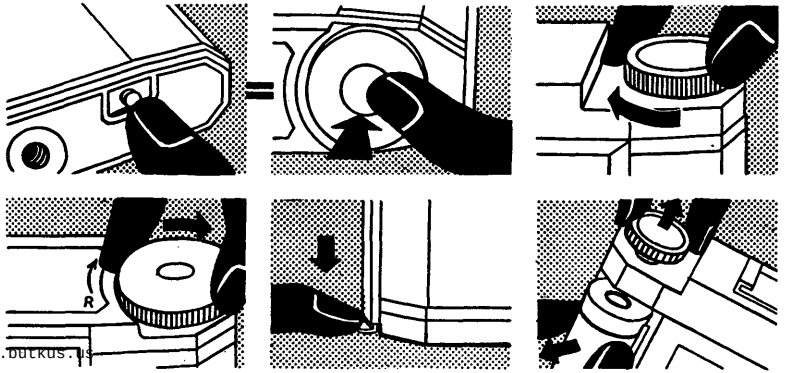
When the whole film has been exposed, the film counter will point to 36 (or to the appropriate number in cases where a film of shorter length has been used, such as a colour film with 20 exposures). If the film counter has not been set, the fact that you cannot wind the film transport any further indicates that all the film has been used up. Do not force the winder if you feel a resistance, otherwise you will tear the film out of the cassette. To unload the film:

1. **Depress reversing button and keep depressed during rewinding.**
2. **Rewind film into cassette.**

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Upper row: (Old Contina I, II and Contessa only: open camera front—left). Set exposure (and aperture, Prontor SLK and SVS Light Values—*centre*), set aperture (old SVS and previous shutters—*right*). *Lower row:* Set distance (*left*), view and release (*centre*), wind film for next exposure (*right*), (Contina I, II, III: top triangle· old Contina I, II, Contessa; bottom triangle).



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Upper row: To unload, depress reversing button for rewinding on Contina I, II, and III (*left*) and on old Contina I, II, Contessa (*centre*), rewind film with Contina I, II and III (*right*). *Lower row:* Rewind film with old Contina I, II, Contessa (*left*), open camera back, (*centre*) remove cassette (*right*).

3. Open camera back.
4. Pull out rewind knob, remove cassette.
5. Close camera back or reload.

2. To rewind the film into its original cassette turn the rewind knob on the top of the Contina I, II and III, or underneath the base plate of the older models, in the direction of the engraved arrow. When rewinding is completed the resistance of the film ceases and the rewind knob turns freely. Make sure that the film is completely rewound by removing your finger from the reversing button. If the rewind knob can be turned freely it is an indication that the film has been fully rewound.
3. Open the camera back as instructed on page 16, No. 1.
4. Pull out the rewind knob (see page 16, No. 2).
5. Close the camera back (see page 16, No. 7), or reload (see page 16).

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CHOOSING AND HANDLING THE FILM

The film for the camera is the standard perforated cine film, 35 mm. in width, as also used in the majority of other 35 mm. cameras. It may be obtained as:

STANDARD DAYLIGHT CASSETTES. These are the simplest form of film packings. The ready-cut and trimmed films for 36 exposures (or 20 exposures on colour) are supplied in cassettes (also called cartridges), which can be loaded in daylight into the camera.

DARKROOM REFILLS are lengths cut and trimmed for 36 exposures and have to be loaded into a cassette in the darkroom (see page 29).

DAYLIGHT REFILLS are cut and trimmed lengths for 36 exposures which are wound on to a centre spool (as used in the cassette) and covered with a black paper leader strip to allow the loading of a cassette in daylight (see page 29).

BULK FILM is supplied in lengths of 18 ft. 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 the darkroom (see below).

Safelights

With darkroom refills, or bulk film, you have to load your cassettes in the darkroom.

In the case of panchromatic films (see page 30) only 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 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 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 cassettes, the edge of the work-bench can be marked with notches or drawing-pins to indicate various lengths, let us say for 12, 24, 36 exposures of film. This considerably simplifies the measuring of film lengths in the darkroom.

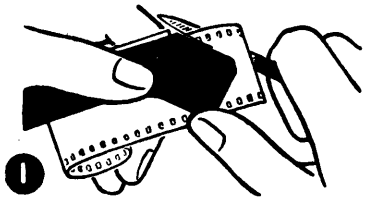
LENGTH OF FILM REQUIRED FOR ANY NUMBER OF EXPOSURES

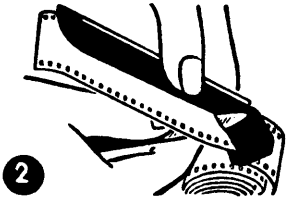
Number of Exposures	*Length of Film Required*		*Number of Exposures*	*Length of Film Required*		*Number of Exposures*	*Length of Film Required*	
	in.	cm.		in.	cm.		in.	cm.
1	11¾	30	14	31¾	80	27	51	130
2	13⅓	34	15	33	84	28	52½	133
3	15	38	16	34½	88	29	54	137
4	16¼	41	17	36¼	92	30	55½	141
5	17¾	45	18	37¾	96	31	57	145
6	19½	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		

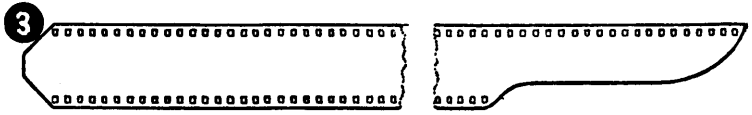
Film ends are best trimmed with the aid of a special film trimming template. At the beginning of the roll of film make the wedge-shaped cut for the centre spool and measure off the required length of film. At the end of this make the curved cut for the take-up spool. The curved cut must not go through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

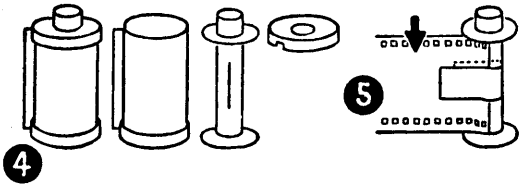
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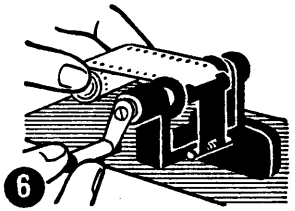


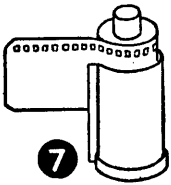
Film back glossy



HANDLING FILMS

1. Correct way of trimming the wedge-shaped end (which is fitted to the centre spool of the cassette) with a standard trimming template. **2.** Trimming of the curved cut with a standard trimming template. Alternatively, cut the end square, and cut down about 2 in. of the film to half width. Do not cut through any perforation holes. **3.** The appearance of the trimmed film, left wedge, right curved cut. **4.** The film cassette, its outer shell, centre spool and separate top. **5.** How to fix the film to the centre spool of the cassette with adhesive tape when normal fixing in the slit is impossible. **6.** Winding the film with the mechanical film winder to the centre spool. **7.** Assembling the cassette. See also pages 28-29.





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 this 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 cassette, as described below. 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 gives 19 exposures; 32 turns a full length for 36 exposures.

When winding the film on and off, take care not to press too hard on the film; neglect of this 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.

Reloading Standard Cassettes

The majority of cassettes consist of a centre spool, which is in a shell with a 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 the top or the bottom of the cassette, according to the construction of the particular container.

Most of the cassettes are intended to be used once only. Practical experience has, however, shown that such cassettes, particularly those made from plastic material or metal, can be reloaded many times as a means of economy, and will behave perfectly satisfactorily if handled and loaded carefully. Reloads and bulk film cost only about half of the complete cassette with film.

 When reloading it is a good idea to carefully brush the

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velvet light trapping from time to time with a small brush (e.g. a ladies' eyebrow brush) to remove any adhering dust or grit that might scratch the film.

Reloading with Darkroom Refills or Bulk Film

1. **Work in the darkroom in appropriate safelight.**
2. **Prepare film when using bulk film.**
3. **Open cassette.**
4. **Fix film on centre spool.**
5. **Wind film on centre spool.**
6. **Insert centre spool into shell; the first 2 in. of film has to protrude from light-trap.**
7. **Close cassette.**

2. As described on page 26.
3. As described on page 27 and 28. In the case of darkroom refills remove the wrappings.
4. 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 1½ in. (4 cm.) piece of cellophane tape round the centre spool, so that on either side about ½ in. tape is used to secure the film (see page 27).

Reloading Cassettes with Daylight Refills

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

3. As described on pages 27 and 28.
4. The actual centre spool of the cassette is not needed and may be kept separately.

The Choice of Black and White Material

There is no such thing as a "best" black and white film for any and every kind of picture. Each type of film has certain characteristics, especially with regard to colour sensitivity, speed, gradation, latitude, and, more particularly, grain. Each will therefore be more suitable for some jobs than for others.

COLOUR SENSITIVITY. Practically all 35 mm. films are sensitive to all colours. They are what is known as *panchromatic*. Some types, particularly those of high sensitivity, are especially sensitive to red. They are thus very suitable for photography with artificial light which is richer in red than daylight.

For special purposes infra-red film can be used. This is sensitive to infra-red rays which are not visible to the human eye. Applications of this material are for night photography by "invisible light", long-distance shots, mist penetration, and scientific copying and research work.

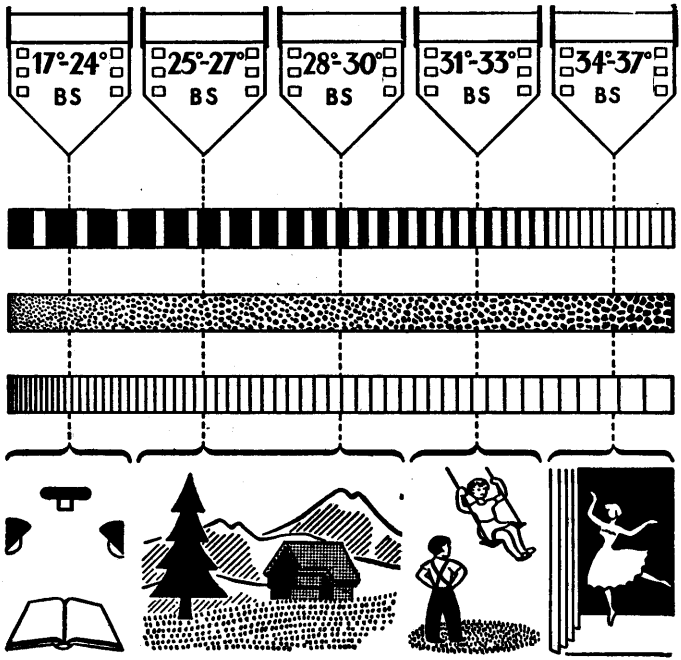
For copying black-and-white objects (books, ledgers, etc.), a slow *positive* film can be recommended. This is sensitive to violet and blue light only. Besides its qualities of fine grain and high brilliancy, it possesses the further advantage that it can be handled in an amber darkroom light.

SPEED. The sensitivity of film materials to light in general is measured in units of *BS*, *ASA*, *Scheiner*, *Weston*, *DIN*, etc. Scientists and manufacturers 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 respect. 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.

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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 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. (See also pages 30 and 32.)

CONVERSION OF DIFFERENT SPEED SYSTEMS

BS Log	*ASA*	*DIN (old)*	*DIN[1] (Zeiss)*	*DIN[2] (new)*	*Scheiner*	*Weston[3]*	*Relative Speed*
20	8	11/10	14/10	10	21	6	1
23	16	14/10	17/10	13	24	12	2
26	32	17/10	20/10	16	27	24	4
29	64	20/10	23/10	19	30	50	8
32	125	23/10	26/10	22	33	100	16
35	250	26/10	29/10	25	36	200	32
38	500	29/10	32/10	28	39	400	62½

[1] *Used on built-in Zeiss meters between* 1956 *and* 1958.
[2] *All Zeiss meters and all German films since February* 1958.
[3] *Use ASA rating on Weston Master III.*

In some systems doubling 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 (ASA and BS Arith. Index, Weston, G.E.).

Slow films of less than about 24° BS 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°–30° BS 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. Disadvantages: further loss of speed if fine-grain development has to be employed for the sake of big enlargements.

Fast films of 31° BS and over for high-speed sport shots, interiors, stage pictures and night photography. Advantages: increased sensitivity to red (artificial light), use of smaller apertures (depth of field) which in their turn facilitate focusing under adverse conditions of lighting (focusing without rangefinder). Disadvantage: graininess (this 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 35 mm. film is coarse, it will soon become visible by

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moderate enlarging, and the finer the structure of grain, the more enlarging will it allow without showing any unpleasant granular effect in the print. As a rule, it can be

CHARACTERISTICS OF SOME 35 mm. FILMS

Make	Type	Speed in ° BS	Speed in ASA	Grain	Gradation
Agfa—					
Isopan FF	P.	23	16	uf.	v.
Isopan F	P.	27	40	ef.	n.
Isopan ISS	Pr.	31	100	mg.	n/s.
Isopan Ultra	Pr.	34	200	mg.	n.
Isopan Record	Pr.	39	640	mg.	n.
Ansco—					
Supreme	P.	28	50	g.	n.
U.S. Pan	P.	31	100	mg.	n.
Super Hypan	P.	34	200	mg.	n.
Ferrania—					
P.3	P.	27	40	ef	v.
S.2	Pr.	31	100	fg.	v.
Gevaert—					
Gevapan 27	P.	26	32	ef.	n.
Gevapan 30	P.	29	64	fg.	n.
Gevapan 33	P.	32	125	fg.	n/s.
Gevapan 36	Pr.	35	250	mg.	n.
Ilford—					
Pan F	P.	25	25	uf.	v.
F.P. 3	P.	29	64	ef.	n.
H.P. 3	Pr.	34	200	mg.	n/s.
H.P.S.	Pr.	37	400	mg.	n/s.
Kodak—					
Panatomic X	P.	25	25	ef.	v.
Plus X	P.	30	80	fg.	n.
Tri X	P.	34	200	mg.	n.
Perutz—					
Pergrano 14	P.	23	16	uf.	v.
Perpantic 18	Pr.	27	40	ef.	n.
Peromnia 21	Pr.	31	100	fg.	n.
Peromnia 23	Pr.	33	160	mg.	n.
Schleussner—					
Adox KB 14	P.	24	20	uf.	n.
Adox KB 17	P.	27	40	ef.	v.
Adox KB 21	Pr.	31	100	mg.	n/s.

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; v.=vigorous.

CONT—D

said that the grain size is in direct relation to the speed of the film. The faster the film, the coarser the grain and vice versa. 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) over-exposure. 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 has been 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.

Colour Film

There are two types of colour film.

The first, negative colour film, produces negatives in colour. These resemble ordinary negatives—the dark parts of the subject are light and vice versa—and in addition the colours are reversed. Thus blues are yellow or brownish, reds are blue-greens, and greens are reddish.

These colour negatives are then printed on a similar kind of material to give colour prints or colour enlargements. We

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can also use the negatives to obtain black-and-white prints in the normal way.

The second type of colour film, known as reversal film, produces positive colour transparencies on the film which was exposed in the camera. These transparencies can then be viewed by transmitted light or projected through a projector.

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

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 exposure meter. Under-exposed and over-exposed films not only produce dense or weak transparencies but also the colour values are distorted. Over-exposure produces pale, diluted colours; under-exposure gives hard deep colours.

Avoid great contrast such as deep shadows; preferably have the light coming from behind you.

For photographs by daylight use daylight type film, use artificial light film when taking pictures by the light of electric bulbs or Photofloods. Daylight film may be used in artificial light and vice versa with the special conversion filters. For colour flash pictures use daylight colour film with blue tinted flash bulbs, or type F film with clear bulbs. See table on page 91.

For distant landscapes and scenes on hazy days a haze filter may be used; this absorbs ultra-violet light thus avoiding an excess of blue. This filter is also useful for colour photography with electronic flash to produce somewhat warmer tones; it needs no increase in exposure.

DISPLAYING THE COLOUR PICTURE. The colour transparency can be viewed in a variety of transparency viewers. The simplest consists of a magnifying glass set in a frame into which the picture can be inserted. If the viewer is held against a bright background, the picture appears

enlarged and well lit. More elaborate viewers have an artificial light source of their own.

The most satisfactory way is to project the transparency in a projector which will throw a large image on a screen.

Finally, you can get inexpensive colour enlargements from most makes of transparencies.

35 mm. COLOUR FILMS ON THE MARKET

Film	*Type*	*Speed in* BS	ASA	*Processing*
Adox Color Neg.	Daylight	24°	20	L
Agfacolor Neg. CN14	Universal	24°	20	L
Agfacolor Neg. CN17	Universal	26°	32	L
Agfacolor Rev. CT18	Daylight	27°	40	M
Agfacolor Rev. CK16	Artificial light	26°	32	M
Anscochrome Rev.	Daylight	26°	32	U
Anscochrome Rev.	Artificial light	26°	32	U
Anscochrome Rev.	Flash	25°	25	U
Super Anscochrome Rev.	Daylight	31°	100	U
Super Anscochrome Rev.	Artificial light	31°	100	U
Ektachrome Rev.	Daylight	26°	32	U
Ektachrome Rev.	Flash	25°	25	U
Ferraniacolor Rev.	Daylight	22°	12	U
Ferraniacolor Rev.	Artificial light	24°	20	U
Gevacolor Neg. N5	Daylight	25°	25	L
Gevacolor Rev. R5	Daylight	25°	25	M
Ilford Colour Rev.	Daylight	21°	10	M
Ilford Colour Rev.	Flash	21°	10	M
Kodachrome Rev.	Daylight	21°	10	M
Kodachrome Rev.	Artificial light	23°	16	M
Kodachrome Rev.	Flash	23°	16	M
Pakolor Super 40 Neg.	Daylight	27°	40	U

PROCESSING: M=films can be processed by the maker only; L=films can be processed by an approved laboratory through a photographic dealer; U=films can be processed by the user by means of a special processing kit.

The colour negative can be printed or enlarged directly on colour paper to produce a colour print of any size. Alternatively, some makes of colour negatives can be printed on positive transparency film to produce colour transparencies for viewing or projection in exactly the same way as explained above.

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THE CONTINA III LENSES

The basic lens system of Contina III is the 1¾ in. (4.5 cm.) Pantar *f* 2.8. This is a convertible lens and developed as a lens set providing alternative short and long focal lengths by interchanging the front component. The Contina III lens thus becomes a wide-angle or telephoto lens system respectively. All other models have a fixed lens and do not allow the use of tele or wide-angle units.

The Interchangeable Lens Mount

The front glass of the 1¾ in. (4.5 cm.) Pantar fitted to the model III is attached by an internal bayonet mount, and may be removed and replaced by the wide-angle or telephoto component, converting the lens to a 1¼ in. (3 cm.) Pantar *f* 4 or 3 in. (7.5 cm.) Pantar *f* 4 respectively. The wide-angle unit has 6 elements, the tele unit 5 elements. With the two remaining elements of the standard lens the full combination has 8 and 7 elements respectively.

FOR WIDE-ANGLE PHOTOGRAPHY the 1¼ in. (3 cm.) Pantar *f* 4 increases the angle of view to 73° compared with 51° for the standard lens, thus showing a field approximately half as large again.

The lens has definite advantages in cases where the practicable distance between camera and subject is limited and insufficient for the standard lens to record the subject in its entirety. The 3 cm. Pantar is thus primarily of use 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. The 3 cm. Pantar therefore can be employed with advantage as a "quick shooting" lens for general purposes where accurate focusing or distance-setting would be inconvenient (e.g. owing to insufficient time).

The lens is fully colour corrected, free from vignetting, has a flat field and is coated.

FOR TELEPHOTOGRAPHY the 3 in. (7.5 cm.) Pantar *f* 4

which has an angle of view of 32°, gives a linear magnification of 1.65 times compared with the standard lens. It is therefore particularly suitable for subjects that are difficult to approach closely, such as animals or 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 perspective. At the same time its reduced depth of field concentrates definition on the portrait, avoiding distracting sharp backgrounds.

Using the Lens Units

To remove the front component, hold the camera in the left hand and depress the locking catch under the lens mount. Grip the edge of the lens with the right hand and overcoming an initial resistance, turn as far as it will go, and withdraw it.

To fit one of the interchangeable front components, align the red dot on the component with the red dot on the locking catch, then insert the component and turn it clockwise until the lock engages with a click.

When using the wide-angle or telephoto components, focusing is no different from the procedure with the standard lens. Simply turn the lens mount until the distance indicated there is opposite the red index mark.

Viewfinders for the Alternative Focal Lengths

Special tubular optical viewfinders are available which fit into the accessory shoe of the Contina III.

The wide-angle finder shows the correct field of view when using the 1¼ in. (3 cm.) Pantar unit while the telephoto finder is correct for the 3 in. (7.5 cm.) Pantar.

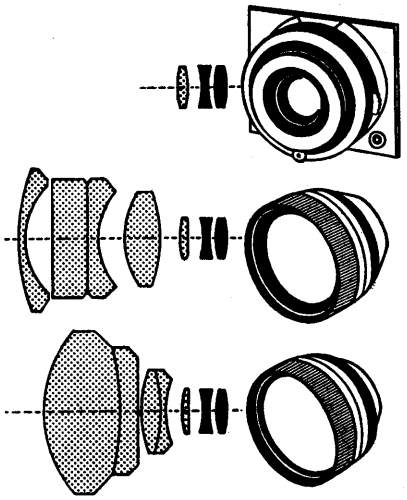
The Contina III with bright line finder has small corners inside the main frame depicting the field of the Tele Pantar.

A UNIVERSAL VIEWFINDER is available showing the correct fields of the 1¼, 1¾ and 3 in. (3, 4.5 and 7.5 cm.) and stereo attachments (see page 55).

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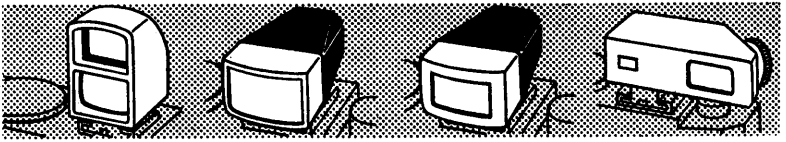
CONTINA III LENSES AND FINDERS

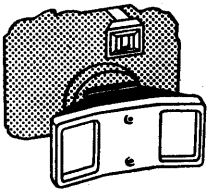




Above: To remove the front of the lens, depress locking catch, grip edge of lens and turn anticlockwise. To fit lens, align red dot on lens component with red dot on locking catch and turn clockwise (see page 54).

Top right: The 1¾ in. (4.5 cm.) Pantar *f* 2.8. *Centre right:* The wide angle 1½ in. (3 cm.) Pantar *f* 4. *Lower right:* the 3 in. (7.5 cm.) Tele Pantar *f* 4. The interchangeable components are shown shaded, the fixed back components for all three lenses are shown solid.





Above: The auxilliary finders for the Contina III (*from left to right*): Universal finder, wide angle finder, telephoto finder, and telephoto focusing finder.

Left: The stereo attachment for the Contina III, the Steritar D, produces two stereo pictures 16×23 mm. on one frame.

THE TELEPHOTO FOCUSING FINDER for the 3 in (7.5 cm.) Pantar indicates at one glance both the correct image field and the distance. This combined view- and range-finder is of great advantage as with long focus lenses the distance should be set as accurately as possible, particularly as the depth of field (see page 57) with the long focal length is rather limited.

FILTERS AND LENS HOOD for the Pantar units are available. Both the 1¼ in. (3 cm.) and the 3 in. (7.5 cm.) Pantar use a 60 mm. screw-in filter. Full details of lens hood are given on page 11.

The Contina III Stereo Attachment

A special stereo attachment, the Steritar D, can be used in conjunction with the Contina III. It will fit into the front bayonet of the lens mount. The stereo attachment produces two pictures 16×23 mm. side by side on one frame of the film. These can be mounted without cutting and transposing. With the Zeiss Ikon O stereo viewer they can be viewed as fully three dimensional images.

The standard Pantar filters can be used in conjunction with the Steritar D.

With the Steritar D a viewfinder mask is supplied which will fit into the camera accessory shoe and reduce the normal finder image to that covered by the stereo attachment.

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METHODS OF FOCUSING

When you photograph a subject, 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, of course, 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 1/20 mm. (1/30 mm. if big enlargements are to be made), should be regarded as sharp. The technical term for the dot is *circle of confusion.*

Control of Depth of Field

The limits defined by the circle of confusion vary with the conditions under which the lens is used. Thus:

Small apertures yield more depth of field than large apertures.

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

In addition, short focus lenses yield more depth than long focus ones. This is of interest with the Contina III where the choice of the focal length also controls the extent of the zone of sharpness available.

The depth of field, dependent on the distance actually focused on and the aperture employed, has to be ascertained from case to case. The effect of aperture and focusing distance on each other can be read off a depth of field indicator.

Incidentally, the depth of field in front of the focused distance is always more limited than the depth behind it.

The comparative shallowness of the depth of field in 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 this way we 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 in moderation. 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 place the focus as near as possible to the spot where you want the greatest sharpness. Thus in the case of distant landscapes it is better to focus on infinity, rather than use the hyperfocal distance (described below) if the sharpness is required in the far distance.

When a lens is focused on such a distance that the depth of field just reaches the far distance (*infinity*) then the lens is

HYPERFOCAL DISTANCES WITH 1¾ in. (4.5 cm.) LENS

(For conversion into metric units, see page 93)

Stop	*Distance Setting*	*Depth of Field from*	*to approx.*
f 2.8	∞	∞	50 ft.
f 4	∞	∞	37 ft.
f 5.6	∞	∞	25 ft.
f 8	20 ft.	∞	10 ft.
f 11	15 ft.	∞	7 ft. 6 in.
f 16	10 ft.	∞	5 ft.
f 22	6 ft.	∞	3 ft.

The best way to utilize the hyperfocal distances accurately at larger apertures is to set the ∞ mark against the aperture to be used on the depth of field scale. That yields closer limits for the depth than shown above for *f* 4, and *f* 5.6.

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focused on the *infinity-near point*, or *hyperfocal distance*. This setting is useful when we want 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

You will often want to take snapshots by seizing a situation as you come across it without any preliminaries, certainly without setting up a tripod, and mostly with the least possible loss of time. To attain this you will not only have to know your camera inside out but will also need a ready-for-shooting lens setting, which will yield a sharp picture every time. Here the relatively short focal length scores; it gives the advantage of a comparatively large depth of satisfactory definition even at the more open apertures.

From what was said about depth of field on the previous pages, it is clear that the stop is used to regulate the definition of our picture in depth (towards both foreground and background) from the point on 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 because the small stops also need correspondingly more exposure owing to the fact that stopping down the lens reduces the light it can pass (see page 57).

In consequence, the practical setting for quick shooting is a compromise; we need a well-selected medium stop with a suitable distance setting, yielding a fairly extensive zone of definition, and still permitting the use of a reasonably short exposure.

While the exposure time should, of course, be set in accordance with the prevailing light conditions (see page 72) a simple rule of thumb with the zone focus settings, is 1/60 sec. on a somewhat overcast day, and 1/125 sec. on a bright day.

The Depth of Field Indicator

The Contina and Contessa carry a depth of field indicator on the front of the shutter, opposite the distance scale on the lens mount. This shows at a glance how much of the subject will be sharp.

To read off the available depth, set the lens mount to the distance of the subject, and look for the distance figures opposite the index lines marked with the aperture you are using. For instance with the lens set to 10 ft. and an aperture of *f* 8, the two lines marked 8 on each side of the central triangular index mark point to about 6½ and just over 20 ft. respectively. The sharp zone therefore extends from 6½ to about 22 or 23 ft. (see page 61).

The depth of field indicator will also show the best settings to obtain a given zone of sharpness. For instance, we may require a scene to be sharp from about 4 to 10 ft. In that case rotate the lens mount until a pair of aperture index lines of the same number are opposite 4 and 10 ft. respectively on the distance scale, and note the aperture and distance setting. In our example this will be the case with the *f* 11 aperture lines. The central triangle mark will then be opposite about 6 ft., indicating that the camera must be set to 6 ft. and the lens stopped down to *f* 11.

Different Contina models have slightly different distance figures on the scale, but the principle is the same in each case. See also page 21.

The Depth of Field Tables

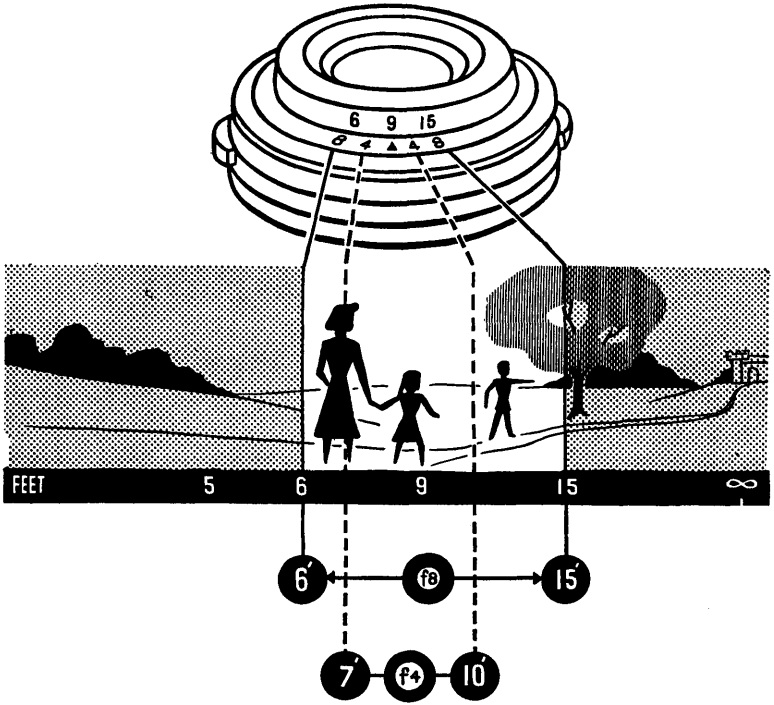
These tables are included (pages 62–64) in spite of the fact that the camera is fitted with a depth of field indicator. The tables supply perfectly accurate figures which cannot be obtained with the indicator, the distance scale not being calibrated in sufficient detail.

The table on page 62 gives the figures for the standard lens on all Contina models; pages 63–64 indicate the depth with the convertible lens units of the Contina III.

The tables are computed on the assumption that the circle of confusion is 1/20 mm. in diameter. The figures on the left of the table relate to the setting of the lens stop. The bold (middle) figure in each group indicates the distance (in feet) to which the lens is to be set on the distance scale. The corresponding figure above then gives the distance (in feet and inches) of the near limit and the figure below gives the distance of the far (distant) limit of the depth of field.

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THE DEPTH OF FIELD INDICATOR



The depth of field indicator shows clearly how much of the subject will be sharp at any given distance. Pairs of aperture numbers are engraved opposite the distance scale, to facilitate accurate and easy indication. Having focused the lens correctly, read the distance figures lying opposite the numbers of the aperture you are going to use. These will be the limits of the depth of field. For example, setting the lens to 10 ft. and using *f* 8 will give a depth of field from 6 ft. 3 in. to 23 ft. Larger apertures reduce the depth of field so that at the same distance, using *f* 4, the depth of field would only extend from 7ft. 5 in. to 13 ft. 9 in.

DEPTH OF FIELD WITH THE STANDARD 1¾ in. (4.5 cm.) CONTINA LENS

(For conversion into metric units see page 93.)

f2.8	2–10½	3–4	3–8	4–7	5–5	7–0	7–6	8–3	9–9	11–6	14–3	18–7	27–3	50–0
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–2	3–8½	4–4	5–6	6–9	9–6	11–0	12–6	15–9	21–6	33–0	75–0	∞	∞
f3.5	2–10	3–3	3–8½	4–6	5–3½	6–9	7–3	8–1	9–3	11–3	13–3	17–6	24–0	40–0
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–2½	3–9½	4–4½	5–7½	6–11	9–10	11–6	13–1	17–3	23–4	40–0	120	∞	∞
f4	2–9½	3–2¾	3–7¾	4–5½	5–2½	6–7½	7–1	7–10¾	8–11	10–8½	12–9	16–6	22–3	35–0
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–2¾	3–10	4–5½	5–8¾	7–1½	10–2	12–3	13–8	18–3	25–4	46–6	210	∞	∞
f5.6	2–8¾	3–1½	3–6½	4–3	4–11½	6–2½	6–8	7–3½	8–1	9–7	11–0	14–0	18–3	25–0
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–4	3–11½	4–8½	6–1	7–8½	11–4	14–6	16–0	23–0	35–1	100	∞	∞	∞
f8	2–7½	3–0	3–4	4–0	4–7	5–7¾	6–0	6–6½	7–3	8–3¾	9–6	11–5	17–0	17–6
	3	3½	4	5	6	8	9	10	12	15	20	20	60	∞
	3–6	4–2¾	5–0	6–8¾	8–8¾	13–11	20–1	21–8	35–0	83–0	∞	∞	∞	∞
f11	2–6	2–10	3–1¾	3–8½	4–2¾	5–1	5–4	5–9½	6–1	7–1½	7–8	9–3	11–0	12–6
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–9	4–7	5–6½	7–8¾	10–6	25–4	33–0	38–10	∞	∞	∞	∞	∞	∞
f16	2–4	2–7½	2–10½	3–4	3–8¾	4–4½	4–5	4–10½	5–5	5–9½	5–10	7–0¾	7–8	8–9
	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	4–2¾	5–4	6–8½	10–4	16–3	56–0	∞	∞	∞	∞	∞	∞	∞	∞

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DEPTH OF FIELD WITH THE 1¼ in. (3 cm.) PANTAR LENS OF THE CONTINA III

(For conversion into metric units see page 93.)

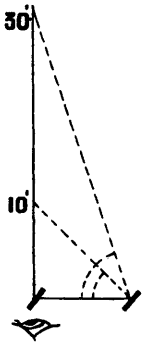
	2–9	3–1½	3–6	4–3	4–11	6–2½	6–8	7–3½	8–1	9–7	11–0	14–0	18–3	25–0
f4	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–4	3–11½	4–8½	6–1	7–8	11–4	14–6	16–0	23–0	35–1	100	∞	∞	∞
	2–7½	3–0	3–4	4–0	4–7	5–8	6–0	6–6½	7–3	8–4	9–6	11–5	17–0	17–6
f5.6	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–6	4–3	5–0	6–9	8–9	13–11	20–1	21–8	35–0	83–0	∞	∞	∞	∞
	2–6	2–10	3–2	3–8½	4–3	5–1	5–4	5–9½	6–1	7–1½	7–8	9–3	11–0	12–6
f8	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	3–9	4–7	5–6	7–9	10–6	25–4	33–0	39–0	∞	∞	∞	∞	∞	∞
	2–4	2–7½	2–10½	3–4	3–9	4–4½	4–5	4–10½	5–5	5–9	5–10	7–1	7–8	8–9
f11	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	4–3	5–4	6–8½	10–4	16–3	76–0	∞	∞	∞	∞	∞	∞	∞	∞
	2–0	2–3	2–5	2–9½	3–0	3–6	3–8	3–10	4–1	4–4½	4–8½	5–1	5–8	6–3
f16	3	3½	4	5	6	8	9	10	12	15	20	30	60	∞
	6–0	8–1	11–4	26–4	200	∞	∞	∞	∞	∞	∞	∞	∞	∞

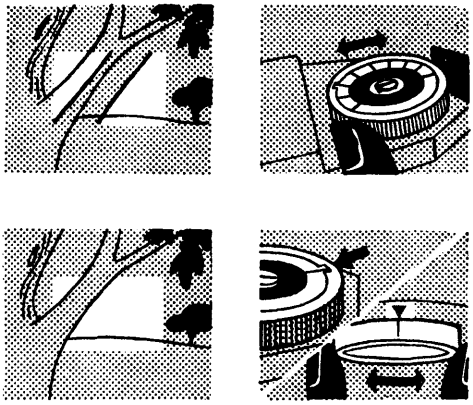
DEPTH OF FIELD WITH THE 3 in. (7.5 cm.) PANTAR LENS OF THE CONTINA III

(For conversion into metric units see page 93.)

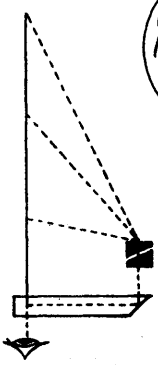
f4	4–7½	5–5½	7–1	7–10	8–7	10–0	12–0	15–0	20–0	30–0	60–0
	5	6	8	9	10	12	15	20	30	60	∞
	5–5½	6–8	9–2	10–6	12–0	15–0	20–0	30–0	60–0	∞	∞
f5.6	4–6	5–3½	6–9	7–3	8–1	9–3	11–3	13–3	17–6	24–0	40–0
	5	6	8	9	10	12	15	20	30	60	∞
	5–7½	6–11	9–10	11–6	13–1	17–3	23–4	40–0	120	∞	∞
f8	4–3	5–0	6–4	6–11	7–6	8–8	10–0	12–0	15–0	20–0	30–0
	5	6	8	9	10	12	15	20	30	60	∞
	6–0	7–6	10–10	12–10	15–0	20–0	30–0	60–0	∞	∞	∞
f11	4–0	4–8	5–9	6–2½	6–8	7–6	8–7	10–0	12–0	15–0	20–0
	5	6	8	9	10	12	15	20	30	60	∞
	6–8	8–8	13–4	16–4	20–0	30–0	60–0	∞	∞	∞	∞
f16	3–9	4–3	5–3	5–8½	6–0	6–8	7–6	8–7	10–0	12–0	15–0
	5	6	8	9	10	12	15	20	30	60	∞
	7–6	10–0	17–2	22–6	30–0	60–0	∞	∞	∞	∞	∞

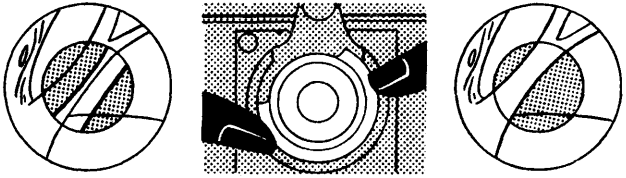
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The rangefinder of the old Contina II covers distances by moving a mirror through about 3°. It shows two separate views of the subject in a rectangular window (*top left*). Turn the setting knob (*top right*) until the two images merge into one (*bottom left*). Then read the distance marked in the cut-out of the setting knob (*bottom right*) and set the distance setting on the lens to the same figure.





The rangefinder of the Contessa rotates two wedge prisms through about 60°. It shows two separate views of the subject in the light centre of a circle (*left*). Turn the milled ring on the front of the camera (*centre*) until the two images merge into one (*right*). No further adjustment is necessary, as the lens is automatically set to the correct distance.

Rangefinder Focusing

A rangefinder is an optical instrument to measure the distance between the subject to be photographed and the camera.

Photographic rangefinders work on the principle of combining two distinct images. Generally this is done by having two mirrors or prisms, one of which remains stationary while the second one is pivoted. The angle through which the movable prism or mirror has to be turned to fuse the double image into one is used to show the distance on the scale. This is the principle employed in the rangefinder built into the old model of the Contina II.

The rangefinder built into the Contessa has two stationary prisms and combining the double image into one is effected by two revolving supplementary wedges. This system results in high accuracy as the wedges of the Contessa must rotate through 60° to cover this distance, while less accurate systems have only 30° movement.

THE RANGEFINDER OF THE OLD CONTINA II. On looking through the eyepiece of the rangefinder one will see in the centre of the field a small bright rectangular section, in which the vertical outlines of the subject appear double. By slowly turning the rangefinder focusing ring on top of the camera, the two images in the centre of the field will merge into a single one. Stop moving the focusing wheel when the two images are exactly superimposed. The scale on the rangefinder focusing wheel then shows distance accurately and automatically. Set the lens (page 6) to the distance indicated by the rangefinder.

THE RANGEFINDER OF THE CONTESSA is combined with the viewfinder and is automatically coupled to the lens. Looking through the viewfinder eyepiece one will see a light circular portion in the centre. It is in this circle that the image of the subject appears double. On turning the focusing ring (around the lens mount) slowly, the two images will merge into one. Stop when the two images are superimposed and the lens will be focused accurately on the subject.

SEPARATE RANGEFINDERS. The old Contina I, and new models I, II, and III have no built-in rangefinder. Users who are not good at estimating distances are advised to use one of the separate rangefinders available on the market, particularly when working at shorter distances (3 ft. to 20 ft.). These instruments are generally fitted with a foot to slide into the accessory shoe mounted on top of the camera. They are used the same way as the old Contina II rangefinder (above). Be sure to acquire a rangefinder with the same calibration as the camera. If the camera is scaled in feet a rangefinder showing the distance in feet is required, if the camera is scaled in metres, one giving a metre reading is needed.

The orthodox way of focusing described may be adopted for taking photographs of subjects that are fairly stationary or do not move at all. For moving subjects a different method of focusing is more suitable.

Set the camera lens with the rangefinder to a distance at which the

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subject will be at a given moment, or focus on a spot which the subject actually has to pass. Watch the scene in the finder, and press the release button when the subject reaches the pre-focused point.

With subjects liable to react self-consciously (e.g. children), set the lens and rangefinder to the distance you intend to photograph at, and then approach your subject quickly, exposing as soon as the two images in the rangefinder coincide.

Alternately, focus on some object which is the same distance from the camera as your real subject, but in a different direction.

When the range is found and set on the lens, swing round to press the release button as soon as your subject comes into the field of view.

See also page 59 for quick shooting with zone focusing methods.

CLOSE-UP WORK

While the Contina and Contessa cameras normally focus down to 3 ft., we can work at still closer distances with the aid of close-up lenses, making the camera suitable for photography of small objects such as plants, small creatures, for copying of books, documents and stamps, table top work, etc. The makers supply a series of such lenses.

The Proxar $f=1$ m. covers subject distances from $39\frac{1}{4}$ to 18 in.

The Proxar $f=0.5$ m. covers subject distances from $19\frac{1}{2}$ to $12\frac{1}{4}$ in.

The Proxar $f=0.3$ m. covers subject distances from $13\frac{1}{4}$ to $9\frac{1}{2}$ in.

The Proxar $f=0.2$ m. covers subject distances from $7\frac{7}{8}$ to $6\frac{3}{8}$ in.

All Proxar lenses are fitted in 28.5 mm. push-on mounts.

Using the Proxar Lenses

Mount the camera on the tripod, and approach the subject until it appears the desired size in the viewfinder field. According to the distance, place the appropriate Proxar lens on the lens mount. Then measure accurately the distance between the front of the Proxar lens and the centre of your subject and look for this distance in the focusing table on page 69.

No change of exposure time is required with the close-up lenses.

At full aperture the image will be slightly unsharp, particularly towards the corners. On stopping down, the definition is improved and will be normal at *f* 8.

The area reproduced when using these close-up lenses does not fully correspond with the viewfinder image but is shifted in the direction of the lens due to parallax.

The shift of the image is downwards towards the bottom when looking through the finder. The amount of image shift in proportion to the picture area is given in the following table:

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PARALLAX COMPENSATION IN CLOSE-UPS

Subject distance							
Inches...	31½	23¾	18	15½	13½	12
Centimetres	80	60.5	44.5	40	35	30.5
Viewing image shifts by	1/12	1/10	1/8	1/6	1/5	1/4

CLOSE-UP FOCUSING WITH PROXAR LENSES
(For conversion into metric units see page 93)

Set Distance on Focusing Mount to:	*Distance in Inches from Front of Lens to Subject with Proxar Lens Marked:*			
ft.	*f*=1	*f*=0.5	*f*=0.3	*f*=0.2
∞	39¼	19½	13¼	7⅞
30	38¾	18½	12¾	7¾
15	32¼	17½	12¼	7½
9	28½	16½	11¾	7⅜
6	25	15¼	11⅛	7¼
5	23¼	14½	10¾	7
4	21	13½	10¼	6¾
3	18	12¼	9½	6⅜

Close-Up Depth.

The depth of field when working at close range with supplementary lenses is obviously rather limited. The table on page 70 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 any series of close-up lenses.

Other Close-up Lenses

Besides the special Proxar lenses, a range of meniscus lenses in suitable mounts can equally well be used. The lenses suggested are +1 diopter, +2 diopters, +3 diopters. The distances obtained with the +1 and +2 diopter lenses are the same as with the Proxar *f*=1 and *f*=0.5 lenses re-

CLOSE-UP DEPTH OF FIELD

(For conversion into metric units, see page 93.)

	37 3/4	33 3/4	29	25 5/16	20 1/2	19 1/16	15 5/8	11 7/8	10 13/16
f 3.5	39 1/2	35	30	26	21	19 1/2	16	12	11
	41 3/8	36 1/2	31 1/4	26 13/16	21 9/16	20	16 1/4	12 1/4	11 3/16
	36 9/16	32 5/8	28 1/16	24 5/8	20 1/8	18 3/4	15 3/8	11 3/4	10 11/16
f 5.6	39 1/2	35	30	26	21	19 1/2	16	12	11
	42 13/16	37 9/16	31 5/8	27 5/16	22	20 3/8	16 1/2	12 7/16	11 5/16
	35 7/16	31 11/16	27 3/8	24 1/16	19 3/4	18 7/16	15 3/16	11 5/16	10 5/16
f 8	39 1/2	35	30	26	21	19 1/2	16	12	11
	44 5/8	38 7/8	32 9/16	28	22 1/2	20 13/16	16 3/4	12 5/8	11 7/16
	32 1/8	29 1/16	25 3/8	22 1/2	18 5/8	17 7/16	14 1/2	11 1/8	10 3/16
f 16	39 1/2	35	30	26	21	19 1/2	16	12	11
	51 1/4	43 3/4	35 13/16	30 7/16	24 3/16	22 3/16	17 11/16	13 3/16	12

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spectively, while the +3 diopter lens gives similar distances (in practice about 10 per cent. longer) to the Proxar $f=0.3$ lens.

The handling and application of these lenses are identical to that described above for Proxar lenses.

Close-up Viewfinder

A special close-up viewfinder is available for the Contina when used in conjunction with the $f=0.5$ Proxar lens. This finder shows the actual field covered and at the same time is fitted with a measuring chain. Coloured beads at 12 and 20 in. aid in accurately gauging the distance while holding the camera in the hand.

EXPOSURE

Correct exposure depends on two factors:

The amount of light reflected from the subject. This depends on time of year, time of day, weather, situation etc.

The film speed, filter, lens aperture and possibly increased exposure for certain fine grain developers.

The correct exposure can be found by using:

EXPOSURE TABLES (page 77). Based on mathematics and practical experience, these tabulate the above factors. Properly used they give exposures within the film's latitude. The Focal Exposure Chart represents the most rapid current version.

OPTICAL EXPOSURE METERS, also called *visual* or *extinction* meters. They measure light with the aid of the eye. Their advantage is their sensitivity to poor light. Their accuracy suffers from the varying sensitivity of the eye from user to user. Carefully and consistently used however, they give exposures within the films' latitude.

PHOTOELECTRIC METERS. The best means of measuring exposure. A photoelectric cell converts light into electricity which moves a pointer over an exposure scale.

The Built-in Exposure Meter

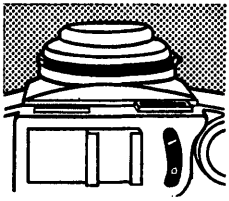
The Contina II and III with SLK shutter have built-in photo-electric meters coupled to the aperture setting ring.

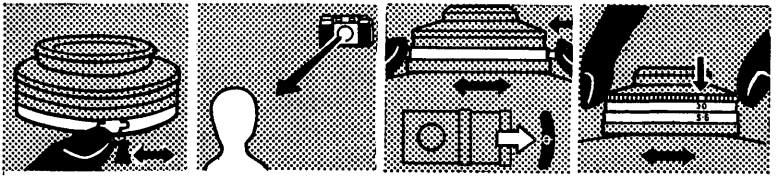
1. **Set film speed.**
2. **Point camera at subject.**
3. **Turn aperture ring to set exposure.**
4. **Select suitable speed/aperture pair.**

1. To set film speed, press back the setting lever below the shutter and move it left or right to bring the appropriate speed against the triangular mark for ASA or DIN. If the speed does not reach the mark turn the aperture ring (which carries the mark) until you can set the speed. You can set intermediate speeds between those shown on the speed ring.

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THE BUILT-IN COUPLED EXPOSURE METER





Top: The latest Contina II and III have a built-in meter coupled to the shutter via the aperture setting ring. Turning this adjusts the diaphragm and also moves a white circle in the window on top of the camera. A catch in the right finger-grip (viewed from above) locks the aperture to the shutter speed setting. Light values are not needed and no scale is provided. Film speeds are set on a ring at the back of the shutter, the scale being visible from underneath.

Above: To use, set film speed by depressing locking lever underneath shutter and moving speed scale against pointer (*left*). Point meter at subject (*centre left*). Depress locking catch and turn aperture ring until small circle coincides with pointer (*centre right*). Set mark on shutter speed ring against required speed-aperture pair (*right*).

The figures beside the triangular mark allow automatically for filter factors. With a 2x filter, set the film speed against figure '2' instead of the triangle. Intermediate factors can also be set.

2. See page 76, Using an Exposure Meter.
3. Turn the aperture setting ring by the two finger grips (depressing the locking-catch) until, in the window on top of the camera, the white circle is exactly over the pointer. Release the lock.
4. Turn the shutter speed ring until the mark is opposite the most suitable speed/aperture pair.

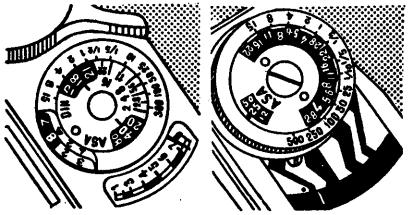
To use the earlier Contina II, III and Contessa exposure meters:

1. Set film speed.
2. Point camera at subject.
3. Turn setting ring to obtain exposure reading.
4. Set camera to reading obtained.

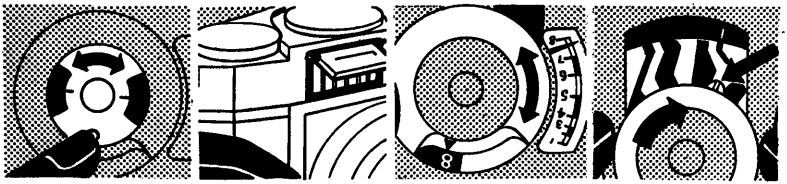
1. Turn the inner scale disc to set correct film speed in the appropriate window, ASA or DIN. The table on page 32 converts other film ratings to ASA or DIN.
2. *Contina IIa and Contessa.* In poor light, if the needle does not move, press button beside the cell to open the meter cover.
   Contina II and III 1956. As above, but the cover must be open in any light to get a reading.
   See page 76; Using an Exposure Meter.
3. *Contina IIa and Contessa:* On the Contina IIa the needle in the curved window will point to a number; on the Contessa, to a white or black block between window and disc.
   Turn the Contina IIa setting ring to align the black triangle (or red figures) with the green or black figure indicated by the needle. The red figures allow automatically for the corresponding filter factor. Turn the Contessa setting ring so that the indicator covers the block opposite the needle. Read off *f*-number against the required shutter speed.
   A green dot on the hinge of the cover is only visible with cover closed. Consequently use the green scale when the green dot shows. Use the black scale with cover open.
   Contina II and III (1956): Turn the meter setting ring to centre the circle over the needle. On the Contina II, read shutter speed (outer ring) against aperture (inner scale). Figures to the right of $\frac{1}{2}$ are time exposures in seconds. On the Contina III the red pointer indicates light values in red (outer ring). In poor light time exposures in seconds (green) register against aperture (black) on the inner scale.
4. See page 21, Nos. 2 and 3.

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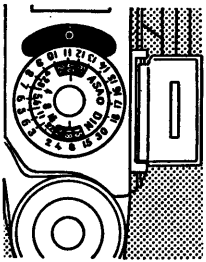
THE BUILT-IN EXPOSURE METER



The exposure meters of the pre-1956 Contina IIa (*left*) and Contessa (*centre*) have a setting ring with film speed indicator and two aperture scales: green with the meter window closed, black with the window open (for poor light). The shutter speeds are engraved on the outer ring.

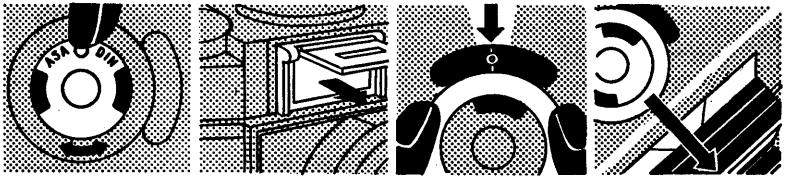


Above: To use, set film speed (*left*), point meter window at subject (*centre left*). On Contina IIa (pre-1956) set outer ring to the same number as needle reading (*centre right*). On Contessa turn ring until pointer faces segment opposite needle position (*right*). Now read shutter speed opposite aperture required.



On the meter of the Contina II (1956) and III the film speed is set as above. The cell cover must always be open for a reading; all readings are covered on one measuring range.

Below: To use, set film speed (*left*). Point open meter window at subject (*centre left*). Turn setting ring until small circle co-incides with pointer (*centre right*). Read off the light value (Contina III) of the aperture and exposure time (Contina II) and set the shutter to the same value (*right*).



Using an Exposure Meter

To get best results, an exposure meter must be used intelligently. This may seem contradictory, after calling it earlier an accurate light measuring instrument. But it measures light from all parts of the subject—highlights, shadows and middle tones. So the reading is an average of 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 highlight 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 it than just pointing a meter at the subject and accepting the reading without question.

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

For some subjects you can take readings really close up, aiming the meter at the part of the subject that you want to have optimum exposure. For instance, many photographers take a close-up reading of the sitter's face in portraiture; out-of-doors you can take a reading of 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 take a reading from this.

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

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EXPOSURE TABLE FOR DAYLIGHT

Add the respective figures in the Tables 1, 2 and 3a; the correct exposure time can be taken from Table 4. For light value settings on the Contina III, add up the figures in the brackets of tables 1, 2, and 3b. The result is the light value to be used on the shutter.

1. *Subject and weather*

	Clear sun	*Cloudy light*	*Cloudy med.*	*Cloudy dull*
Distant land or seascape without foreground	0 (13)	1 (12)	2 (11)	3 (10)
—with light foreground ...	1 (12)	2 (11)	3 (10)	4 (9)
Open streets, squares, light buildings	2 (11)	3 (10)	4 (9)	5 (8)
Figures, groups in open, near objects without heavy shade	3 (10)	4 (9)	5 (8)	6 (7)
—in shade	4 (9)	5 (8)	6 (7)	7 (6)
Average interiors, diffused light	10 (3)	11 (2)	12 (1)	13 (0)

2. *Month and time*

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

3a. Film speed and aperture

Film speed	*Stop*					
B.S.	*f* 2.8	*f* 4	*f* 5.6	*f* 8	*f* 11	*f* 16
31–32°	1	2	3	4	5	6
28–29°	2	3	4	5	6	7
25–26°	3	4	5	6	7	8

3b. Film speed Factors

(1)
(0)
(–1)

4. *Result (sum of Tables 1+2+3a)*

Sum	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**

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

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.

Exposure in Practice

The 35 mm. photographer who shoots haphazardly, relying on the latitude of modern films, just like a snapshooter with a box camera, does not deserve, and will not get, better pictures than the man with the simple instrument.

The use of some exposure help is strongly recommended to secure negatives suitable for enlarging. Miniature negatives must be sharp, have fine grain and show a well balanced gradation from black to 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

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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, with a film of medium speed (26–28° BS or 25–50 ASA), will not show unpleasantly.

The latitude towards under-exposure of any film is very small. At the same time the popular rule rather to over-expose does not apply to miniature negatives either, as over-exposed negatives generally show more grain with appreciable loss of definition, making such negatives unsuitable for good enlargements. So accurate exposure is essential.

While keeping all this in mind, always try to keep the shutter speed short. This is important to avoid camera shake. Even the slightest shake will result in inferior definition of the negative. Experience shows that 1/125 sec. is safe, while you have to hold the camera very steady when using 1/60 sec. or 1/30 sec. Short shutter speeds are also desirable, to arrest movement of the subject.

Remembering that the next bigger aperture (smaller number) allows you to halve the shutter speed should make it easy to arrive at a suitable compromise between a stop yielding adequate depth of field (see page 57) and a shutter speed sufficiently short to exclude camera shake and to arrest the movement of the subject. If, for example, the correct exposure at *f* 8 is 1/30 sec., then with *f* 5.6 you can use 1/60 sec. and with *f* 4, 1/125.

If you intend to use extra-fine-grain developers, remember that some cause loss of speed and you therefore have to compensate by increasing the exposure time. Such negatives will, however, stand a high degree of enlargement without showing unpleasant grain.

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	1/125	1/75	1/60	1/30
Cyclist	1/500	1/300	1/200	1/100	1/75	1/40
Skater	—	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	—	1/500	1/400	1/250	1/125	1/60
Waves	1/500	1/300	1/200	1/100	1/75	1/40
Heavy waves	—	—	1/500	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 ...	—	—	1/500	1/300	1/150	1/75
Slow train	1/500	1/300	1/200	1/100	1/75	1/40
Fast train	—	—	—	1/500	1/250	1/100
Aeroplane	—	—	—	—	1/400	1/200

The values given are for perpendicular displacement to the optical axis, i.e. the shutter speeds as listed above are applicable to motion which cuts right across the direction in which the lens and the photographer look.

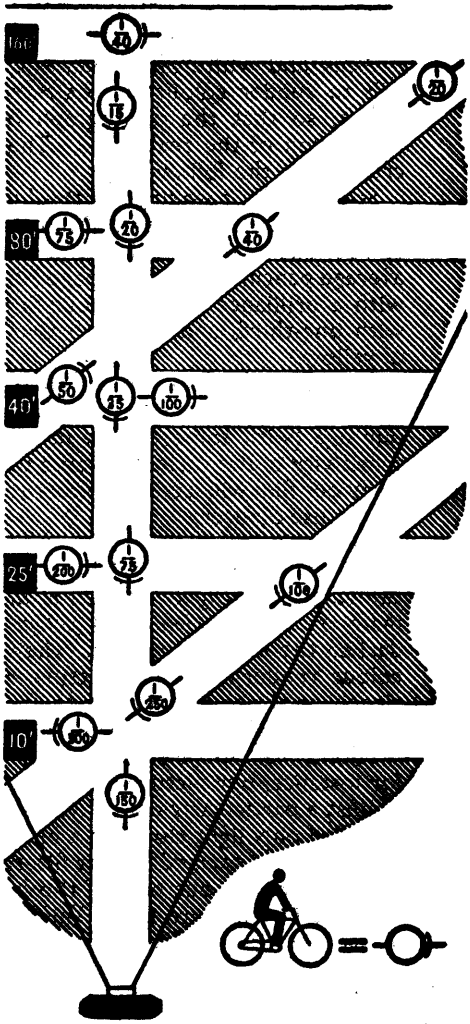
For motion 45° to the optical axis increase time by 100 per cent. In other words, if the subject obliquely approaches or recedes from the camera the exposure time can be longer, say 1/60 sec. instead of 1/100.

For motion parallel to the optical axis increase time by 300 per cent. That means if it directly comes towards the camera (or for that matter moves away from it) the exposure time can be three times longer, say 1/10 of a second instead of 1/30.

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EXPOSURE TO ARREST MOVEMENT

This drawing assumes that we want to photograph a cyclist making 15 miles p.h., the first cross road being 10 ft., the following ones 25, 40, 80 and 160 ft. respectively from the standpoint of the camera. We find that the cyclist coming directly towards the camera (or going from it) has at 10 ft. to be taken with 1/150 sec. to make him appear sharp on the film, while at 40 ft. 1/35 sec. will be sufficient. If he moves parallel with the camera at 25 ft., 1/200 sec. is required, while at 160 ft. only 1/40 sec. would be necessary. Finally if he moves across (at an angle of about 45°) at 10 ft., 1/250 sec. is required to arrest his movement on the negative, while at 80 ft., 1/40 sec. would do. If a subject with *twice* the speed (that is 30 m.p.h.) should be photographed, only *half* the exposure time (i.e. instead of 1/100 only 1/200 sec.) should be used; is a subject moves with *half* the speed (7½ m.p.h.) *twice* the exposure time is permissible (i.e. 1/25 instead of 1/50 sec.). While the camera does not carry all the shutter speeds shown, most of them can be obtained by setting the speed ring between two marked speeds.



CONT—F

USING FILTERS

Black and white film, even when fully colour sensitive, 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 explanation of this discrepancy is the following.

Scientifically speaking, to the human eye yellow appears to be 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 (page 30), 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.

Therefore, to obtain a colour rendering which shall correspond to the impression of colours as perceived by our eye (with some degree of accuracy), the comparative sensitivity of the various colours to each other as responded to by our film will have to be corrected. This can be achieved by the use of filters.

Filters are employed to correct on our negative material the various degrees of brightness of the actual picture. On the whole 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 our picture which corresponds more closely to the impression made upon our eye by the object; here we speak of "correction filters".

Filters may also be employed to produce certain effects; for instance, our 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 employed to such ends are termed "effect filters".

All filters cut out part of the light and so necessitate an increase in exposure time. This is expressed as a factor by which normal exposure must be multiplied. It not only depends on the filter characteristics but on the colour sensitivity of the film and the colour of the light used. Every

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make of film may therefore have a different filter factor. There are tables available which speak of 1.4 or 1.7 times the exposure, but we can afford to ignore these fractions and content ourselves with round figures, such as 1½, 2, 3 times etc.

On the Contina II and III the filter factor can be allowed for automatically. See page 74.

The following list gives a summary of the filters recommended for black-and-white photography. The best practical guide to choosing and handling filters is the *Focal Filter Chart.*

For filter sizes see pages 10 and 56.

FILTER FACTORS

Filter	*Pan Film Normal*		*Pan Film Oversensitive to Red*	
	Daylight	*Artificial Light*	*Daylight*	*Artificial Light*
Light yellow ...	1½	1½	1½	1½
Medium yellow	2	1½	2	1½
Deep yellow ...	3	2	1½	2
Orange ...	5	2	4	2
Light red ...	7	3	4	2
Yellow-green ...	2	1½	2½	1½
Green ...	4	3	4	3
Light blue ...	—	1½	—	1½

YELLOW FILTERS mainly reduce the effect of blue, rendering it darker. They are therefore used to get better cloud effects on a normal blue sky. In the case of a very light blue sky, a darker filter should be used.

GREEN FILTERS act similarly to yellow filters, but also hold back red (render it darker) to which some panchromatic films are comparatively over-sensitive (photographing it too light).

ULTRA-VIOLET FILTERS. The very light ultra-violet filter is only to be used at heights of 6,500 ft. (2,000 m.) and over to avoid an unduly dark sky, such as would be obtained by using a yellow filter. At the same time it absorbs the ultra-violet rays of the high atmosphere for which the lens is not corrected and which would reduce the definition.

ORANGE FILTERS over-correct skies and serve, therefore, as "effect' filters for drawing heavy clouds against a dark sky, and to give very clear distant views in landscapes by eliminating light haze, etc.

RED FILTERS have a still stronger effect than orange filters, and are used for extreme contrast, creating black sky with brilliant clouds, faking sunshine into moonlight effects, etc.

DARK RED FILTERS are used only with infra-red film, chiefly for scientific purposes. They penetrate mist in long distance photography.

BLUE FILTERS are for portraits with highly red-sensitive panchromatic film in artificial light. They absorb part of this red sensitivity. This results in better skin tones and darker lips.

FILTERS FOR COLOUR WORK. See page 51.

The Contapol 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. E.g. 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 consists of a layer of herapathite, cemented between two optical flat glasses. It suppresses light vibrating in one particular plane, while light vibrating in a plane at right angles to this will pass through freely. Light reflections from glass, china, enamel, polished wooden surfaces and water (but not metals) vibrate to a large extent in one plane (i.e. they are polarized) and can therefore be almost extinguished by placing the polarizing filter in proper position over the lens. This screen 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 determine the best position. Care should be taken that the angle to the subject at which the effect is observed is the same as when used on the camera. For the maximum effect the camera should point at an angle of about 35° at the

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reflecting surface. The polarizer is pushed on the lens mount in this position. As the polarizing filter is slightly tinted, so the exposure time should be increased, the factor being about 3 times.

The Contapol 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.

The Contapol can be used with the normal 28.5 mm. lens hood and also supplementary close-up lenses.

FLASH PHOTOGRAPHY

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", with which you can illuminate your subject 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 1/40 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, 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. The light is strong enough to allow medium to small apertures 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.

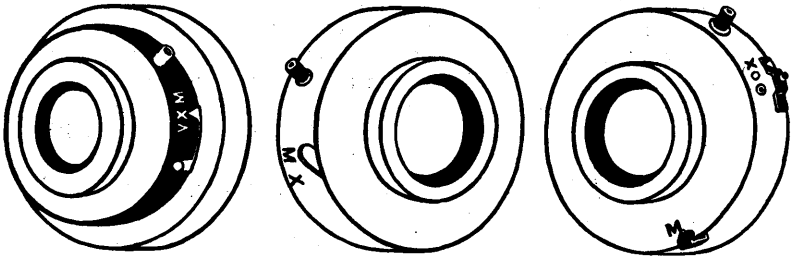
A diffusion screen may be placed in front of the bulb to soften the light.

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 rather bigger and heaver than the flash bulb outfit, its comparative light output equals the 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 (1/700 to 1/200 sec.) and will arrest the fastest movements. The cost of an individual exposure is negligible.

How to Use Flash

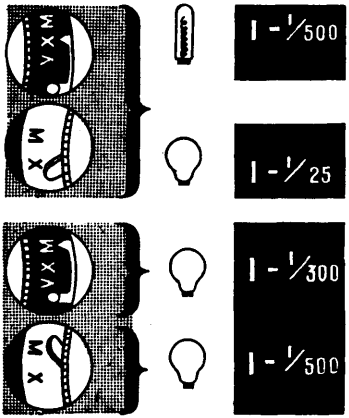
The Prontor or Compur shutters of the cameras are internally synchronized for flash. The first type marketed fires the flash at the moment the shutter is released. The technical term for this is "X" synchronization. The flash socket protrudes on the flange of the shutter. An electrical

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The Prontor SVS and SLK shutters (*left*), the Synchro-Compur shutter (*centre*), and the older Prontor SV shutter (*right*) have adjustable flash synchronizing settings X and M (on earlier models of the Prontor SV shutter; X, F, M). Prontor S and synchronized Compur Rapid shutters have a flash plug, but no adjustment; the synchronization there corresponds to the X setting. On the Prontor SVS and, Synchro-Compur shutters a simple movement of the synchronizing lever selects the appropriate synchronization. On the Prontor SV move the synchronizing lever to X (for X synchronization). Move it to the yellow dot *and* move the lower (self-timer) lever to M for M synchronization.

The V setting on the Prontor SVS and SLK shutter is the built-in delayed action release (self-timer) for self-portraits. At this setting the shutter is also automatically X synchronized. M synchronization cannot be used in conjunction with the delayed action (V) setting. To use the self-timer on the Prontor SV shutter, move the lower lever to M, and the upper one to X.



The X setting is suitable for electronic flash at all speeds, and for ordinary (class M) flash bulbs up to 1/30 sec.

The M setting is suitable for ordinary flash bulbs (class M) at all speeds. It is *un*suitable for electronic flash.

cable connects the flash gun (with flash bulb and reflector) to the flash socket by means of a special plug. On releasing the shutter an electric circuit is automatically closed through the flash socket when the shutter is fully open, setting off the flash bulb at this very moment.

With this internal "X" synchronization shutter speeds up to 1/30 sec. can be used if flash bulbs are employed. With these bulbs the firing delay is generally some 20 milliseconds (1/50 sec.). Electronic flash has no firing delay and can be used with any speed.

The shutters of early 35 mm. Ikonta cameras which are not originally internally synchronized can be so converted. A mechanical synchronizer can be employed, which screws into the cable release socket of the body release. Pressing the plunger of this flash release will then simultaneously release the shutter and fire the flash bulb. However, no mechanical synchronization is entirely reliable.

Speed-Synchronized Shutters

The shutters of the models supplied since 1951 are speed-synchronized for using flash bulbs even at the fastest shutter speeds.

THE SPEED-SYNCHRONIZED PRONTOR SLK, SVS and SV shutter has an adjustable flash contact which can close the flash circuit, either when the shutter is fully open (X-setting, identical with normal synchronization of shutters with flash contact) or approximately 20 milliseconds earlier to allow for the firing delay of most flash bulbs (M-setting).

For the X-setting move the synchronizing lever to the red dot (X). The shutter closes the flash circuit at the moment when the blades are fully open. This setting is suitable for electronic flash at any speed, and for flash bulbs up to 1/30 sec.

For the M-setting move the synchronizing lever to the yellow dot, and set the synchronizing lever to "M". The shutter closes the flash circuit 20 milliseconds before the shutter blades are fully open. This setting is suitable for the

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majority of flash bulbs, at all shutter speeds up to 1/300 sec. This setting will not synchronize electronic flash.

For use, connect the flash lead from the flash gun to the flash socket on the shutter. Set the synchronizing lever to the synchronizing setting required (see above). On the SV shutter set also the delayed action lever (except at the X-setting). Set the aperture and shutter speed as usual. Put a bulb in the flash gun, focus, and release the shutter to fire the flash and take the picture.

With the M-setting the delayed action lever must be reset for every exposure. At X no resetting is needed.

When the SLK and SVS shutter is set to V for delayed-action (self-portraits, etc.) it is automatically X-synchronized. With the SV shutter set to X you can use the delayed action release in the usual way if you want to appear in the picture yourself.

At the M-setting the delayed action mechanism is part of the synchronizing system and thus cannot be used for its original purpose as "delayed action".

On the Prontor SVS (with light value scale) the settings M, X, and V appear in a peep window behind the aperture indication, on moving the lever below the shutter.

THE SPEED - SYNCHRONIZED SYNCHRO - COMPUR shutter has two synchronizing settings which are set by means of a synchronizing lever.

For the X-setting move the synchronizing lever to position X. The shutter closes the flash circuit at the moment when the shutter blades are fully open. This setting, which is identical with the normal synchronization of the Compur-Rapid shutter, is suitable for electronic flash at any speed, and for flash bulbs at speeds up to 1/25 sec.

For the M-setting move the synchronizing lever to position M. The shutter closes the flash circuit 16–18 milliseconds before the shutter blades open, to allow for the firing delay of most average flash bulbs. This setting is suitable for normal flash bulbs at all shutter speeds up to 1/500 sec. The M-setting will not synchronize electronic flash.

For use connect the flash lead from the flash gun to the flash socket on the shutter. Set the synchronizing lever to the appropriate position. Set the aperture and shutter speed as usual. Put a bulb in the flash gun, focus, and release the shutter to fire the flash and take the picture.

The table on page 31 summarizes the shutter speeds at which most flash bulbs on the market can be synchronized with the various synchro-settings of the Prontor SLK, SVS, SV and the Synchro-Compur speed-synchronized shutters.

Normally the flash gun is fitted into the accessory shoe on top of the Contina or else attached to the camera by means of a bracket. In either case it points directly at the subject to be photographed. While this method will give satisfactory results, a more pleasing form of illumination can be achieved by "bouncing" the flash. To do this the flash gun is angled so that the light "bounces" off a light ceiling or wall on to the subject. The advantage of this method is that it gives a softer light more akin to daylight, and avoids the hard shadows normally associated with flash. However, a wider aperture is required than for direct flash.

To facilitate the tilting of the flash gun a ball joint adaptor is available to fit in the camera accessory shoe and hold the gun. It can then be angled in any direction.

The Correct Aperture

The correct aperture to use with some of the more common flash bulbs is shown on p. 91. It assumes they are used in an efficient reflector in a room of average brightness and with a shutter speed up to 1/30 sec. with a film speed of 30–32° B.S.

In bright rooms, or with films faster than 32° B.S., use the next smaller aperture. In very large rooms, at night outdoors, or with slow 27–29° B.S. film use the next larger aperture.

The *Focal Flash Chart* 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 and shows typical flash set-ups.

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SYNCHRONIZED SHUTTER SPEEDS

Flash	Shutter Speed (Sec.) Synchro-lever set to X	M
Sylvania SF	1–1/125	—
Philips PF 1, 5, 14, 25, 38, 60		
Mazda No. 1, 5, 22	1–1/30	1/60–1/500*
G.E.C. No. 1, 5, 22		
Philips PF 100	1–1/15	1/30–1/60
Electronic flash	1–1/500*	—

*1/300 on Prontor SVS shutters.

APERTURES WITH CLEAR FLASH BULBS

(*Black and white films 30–32° BS, shutter speed 1/30 sec.*)

Distance	Sylvania SF, Mazda or G.E.C. No. 1 Philips PF 1	Philips PF 14	Mazda or G.E.C. No. 5 Philips PF 5, 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	—	—
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

APERTURES WITH BLUE FLASH BULBS

(*Daylight colour film 22° BS, shutter speed 1/30 sec.*)

Distance	PF 1/97 No. 1B	PF 5/97, 25/97	No. 5B	No. 22B, PF 60/97
3½ ft. (1 m.)	f 8	f 16	f 11	—
5 ft. (1.5 m.)	f 5.6	f 11	f 8	f 16
7 ft. (2.2 m.)	f 4	f 8	f 5.6	f 11
10 ft. (3 m.)	f 2.8	f 5.6	f 4	f 8

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÷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÷8=20. So the flash must be 20 ft. from the subject.

So far we have assumed that the exposures have been for average shots without much subject movement. For these a shutter speed of 1/30 sec. is long enough to utilize all the light emitted from the bulb. On the other hand, to arrest fast movements a faster shutter speed is required, such as 1/125, 1/250 or ever 1/500 sec. With each of these speeds a different guide number is needed (usually printed on the flash bulb packet) to determine the correct exposure. They allow for a wider aperture to compensate for the fact that at fast shutter speeds some of the light emitted from the bulb is lost.

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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.		$\frac{3}{8}$ in.
$\frac{1}{2}$ in.	1.27 cm.	2 cm.		$\frac{13}{16}$ in.
1 in.	2.54 cm.	3 cm.		$1\frac{3}{16}$ in.
2 in.	5.08 cm.	4 cm.		$1\frac{9}{16}$ in.
3 in.	7.62 cm.	5 cm.		$1\frac{15}{16}$ in.
4 in.	10.2 cm.	6 cm.		$2\frac{3}{8}$ in.
5 in.	12.7 cm.	7 cm.		$2\frac{3}{4}$ in.
6 in.	15.2 cm.	8 cm.		$3\frac{1}{8}$ in.
7 in.	17.8 cm.	9 cm.		$3\frac{1}{2}$ in.
8 in.	20.3 cm.	10 cm.		$3\frac{15}{16}$ in.
9 in.	22.9 cm.	12 cm.		$4\frac{3}{4}$ 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.		$9\frac{13}{16}$ in.
2 ft.	61.0 cm.	30 cm.		$11\frac{3}{4}$ 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.		$23\frac{5}{8}$ 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.

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