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# INSTRUCTIONS FOR USE

of the


# ALPA

## REFLEX

## Mod. 9d and 9f

*Only perfect knowledge of all functions of the ALPA will give you the best results and avoid unnecessary troubles.*

*It is therefore in your own interest to study these instructions carefully, starting with the brief instruction guide attached to the inside back cover.*

**Manufactured in Switzerland by**
**PIGNONS S.A., Ballaigues**



# Operating Instructions for the ALPA Reflex Model 9d and 9f

The scope of this manual is intentionally restricted to provide information on the operation of the ALPA Reflex cameras; it does not contain general information on photographic problems, for which reference should be made to the many excellent photographic handbooks available.
The ALPA Reflex is the result of years of research and development, undertaken in an endeavour to provide for all the increasingly exacting requirements of expert photographers. Improvements and modifications are constantly being introduced as has always been the ALPA practice; such modifications may even be introduced in the course of production, without their being indicated by a new mark number. Nevertheless you will find in this manual all the data necessary for obtaining the best possible performance from your ALPA Reflex camera.

## A. DESCRIPTION

The ALPA Reflex 9d and 9f is equipped with a pentaprism permitting eye-level, through-the-lens viewing of the laterally-correct image on the ground-glass screen.
All the accessories are identical to those of the earlier models 4–8 and 4b–8b, with the exception of the ever-ready case which is the same as that introduced for the model 6c.
The body of the ALPA Reflex 9d and 9f consists of a light-alloy die casting, ensuring great strength and robustness. It is virtually impossible to deform the camera body, although it may be broken if it receives a heavy blow or fall.
The body is covered with a special type of leather-finish plastic material, which is unaffected by perspiration, heat, cold and other climatic influences.
All the operating knobs and levers are designed for convenient operation even when wearing gloves.
Both models are equipped with the ALPA quick-return mirror which swings out of the image path just for the duration of the exposure and then returns to the viewing position immediately, even when pressure on the release button is maintained. The very slight vibration which is felt when taking a picture actually occurs when the second shutter blind reaches its stop and releases the mirror, i.e. after the exposure has been made; it can therefore have no effect upon the sharpness of the image.
The difference between models 9d and 9f lies in the exposure-measuring mechanism which is not fitted on model 9f. In addition the catch (C), fig. 5, is absent on model 9f.
Every possible precaution has been taken to avoid the possibility of damaging the camera by incorrect operation. However, it is most strongly recommended that the brief instructions **at least should be studied before attempting to use the camera.** In particular, it is most important that the mirror should never be touched with the fingers.

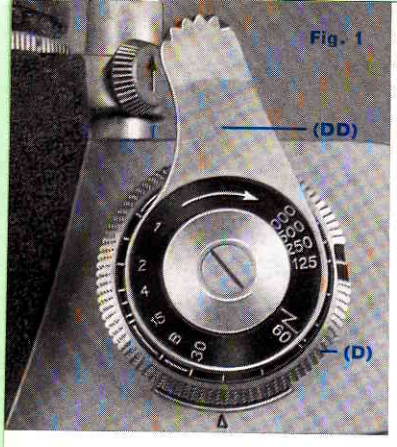


Fig. 1

*Position of rapid wind lever, if ALPA 9d is wound.*

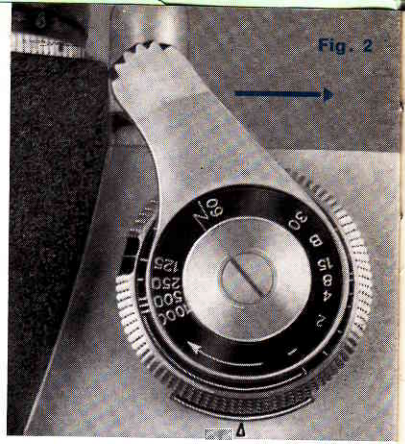


Fig. 2

*Position when ALPA 9d is not wound.*

## B. EXTERNAL CONTROLS (EXCLUDING EXPOSURE MEASUREMENT)

**Focal-plane shutter:** The winding knob (D) is operated by means of the rapid-wind lever (DD) (see fig. 1); it tensions the shutter, advances the film by one frame and operates the frame counter.
The range of shutter speeds available extends from 1/1000 to 1 second together with the brief time exposure setting B. The shutter is tensioned with a single swing of the lever (DD), which turns in a clockwise direction through only 160°. As a result of this short travel (and also of the fact that the lever has to perform three separate functions), a certain resistance has to be overcome when operating the rapid-wind lever. The lever should be swung until it reaches a positive stop, but excessive force must never be employed. If the shutter is not completely wound, the interlocking mechanism will prevent it from being released.


Fig. 3

### SETTING THE SHUTTER SPEED (Fig. 3)

Depress the outer milled ring of the shutter-wind knob (D) and turn it until the index stroke on the edge of the ring engages opposite the desired speed setting. The shutter speed can be adjusted at any time, regardless of whether the shutter is tensioned or run off. The position of the knob (D) and the arrow will always indicate whether or not the shutter is tensioned (fig. 1 & 2).



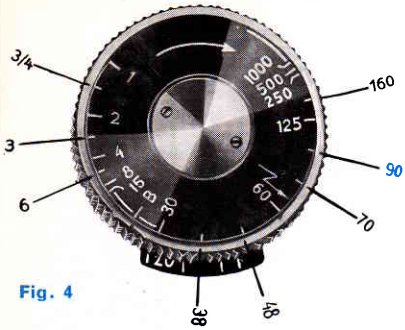


Fig. 4

The shutter speeds marked correspond to the international standard settings and cover the following speeds:
1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500 and 1/1000 sec.
The unnumbered strokes between the indicated speed settings provide a number of intermediate speeds (fig. 4). The position of these strokes gives an approximate indication of the shutter speeds obtainable at these settings. Other intermediate speeds can also be selected except within the zones indicated by a line running around the circumference of the setting knob: for example, it is impossible to select intermediate values between 1/1000 and 1/500 sec and between 1/500 and 1/250 sec since these speed settings are only one click-stop apart. Speeds faster than 1/1000 sec cannot be set, neither is it possible to select intermediate speeds between 1/15, B and 1/30 sec (note line around edge of knob).
The B setting is used for making exposures of any desired length, the shutter remaining open for as long as pressure is maintained upon the release knob. For taking long time exposures it is advisable to use a cable release with a locking device (see page 25). The flash symbol ↙ alongside the 1/60 sec speed setting indicates the fastest shutter speed which can be used with electronic flash units. If faster speeds are employed with X-synchronization, then only part of the image field will be exposed since at the higher shutter speeds the slit in the focal plane shutter only exposes a portion of the image field at a time.
In all, 60 different shutter speed settings can be selected.
It is obvious that the selection of the correct shutter speed depends upon the nature of the subject. The factors to bear in mind are the movement of the subject, the direction of this movement and the distance between the subject and the camera; the focal length of the camera lens can also be decisive. The steadiness with which the camera can be held should also be born in mind in border-line cases. Speaking generally, it is always advisable to give the shortest exposure possible in order to obtain the best image definition; for this reason the 1/125 sec setting is marked in red on the shutter speed scale and also on the knob (B) of the exposuremeter potentiometer to indicate the most desirable initial setting. Since the winding knob (D) rotates as the shutter runs off, it **is important** to ensure that it **is not obstructed or retarded since otherwise** the image will not be uniformly exposed.

**SHUTTER RELEASE KNOB:** (E) and (EE) in fig. 5; this is located on the front of the camera body. When releasing the shutter it is advisable to press in the opposite direction with the thumb against the camera back so as to hold the camera as steady as possible at the moment of release. There is a conical thread in the face of the release knob (E), into which a cable release can be screwed (see also fig. 41 on page 24).
Lenses with automatic pre-set diaphragms are fitted with their own integral release knob (EE) which fits in front of the knob in the camera body and transfers the release pressure directly to it.
Caution: If the release knob (E) is accidentally depressed **whilst** the shutter is being tensioned, then the

mirror will not rise the next time an exposure is made and so one frame will be lost.
The release catch (C) only operates on the release knob (E) itself; it will have no effect when a cable release is employed. This however is not the case when a cable release is screwed into the release knob (EE) on one of the lenses.
The ALPA Reflex model 9f does not have a shutter-release catch (C).

## DELAYED-ACTION RELEASE (Fig. 5):

The ALPA models 9d and 9f are fitted with a built-in delayed-action selftimer. The delay tensioning lever (K) can be set to any desired position according to the period of delay required. If the lever is swung right up to its stop, then about 20 seconds will elapse before the shutter opens; if it is moved through only 90° then the delay will be about 6 seconds. First tension the camera shutter, then set the delay and finally depress the release knob (E) fully; this will set the delayed-action mechanism in motion, giving you plenty of time to take up your position "in the picture".
**Important: When using the delayed-action release in conjunction with a lens with a fully-automatic pre-set diaphragm, it is essential to disengage the automatic diaphragm (see pages 11-14) or otherwise the picture will be taken at the full aperture setting.**
If a delayed-action exposure is taken with the shutter set to B, then the exposure time will be about 2–3 seconds. The extremely gentle and vibration-free release obtained by using the selftimer can be extremely useful when it is necessary to use fairly slow shutter speeds without a steady support for the camera. If for any reason a picture cannot be taken after the delay mechanism has been tensioned, provision is made on the ALPA 9d for de-tensioning the mechanism: lock the release button with the catch (C) and then press the release button (E) until the delay tensioning lever (K) has returned to its original position.

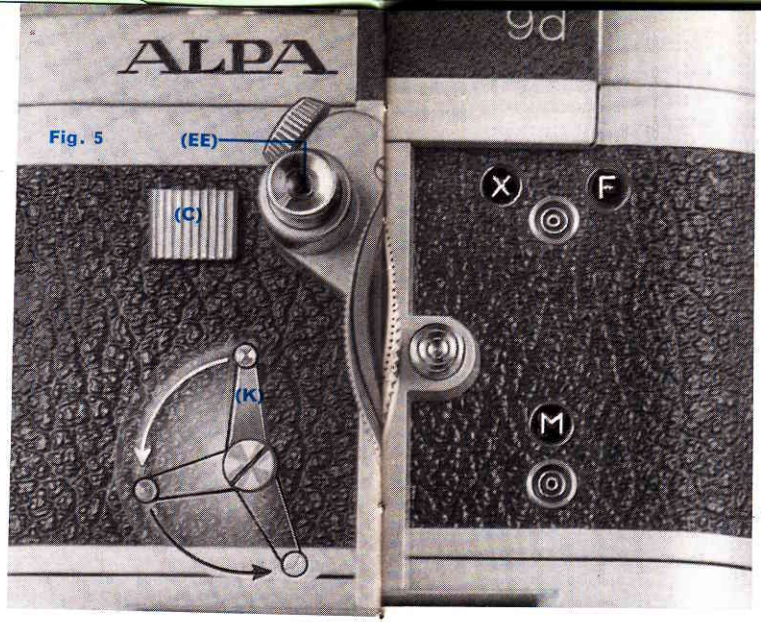


Fig. 5

## FLASH SYNCHRONIZATION (Fig. 6)

The ALPA 9d and 9f have two flash contacts which accept the standard coaxial synchro plug Ø 3 mm. The upper contact, marked X and F, permits the use of electronic flash units at shutter speeds up to 1/60 sec. If faster speeds are used, only part of the image will be exposed. At slow speeds — up to 1/15 sec — it is also possible to use this contact for flashbulbs having a very short delay to peak (Class F bulbs, 5 milliseconds delay); these bulbs are not specifically designed for use with focal plane shutters, but are more economical.
The lower contact marked M is intended for use with Class FP bulbs specially made for focal plane shutters; these have a long peak-brilliance period to ensure uniform illumination of the entire image field. They can be synchronized with all shutter speeds up to 1/1000 sec.
A table describing the use of the various types of flashbulbs will be found on the inside cover of this booklet.



Fig. 6

## CHANGING LENSES

Depress the knob (L fig. 7) and turn the lens counter-clockwise until it can be removed without difficulty. To re-insert a lens, align the red dot on the lens mount (R) with the red dot (R) on the front plate of the camera; then press gently on the lens and turn it in a clockwise direction until you hear an audible click, indicating that the lens is correctly locked in position. The locking catch necessarily has to have a small degree of play to prevent it from becoming jammed.

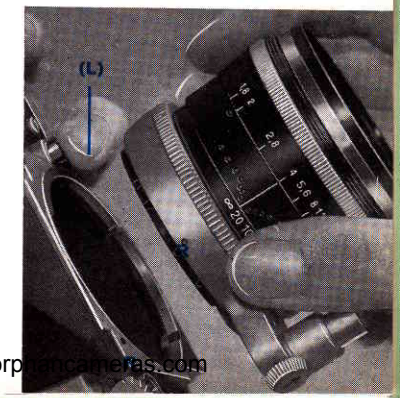


Fig. 7

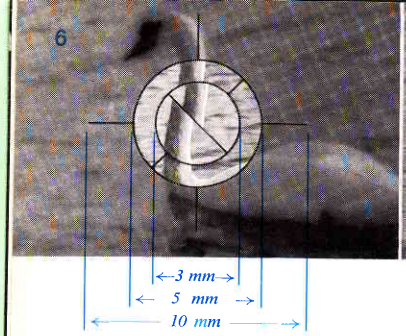



**Fig. 8**
*not sharp*

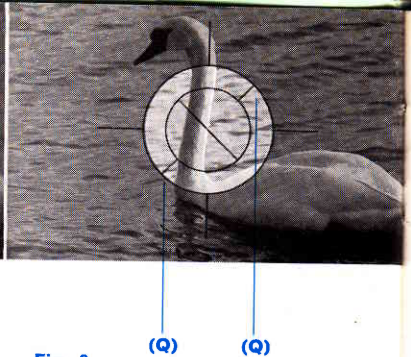



**Fig. 9**
*sharp*

## FOCUSING (SETTING THE TAKING DISTANCE)

This is done by rotating the setting ring for the helical-thread mount of the lens.
There are three methods of checking the focus :

*a) By reflex focusing on the ground-glass screen :*

The image on the ground-glass screen is upright and because of the built-in pentaprism appears laterally correct (i.e., the right way round). The eye-piece is designed to allow the whole image field (23 × 35 mm in size, i.e. 1 mm smaller in each direction than the film image) to be viewed at a high magnification (× 4.5). The image area of the screen corresponds to the maximum mask aperture for slide projection, thus ensuring that what-ever can be seen on the screen will be included in the projected image. Even when using lenses with a stand-ard focal length of 50 mm the screen image appears almost life size, an important advantage for the close scrutiny of the subject : in other words the image appears just as large as does the subject when you view it with your unaided eye. The screen image is particularly brilliant and can still be viewed easily after stopping down to small apertures for assessing the depth of field.

When the exit pupil of the camera lens is at a considerable distance from the screen (e.g. when using the Switar for extreme close-up work, or when using very long focus lenses at small apertures) then an area of shading will be observed at the upper edge of the screen because the cone of light rays will be too wide for the reflex mirror to reflect it in entirety. This phenomenon will not however have any effect upon the quality of the actual film image and need cause no anxiety.
Owners of earlier ALPA cameras may notice that the ground glass screen of the model 9d has a greater scattering effect than formerly ; this has been introduced intentionally in order to permit more exact exposure measure-ment under all circumstances.
The eyepiece of the model 9d is pro-vided with an enlarged soft-rubber cup to exclude straylight from falling upon the eyepiece lens. It can be rotated for taking horizontal and vertical pictures. Users suffering from vision defects can fit **additional** corrective glasses into a special ALPA mount for fitting inside the eyepiece cup (see page 25).

*b) Focusing with the split-image range-finder*

(figs. 8 & 9)

The ALPA camera bodies models 9d and 9f are normally fitted with a ground-glass screen which has a split-image rangefinder in the centre. This is formed by two crossed prisms which appear as a pair of semi-circles ; they are surrounded by a ring of completely transparent glass (diameter 5 mm.) Select a specific detail in the subject to be photographed and then adjust the helical focusing mount of the lens until the two semi-circular images are in perfect alignment, with no displace-ment at the dividing line. At this point the image will be perfectly focused (fig. 9).
The clear glass ring makes it possible to inspect the **aerial image, which may lie either in front of or behind the plane of the ground-glass screen and will still appear visually sharp. It can however be used for the rapid location of important details on which the image can be focused. The clear glass ring can also be used for focusing when taking photomicrographs, the image being in perfect focus when the aerial image and one of the two lines (Q) shown in figure 9 appear equally sharp. This is the only method of ensuring that the image is located exactly in the focal plane.**
Both of the semi-circular prisms will appear uniformly bright under normal conditions, e.g. when the diaphragm of the taking lens is fully open. Under certain circumstances (small lens aperture, long distance between exit pupil of lens and screen) it may happen that only one of the semi-circles appears bright. It is however still possible to use the split-image range-finder by aligning the image between the prism and the clear-glass ring. The displacement here will only be half as great as between the two prisms, but will still be perfectly ade-quate for precise focusing.
Warning : The high magnification of the ground-glass screen image in the ALPA Reflex makes focusing remark-ably convenient but nevertheless gives rise to a danger of taking photographs at too small an image scale. To avoid this, one should always bear in mind that the screen provides three indica-tions of scale which offer an immediate reference standard : the diameter of the rangefinder prisms is 3 mm, the diameter of the clear ring is 5 mm and the overall length of the cross-hairs is 10 mm (fig. 8). By using these references it is possible to avoid photographing a distant ship (for ex-ample) so that it appears barely 1 mm long on the film, and they provide a useful warning that a longer-focus lens should be inserted.

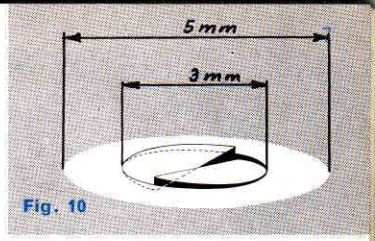



**Fig. 10**

*c) Focusing by scale*

All the ALPA interchangeable lenses are provided with engraved distance scales which can be used to pre-set the lens to a specific focus distance whilst using the ground-glass screen solely for fine-focus adjustments. When taking flash pictures for example, it may occur that the existing light is so dim that screen focusing is virtually impossible : the lens may then be focused by scale and stopped down to a smaller aperture to provide suffi-cient depth of field to allow for error. In sports photography too it is often necessary to focus by scale on account of lack of time.

## C. LOADING THE ALPA REFLEX

In the base of the ALPA is a hinged key (M), fig. 12. This should be lifted and turned to the right in a clockwise direction as far as it will go. The baseplate and back of the camera (which form a single cast unit) can then be lifted off by pulling on the key ; The back should always be lifted off **upwards** and **never slid off sideways,** in order to avoid damaging the film pressure plate.

## LOADING

Fig. 13a shows the best method of holding the film cassette in order to secure the beginning of the leader tongue in the slit (marked by an arrow) in the empty take-up spool. The edge of the film must be right up against the flange of the spool. Then pull out just sufficient film to allow the cassette to be placed in its chamber, and rotate the take-up spool with the finger as shown in fig. 13b until at least one full turn of film is wound on to it. Ensure that the teeth of the sprocket roller are engaging the perforations correctly, although it is not necessary to wind on sufficient film whilst the camera is still open for the sprockets to engage the perforations on both sides. The film is advanced by turning the shutter-tensioning lever (DD).

When the film is correctly in position, the camera back should be replaced **from above** (holding it by the key) and locked securely by turning the key to the left. Once the key has been folded back into its recess, the camera body will remain securely sealed.

Now tension the shutter and **make sure that the central screw in the rewind knob (N) rotates as the film is advanced.** The film must be wound on and the shutter release 2–3 times in succession in order to run off the fogged leader before the first exposure can be taken. The frame counter (fig. 11) should then indicate 0.

Whenever possible the camera should be loaded by subdued light in order to prevent excessive fogging at the beginning of the film; if no other shade is available, turn your back to the light.

Caution: If a partially exposed film is removed from the camera after rewinding, it is important to **make a note of the number of exposed frames** (as indicated by the frame counter) **before opening the camera back**; this is because the counter automatically springs back when the camera back is removed. After advancing the usual three blank frames for loading the camera, the frame counter will once again indicate 0.

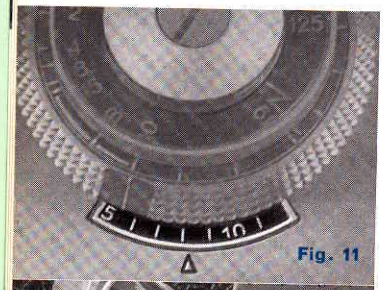



Fig. 11

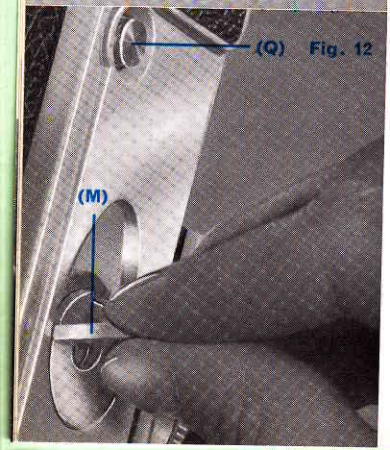



Fig. 12

## UNLOADING THE CAMERA

When the frame counter indicates that the last frame has been reached (according to whether a 20- or 36-exposure cassette is being used), then the rapid-wind lever should be operated with caution. According to the length of the leader fogged in loading the camera, you may obtain one or two frames more or less than the specified number of exposures. If a strong resistance is felt when winding the shutter, then do not employ force or you may tear the perforations or, more serious still, tear the end of the film away from the cassette core and so make it impossible to rewind it.



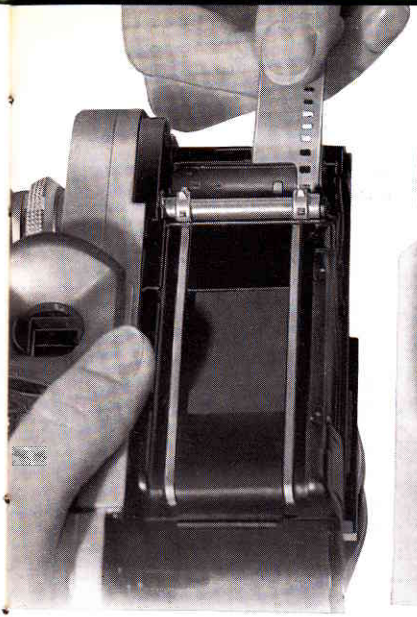


Fig. 13 a

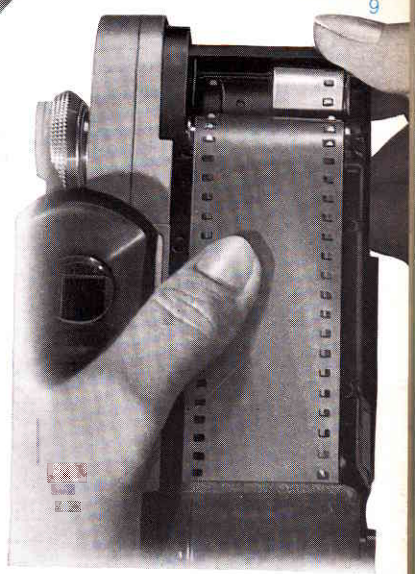


Fig. 13 b

Fig. 13 c

**Fig. 13**

*13 a: Push film end beneath spring clip*

*13 b: Turn take-up spool by hand*

*13 c: Replace camera back*

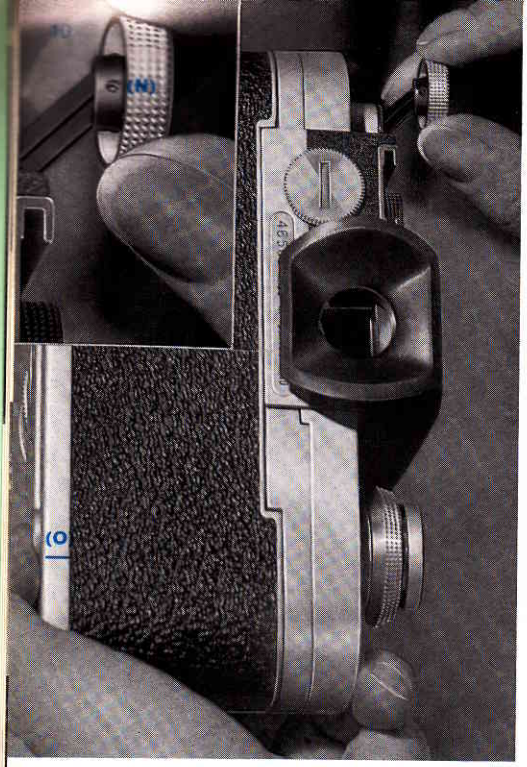



Fig. 14

The fully-exposed film must then be rewound into the cassette. Depress the rewind release knob (O), fig. 12, in order to disengage the sprocket interlocking for the whole duration of the rewinding operation ; it is not necessary to hold the release knob depressed throughout rewinding. Pull out the rewind knob (N), fig. 14, and turn it like a crank in the direction indicated by the arrow (fig. 14). When rewinding the film a distinct resistance will be felt at first ; when all the film is rewound, it will distinctly be heard breaking free from the take-up spool and then the camera may be opened and the exposed film removed in its original cassette. When a new film is inserted the rewind release knob (O) will spring out automatically. It is important to avoid depressing the rewind release knob (O) accidentally whilst the camera is loaded, since this will result in two exposures being superimposed on the same frame. If this knob should be depressed accidentally, then a further blank frame should be wound on, keeping the lens covered.

Fig. 15


**ALPA lens caps:** The front cap snaps into the front of the lens (or on top of a filter) with a slight pressure. A gentle pull combined with a slight turn removes it again. Only a few special lenses come with a cap supplied by the lens manufacturer. The rear cap fits the bayonet mount of all ALPA lenses and locks in position on turning it through 60°. Fig. 15 shows the 90 mm Alfitar lens with both front and rear caps.



## D. THE INTERCHANGEABLE LENSES FOR THE ALPA REFLEX

ALPA offers you the only complete set of 10 lenses with automatic diaphragms from 24 mm up to 180 mm. Other lenses range up to 5000 mm focal length !

### a) Standard 50 mm lenses

You can choose between Kern Switar f/1.8 APOCHROMAT and Kern Macro-Switar f/1.8 APOCHROMAT, both equipped with automatic diaphragms.

**Fig. 16 and 17: Switar 50 mm f/1.8 APOCHROMAT**

The helical mount with 6 mm extension (ring SS) allows close focusing down to 17" from the front of the lens mount. The distance scale is calibrated from infinity to 3 feet. Closer distances are calibrated in fractions engraved in red, indicating the reproduction ratio (image/subject). The last figure 1/9 indicates that the image will be 1/9 of the actual size, so that a 9 × enlargement will reproduce it in life size. At this distance the ground glass image appears about 4.5 × larger than the subject, because of the 3 built-in magnifying lenses.

Fig. 16

The diaphragm is set with the front ring (F). All apertures have click stops (in fig. 16 and 17 the diaphragm is set at f/4). The lower ring (AA) has a red triangle as index mark. If turned all the way to the left (fig. 16), it engages the automatic mechanism, i.e. the diaphragm remains open for viewing and closes to the preset stop only upon pressing the release knob (EE) for taking the exposure. If turned to its extreme right, so that the red triangle coincides with the black index (fig. 17), the automatic mechanism is disconnected and the diaphragm remains closed at the set stop. If the red triangle is somewhere between the extreme left and right positions, it will remain **partly** open for viewing and close to the preset stop, when the release knob (EE) is depressed.

**Fig. 18: Macro-Switar 50 mm f/1.8 APOCHROMAT**

The Macro-Switar f/1.8 has a helical mount with an 18 mm extension (ring SS) for distance setting, which permits close-ups down to a reproduction ratio (image/subject) of 1/3 of the actual size, which corresponds to a distance of 7 inches from the front of the lens mount. The white figures indicate the distances in feet and inches, measured from the back of the camera. The red figures indi-

Fig. 17


Fig. 18

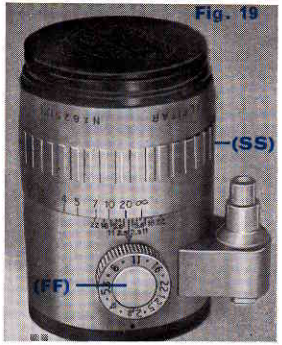



Fig. 19


Fig. 20

cate the image/subject ratio. The last figure 1/3 indicates that the image will be 1/3 of the actual size. At this distance the groundglass image appears about 1.3 × larger than the subject, because of the 3 magnifying lenses. The green figures give the exposure factors (see page 15).
The diaphragm is set with the front ring (F). All apertures have click stops (in fig. 18 the diaphragm is set at f/4).
The knurled knob (PP) is for engaging and disengaging the automatic mechanism. Arrow in horizontal position (parallel to optical axis) = automatic diaphragm. Arrow in vertical position = automatic diaphragm disconnected.
Fig. 18 shows the Visifocus automatic depth-of-field indicator (V), giving the sharp-focus zone in colored orange dots according to the chosen f/stop.

## b) Automatic wide angle and telephoto lenses

The lenses are listed according to their manufacturers :

### ANGÉNIEUX :

**Retrofocus 24 mm f/3.5**
with automatic diaphragm
**Retrofocus 28 mm f/3.5**
with automatic diaphragm
**Alfitar 90 mm f/2.5**
with automatic diaphragm
**Alitar 180 mm f/4.5**
with automatic diaphragm

**Fig. 19 and 20 :**

### ANGÉNIEUX LENSES

The distance is set with the helical mount (SS), while the diaphragm is set with the dial (F) on top of the lens mount. All apertures have click-stops. The automatic diaphragm can be disengaged by the lever (PP) underneath the lens.



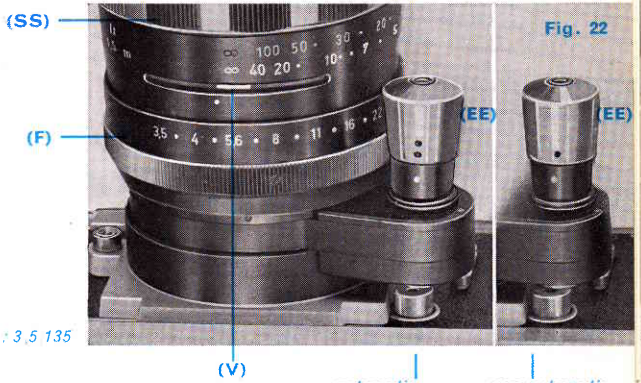
### SCHNEIDER :

**Curtagon 35 mm f/2.8**
with automatic diaphragm
**Tele-Xenar 135 mm f/3.5**
with automatic diaphragm,
both equipped with automatic depth-of-field indicator.


Fig. 21

**Fig. 21 : Curtagon 35 mm f/2.8**

The distance is set with the focusing ring (SS), the aperture with the diaphragm ring (F). The automatic diaphragm can be disengaged with the small ring (TT) around the release knob, which can be turned by depressing the switch (T). In position (1), white line to white dot, the automatic diaphragm is engaged ; in position (2), white line to red dot, it is disengaged. Fig. 21 also shows the automatic depth-of-field indicator (V), a white zone within the red zone.




Tele-Xenar 1 : 3.5 135

Fig. 22

**Fig. 22 : Tele-Xenar 135 mm f/3.5**

The distance is set with the focusing ring (SS), the aperture with the diaphragm ring (F). The automatic diaphragm can be disconnected by turning the release knob (EE). If three dots are in line, the diaphragm operates automatically, with two dots in line it is disengaged. The automatic depth-of-field indicator (V) also shows a white zone within the red zone.

**KINOPTIK :**

**100 mm f/2 Apochromat**
with automatic diaphragm
**150 mm f/2.8 Apochromat**
with automatic diaphragm.

**Fig. 23 : 100 mm f/2 and 150 mm f/2.8 APOCHROMATS**

The distance is set with the focusing ring (SS), the aperture with the diaphragm ring (F). The automatic diaphragm can be disconnected by turning the disc (PP). If opposite the two dots, it means that it is engaged, opposite the single dot it is disengaged.

**Fig. 23**


### c) Lenses without Automatic Diaphragm

All other lenses have the normal helical mount for distance setting and a second ring to set the f/stop, so that no further instructions are necessary. (See also lens chart, page 31.)

### DEPTH-OF-FIELD INDICATORS

The Macro-Switar, Curtagon and Tele-Xenar are equipped with **automatic** depth-of-field indicators, as shown above. Most other ALPA lenses have the usual depth-of-field scale engraved on their mounts, and it is easy to determine the depth-of-field by reading the distance range between the two identical f/numbers. Best possible sharpness will always be achieved in the plane on which the lens is focused. Sharpness decreases in front and behind this plane, yet within the depth-of-field zone it is still acceptable.

### EXPOSURE FACTORS

Once the correct shutter speed or aperture setting has been determined with the ALPA 9d, then there is no need to bother further about the exposure factor since these are automatically allowed for in taking the reading. When taking flash pictures, however, for which the correct aperture must be determined by calculation, then it is essential to allow for these factors. The **relative** lens aperture values (which are obtained by dividing the lens extension by the diameters of the lens opening) can only be strictly applied when the lens is focused on subjects at a great distance and the lens extension is effectively equal to the focal length. When the lens is focused on objects nearer to the camera, the extension increases whilst the opening remains unaltered : as a result the relative aperture becomes smaller. When the image scale (reproduction ratio) reaches 1/10 natural size, it becomes necessary to make allowances for this effect. At this image scale the exposure factor is × 1.2. This factor increases rapidly and at a reproduction ratio of 1 : 1 („same-size" reproduction) it reaches a theoretical value of × 4.

All ALPA interchangeable lenses having mounts which permit extreme close-up focusing (without special accessories) bear the appropriate exposure factors engraved in green. For example, when using the Makro-Switar at its closest focusing distance — 1/3rd actual size — the exposure factor is × 1.8.



### INFRA-RED PICTURES

None of the lenses (not even the Apochromats) are corrected for wavelengths within the infra-red region of the spectrum. In order to take pictures on infra-red film it is necessary to fit a filter over the lens which almost completely cuts the visible portion of the spectrum (e.g. ALPA filter No. 64, dark red). It is also necessary to correct the distance (focus) setting by **increasing** the lens extension since the effective focal length is longer for infra-red rays. In place of the normal distance-setting index, the subject distance should be set to the red marking which according to the lens in question will be found between the infinity and the 10 metre (34 foot) settings. After focusing visually (without a filter) the indicated subject distance should be set to this red mark to provide the necessary compensation when taking pictures on infra-red film (with filter). Since the various types of infra-red films available on the market do not all have their maximum sensitivity at the same wavelength, this focusing compensation factor can only be an approximation ; it is therefore highly advisable to undertake a few carefully-documented test exposures with the selected brand of film and filter at various extension-correction settings in order to determine which will yield the best results. Despite these precautions, infra-red photographs should always be taken at the smallest possible aperture settings in order to ensure the best definition.

The exposure determination by the ALPA 9d method is not possible with the darkest red filter in position. Therefore the metering should be done without filter and the time indicated multiplied by the factor indicated by film manufacturer for his brand.

### RELATION BETWEEN DISTANCE AND IMAGE/SUBJECT REPRODUCTION RATIO

Formula : Divide the distance by the focal length, deduct 1 and you get the denominator of the fraction for the image/subject reproduction ratio.

Problem : Distance : 1000 mm (3 feet). Focal length : 50 mm. Reproduction ratio ?

Solution : 1000/50 = 20, minus 1 = = 19, the ratio is 1/19, i.e. the picture will be 1/19 of the actual life size of the subject.

In reverse, you can also determine with the same formula what distance has to be used to obtain a given reproduction ratio. Add 1 to the denominator of the fraction for the ratio and multiply by the focal length of the lens.

Problem : Reproduction ratio : 1/9. focal length : 50 mm. Distance ?

Solution : 9 plus 1 = 10 × 50 = 500 mm (20 inches).