

**FLEXARET IV<sub>a</sub> REFLEX**  
**CAMERA**



## Description:

The FLEXARET IVa is a twin-lens reflex camera for twelve  $6 \times 6$  cm exposures on 120 films or for thirty-six  $24 \times 36$  mm exposures on 35-mm cine film.

The focusing is effected by a simultaneous movement of the two objectives (mounted on a common panel) by means of the focusing lever within a range of about  $110^\circ$ . The viewing lens is a  $f\ 3.0$ ,  $F = 80$  mm three-glass coated anastigmat; hence its definition is rather low, as a result of which the focusing is more accurate. A full-screen magnifier which can be tilted over the ground-glass screen facilitates focusing. On the ground-glass screen an upright, non-reversed, bright and sharp image is seen. It is possible also to take snapshots from the eye-level, providing that the viewfinder has been adjusted to an open frame finder. This proves to be very advantageous, particularly when taking quick, sports shots.

The taking lens is a four-glass BELAR coated anastigmat,  $f\ 3.5$ ,  $F = 80$  mm, with a focusing range from infinity up to 3 ft.

The camera is equipped with a five-laminae central-type shutter fitted with synchronization for various kinds of flashlight and with delayed action. It is usually a PRONTOR SVS-type shutter. The mechanisms actuating the cocking of the shutter, the setting of the exposure time and that of the diaphragm, are mounted on the shutter; the release lever and the thread-nipple for the wire release are located on the camera body, these mechanisms being blocked by the rewind mechanism, thus preventing repeated exposures from being made on the same frame. In special cases (e. g. when making trick shots), two or more exposures can be effected directly on the shutter.

The advancing of the film is carried out by means of a rewind knob located at the right hand side of the camera. When rewinding the beginning of film up to the first exposure and towards the end of film after the twelfth exposure the film can be advanced continuously by means of the rewind knob. From the first exposure up to the twelfth one the rewind knob is blocked automatically always after the film has been moved a distance corresponding to the width of one frame. Simultaneously, the release lever is released; by pressing down the release lever when making an exposure the rewind knob is released once more and can be rotated again. An exposure cannot be effected, however, unless the film has been rewound. Hence, the film cannot be rewound without exposing, as a result of which the same frame cannot be exposed twice.

The number of the exposures from 1 up to 12 is indicated automatically by means of a film counter which is set automatically in the zero position when the back of the camera is opened. For counting the exposures made on a 35-mm cine film the camera is fitted with an additional counter located by the side of the principal film counter window, this auxiliary counter indicating the exposures in tens.

The auxiliary counter must always be set by hand to the respective ten, the total number of exposures being read-off on both of the two counters.

Should it be required to work with a 35-mm cine film, the camera can be adjusted for this purpose very easily. The 35-mm film guide has only to be inserted into the camera, and then the extension pivots set up on the upper spool pivots. The film can be wound up either on a standard 35-mm spool or upon a spool inserted into a standard magazine. In both cases the film is no longer rewound into the original magazine. In the first case the exposed film should be removed together with the



spool in the dark room; in the second case the film wound up into the magazine can be removed in daylight.

Also when using a 35-mm cine film both the rewind knob and the release lever are blocked against a double exposure and against advancing the film without exposure. The release lever is located at the right hand side of the viewing lens so that it can be actuated by means of the right hand thumb. This is very convenient since it enables the camera to be held firmly with both hands while exposing. Simultaneously, the focusing lever can be actuated with the forefinger of the left hand.

The forefinger of the right hand can be used for cocking the shutter. Thus all the operations preceding the exposure can be effected very easily and quickly without crossing the hands.

The depth of the focus scale is engraved on the focusing lever.

After tilting the cover lid of the viewfinder folding hood, the remaining three lids are set automatically into working position; on closing the viewfinder folding hood it is sufficient only to press down the cover lid, as a result of which the folding hood is closed automatically.

With the latest model of the FLEXARET IVa the rewind knob has been designed to register the kind and sensitiveness of the film used. The design of this device eliminates the possibility of any handling after the film has been loaded and the camera closed, thus ensuring that the figures shown by the indicators are correct.

## DIRECTIONS FOR USE.

### 1. Sensitive Material:

Standard 120 ( $6 \times 9$  cm) roll film should be used on which twelve  $6 \times 6$  cm exposures can be made.

If it is required to work with 35-mm perforated cine film, use standard packing in magazines containing up to 1.6 m (i. e. 63 in.), and make thirty-six  $24 \times 36$  mm exposures.

It is possible, however, to use also other types of magazines with cine film, e. g. magazines without a spool (e. g. AGFA-KARAT-Film) for twelve  $24 \times 36$  mm exposures. It is obvious that in all cases various types of sensitive material, black-and-white or colour, can be employed.

### 2. Opening the Camera:

At the left hand side of the camera there is a milled knob (see Fig. I-1) which can be unscrewed by rotating it to the left. It can then be pressed down, as a result of which the back of the camera is opened.

### 3. Preparing the Camera for Loading the Film:

#### a) $6 \times 9$ cm

Inside the camera there is an empty spool (see Fig. III-3) which should be located in the upper spool chamber (see Fig. IV-4). If this is not the case, the inserting of this empty spool is effected in the following way:

Pull out the rewind knob (see Fig. II-2) in the direction of its axis and turn it slightly to the left (i. e. anti-clockwise direction). The knob remains in the withdrawn position. Insert the empty spool into the upper spool chamber so that the longitudinal slot at one side of the spool faces the rewind knob. Then slightly press the spool with the left hand thumb in the direction of the spool axis so that the firm spool pivot (see Fig. IV-6) snaps into the circular opening on the left hand side of the spool.

While holding the left hand side of the spool with the left hand thumb, turn the rewind knob by means of your right hand first to the left, until the knob snaps in, whereupon, by turning the knob to the right, the key of the transporting pivot snaps into the longitudinal slot in the right hand spool side. Thus the spool is inserted correctly into the upper spool chamber. This can be checked by turning the rewind knob. The spool must rotate simultaneously with the rotating knob. The rewind knob can be turned only to the right (i. e. in clockwise direction), providing that the spool has been inserted correctly.

#### b) 35-mm Cine-film:

Set up the small extension pivot (see Fig. V-8) upon the firm spool pivot (see Fig. V-6) in the upper spool chamber, inserting the spring-loaded inner part of the small extension pivot into the opening in the firm pivot.

Next set up the large extension pivot (see Fig. VI-9) upon the transporting pivot of the rewind knob so that the key of the transporting pivot (see Fig. VI-7) snaps into the groove (see fig. VI-10) of the large extension pivot.



If it is desired to load the film on a spool only, insert the spool between the two extension pivots in the following way:

Take the side of the spool with the left hand according to Fig. VII-11 and put the opening on its other end upon the large extension pivot (see Fig. VII-9) so that the transporting insert of the spool snaps into the space between the projecting pins of the pivot, pressing the spool simultaneously in the direction of its axis towards the rewind knob so that it can also be put upon the small extension pivot.

Supposing it is desired to work with a magazine, the inserting of the magazine with the spool must be carried out simultaneously with the loading of the film (see paragraph 4b).

Insert the 35-mm film guide (see Fig. VIII-12) into the camera, taking care that the guide seating surfaces are seated properly on the recess in the camera body (see Fig. VIII-13). Simultaneously, the roller (see Fig. VIII-15) is turned towards the lower spool chamber.

#### 4. Loading the Film:

Before loading the film first make certain whether the auxiliary counter (see Fig. IX-16) indicates the correct position. The window of this counter must show zero. Should it not do so, the milled knob (see Fig. IX-17) must be rotated in the clockwise direction until the zero appears in the window.

a) 120 roll film (6 × 9 cm):

The film roll can be inserted into the camera in daylight.

Swing off the left hand hinged pivot (see Fig. X-18) of the lower spool chamber, and put on the pivot the spool with the film. The other end of the spool points towards the firm pivot (see Fig. X).

Next tilt down the hinged pivot into the spool chamber, taking care that the firm pivot (see Fig. X) snaps into the opening in the side of the spool.

The backing paper is always sealed by means of a paper strip which can be easily torn off, whereupon a piece of backing paper about 15 cm (i. e. 6 in.) in length should be wound off. The top side of the backing paper, which is fitted with printed inscriptions and figures, must always face the direction away from the camera, providing the film has been loaded correctly (see Fig. XI).

Insert the cut-off end of the backing paper into the longer longitudinal slot of the empty spool (see Fig. XI). By turning the rewind knob to the right the backing paper is wound on to the upper spool until the triangle-shaped marks (◀▶) printed at the side of the backing paper are set opposite the circular white dots (see Fig. XII-19) close to the film guide. Simultaneously, the backing paper can be braked very slightly by means of the left hand thumb (see Fig. XII). Care must be taken, however, that the backing paper does not slide over the measuring roller (see Fig. X-20). Under no circumstances should the backing paper be braked so violently that the lever (see Fig. X-21) determining the basic position of the blocking mechanism could be swung off. This would result in the forming of an undue space before the first exposure.



Furthermore, care should be taken that the backing paper is wound correctly on to the upper spool.

The back of the camera (see Fig. XIII-22) can be closed by pressing it down with both thumbs (see Fig. XIII) until it snaps in, whereupon the milled knob (see Fig. XIII-1) is secured by being screwed so that it cannot be pressed down. As a result, the camera cannot be opened by accidental pressing of the knob.

#### b) 35-mm Cine film:

After having inserted the empty spool between the extension pivots in the upper spool chamber, insert the magazine with the film into the lower spool chamber and wind off a piece of film about 10 cm (i. e. 4 in.) in length. Insert the film first under the left hand guide sprocket (see Fig. XIV-23), then under the right hand one, set the sprocket holes on the teeth of the measuring sprocket (see Fig. XIV-20); next insert the film under the swing-off pressure plate (see Fig. XIV-25) of the 35-mm film guide, and tilt down the pressure plate upon the film, fixing its end to the empty spool as usual.

Next turn the rewind knob slightly to the right, just to stretch the film. With the camera back opened it is not permissible to continue rotating the rewind knob in order to avoid damage of the film perforation.

Afterwards close the camera back immediately.

In case it is required to wind the film into a magazine, the following procedure should be observed:

From a loaded magazine wind off a piece of film about 10 cm (i. e. 4 in.) in length, attach its end to the spool as usual and insert the spool together with the attached film into the magazine according to Fig. XV. Put the loaded magazine into the lower spool chamber, insert the film under the guide rollers (see Fig. X), under the guide pressure plate (see Fig. XV) in the same way as described in the foregoing paragraph. Put the empty magazine into the upper spool chamber in the same way as the spool only (see paragraph 3b).

Stretch the film slightly by means of the rewind knob, holding the empty magazine with the left hand thumb so that the magazine cannot turn accidentally. Afterwards close the back of the camera.

## **5. Setting the film for the first exposure:**

Turn the rewind knob (see Fig. XVI-2) until it is blocked automatically. Simultaneously, the figure "1" appears in the counter window (see Fig. XVI-42), indicating that the film is prepared for the first exposure.

## **6. Preparing for exposure:**

### **a) Focusing:**

Upon pressing down the knob (see Fig. XVII) the viewfinder folding hood is opened automatically. Swing the magnifier (see Fig. XVII-27) over the ground-glass screen, approach the eye close to the magnifier and focus the image on the screen by moving the focusing lever (see Fig. XVIII-28) with the left hand

forefinger. If the image on the ground-glass screen is properly focused, the image on the film will be perfectly sharp as well.

In case moving objects are to be photographed which cannot be focused before exposure, determine the distance of the object by estimation and set the estimated value on the distance scale (see Fig. XIX-29) below the focusing lever. (Fig. XIX-28.)

This scale is fitted with figures indicating distances either in metres or in feet. The object at an infinite distance is marked by the sign " $\infty$ " (infinity), or "INF". If, for instance, the reference mark of the focusing lever (see Fig. XIX-30) is set opposite the number "2", the image of the photographed object located at a distance of 2 m (i. e. approx. 7 ft) from the objective front lenses is focused.

#### b) Stopping down the lens:

The amount of light which is allowed to pass through the objective can be made variable by stopping down the lens. The diaphragm scale (see Fig. XIX-31) is fitted with stop numbers 3.5, 4, 5.6, 8, 11, 16, 22, opposite which the point of the diaphragm lever (see Fig. XIX-32) can be set. If the stop number "3.5" has been set, the objective is fully open, whereas, on the other hand, with the lens stopped at "22" only a small amount of light is allowed to pass. These stop numbers have been chosen so that stopping down to the next higher number entails doubling the exposure.

#### Example:

When stopping down to "5.6" a certain amount of light is allowed to pass through the lens. When stopping down to the next higher stop number "8", the



amount of light is halved; on the other hand, however, when stopping down to "4" the amount of light is doubled. Every objective provides the best results with a certain stop number, usually within a range of from 8 up to 11, securing the maximum definition or depth of focus within these limits.

**c) Setting the exposure time:**

The shutter is equipped with figures indicating the shutter speed, i. e. the time of exposure.

There are the following figures on the PRONTOR SVS shutters: 1, 2, 5, 10, 25, 50, 100, 300. The figure "1" indicates 1 second, the figure "2" corresponding with 1/2 second, "5" with 1/5 second, "100" with 1/100 second, etc.

In addition, the shutter is equipped with the letter B for time exposures.

It is recommended that beginners use a shutter speed of 1/100 for snapshots to avoid rocking the exposure. Only experienced photographers can take snapshots with a shutter speed of 1/25 sec., or even lower.

By turning the external milled shutter ring (see Fig. XIX-33) the chosen speed number is set opposite the reference mark on the shutter. The shutter speed should be chosen with regard to the stop used, or, vice versa, the suitable stop number should be chosen in accordance with the shutter speed either according to experience, or according to the EXPOSURE TABLE, or with the help of an exposimeter.

**d) Cocking the shutter:**

The shutter is cocked by pressing down the cocking lever (see Fig. XIX-35).

## 7. Exposure:

After having focused, set the stop and the shutter speed, and, after having cocked the shutter, the exposure can be made. Before exposing, the magnifier should be swung back into its original position.

Hold the camera firmly with both hands, the best way being shown in Fig. XX, and at a suitable moment, press down the release lever (see Fig. XXI-36) lightly and without rocking with the right hand thumb. When exposing, the image can be observed on the ground-glass screen. When using a 35-mm cine film, the image of the photographed object must be positioned within a rectangle drawn on the screen for this purpose.

## 8. Exposures from eye level:

In some cases, e. g. when taking rapid sports snapshots, or when using a 35-mm cine film for longitudinal pictures, it is convenient to use the open frame finder. Press down the flap of the viewfinder lid (see Fig. XXII) into the horizontal position over the ground-glass screen, swing off the magnifier (see Fig. XXII-27) into the vertical position, approach the eye close to the square-shaped opening in the viewfinder back (see Fig. XXII-27) and observe the photographed object.

When using a 35-mm cine film, only the inner hinged portion of the viewfinder front part should be tilted down (see Fig. XXI-39).

## 9. Exposures by means of the wire release:

If it is desired to make wire release exposures, screw the wire release into the thread nipple (see Fig. XXI-40) at the front side of the camera. It is recommended, however, to use the wire release for time exposures only (see paragraph 11).

## 10. Delayed action exposures:

The PRONTOR SVS type shutter incorporates a delayed action equipment. From the moment the release lever (see Fig. XXI-36) is pressed down it takes about 6 seconds until the exposure takes place. The delayed action equipment can be used for all exposure times from 1 second up to 1/300 second, except for the B-position setting.

The change-over lever (see Fig. XIX-41) of the shutter must be set to the position marked with the letter "V" before or even after cocking the shutter. For exposures of this kind the camera should be mounted on a tripod or on a suitable support.

## 11. Time exposures:

These exposures cannot be made directly in the hands; the camera must be screwed on to a tripod. The bottom part of the camera is fitted with a 3/8" — or 1/4" — thread tripod nut into which the tripod screw should be screwed.

It is advantageous to use the wire release for exposures of this kind.



The milled shutter ring (see Fig. XIX-33) is set with the letter "B" opposite the reference mark (see Fig. XIX-34). Then the shutter is cocked by means of the cocking lever (see Fig. XIX-35). Upon pressing down the release lever or the wire release, the shutter is opened and remains open as long as the release lever is pressed down.

## 12. Further exposures:

After actuating the first exposure by pressing down the release lever (see Fig. XXI-36), the blocking mechanism of the rewind knob is released automatically and the rewind knob can be turned again until it is blocked automatically. Thus the film is prepared for the next exposure, the film counter indicating automatically the next number.

If a 35-mm cine film is used, it is necessary before or after every eleventh exposure to turn the milled knob (see Fig. IX-17) of the auxiliary film counter by  $90^{\circ}$  in clockwise direction.

Simultaneously, the milled knob snaps in slightly and in the window (see Fig. IX-16) of the auxiliary film counter there appears the figure 1, 2, or 3, according to whether the 11th, 21st, or 31st exposure is being made. In case the knob of the auxiliary counter (see Fig. IX-17) is turned by more than  $90^{\circ}$ , the milled knob must be rotated in the original direction until the correct figure appears in the respective window.

If number "1" does not appear in the main counter window when the milled knob of the additional counter is turned slowly, we must turn the milled knob further on in the direction of the arrow by  $360^{\circ}$  in order to obtain the required setting of both counters.

To avoid covering the window in the milled knob with our finger when handling the additional counter, we had better turn it lightly by grasping it with two fingers from the side by the milled edge of the knob.

When turning the auxiliary counter, the principal counter (see Fig. IX-42) always springs from the number "11" to the number "1", showing on further exposures further numbers, i. e. 2, 3, etc. up to "11".

Thus the auxiliary counter (see Fig. IX-16) counts the tens, the principle counter (see Fig. IX-42) the ones.

For instance, the window of the auxiliary counter shows "2", the principal counter window showing "7"; hence the "27th" exposure is being made.

When using 120 roll film ( $6 \times 9$  cm) the auxiliary counter must not be handled.

### 13. Closing the viewfinder:

By tilting down the cover lid of the viewfinder (see Fig. XXIII-43) the viewfinder folding hood is closed automatically – and the lid snaps in.

### 14. Removing the exposed film from the camera:

#### a) 120 roll film ( $6 \times 9$ cm):

After having exposed the twelfth shot, turn the rewind knob (see Fig. II-2) without stopping, as a result of which a red mark appears in the window of the principal counter indicating that the whole film has been exposed.

Turn the rewind knob about 5 times and only then open the camera back. Pull out the rewind knob in the direction of its axis (see Fig. 11), as a result of which the film roll is raised by the pressure exercised by means of the pressure spring so that the film roll can easily be removed from the camera.

Care should be taken that the film does not uncoil. Seal the end of the backing paper by means of a paste strip attached to the end of every film. This procedure can be effected in daylight.

#### b) 35-mm cine film:

After having exposed the last shot distinct resistance will be felt when turning the rewind knob. It occurs if the end of film is attached to the lower spool. Stop turning the rewind knob in order to avoid damaging the film.

To avoid losing the last exposed shot, it is necessary — even in case the film is rewound into a magazine — to remove the magazine from the camera in a dark room.

If it is desired to remove the film from the camera in daylight, it must be taken into account that one or two of the last exposures (according to the length of film, to the way of loading, etc.) will be illuminated when taken out from the camera, i. e. depreciated. It is recommended, therefore, when loading the film into the magazine by oneself, not to fasten the end of film to the spool; as a result, it is possible to rewind the whole film into the upper magazine.

Removal of the spool or magazine from the camera is easy and need not be especially described.



## 15. Depth of focus:

Every objective reproduces sharply not only the objects located in the focusing plane, but also objects lying before and behind this plane. This phenomenon is called "depth of focus" which is the larger the more the lens is stopped down.

The camera is equipped with a depth of focus scale located directly on the focusing lever (see Fig. XIX-44). This is very convenient since it is possible – after having focused – immediately to read off the two distances within which the photographed objects will be reproduced sharply. The scale is computed for a maximum unsharpness (the so-called dispersion ring) of 0.05 mm.

### Example:

The focusing lever is set with its reference mark opposite the number "3" on the metric distance scale (see Fig. XIX-29). Supposing the objective is stopped down to "8", read off on the distance scale the distances lying opposite to the two numbers "8" which are located on the focusing lever on either side of the central reference mark. They are distances about 2.5 m and 3.8 m. If the lens is stopped down to "16", the distances read off will be approximately 2.1 m and 5.5 m.

In case it is desired to determine the depth of focus more accurately, the enclosed "Depth of Focus Table" can be used which has been computed for a maximum unsharpness of 0.05 mm.

Depth of Focus Table for the BELAR f 3.5, F = 80 mm Lens:  
(Distances in metres)

Distance in metres	Stop Number						
	3.5	4	5.6	8	11	16	22
1	0.98—1.02	0.97—1.03	0.96—1.04	0.95—1.06	0.93—1.08	0.90—1.12	0.87—1.18
1.2	1.17—1.24	1.16—1.24	1.15—1.26	1.12—1.29	1.10—1.32	1.06—1.39	1.01—1.48
1.5	1.45—1.56	1.44—1.57	1.41—1.60	1.38—1.64	1.34—1.70	1.28—1.82	1.22—1.97
2	1.50—2.11	1.89—2.12	1.85—2.18	1.79—2.27	1.72—2.39	1.62—2.62	1.52—2.97
3	2.78—3.26	2.75—3.30	2.66—3.44	2.54—3.66	2.41—4.00	2.21—4.72	2.01—6.03
4	3.62—4.48	3.57—4.56	3.42—4.83	3.22—5.30	3.00—6.04	2.70—7.87	2.41—12.43
7	5.89—8.64	5.76—8.94	5.38—10.06	4.89—12.38	4.40—17.45	3.77— $\infty$	3.22— $\infty$
20	12.93— $\infty$	12.31— $\infty$	10.67— $\infty$	8.80— $\infty$	7.38— $\infty$	5.74— $\infty$	4.54— $\infty$
$\infty$	36.31— $\infty$	31.78— $\infty$	22.72— $\infty$	15.92— $\infty$	11.60— $\infty$	8.00— $\infty$	5.83— $\infty$

Depth of Focus Table for the BELAR  $f$  3.5,  $F = 80$  mm Lens:  
(Distances in feet)

Distances in ft	Stop Number						
	3.5	4	5.6	8	11	16	22
3.5	3.41—3.61	3.38—3.62	3.35—3.67	3.28—3.74	3.22—3.87	3.08—4.04	2.95—4.30
4	3.87—4.13	3.84—4.17	3.80—4.23	3.71—4.33	3.61—4.46	3.48—4.72	3.31—5.09
5	4.79—5.22	4.76—5.25	4.69—5.35	4.56—5.54	4.43—5.77	4.20—6.20	3.97—6.79
7	6.59—7.45	6.56—7.51	6.40—7.74	6.17—8.10	5.91—8.60	5.51—9.58	5.12—11.12
9	8.37—9.74	8.33—9.84	8.04—10.24	7.68—10.89	7.28—11.81	6.69—13.75	6.10—17.16
12	10.89—13.35	10.76—13.55	10.33—14.30	9.74—15.58	9.12—17.59	8.20—22.28	7.35—32.81
20	17.13—24.05	16.77—24.77	15.75—27.36	14.44—32.48	13.09—42.42	11.32—86.55	9.71—INF
50	35.20—86.29	33.76—96.26	29.89—INF	25.49—INF	21.52—INF	17.13—INF	13.71—INF
INF	118.90—INF	104.03—INF	74.31—INF	52.03—INF	37.83—INF	26.02—INF	18.93—INF



**Flashlight Exposures.**  
(This table applies to PRONTOR SVS Shutters.)

Kind of flashlight	Manufacturer and type		Position of change over lever and shutter speed	
			M - yellow	K - red
	Osram	K 0, XP F 1 F 2	—	1 up to 1/25 second
		K F	—	1 up to 1/50 second
	General Electric	SM	—	1 up to 1/50 second
	Wabash-Sylvania	SF	—	1 up to 1/100 second
	Philips	PF 3	1/50 up to 1/100 second	1 up to 1/50 second
		PF 14, PF 1 PF 25, PF 5 PF 60	1/50 up to 1/300 second	1 up to 1/25 second
		S 0, XM 1 S 1, XM 5 S 2		
	General Electric	No 5 No 11 No 22		
	Wabash-Sylvania	Press 25 Press 40 Press 50 No 0 No 2		
		Philips General Electric Wabash-Sylvania	1/25 up to 1/50 second	1 up to 1/10 second
Electronic flashlight tubes	All makes and types		—	1 up to 1/300 second

## **16. Flashlight exposures:**

The PRONTOR SVS-type shutter is equipped with a flashlight synchronizer. When effecting exposures of this kind insert the plug of the flashlight cable into the terminal of the flashlight synchronizer (see Fig. XIX-45).

Any kind of flashlight may be used, providing, however, the change-over lever is set accordingly and a suitable shutter speed chosen.

In the enclosed "Flashlight Exposures" table can be found the respective positions of the change-over lever together with the suitable shutter speed for various kinds of flashlight illuminators.

## **17. Maintenance:**

The photographic camera is a precision instrument which should be handled with proper care.

Before loading a new film it is recommended to brush the interior of the camera thoroughly with a hair brush. The objectives can be cleaned (not too often!) by means of a clean, soft linen cloth. The lens surfaces should be cleaned from dust by means of a soft hair brush. The camera should be protected against shocks, dampness and chemical evaporations.

## **18. Developing of film:**

If you wish to develop the film by yourself, sufficient care must be devoted to this work in order to secure a fine grain development and to avoid scratching the film.

It is recommended to develop the film in a tank and to use developers of well-known trade marks, e. g. AGFA-ATOMAL, Ilford-P. A. Universal, Kodak D-76, etc.

For those who wish to prepare the developer by themselves, the following approved prescriptions both for cine film and roll film are recommended:

**a) KODAK Developer D-76:**

Metol . . . . .	2 g
Hydroquinone . . . . .	5 g
Crystalline Sodium Sulphite . . . . .	200 g
Borax . . . . .	20 g
to be supplemented with water up to 1000 cu. cm.	

The same as above with D-76 R regeneration solution:

Metol . . . . .	3 g
Hydroquinone . . . . .	7.5 g
Crystalline Sodium Sulphite . . . . .	200 g
Borax . . . . .	20 g
to be supplemented with water up to 1000 cu. cm.	

**Preparing the developer:**

Dissolve metol in 200 cu. cm of water of a temperature of 50° C; in another 200 cu. cm of water of 70° C, dissolve about one fourth of sodium sulphite, adding hydroquinone to this solution. This solution should be poured slowly and under



constant stirring into the metal solution already prepared. Next dissolve the rest of the sodium sulphite in a further 200 cu. cm of water, 70° C warm, and add borax. After total dissolution has taken place, pour the solutions together and add cold water till 1000 cu. cm of liquid are obtained.

The developer with regeneration solution is prepared in a similar way.

For preparing the developer use on principle distilled, or at least boiled water with an admixture of 1 g of secondary sodium phosphate to 1 litre (= 61.027 cubic inches) water.

A developer prepared in the way described above maintains its original properties for a long time if preserved in well sealed bottle of brown-glass at room temperature, and if refilled after every developing of a film with the regeneration solution. The amount of added regeneration solution is indicated by the amount of developer removed by the film, and the number of films worked-up in the developer, depending on the degree of cleanliness maintained during the work (up to 24 pieces).

For maintaining the same negative contrast the following table of relation between the time of developing and temperature should be observed:

Temperature ° C	Developing Time min.
12	36
15	26
18	20
21	15
24	12

If the developing times quoted above are observed, the D-76 developer provides soft negatives, a very good compensation and maximum reproduction in the shadow areas. As for the magnitude of grain, it very closely resembles that of genuine fine-grain developers, and since it does not reduce the sensitiveness of the material developed, it can quite satisfactorily be used for developing normal exposures.

**b) AGFA-14 Developer:**

Metol	4.5 g
Anhydrous sodium sulphite	85.0 g
Anhydrous soda	1.0 g
Potassium bromide	0.5 g
to be supplemented with water up to 1000 cu. cm.	

**Preparing the developer:**

The chemicals are dissolved in the sequence quoted above in 750 cu. cm of distilled or boiled water, 50° C warm, and supplemented with cold distilled or boiled water up to 1000 cu. cm.

After developing 5 cine films or 3 roll films in one litre of developer, add 5 cu. cm of 20% soda solution and, besides this, refill with fresh developer to the original volume. This kind of regeneration can be repeated twice.

At a temperature of 18° C and a developing time of 16 up to 20 minutes the AGFA-14 developer provides soft negatives of approximately the same grain as

the D-76 developer, no prolonged exposures being necessary with regard to this developer.

### **Accessories for the FLEXARET IV Reflex Camera:**

- a) An ever-ready leather case with a strap for carrying in the hand or over the shoulder.
- b) A sunshade, 30 mm in diameter, to be set up on the taking lens. When photographing against the light, the sunshade prevents direct sunrays from penetrating into the objective, thus eliminating the reflection of rays.
- c) **Colour filters, 30 mm in diameter:**

In order to facilitate the correct transfer of natural colours into the neutral black-and-white scale of the sensitive material, eight types of colour filters are supplied with the camera. These filters are made of optical glass, tinted in the material, accurately ground and polished, and fitted with mounts for setting up on the objective. The following table contains a specification of colour filters, their suitability for use and the respective exposure prolongation.

The prolongation factors are quoted only approximately, reliable specifications of the degree of sensitiveness of the film material being impossible. It is recommended to every amateur, therefore, to attest these factors once more when using his own material.