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HASSELBLAD 500EL

INSTRUCTION BOOK

The Hasselblad 500 EL — your new camera which you have just unpacked — will help you to solve many picture-taking problems.

The best and most effective way to become familiar with this new camera, operated by an electrically-driven motor, is to study it carefully, its parts and its accessories, a little at a time. The more thoroughly you study its movements, and how the camera should be used, the quicker you can take advantage of all its features in your practical work.

You will also find, described in these instructions, a great many accessories of service to you. They help to make the Hasselblad 500 EL a camera useful in an extremely wide range of work, and can solve a great many different photographic problems. This camera is a part of the Hasselblad system and all the accessories available for the Hasselblad 500 C, with the exception of a very few, can also be used with the 500 EL.

We wish you much pleasure and success with your new camera.

Fig. 1

The Hasselblad 500 EL is an electric motor-driven $2\,^1/_4 \times 2\,^1/_4$ **SLR** camera. Like the world-famous Hasselblad **500 C**, the 500 EL is based on a series of interchangeable camera components – various types of film magazine, lenses and viewfinders can be attached to the camera body as required. Using various combinations of these components – with the possible addition of one or several special accessories – the Hasselblad 500 EL can be adapted to master practically every conceivable situation encountered in the majority of photographic applications.

The Hasselblad 500 EL is equipped with a reliable electric motor which gives the photographer greater freedom, permitting him to devote more time to actual photographic work – focusing and exposing – by relieving him of the mechanical task of advancing the film and cocking the shutter. The motor is powered by one or two rechargeable batteries which last for 1,000 and 2,000 exposures respectively on a single charge.

A number of advanced engineering features make the Hasselblad 500 EL a camera far above the ordinary. For example, you can take pictures with the aid of a timer, by radio or using remote release cords. You can also switch the camera to "automatic" and take a series of rapid-sequence shots. The rapid-exposure feature which was introduced on the 500 C to reduce camera reaction time is also incorporated in the Hasselblad 500 EL.

Power operation and facilities for remote release

broaden the nature photographer's scope and provide unexcelled opportunities of obtaining exclusive pictures. For industrial subjects, as well as in scientific laboratories, the 500 EL with timer, radio or remote release cords permits fast and simple operation whether set up for a programmed sequence of shots or in situations where an operator handles the camera in addition to other work tasks. In many other fields the 500 EL makes for faster and more effective photography: the portrait photographer need no longer be tied to his camera, on press assignments the camerman need never take his eye from the viewfinder . . .

Fig. 2

The Hasselblad 500 EL will add speed and dexterity to your camera technique, too.

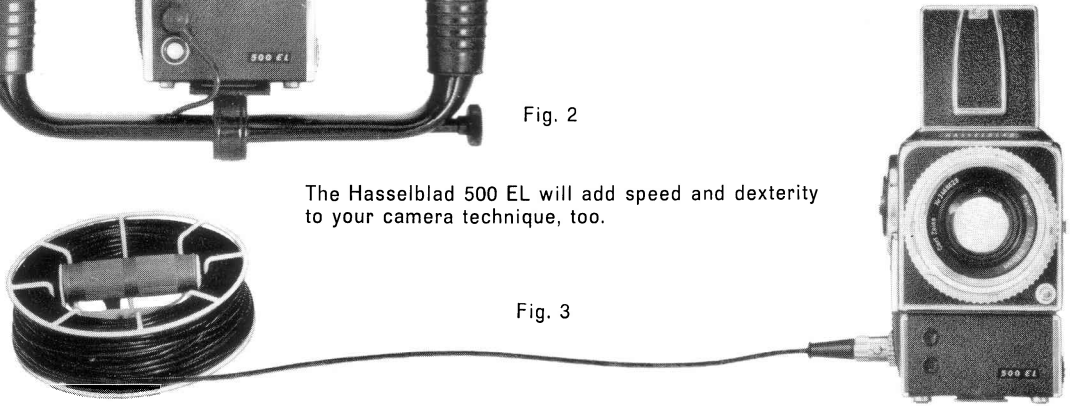


Fig. 3

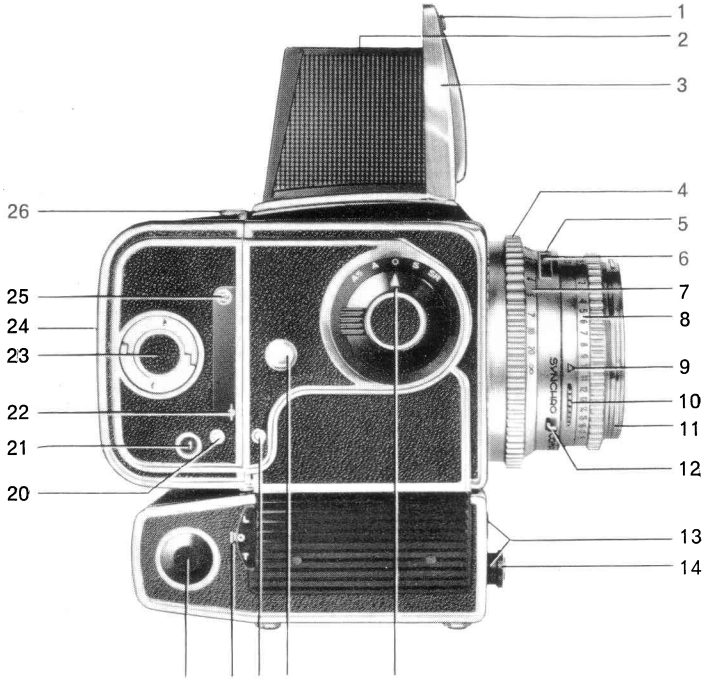


Fig. 4

1 Catch for focusing hood and magnifier
2 Fine-focusing magnifier
3 Interchangeable focusing hood
4 Focusing ring
5 Central index for setting shutter speed, diaphragm and distance
6 Movable depth-of-field indicators
7 Distance scale
8 Exposure value scale
9 Exposure value index
10 Exposure value catch
11 External and internal bayonet fittings for filter, sunshade, etc.
12 Diaphragm catch for checking depth of field on the groundglass
13 Front sockets
14 Release button
15 Selector
16 Carrying-strap button
17
18 Time lever
19 Side socket
20 Film signal
21 Exposure counter
22 Film plane marking

23 Loading key for film
24 Film window for visual film check
25 Magazine identification
26 Magazine catch
27 Diaphragm scale
28 Synchronizer contact for M and X
29 Lever for synchronization and self-timer
30 Catch for M X V
31 Speed scale
32 Setting ring for speed, diaphragm
33 Lens catch
34 Cable hook
35 Fitting for accessory items
36 Catch for battery compartment
37 Spool holder catch
38 Magazine slide

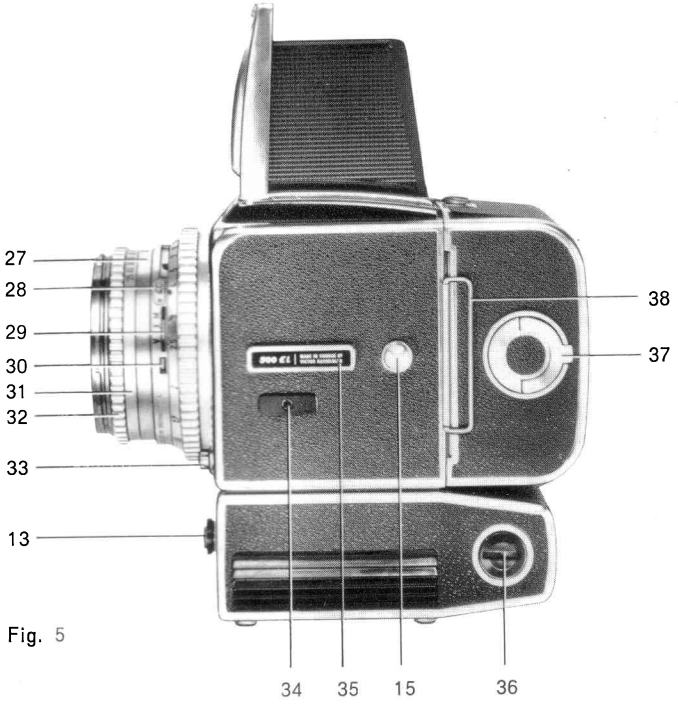


Fig. 5

METHODS OF EXPOSURE

With the Hasselblad 500 EL you can choose between five different ways of making an exposure. These are indicated on the selector scale and the various [illegible] as follows:

Fig. 6

O

Normal setting — after an exposure the film is advanced, the shutter is cocked and the mirror returns to its focusing position.

Fig. 7

S

Speed setting — reduces the reaction time of the camera (between release and exposure) to a minimum. This is accomplished through the following normal release sequence being carried out in advance when the selector is turned to 'S': the mirror is lifted, the auxiliary shutter is opened, and the diaphragm is stopped down to the pre-set aperture.

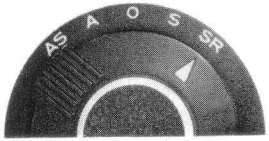


Fig. 8

SR

Speed Repeat setting — same as speed setting, except that the camera remains at this setting after exposure.

Fig. 9

A

Automatic setting — at this setting the camera continues to make exposure as long as an exposure signal is given (and the magazine exposure counter indicates that it contains unexposed film) by means of a release cord, for example. Time between each exposure approx. 1 sec. Avoid using the automatic setting for exposure times between 1 and 1/15 sec. See page 19.

Fig. 10

AS

Automatic Speed setting — same as automatic setting, except that the camera remains at the 'S' setting on cessation of the exposure signal.

Exposure times longer than 1 sec. (B, T)

For long exposure times – from 1 sec. to about 1 minute – expose film by means of the release button (or remotely by radio or cord) for the length of time required. Set the shutter at 'B'.

For long-duration exposures (over 1 minute) open the shutter by moving the time lever to 'T' (shutter set at 'B'). To close the shutter, return the time lever to the 'O' setting. This advances the film and cocks the shutter. The camera's release solenoid consumes no current when exposures are made with the time catch. To save the batteries, use the time lever for all exposures longer than 1 minute. The time lever is also used when making exposures with the self-timer. See also page 21.

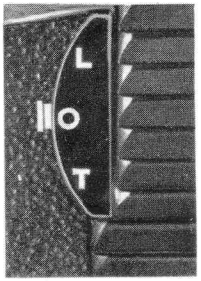


Fig. 11

ALTERNATIVE RELEASE METHODS

The Hasselblad 500 EL has three release sockets – two at the front and one at the side. Recharge cords can also be connected to the side socket. Alternative release connections are as follows:

Release button (Front socket)

Normal exposures with the Hasselblad 500 EL are made with the release button. This can be attached to either of the two front sockets.

Fig. 12

Release cords (Front socket)

Cords measuring 1 foot, 10 or 20 feet (FK 30, FK 300, FK 600) can be connected to either of the front sockets. When using either of these cords, the release button need not be removed and will continue to function normally — exposures can then be made using either cord or button. Note that the camera cannot be released if the magazine film counter indicates that the last frame has been exposed or if the magazine slide has not been removed.

Fig. 13

Cords (Side socket)

The following standard cords may be connected to the camera's side socket:

SK 150 is a release cord measuring 5 feet in length.

Fig. 14

LK 50, LK 500 and DK 3000 are extension cords measuring 5, 16 and 100 feet in length respectively. Two to six DK 3000 may be joined together to make a longer release cord. However, a transistor amplifier (MOTTC) must be used if cord length exceeds 100 feet. Do not use two or more amplifiers at the same time. Power for the amplifier is provided by the camera batteries.

Fig. 15

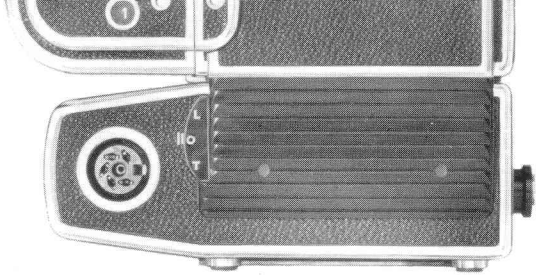


Fig. 16

Cord reel

The Hasseblad cord reel holds 100 feet of cord and provides a quick and convenient means of carrying, laying out and storing DK 3000 cords.

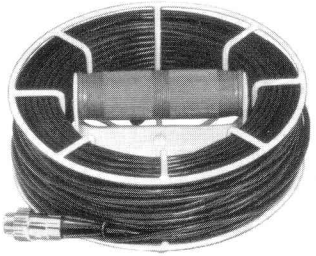


Fig. 17

Timer (Side socket)

Using the Hasselblad timer, the Hasselblad 500 EL can be programmed to make exposures at fixed intervals – from one frame every two seconds to one every 60 hours. The Hasselblad timer is connected to the side socket of the camera. The timer is electric and runs off a mains supply.

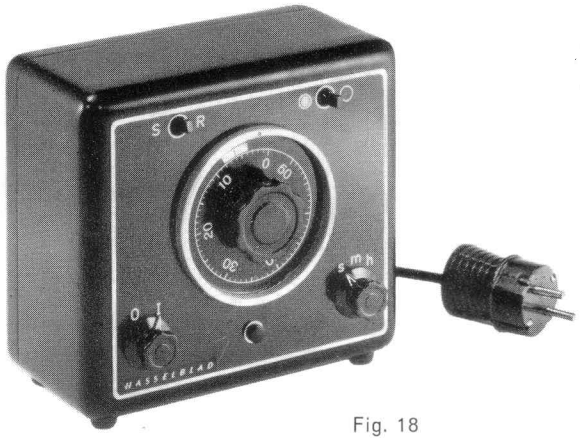


Fig. 18

Radio

The Hasselblad 500 EL may also be remotely controlled by radio. A tone transmitter operating on the 27 mc/s radio control band is employed to send a release signal to the camera. It is powered by two standard flashlamp batteries. The receiver can be mounted in a special leather case designed for attachment to the camera accessory shoe. Power for the receiver is supplied by the camera batteries. As a rule, permission of local authorities concerned must be obtained for possessing and operating installations of this type.

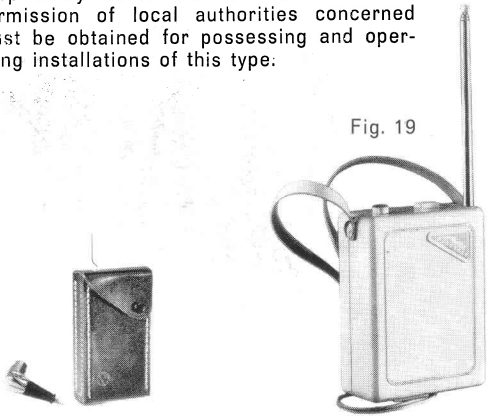
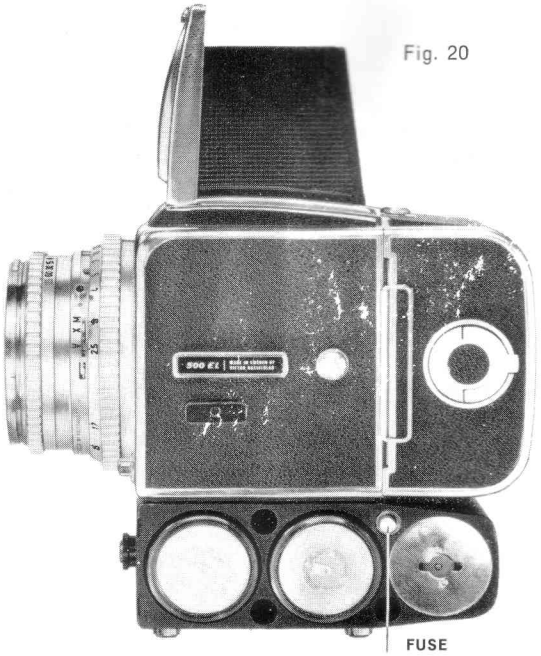


Fig. 19

Other release methods

The Hasselblad 500 EL shutter can be triggered by changes in a closed or open circuit (photocell, etc.) A circuit diagram of the camera's electrical system will be found on page 32.

Fig. 20



A 1.6-amp 5×20 mm time-lag fuse is fitted in the hole (see fig. 20).

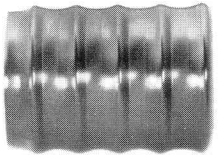
BATTERIES

The electric motor fitted to the Hasselblad 500 EL is powered by one or two rechargeable batteries which last for approximately 1,000 and 2,000 exposures per charge respectively. These batteries are DEAC type 5/500 DKZ nickel cadmium cells, 35×50 mm.

To fit the batteries in the camera, remove the battery compartment cover on the left-hand side of the camera. Turn the catch anti-clockwise a quarter-turn, bringing the slot into a vertical position. Open the cover slightly and slide it towards the front of the camera.

Insert the batteries in the camera's narrowest end first (see Fig. 20). If the batteries are inserted the wrong way the battery compartment cover cannot be closed. When only one battery is used, it may be placed in either space.

The camera cannot work until the battery compartment cover is fitted in place.



Recharge unit I

Supplied as standard with the Hasselblad 500 EL is one recharge unit I. This unit is designed to recharge one or two batteries in the camera. Charging time for one battery is 14 hours and for two batteries 28 hours. The unit is adjustable for operation on either 110-volt or 220-volt a. c. mains. Before plugging into a wall point, make sure that it is adjusted for the right voltage, (see Fig. 21) and then connect it to the side socket on the camera.

Note: Do not connect the recharge unit if the batteries have been removed from the camera.

At the **beginning** of the charging period, a fully discharged battery requires charging for 40–60 seconds for each exposure.

Do not overcharge the batteries.

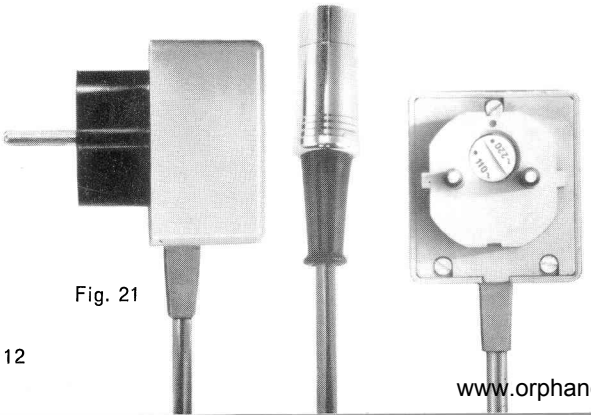


Fig. 21

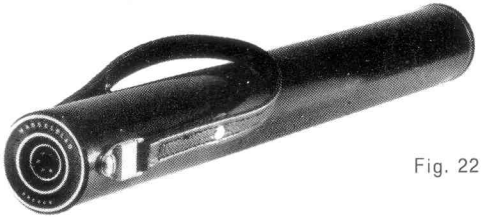


Fig. 22

Battery case

This is designed to permit charging of the camera batteries at times when no mains supply is available. Five dry batteries (monocell VII, 1.5 volt) will bring one battery in the camera to fully-charged condition. If the dry batteries are of good quality, two camera batteries can be charged **simultaneously** and both will be brought to fully-charged condition. Film can be exposed while the battery case is connected, but at least one battery must be fitted in the camera. Charging time is 14 hours.

Recharge unit II

Fig. 23

This unit is intended for charging batteries in the camera or in the Hasselblad battery box which may be connected to the recharge unit. Recharge unit II is equipped with an adjustable timer which automatically interrupts the charging process when the pre-set time has elapsed. Charging time for one or two fully discharged batteries is 14 hours. Sockets are provided for continuous charging, the Hasselblad 500 EL and batteries to be run off the mains supply when the camera is set up for stationary use. A special socket is also provided to release the camera through cord SK 150.

Lens and shutter

The standard lens supplied with the Hasselblad 500 EL camera is a Carl Zeiss Planar f/2.8 with an 80 mm focal length and a 52° angle-of-view. This modern lens is highly corrective and has excellent resolving power over the entire field. It comprises 7 lens elements. Each lens has a Synchro-Compur between-lens shutter with exposure value, automatic diaphragm and depth-of-field indicators. Together, each lens and between-lens shutter form an interchangeable unit which functions automatically via direct contact with the film-advance mechanism. Other lenses—the Distagon f/4/50 mm, the S-Planar f/5.6/120 mm, the Sonnar f/4/150 mm, the Sonnar f/5.6/250 mm and the Tele-Tessar f/8/500 mm—all feature indvidual between-lens shutters and are coupled to the camera just as easily as the standard lens. The focal length of these additional lenses are chosen to cover virtually every phase of potography from wide angle to telephoto. The Planar and Sonnar lenses are of equal diameter and consequently have the same bayonet fittings for filters and sunshade.

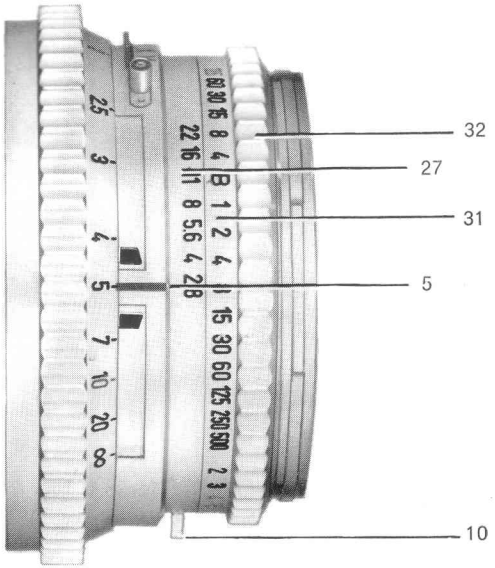


Fig. 24

Shutter speeds

Shutter speeds are arranged in **geometrical** progression running from 1 second **to** 1/500 of a second and B. The scale (31) **graduations** are equidistant and include: B, 1, 2, 4, 8, 15, 30, 60, 125, 250 and 500. For B exposures made when using the EVS setting, the speed scale is continued with the following series of green, engraved numbers: 2, 4, 8, 15, 30, 60 and 125 seconds. Shutter speeds are set with the speed setting ring (32); they are set against the black central index (5).

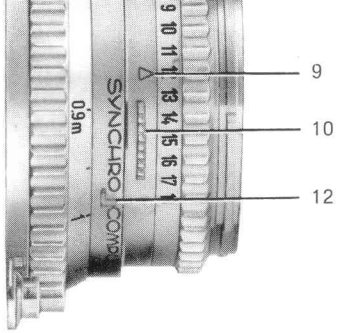
Diaphragm

The standard lens diaphragm scale includes f/2.8, f/4, f/5.6, f/8, f/11 and f/22 stops. The diaphragm ring (27) is released from the speed setting ring (32) by moving catch (10) towards the camera body after which aperture is set against the black central index (5).

Shutter speeds and aperture can be set in direct relation to each other since the scale graduations are immediately adjacent and are read against the same index (5). This feature enables you to view the combined aperture and shutter-speed settings at a glance.

Automatic diaphragm control

AN focusing is normally done at maximum diaphragm opening. Stopping down to the actual aperture used for the exposure takes place automatically on exposing the film. The depth-of-field indicators (page 18) show the depth of field at different



apertures. However, it is possible to check the effect of the selected aperture by pressing catch (12) upwards. Spring action then snaps the diaphragm to the pre-set opening. The diaphragm is returned to maximum aperture by turning to full opening or by advancing the film after an exposure.

Exposure value system

Like the diaphragm scale, the speed scale is provided with identically-spaced graduations. Thus the factors of aperture and speed can be combined to form a single aperture speed factor. The purpose of this feature is to enable you to obtain identical exposure with all combinations of settings for a given exposure factor. This aperture/speed factor is expressed in exposure values ranging from 2 to 18 (standard lens), and these figures are engraved in red. The shutter speed for each exposure value is twice that of the next lower exposure value.

EVS		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
APERTURE	2,8	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500						
	4	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500					
	5.6	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500				
	8	15	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500			
	11	30	15	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500		
	16	60	30	15	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500	
	22	125	60	30	15	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500

Fig. 26

Setting

Push the exposure value catch (10) backwards to release the ring on which the red EVS numbers are engraved. Exposure meter readings can be transferred directly to the corresponding EVS number opposite index (9). The exposure value (EVS number) provides a series of aperture/speed combinations, all of which provide identical exposures.

Example:

Seven alternative aperture/speed settings can be used with an exposure value of 12. Thus the entire range of apertures on the diaphragm scale can be used, and shutter speeds will vary between 1/500 —1/8. Scales (27) and (31) will then be set at the combinations shown in red on the table. (Fig. 26).

Times longer than one second are shown to the left of the diagonal blue line on the same table. Thus the exposure values can also be used for exposures up to 125 seconds at f/22. These speeds are engraved in green on the speed scale.

Setting to half units

The EVS scale can be set very accurately even down to half units. This is of particular importance in allowing for the increase in shutter times when using color filters or when taking color photographs in general. The narrow exposure latitude of certain color films necessitates extremely accurate exposures; an error as small as a single EVS number can have a serious effect on both the exposure and the color balance.

Long exposure times

With EVS values of 8 and below, the possibilities of using instantaneous shutter speeds are limited. The table (28) shows aperture/speed combinations for exposures of more than 1 second at EVS values of 2—8. The green figures on the lens indicate the correct exposure times for the relevant apertures when the shutter is set to B.

Example

Set the EVS scale to 5. For the sake of depth of field you wish to use f/11. According to the table (fig. 28) the exposure time is 4 seconds. The scales (27) and (31) on your camera show the same value as the table.

When making long exposures on color film, however, allowance must be made for the color balance correction factor.

These corrections are given in the table below:

exp. time as per exposure meter	correction factor
1–3 secs.	1.0
3–6 secs.	1.3
6–10 secs.	1.6
10–18 secs.	2.0
18–31 secs.	2.5
31–60 secs.	3.0
60–130 secs.	4.0

One EVS number = factor 2.0. The figures are those for Eastman Kodak Ektachrome film.

Fig. 27

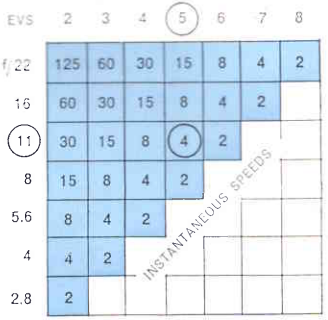


Fig. 28

Focusing and depth of field

The focusing ring (4) (standard lens) is adjustable to distances between 3 feet and infinity. The distance scale is engraved on the ring and corresponds directly with the central index and the movable depth-of-field indicators. After the picture on the ground glass screen has been brought into focus, the distance of the film plane from the subject will equal the distance-scale value opposite the central index (5).