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Unloading (See page 20)

1. **Push in rewind button.**
2. **Rewind film.**
3. **Open camera back,** remove film.

Shooting (See page 18)

1. **Wind film transport.**
2. **Pre-set shutter speed.**
3. **Focus and determine picture area.**
4. **Set correct aperture** (see "exposure determination" below).
5. **Release the shutter gently.**

Transport Lever Lock

When the camera is not used, the transport lever should be in the locked position, fully back to the camera body. To lock the lever, depress the button on top of the centre of the transport lever axis. The lever, which acts also as meter switch, will retract inwards to the camera body to prevent accidental switching on of the meter. The meter lock is automatically released (the button pops up) when the film transport lever is actuated from its rest position.

Exposure determination

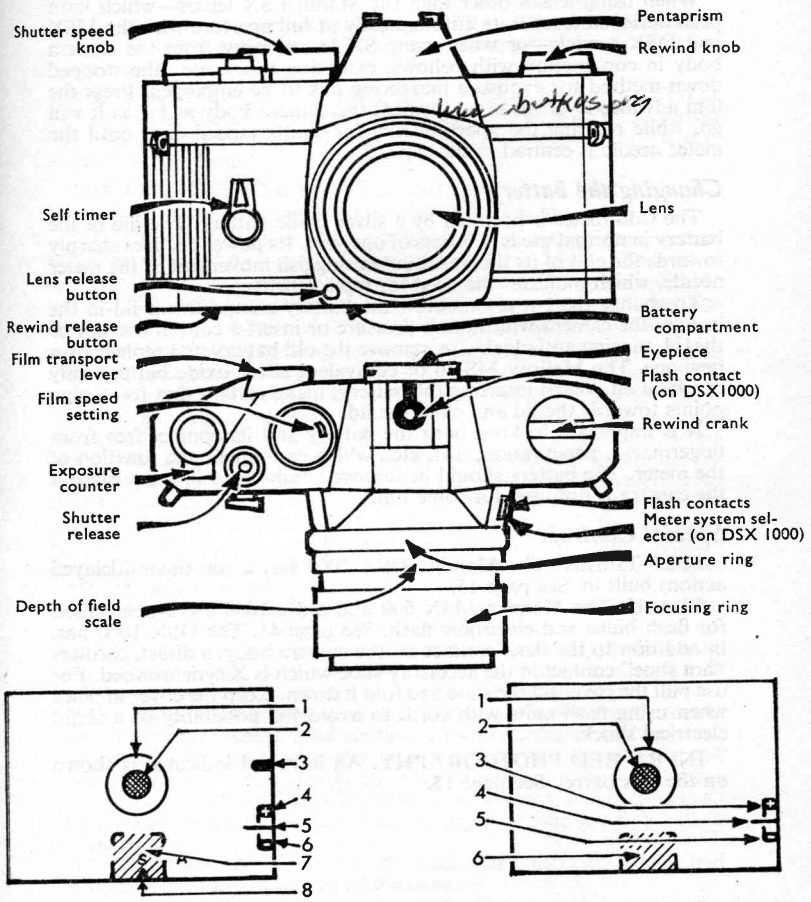
The general working of the DSX meter is as described for the DTL meter and that of the MSX 500 for the TL meter on page 40. To use the meter set film speed, pre-select shutter speed as instructed on page 18. Now select on model DSX 1000 the metering system in accordance with the explanations given on page 40, by moving the meter system selector (below the flash contacts) to S for spot reading or A for average exposure measurement. An indicator in the base of the viewfinder points either to S or A as visual reminder of the setting chosen.

Point the camera to the subject so that the meter field indicated in the MSX 500 finder or the spot measuring setting on the DSX 1000 encompass any darker subject matter of importance. For average shots with the MSX 500 and A setting on the DSX 1000, the finder should cover the actual subject area to be taken.

With the transport lever in switched-on position (see above) rotate the aperture ring on the lens mount until the needle on the right hand side of the viewfinder is in the centre of the claw. You are now ready to take the photograph.

If the needle remains on the + side, the light is too strong for the shutter speed selected. Set a faster shutter speed. If the needle remains on the — side, set a slower shutter speed. On the model DSX 1000 a red warning signal appears in the finder to indicate insufficient light.

The procedure of pre-selecting the shutter speed and finding the correct aperture to suit can be reversed. You can pre-select the aperture required and then centre the exposure meter needle by rotating the shutter speed dial.



Left: DSX1000 finder. 1, Clear ground glass. 2, Microprism. 3, Low-light warning. 4, Over-exposure zone. 5, Meter needle. 6, Under-exposure zone. 7, Spot metering area. 8, Meter system indicator. *Right:* MSX500 finder. 1, Clear ground glass. 2, Microprism. 3, Over-exposure zone. 4, Meter needle. 5. Under-exposure zone. 6, Spot metering area.

Stopped-Down Metering

When using lenses other than the Mamiya SX lenses—which have been designed to operate automatically at full aperture with the MSX and DSX models—or when using SX lenses away from the camera body in conjunction with bellows, extension tubes, etc., the stopped down method for exposure measuring has to be employed. Press the film advance lever inwards, towards the camera body as far as it will go, while rotating the aperture ring (or shutter speed dial) until the meter needle is centred in the claw.

Changing the battery

The CdS meter is powered by a silver oxide battery. The life of the battery in normal use is in excess of one year. Its power declines sharply towards the end of its life, resulting in sluggish movement of the meter needle, which indicates the need for replacement.

To change the battery unscrew the battery compartment lid in the base of the camera with thumb pressure or insert a coin in the slot of the lid, turning anti-clockwise, remove the old battery and replace by a new one. The Mallory MS-76 or equivalent silver oxide battery only can be used. When inserting the battery, make certain that its + sign points towards the lid and close the lid.

It is important to keep both the battery and its contact free from fingermarks, perspiration, dirt, etc., which can impair the function of the meter. The battery should be removed and stored in a dry place if the camera is not used for some time.

Special Controls

SELF-TIMER. The Mamiya DSX 1000 has a self-timer (delayed action) built in. See page 15.

FLASH. The Mamiya MSX 500 and DSX 1000 are synchronised for flash bulbs and electronic flash. See page 45. The DSX 1000 has, in addition to the flash contact on the camera body, a direct, cordless "hot shoe" contact in the accessory shoe which is X synchronised. For use pull the cover off the shoe and fold it down. Keep the cover in place when using flash-units with cord, to avoid the possibility of a slight electrical shock.

INFRA RED PHOTOGRAPHY. An infra-red indicator is shown on the lens barrel. See page 15.

MAMIYA SEKOR AUTO XTL

This is the most sophisticated Mamiya TTL SLR camera. It features automatic and manual exposure control for both spot and average readings.

THE STANDARD LENS is the Mamiya Sekor ES 55 mm. *f* 1.4 or *f* 1.8 in special Mamiya Sekor bayonet mount. Lenses with screw thread for the previous Mamiya models as well as those designed with Pentax/ Praktica screw mount can be used with adaptor.

THE FOCAL PLANE SHUTTER has speeds from 1 sec. to 1/1000 sec. and B for time exposures. A self-timer is built in.

THE VIEWFINDER is of the pentaprism type with micro diaprism centre surrounded by a ground-glass area on fresnel field. The base of the viewfinder field shows the shutter speeds with speed indicator needle. The right side shows auto/manual setting, spot and average metering system, under- and over-exposure warning and apertures.

EXPOSURE METERING is by automatic control with sensitive CdS cell providing average or spot 6% centre reading. The light is measured at the film plane. On setting the lens to AUTO (or green dot) the camera automatically selects correct exposure or the lens may be manually set to the aperture indicated in the viewfinder. The metering system also operates with Mamiya Sekor 42 mm. screw mount lenses (with adaptor). Preset lenses and other attachments can be used with the stop down exposure control. The film speed range is ASA 25 3200, DIN 15 to 36. The meter uses a 1.5 v silver oxide S-76 battery. A battery on/off switch and tester are built in. A built-in exposure hold control permits fixing the exposure for a chosen part of the subject while the camera position is changed.

The camera is flash synchronised. Two outlets (FP and X) are provided on the camera body and a X flash contact is built into the accessory show for cordless "hot shoe" use. Electronic flash can be used on speeds from 1 to 1/60 sec., focal plane bulbs on speeds 1 to 1/1000 sec., M and F flashbulbs at speeds 1 to 1/30 sec.

The camera back swings open (but is also removable) to insert the film. The film transport is by single- or multi-stroke thumb operated 150° rotation lever. The transport lever also contains the meter on/off switch. The film counter is progressive from S (start) to 36 with frames No. 20 and 36 indicated in red. The counter automatically resets itself to start on opening the camera back. A depth of field preview button is built in.

The right hand front corner of the body has a serrated rubber pad to facilitate non-slip easy grip of the camera.

FOR CLOSE-UP PHOTOGRAPHY below the minimum focusing range of 18 in. (0.45 m.) close-up lenses, extension tubes, bellows focusing devices, reversing adaptor, microscope adaptor, slide copier are available.

Other accessories include rubber eye cup with adaptor, correction lenses for wearers of glasses, filters, lens hood, angle finder, magnifier, copying stand and an extensive range of wide-angle and tele lenses. A motor drive can be added without modification to the camera.

Loading (See page 16)

1. **Open camera back by pulling up rewind knob.**
2. **Insert film.**
3. **Fix film to take-up spool.**
4. **Close camera** and take up film slack.
5. **Make two blind exposures** and wind for first exposure
6. **Set the film speed.**

Unloading (See page 20)

1. **Push in rewind button.**
2. **Rewind film.**
3. **Open camera back,** remove film.

Shooting (See page 18)

1. **Wind film transport.**
2. **Pre-set shutter speed.**
3. **Focus and determine picture area.**
4. **Set correct aperture** (see "exposure determination" below).
5. **Release the shutter gently.**

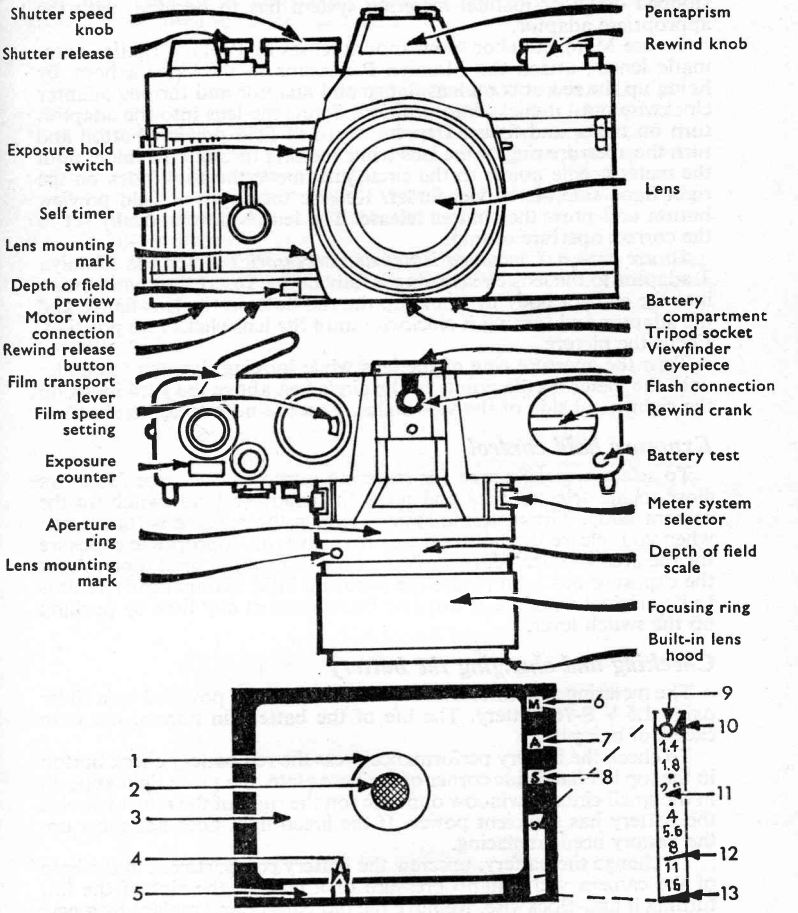
Transport Lever Lock

When the camera is not used, the transport lever should be in the locked position, fully back to the camera body. To lock the lever, depress the button on top of the centre of the transport lever axis. The lever, which acts also as meter switch, will retract inwards to the camera body to prevent accidental switching on of the meter. The meter lock is automatically released (the button pops up) when the film transport lever is actuated from its rest position.

Exposure determination

Set film speed (see page 16, No. 7), pre-select shutter speed (see page 18, No. 2), for average outdoor shots generally to 1/125 sec. For automatic operation set the lens aperture ring so that AUTO (or green dot) shows to the red index dot. Check in viewfinder that the exposure needle does not point into the red area. You can now release the shutter.

You have a choice of two systems under which to determine the exposure: spot or average, see page 40. To set for the required system move the selector switch on the camera body down to free the there engraved S for spot measuring or up for A, average reading. The letter S or A shows in a yellow square in the viewfinder as a reminder of the measuring system set.



Mamiya Sekor Auto XTL Finder: 1, Clear ground glass. 2, Microprism. 3, Fresnel screen. 4, Shutter speed indicator. 5, Shutter speed scale. 6, Manual indicator. 7, Average metering indicator. 8, Spot metering indicator. 9, Stopped-down metering index. 10, Under-exposure zone. 11, Aperture scale. 12, Meter needle. 13, Over-exposure zone.

Manual or Stopped–Down Metering

When using lenses other than the Mamiya Sekor ES lenses the stopped down or manual metering system has to be used, with the appropriate adaptor.

To use Mamiya Sekor screw mount lenses or Pentax/Praktica automatic lenses, attach the Mamiya P adaptor to the camera body by lining up the red dots on lens flange and adaptor and turning adaptor clockwise until it clicks into position. Screw the lens into the adaptor, turn on meter and focus. Depress depth of field preview button and turn the aperture ring of the lens while looking through the finder until the meter needle points to the circle just above the *f* 1.4 index on the right hand side of the viewfinder. Release the depth of field preview button and press the shutter release. The lens is automatically set to the correct aperture setting.

To use pre-set T mounted lenses and accessories attach the Mamiya T adaptor to the lens by screwing it fully home. Insert the combination into the camera body by lining up the red dots on the lens flange and the adaptor and turning it clockwise until the lens clicks into position. Focus the picture.

Turn the aperture ring of the lens while looking through the finder until the meter needle points to the circle just above the *f* 1.4 index on the right hand side of the viewfinder. You are now ready to shoot.

Exposure hold control

To select a specific area for metering purposes (see page 39) move close to the selected area and press the exposure hold switch on the camera body. The metering system retains the reading so taken and when you release the shutter the camera gives an appropriate exposure for the area so selected, regardless of the full subject area tones. After the exposure has been made, the exposure hold automatically returns to its original position. It can also be released at any time by pushing up the switch lever.

Checking and changing the battery

The metering system of the Auto XTL camera is powered by a silver oxide 1.5 V S-76 battery. The life of the battery in normal use is in excess of one year.

To check the battery performance press the red battery check button in the top left hand side corner of the base plate. If a green light appears in the small circular window opposite (on the right of the rewind knob), the battery has sufficient power. If the green light does not show up, the battery needs replacing.

To change the battery, unscrew the battery compartment in the base of the camera with thumb pressure or a coin in the slot of the lid, turning it anti-clockwise. Remove the old battery and replace by a new one. When inserting, make sure that the + sign on the battery points towards the lid, and close lid.

It is essential to keep both battery and its contacts free from fingermarks, perspiration, dust, etc., which can impair the function of the meter. The battery should be removed and stored in a dry place if the camera is not used for a long period.

Changing lenses

To remove the lens hold the camera body securely in one hand and press the lens release button on the front right hand side upwards. With the other hand grasp the lens and turn it anti-clockwise until the red dots on lens mount and camera body point to each other. Now pull the lens straight from the body.

To insert a lens line up the two red dots of lens and camera body, insert lens into lens flange and rotate the lens clockwise until it clicks audibly into position.

The Mamiya Sekor ES lenses designed for the Auto XTL camera range from 21 mm. *f* 4 to 800 mm. *f* 8, plus a 90–230 mm. *f* 4.5 zoom and a 60 mm. *f* 2.8 macro.

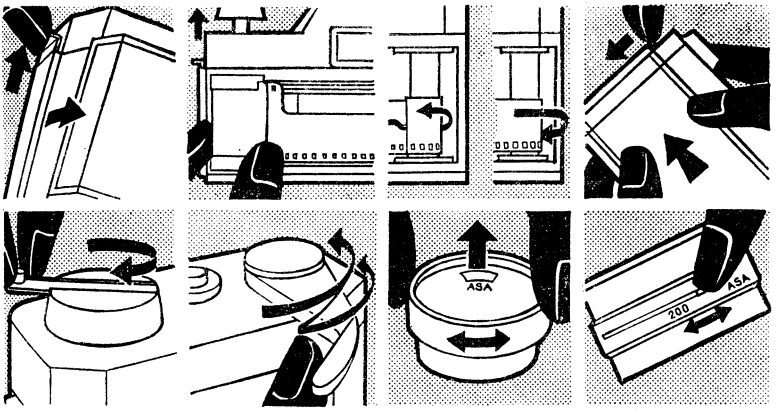
Special controls

SELF-TIMER. The Auto XTL camera has a built-in self-timer (delayed action), see also page 15. The timer is released by depressing the shutter release button. To obtain shorter delay times than about 8 seconds, the lever may be rotated to intermediate positions.

FLASH. The Mamiya Auto XTL is synchronised for flash bulbs and electronic flash, see page 45. The Auto XTL has in addition to the flash contacts on the camera body, a direct cordless "hot shoe" contact in the accessory shoe, which is X syncronised.

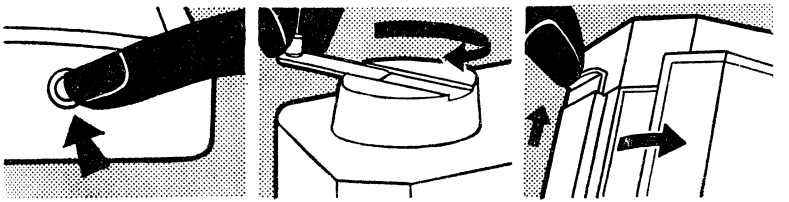
INFRA RED PHOTOGRAPHY. An infra red indicator is shown on the lens barrel, see page 15.

LOADING



Top, left to right: Open the camera back by releasing the back latch. Insert the cassette and take the film leader across to the take-up spool. Fix film to take-up spool by inserting its end into one of the slots. Note that in all models *except* the 528 TL, the film must pass *under* the take-up spool as it is transported, i.e. emulsion outward. Close the camera back by pressing downwards on the latch. *Bottom, left to right:* Turn the rewind crank to take up the film slack in the cassette. Operate the film transport lever and shutter release twice to dispose of leader and fogged film. Set the film speed.

UNLOADING



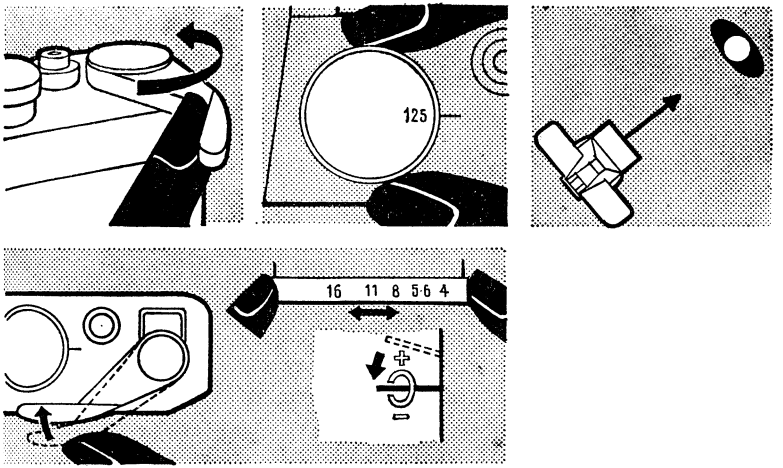
Press the rewind button inwards to disengage the sprocket drive. Operate the rewind crank until you feel the film leave the take-up spool. Open the camera back and remove the cassette.

ing it until the speed of the film used in ASA or DIN shows to the index in the cut out window. For model 528TL see green pages.

Shooting

Practise the following operations first with an empty camera until you can do them practically automatically.

1. **Work the film transport.** A single stroke of the advance lever transports the film and the film counter and tensions the shutter ready for the next exposure. The advance lever does not swing right back; it leaves a small gap that makes its handling easier. Only after having finished taking pictures should the lever be pushed fully towards the camera body by depressing the centre of the transport lever. This prevents accidental switching on the meter and facilitates carrying the camera and closing the ever-ready case.
2. **Set the shutter speed.** Shutter speeds can be set before or after the shutter has been wound. The speeds are on a single disc on the camera top plate. The speeds are engraved on the disc and the disc is turned by its rim until the speed required is opposite the black line. It has to click into position. The speed selector can be turned in either direction. The numbers represent fractions of seconds, e.g. 125 is 1/125 sec. When the selector is set to B the shutter remains open as long as the shutter release remains depressed. For long time exposures, a cable release with locking device can be used in conjunction with the B setting. Pressing the release and locking the cable while in the pressed down position, the shutter remains open until the cable release lock is undone.
3. **Focus** and determine the picture area to obtain a sharp picture and the view you want (see page 12).
4. **Set the aperture.** The aperture for the prevailing light conditions is measured and set with the built-in meter, see green pages.
5. **Release the shutter gently.**



Shooting with the Mamiya Sekor. *Top, left to right:* Transport the film by operating the film transport lever, which also tensions the shutter. Set the shutter speed. Point the camera to the subject, frame and focus the picture. *Bottom:* Press in the film transport lever to switch on the meter and turn the aperture ring until the meter needle is centred in the indicator mark. The shutter can then be released.

Unloading

After all exposures have been made, the film has to be rewound into its cassette before unloading it. The film counter automatically shows when all exposures have been used. Alternatively, when all film has been wound out of the cassette, some resistance is felt when attempting to wind on. In this position it is important not to try to force the lever on but bring it back to its original position. The partly transported lever can be returned by depressing the rewind button while at the same time moving the transport lever as far as it will go. Proceed as follows:

1. **Set for rewinding** by depressing the rewind button in the base of the camera. Once depressed it will stay in place. (The rewind button will return to its original position when the film transport lever is actuated.)
2. **Rewind the film.** Lift the rewind crank and turn it in a clockwise direction. After a time you feel a slight resistance which is caused by the film being pulled out from the take-up spool. The film is now rewound into its cassette.
3. **Open the camera back** (see Loading No. 1) or reload with a new film.

Cutting Off Exposed Lengths

If a film which is only partly exposed has to be processed, wind the transport lever for the next exposure and, in the darkroom or in complete darkness, open the camera and cut off with a pair of scissors the frame which lies in the film aperture. Retrim the remainder of the film, fix it again on the take-up spool, and close the camera.

It is ready for the next exposure. The self-setting exposure counter will count again from No. 0 on. Allowing for the loss of approximately three frames, a note has to be made of the number of exposures remaining.

The re-inserting can be done in daylight. In this case a

total of about five frames are lost, for, after inserting and closing, two blind exposures have to be made.

Some makes of colour film which are returned to the manufacturers for processing are for technical reasons only accepted in their full length and should, therefore, not be cut.

Intentional Double Exposures

If you have made one exposure and want to take a second one on the same piece of film, push in the rewind knob and rewind until you hear a click. Then wind on again by the transport lever, this brings the last exposed frame again into position to take the second exposure on it. As the exposure counter moves on you have to remember that you can take one more frame on the film than shown on the counter.

Changing Partly-exposed Films

To replace a partly-exposed film by another one, for instance if you want to take a few colour photographs in between some black-and-white shots, proceed as follows:

1. **Check the number of exposed frames** on the film counter.
2. **Rewind the film** but stop immediately you feel a slight resistance. This resistance comes from pulling the film end from the take-up spool. If the film is to be reloaded again, you must not pull the whole film into the cassette, otherwise the film end would have to be extracted by opening the cassette in the darkroom.
3. **Unload the re-wound film** and note the number of exposures taken on the beginning of the film. Now you can load the camera with any other type of film.

   When reloading, load the partly exposed film in the usual way, cover the lens with a lens cap (or hold some opaque material against the lens) and, where possible as additional precaution stop fully down and repeat winding and releasing until the film counter has advanced by the number of frames already exposed. To be on the safe side it is advisable to allow one more frame to pass. The rest of the film can now be exposed in the usual way.

Film Packings for the Mamiya Sekor

In addition to the films which come ready packed in cassettes for 36, 20 and in some instances 12 exposures, black-and-white and, more rarely, colour 35 mm. film is also available in various loose packings for loading into cassettes. This is a cheaper way of using film as you do not have to buy a new cassette every time with the film. The following packings are available.

DARKROOM REFILLS are lengths cut and trimmed for 36 exposures and have to be loaded into a cassette in total darkness (e.g. in a darkroom, a really well darkened room or a light-tight changing bag).

DAYLIGHT REFILLS are cut and trimmed lengths for 20 or 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 loading of a cassette in daylight.

BULK FILM is supplied in lengths of 18 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 total darkness. Working in total darkness for loading darkroom refills or bulk film is not difficult. It is, however, advisable to practise filling with a dummy film first in daylight before starting the darkroom work.

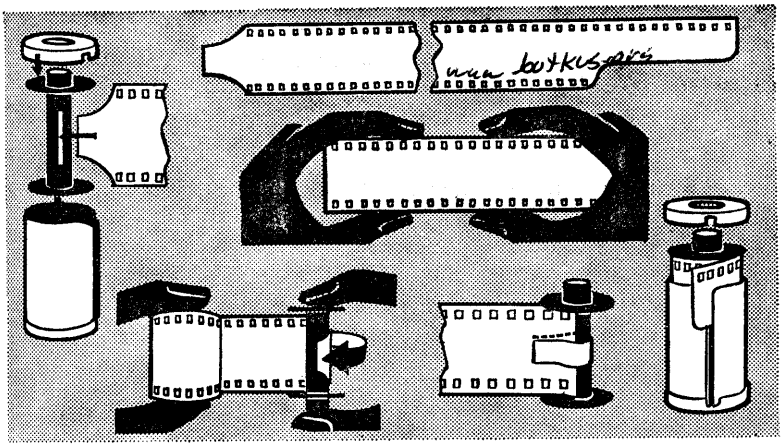
Handling, Winding and Trimming the Film

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 spot on which the loading is done should be perfectly dry, clean and dust free.

When using bulk film in loading cassettes, the edge of the work-bench can be marked with notches or drawing-pins to indicate various distances, let us say for 12, 24, 36 exposures of film. This considerably simplifies the measuring of film lengths in the darkroom.

The film ends need trimming. At the beginning of the roll

HANDLING, WINDING AND TRIMMING THE FILM



To load standard 35 mm. cassettes, trim the required length of film at each end or use ready-trimmed refills. Push end of film into cassette spool or attach with adhesive tape. Handling the film by its edges only, wind it on to the spool and insert spool in cassette, allowing an inch or two of leader to protrude. Replace cassette cap.

of film make either a straight or wedge-shaped cut for the centre spool of the cassette and measure off the required length of film (see table below).

At the end of this make the curved cut for the take-up spool. The curved cut should start between the fifth and sixth bottom perforation—when emulsion is towards you—and must not go through a perforation hole.

The ready-cut film is now spooled on the centre spool of the cartridge or cassette. While winding on, hold the film only by its edges.

Also, take care not to press too hard on the film, and don't squeeze the film-ends when drawing through the hand.

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	13⅛	34	15	33	84	28	52½	133
3	15	38	16	34¼	88	29	54	137
4	16¼	41	17	36¼	92	30	55½	141
5	17¾	45	18	37¾	96	31	57	145
6	19¼	49	19	39¼	100	32	58½	148
7	20¾	53	20	40½	103	33	60	152
8	22	56	21	42	107	34	61½	156
9	23¾	60	22	43¾	111	35	63	160
10	25¼	64	23	45	114	36	64½	164
11	26¾	68	24	46½	118	37	66	167
12	28½	72	25	48	122	38	67½	171
13	30	76	26	49½	126	Including trimming		

Failure to take the first precaution may result in fogging, while neglect of the latter precaution may give rise to peculiar kinds of exposure effects known as "lightning flashes". These are due to electrical discharges, and appear as dark, zigzag lines running from the edge of the film towards the centre of the picture.

Loading Standard Cassettes

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

Most cassettes are actually intended by their makers to be used once only, and with the film originally supplied in it. However, provided they are reasonably robustly made, and the light-trapping velvet slot is in good condition, these cassettes *can* be reloaded many times, and will give perfectly satisfactory results—*if handled carefully.*

Loading with Bulk Film or Darkroom Refills

Work in total darkness and prepare the film as described (page 22).

1. **Open the cassette.**
2. **Fix the film to the centre spool.** 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 cellulose tape round the centre spool, so that on either side about ½ in. tape is used to secure the film.
3. **Wind the film on the centre spool.**
4. **Insert the centre spool into shell,** leaving the first 2 in. of film protruding through the light-trap.
5. **Close the cassette.** Where top and bottom are originally fastened by the outside label, fix the top and bottom cover to the shell, preferably with a length of cellulose tape.

Loading with Daylight Refills

No darkroom is necessary, but work in subdued daylight or artificial light.

1. **Remove film wrapping and label from refill.**
2. **Open the cassette.**
3. **Introduce the refill into shell of the cassette,** leaving the first 2 in. of paper-leader protruding through light-trap. The actual centre spool of the cassette is not needed.
4. **Close the cassette.**
5. **Pull out the paper-leader and 2 in. of film.**
6. **Cut off the paper-leader.** Where top and bottom are originally fastened by the outside label, fix the top or bottom cover to the shell, preferably with a length of cellulose tape.

FILMS AND FILTERS

There are two kinds of films available for the Mamiya Sekor camera: black-and-white and colour.

Black-and-White Film

This produces a negative on which the colours and brightness range of the subject are translated into black and white. From it, prints or enlargements on paper or black-and-white transparencies can be made.

The black-and-white film used normally is panchromatic, i.e. it is sensitive to all colours. There is a choice of several types differing mainly in sensitivity as well as certain other characteristics.

SLOW FILMS are of low sensitivity requiring comparatively long exposure. Their main advantage is the extremely fine grain, permitting a high degree of enlargement without its granular structure becoming unpleasantly visible. Such films also yield images of the greatest sharpness. On the other hand, these slow films are not very suitable for coping with fast movement in other than exceptionally good lighting, nor for general work in poor light. Such films are rated at 40–80 ASA or 17–20 DIN.

MEDIUM SPEED FILMS still yield a reasonably fine grain with good gradation. They are the most suitable material for all-round photography, other than in poor light. These films are rated at 80–100 ASA or 20–23 DIN.

FAST FILMS with somewhat coarser grain (still acceptable for reasonable degrees of enlargement) will cope with most light conditions including poor light and interiors in favourable conditions. This is the right film for the photographer who wants to be prepared for the unusual, to arrest fast movement with high shutter speeds, as well as shots in poor light. The ratings are 200–400 ASA or 24–27 DIN.

ULTRA FAST FILMS are primarily intended for high-speed sports shots in dull weather, interior snapshots in poor light, night photography and ill-lit stage pictures. These films are specialist types for conditions where normal

materials are totally inadequate. They should not be used for general photography.

The high speed is achieved at some cost in definition and graininess. Speed ratings range from 500–1600 ASA or 28–33 DIN.

The above speed figures are based on the latest ASA Standard for film speeds (and on the BS and DIN Standards under revision). These figures, when used on the exposure meter, give minimum correct exposures, to make the most of the versatility of the film and of the image quality. They are also the figures quoted by most film manufacturers. Sometimes films are, however, still rated according to earlier standards which in effect incorporated a generous safety factor against underexposure—by the simple process of over-exposing films about 100 per cent (well within the exposure latitude of most black-and-white films). So you may come across films apparently only half as fast as others of similar type, because of this difference in ratings. The table on pages 65, 68 indicates the current film speeds to be used with the exposure meter, even if the film packing gives a lower rating.

This applies to *black-and-white negative* materials only; speed rating methods have not changed for colour films.

There is a wide range of different makes of film, in all speeds, on the market. Their characteristics, apart from speed, vary slightly from make to make. It is safe to say that all wellknown brands are reliable and good. The best film is the one you are used to.

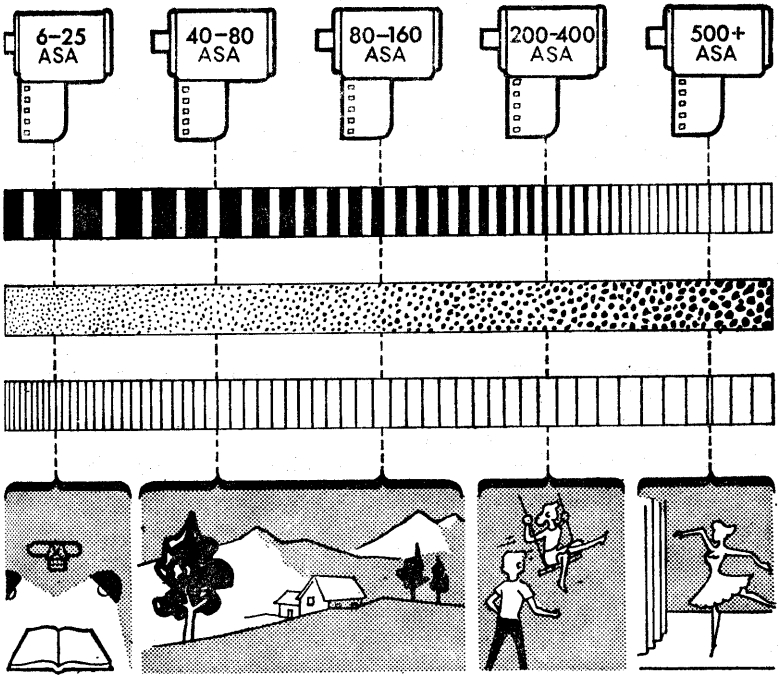
Professional photographers and advanced amateurs may find one or the other characteristics of a particular make, i.e. its gradation, granular structure, acutance, etc., of particular value for specific jobs.

Colour Film

These films produce an image in colour after appropriate processing, corresponding directly or indirectly to the natural colours of the subject.

Colour film is as easy to use as black-and-white film, but needs a little more care in exposure.

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. As the speed grows (*from left to right*) films decrease in contrast, while the graininess increases. As the speed grows, the acutance and resolution also tend to drop (i.e. the degree to which the film can sharply reproduce very fine detail). The bottom row indicates the types of subjects for which films of the various speeds are best.

Processing is more complex and is often carried out by the film maker or specially appointed processing laboratories.

There are two basic types of colour film: reversal and negative.

Colour Reversal Film

This film is also referred to as Colour Slide film. It produces a colour transparency on the actual film exposed in the camera. This transparency, when held up to the light, shows a positive image with all parts of the subject in their original colours. It can be viewed in a suitable transparency viewer with a magnifier, or it can be projected in a slide projector to give a large and brilliant picture on a screen.

Although the colour transparency is an end product, it can still be used to make:

(*a*) duplicate positive colour transparencies;
(*b*) a black-and-white negative which can then be used to produce black-and-white prints or enlargements;
(*c*) a colour negative for making colour prints and enlargements, as from colour negative film (described below);
(*d*) direct colour enlargements on colour reversal paper.

For correct colour rendering, colour reversal films have to be carefully matched to the light by which they are to be exposed. Accordingly, some makes are available in the following types:

(*a*) daylight colour film, which will give correct colour reproduction in daylight, with blue-tinted flash bulbs and electronic flash;
(*b*) artificial light type colour film, which will give correct rendering by photoflood illumination, or high-power tungsten light.

Colour reversal films made for one kind of light may be used under different light conditions with the aid of a conversion filter recommended by the manufacturer.

Different makes of colour film may yield transparencies of a slightly different characteristic colour quality, colour saturation and colour contrast. Which you prefer is very much a matter of personal taste, and you can only be recommended to try various makes to find the one which suits you best.

Colour Negative Film

This film is also referred to as Colour Print film. On processing, it produces a colour negative which shows a negative image of the subject in its complementary colours, e.g. blue appears yellow, red appears blue-green and so on.

These colours may sometimes be hidden under an overall orange or reddish tint.

The main purpose of the colour negative is the production of colour prints on paper. The quality is generally somewhat higher than that obtained from a positive transparency.

From the colour negatives you can make:

(*a*) any number of colour prints in varying sizes,
(*b*) direct black-and-white prints or enlargements, in the same way as from a black-and-white negative.
(*c*) positive colour transparencies for viewing or projection.

Colour negative films are suitable for exposure by any type of light, e.g. daylight, flash or photofloods. The necessary adjustment of the colour rendering is carried out during the printing stage. Manufacturers sometimes recommend conversion filters even with colour negative films. These mainly serve to simplify the subsequent correction needed in printing.

Colour Film Speeds

The majority of colour films, reversal and negative, are rated between 25 and 80 ASA or 15 and 20 DIN, corresponding to a slow to medium speed for black-and-white material. There are also reversal colour films of 100–500 ASA for poor light conditions.

As with black-and-white films, the slower types tend to yield improved image detail, especially with negative colour

film, while the fastest emulsions may show slightly reduced colour saturation and image sharpness.

The Choice of Colour Film

Making your choice between colour reversal or negative film (in spite of the various uses that can be made of either type of material) remains an individual question.

First, there is the way you want to see the result, as a colour print or as a colour transparency. The print has no doubt much to commend itself. It is easily shown, stored and carried about. The transparency calls for the aid of a viewer or projector.

Next, the all-in cost of a colour print is about three times that of the transparency. This may at times be mitigated by the fact that from unsuitable negatives no colour prints need or can be made. The transparency user, however, has additional outlay in the form of a viewer or projector with screen (in most cases both).

A final point to consider is the quality. The transparency will record each colour and its brilliance in full. Held to the light or projected on a screen, the brightness range, which may be 100 : 1, is fully or almost fully retained. It shows colours brilliant with great depth and realism. The colour print can at its best only reflect four-fifths of the light falling on it and even the darkest tones reflect about one-twentieth to one-tenth, so that the full range is no more than 16 : 1. While the colour print is, by necessity, duller than the transparency, it is only fair to say that the eye soon adjusts itself to the reduced brightness range, and subjects without great contrasts will be very satisfying.

From the point of view of convenience, reversal film has the advantage that it directly gives finished colour pictures of high quality and is still capable of producing colour prints as well. For the maximum versatility and control in print making, however, negative film is superior.

Filters for Black-and-White Film

By its nature, a black-and-white film can only translate colour values of the subject into tones of lighter or darker

grey. Mostly these correspond fairly closely to the *brightness* of the colours, but do not of course differentiate between them. In certain cases the difference between the brightness of two colours may be so slight, that both record in almost the same tone of grey.

There a filter helps by modifying the depth of one or the other colour, and so making it show up lighter or darker than it would normally.

The commonest example is the blue sky with white clouds in a landscape. The blue is so brilliant (and the film is often excessively sensitive to it), that the clouds do not show up against it. By putting a yellow filter in front of the camera lens we can subdue or "hold back" the blue, and so make it record darker in the final print.

We can even go further and over-emphasize the effect progressively with an orange or red filter; these darken the blue so much that the sky looks almost black for a really dramatic effect.

The same considerations hold for other filter effects. For instance, the film renders a red rose in the same tone of grey as the leaves of the rose bush. With the colour contrast gone, the rose disappears in its surroundings. A green filter makes the rose darker and the leaves lighter; conversely, a red filter will show up the rose as light against dark foliage. Scientifically, both filters falsify the tone rendering, but produce a more acceptable pictorial result.

In all these cases a filter *lightens objects of its own colour, and darkens objects of its complementary colour*. Apart from isolated instances in pictorial photography, such contrast control is very valuable in copying and scientific work.

All filters cut out some part of the light and thus, as a compensation, an increase in exposure time is necessary when using them. This is stated on most filters in the form of a filter factor indicating by how much (e.g. 2 times, 3 times) the exposure must be increased with that filter. The factors are approximate for they depend not only on the nature of the filter but also on the exact colour sensitivity of the film and on the colour of the prevailing light. The

meter of the Mamiya Sekor automatically allows for the factor of any filter placed over the lens.

Filters for Colour Film

The normal yellow, orange and other filters for black-and-white film must never be used with colour films, as they would give the colour picture a strong over-all colour tint.

In daylight and with daylight type film, only two filters are ever required. One is a haze filter, almost colourless but for a slight straw tinge. It is usefully employed on hazy days and in high altitudes to avoid excessive bluishness of the colour picture, especially with distant landscapes, seascapes and near water. This filter does not call for any change in exposure. On dull days, a skylight filter compensates for the excessive coldness of the colour rendering.

Either filter is also useful for colour photography with electronic flash, as it produces somewhat warmer tones.

CONVERSION FILTERS are used if a colour film, balanced for one type of light, should be used in another type of light. The film manufacturers give specific recommendations, generally in the instructions with the film.

Table of filters suitable for black-and-white and colour photography is on page 69.

The 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. Thus 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 sometimes be overcome by the use of the polarizing screen.

It has the special property of suppressing so-called "polarized" light. Light reflections from glass, china, enamel, polished wooden surfaces, water, are to a large extent polarized and can, therefore, be almost extinguished by placing the polarizing filter in the proper position over the

lens. This screen will prove particularly useful when taking shop-windows, furniture, photography of wet objects, etc. provided the shot can be taken at an angle of about 35° to the plane of the subject containing the reflection. At other angles, reflection can be reduced but may still be plainly visible.

The Mamiya Sekor is ideal for judging the actual effect. The filter is placed in front of the lens, and then by slowly rotating the filter one can find the best or desired result on the reflex-focusing screen. As the polarizing filter is slightly tinted, the exposure time should be increased, the factor being about three times. The meter of the Mamiya Sekor automatically allows for this.

The 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.

EXPOSURE

Exposure means—to expose the film in your camera to light. The dose of light any film needs to produce the right sort of image depends on how sensitive that film is to light. A fast film is more sensitive than a slow film.

Once your choice of film is settled, the basic condition of exposure is settled with it. You are now left with the problem of scaling the light you find in front of your camera to the amount your film needs.

Your job is to judge the light reflected from the subject you are about to photograph. Your grandfather, as an amateur photographer, used to take into account his geographical position, the time of the year, the hour of the day, the state of the sky as well as the tone of the subject itself, and by so adding one thing to another size up the light reflected from the subject. The experienced professional, of course, hardly ever worked that way. He just had a look and he knew.

Today a light meter or exposure meter does the same for any photographer. It takes a look, it measures the light and it lets you know.

In fact, it does more than that. It translates the light measured straight into terms of photographic exposure. It does so by presenting you with the choice of aperture numbers and shutter speeds, sorting them out in pairs.

Aperture and Speed

The aperture number or *f*-stop controls the *amount of light* allowed to enter through the lens. These numbers run in a series: 2–2.8–4–5.6–8–11–16; each higher stop number lets through half the light of the next lower number (next larger stop).

The shutter speed controls the *length of time* for which the lens is kept open to light. Shutter speed figures represent fractions of a second: 2=$\frac{1}{2}$ sec., 4=$\frac{1}{4}$ sec. . . . 500=1/500 sec.

The actual exposure is a product of these two: "how

much" and "how long". A large amount of light striking the film for a short time may produce an image similar to that produced by a small amount of light striking the film for a long time. Hence the free choice from a series of balanced aperture-shutter combinations offered by your exposure meter: more or less open apertures paired with more or less quick shutter speeds and more or less stopped down apertures paired with more or less slow shutter speeds.

Choosing the Combination

Even though the built-in meter measures for you the correct exposure you still have one decision to face: which aperture-shutter combination to choose for any given shot. Paradoxically enough they all are right and yet one is better than the other.

Why should it be so?

Because both the aperture and the shutter also have secondary functions and effects.

The aperture not only controls the amount of light that is allowed to pass the lens—it also has a bearing on how much of the image will be sharp.

The shutter, in controlling the length of time for which the light strikes the film, will inevitably record any movement during that time as a slight or greater blur.

So you are left with three things to think of:

How fast is the action you want to catch?

How much of the scene in front of the lens has to be sharp?

Is the light good enough for either?

If there is fast action you have to choose and pre-set an appropriately fast shutter speed and then pair it with the stop which is right by your meter.

If the scene is to be sharp from a point close to the lens to some other point well away from it, you should choose the stop that will yield the necessary depth of field and then pair it with the shutter speed agreed by your meter for correct exposure.

If the light is very poor, the chances are that you may not

be able to cope with either extremely fast or particularly deep subjects.

Yet your choice in putting shutter speed or depth of field first should still be governed by what you value most about the picture you propose to take.

Exposure nowadays is no problem at all. But to hit it off in such a way that it will produce the picture *you* want is still a matter of intelligent judgment.

Time Exposures

When the light is very weak, especially when you have to use a small stop, even the slowest shutter speed of 1 sec. may be too short. In that case, you need time exposures. Set the shutter to B and press the release button. The shutter now remains open for any length of time until you let go of the release button.

For such time exposures, the camera must be mounted on a firm support such as a tripod. It is safest to release the shutter with the help of a cable release to avoid shaking the camera. This screws into the release button.

For long time exposures, where the shutter is to remain open for longer than you can conveniently keep the release depressed, use a cable release with a lock. To make the exposure set the shutter to B, press the cable release plunger with the locking plate lifted. The shutter will now remain open until the locking plate is depressed. On cable releases with locking screws, tighten the screw on pressing the plunger and undo the screw to close shutter.

Using an Exposure Meter

To get the best results an exposure meter has to be used intelligently. This may look like a contradiction, since we have already said that it is an accurate light measuring instrument. But light from all parts of the subject—highlights, shadows and middle tones—falls on the meter, so the reading it gives us is an average one for the whole subject area.

Meters are scaled to suit typically average subjects—i.e.,

subjects with more or less equal 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 using a meter than just pointing it at the subject and accepting without question the reading indicated.

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

For some subjects you can take a reading from really close up, aiming the meter at the part of the subject that you want to make sure has optimum exposure. For instance, many photographers take a close-up reading of the sitter's face in portraiture; out-of-doors you can take the reading from 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 on which the light falls from the same direction and take a reading from that.

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

Using the Mamiya Sekor Meter

After having examined above how to use exposure meters in general, the advantage of using the metering system of the Mamiya Sekor becomes evident. These cameras employ a spot meter, measuring in the case of the TL models only 10 per cent of the screen area and with the DTL only 6 per cent. This means that pointing the metering field to the subject area where correct exposure is required (such as in strong side light, against the light or a subject which itself is in the shade while the rest of the picture area covers a bright sky) eliminates the effect of strong light from other parts of the subject.

With the TL models you select a section of average light in a straightforward and reasonably illuminated subject for average light exposure. The DTL uses a CdS cell behind the mirror for spot reading and in addition you are able to set the meter to average light when two CdS cells, one on either side of the viewfinder eyepiece, measure the light of the whole scene, combining out the measurements to give one

"average" result. For the method of using the meter see green pages.

Shutter Speeds and Movement

The actual shutter speed you need within a series of available aperture-speed combinations is governed by considerations of camera steadiness as well as of subject movement.

An unsteady camera hold results in camera shake, to which a small and light instrument such as the Mamiya Sekor is particularly liable. Even the slightest shake will result in inferior definition of the image. Practical experience goes to show that 1/125 sec. is safe, while you have to hold the camera particularly steady when using 1/60 or 1/30 sec. Where lighting conditions make even longer exposure times essential and there is no subject movement, either support the camera on a tripod, or look round for extra support for your elbows and hands—e.g. a wall, railing, etc.

The shutter speed required to arrest movement depends of course primarily on the speed with which the subject moves. Remember, however, that parts of the subject (e.g. the legs of a runner) may move faster than the subject as a whole; you may sometimes have to compromise and show such parts slightly unsharp. Often that is not a serious fault, as slight blurring—provided the main part of the subject is sharp—helps to emphasize the impression of movement. Other factors to consider are the distance of the subject—the farther away, the less noticeable the movement blur; the focal length of the lens—a long-focus lens in effect brings the subject nearer; and the direction of the movement. Objects moving across your field of view blur more than if they are approaching or receding.

Aperture and Depth of Field

When you focus the Mamiya Sekor on a given object, the image of that object will be really sharp on the film. Things nearer or farther away will be gradually less and less sharp,

until they are noticeably blurred. The range of distances over which objects are still acceptably sharp, before you do notice the loss of definition, is known as the depth of field.

You can control the extent of this sharp zone by the lens aperture. As you stop down the lens, the zone of sharpness grows in both directions; as you open up the lens, its depth decreases.

You can obtain the actual zone of sharpness at various apertures and distances from tables, but in practice, the most convenient way is to use the depth of field indicator on each lens.

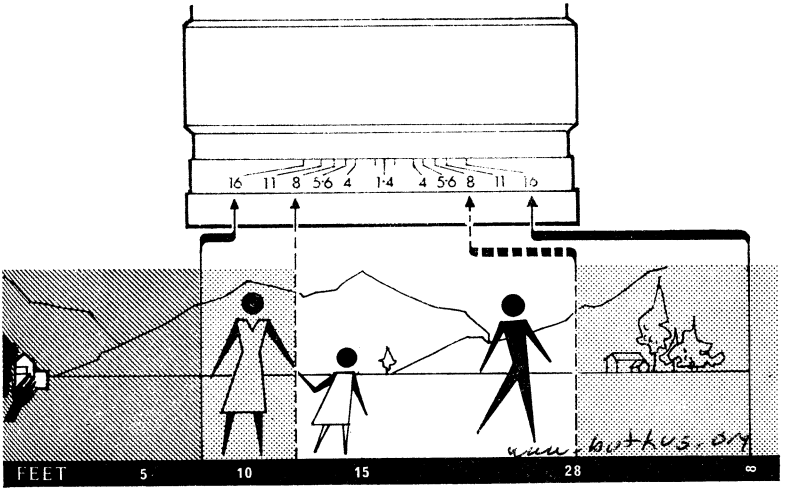
This is a special scale marked in aperture numbers opposite the distance scale. There are two sets of such marks from the largest stop (*f* 1.4, or *f* 1.8) to the smallest (*f* 16) on each side of the focusing index (the mark that indicates the distance to which you have set the lens).

At any distance setting, the distance figures opposite each pair of aperture numbers on the depth of field scale give the near and far limits of sharpness. For example, at 10 ft. you may find the two stop values 8 on the scale (*f* 8) opposite about 8 and 14 ft.—so you have a sharp zone from 8 to 14 ft. At *f* 4, the distances opposite the stop values 4 may be 9 and 12 ft. respectively; at *f* 16 you might get a sharp zone from 6 ft. to 30 ft. You will also notice that the depth of field is greater at far distances than near ones.

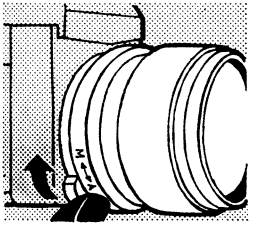
Two more points on depth of field:

Firstly, the depth obtained depends also on the focal length of the lens. Short focus lenses yield more depth and tele lenses less depth.

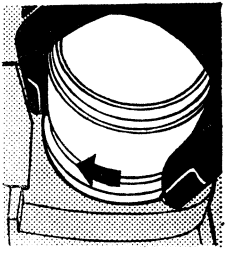
Secondly, the sharp zones obtained by the indicator are based on a somewhat arbitrary assumption of how much blurring is acceptable. So depth of field data for different cameras with the same lens may not always agree, and you are also quite safe in rounding off figures obtained from such data. To make really big enlargements from your negatives, you can use stricter standards of sharpness by stopping down further. (For previewing of depth of field on lenses with automatic diaphragm, see p. 14).



Mamiya Sekor lenses have a depth of field scale engraved on the lens barrel behind the focusing ring. It has lines pointing to the distance scale from a set of aperture numbers each side of the focusing mark. Each pair of lines from the same aperture number indicates the nearest and farthest planes of sharp focus at that aperture. Thus, with a standard lens set to 15 ft., the depth of field extends from 8½ ft. to infinity at *f* 16 or, at *f* 8, from 12 ft. to 28 ft.



The Mamiya Sekor cameras are fitted with a manual-auto lever on the lens mount. The diaphragm closes down to the pre-set aperture when the lever is moved to M so that the effect of the shooting aperture on depth of field can be seen on the focusing screen.



Lenses are changed except on the 528 TL, by unscrewing from the mount. The exposure meter must be switched off during this operation.

Zone Focusing

With action subjects and similar occasions where you want to shoot quickly, determining sharp zones even with the depth of field indicator wastes too much time. There you need prepared settings covering given near and medium distance ranges that you can easily memorize and set on the camera. The focusing zone table (page 63) gives such settings; then you only have to worry about keeping the subject within that zone while you shoot.

With landscapes and views, you sometimes need depth from infinity to the nearest possible point. Thus, by stopping down to *f* 8 and focusing on 25 ft. you get a really extended zone from infinity down to about 13 ft. But don't use this "hyperfocal distance" setting for maximum sharpness in the far distance; in that case focus on infinity (∞).

FLASH WITH THE MAMIYA SEKOR

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

Flash Bulbs

The flash bulb is similar to a minute 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 and 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. Most flash guns incorporate a capacitor unit which increases the reliability of firing, even when the battery is nearly exhausted. The shutter speed, provided it is slower than 1/30 sec., has no effect on exposure since the flash is shorter than the exposure time. Due to the fact that focal plane shutters travel across the film and do not expose it all simultaneously except at certain speeds, the special instructions on page 46 have to be followed.

Popular size flash bulbs are now being made only in the blue-tinted variety. These can be used for black-and-white or colour (negative or reversal) photography, either as the sole light source or as fill-in lighting by daylight. Clear glass bulbs used to be recommended for negative colour films but this is no longer the case.

Electronic Flash

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 somewhat bigger and heavier than the flash bulb outfit, its comparative light output equals an 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 1/2000 sec.) and will arrest the fastest movements. The cost of an individual exposure is negligible.

Electronic flash is universally suitable for black-and-white, negative colour and also for daylight type reversal colour films. It can be used for fill-in lighting by daylight.

Mamiya Sekor Flash Synchronization

The Mamiya Sekor cameras have two standard 3 mm. coaxial flash terminals on the camera body accepting any regular flash unit. One contact is marked X, the other one FP. The Mamiya 528 has one contact only.

The flash gun can be connected to the camera body by an accessory shoe or a flash bracket.

The shutter speeds usable with flash are:

With Mamiya Sekor DTL, 500, 1000 *and TL*500, 1000

Electronic flash:	X contact for speeds 1/60 to 1 sec.
FP bulbs:	FP contact for speeds 1/1000 to 1/60 sec.
	X contact for speeds 1/30 to 1 sec.
M class bulbs:	FP contact for speeds 1/30 to 1 sec.
	X contact for speeds 1/15 to 1 sec.

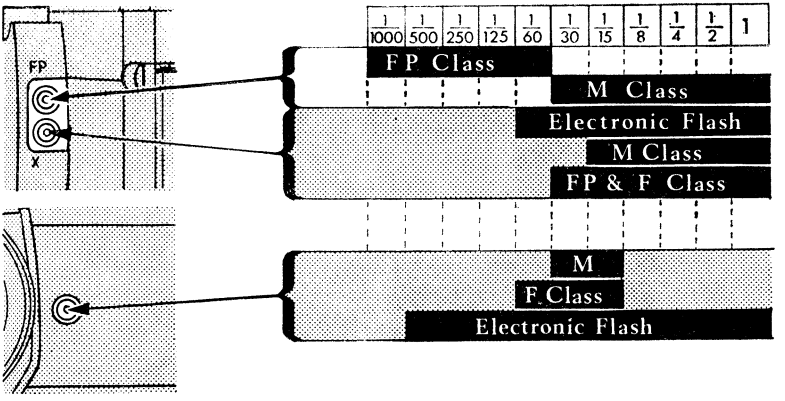
*With Mamiya Sekor TL*528

Electronic flash for all speeds 1/500 to 1/15 sec.
M class bulbs for speeds 1/30, 1/15 sec.

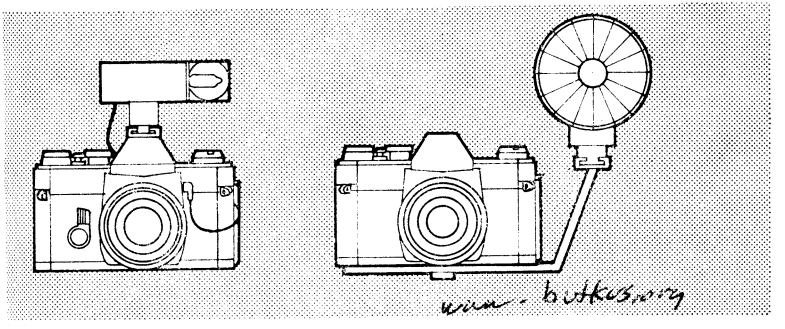
Exposure Guide Numbers

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 by



All models except the 528 TL have FP and X flash contacts for synchronisation of bulbs and electronic flash. The shutter speeds and settings that can be used are shown diagrammatically above. The 528 TL contacts are both of the X type for electronic flash at all speeds and bulbs only at the slower speeds.



The flash gun can be connected to the camera with the aid of an accessory shoe fitting (*left*) or with the aid of a flash bracket (*right*). The latter is generally preferable so that the flash is not dead in line with the lens.

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 1/60 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 even 1/500 sec. but use them only in accordance with the details above, otherwise you get an image on part of the frame only or no image at all. 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.

Synchro-Sunlight

If you want to use flash in conjunction with daylight, e.g. to lighten deep shadows, the exposure time is taken for the sunlit side of the subject and the aperture used according to this reading. Now take the flash guide number for the shutter speed preselected, increased by half and divide it by the aperture to be used. The result is the flash-to-subject distance for a normal fill-in light. With daylight colour film, use only blue flash bulbs or electronic flash.

Example: Exposure meter reading at 1/30 sec.—*f* 16.
Guide number for the flash at 1/30 sec.—120.
The guide number increased by half is 180. Divide 180 by 16—11.

That means that the flashgun should be 11 ft. from the subject. It is advisable to use an extension cable between camera and flashgun. This enables you to place the flash farther away from or closer to the subject than the camera.

USING ALTERNATIVE LENSES

The field of view covered by the standard lens is ideal for the majority of subjects. Occasionally, however, a greater or reduced field of view has distinct advantages. There are also advantages in using lenses specially designed for certain types of work. There are several such specialized lenses for the Mamiya Sekor, which provides facilities for swift interchange of lenses.

The Model 528 has a fixed lens to which a wide angle and a tele converter can be added.

Wide Angle Lens

A wide angle lens is a lens of shorter focal length. It sees and reproduces more of the subject in front of the camera than does the standard lens.

Such a wide angle lens has definite advantages in cases where the practicable distance between camera and subject is limited and the standard lens cannot record the whole of the subject. The wide angle lens is, therefore, primarily used 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. It can, therefore, be employed with advantage as a quick-shooting lens for general purposes where accurate focusing or distance-setting would be inconvenient (e.g. through insufficient time).

To get a large image, even of a near subject, you have to go really close to it. Near objects then tend to dwarf more distant ones, and the resulting picture shows pronounced perspective effects. In this way, the wide angle lens can be used to emphasize perspective.

Wide angle lenses made for the Mamiya Sekor cameras are listed in the lens table on page 53.

Telephotography

A tele lens on the other hand has a smaller angle of view than the standard lens. It is of longer focal length, and repro-

duces less of the subject in front of the camera than the standard lens does, but on a larger scale.

Such a lens is particularly suitable for subjects that are difficult to approach closely, such as animals, 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 and subdued perspective.

At the same time, its lesser depth of field concentrates definition on the portrait, avoiding a sharp background which would detract from the main object.

Long focus lenses made for the Mamiya Sekor cameras are listed in the lens table on page 54.

Zoom Lenses

A zoom lens is so constructed that its focal length is infinitely variable within stated limits. It does away with the necessity for changing the lens when a different focal length is required and facilitates exact framing of the subject. Once focused, the zoom lenses remain in sharp focus at all settings of the zoom control. Both zooming and focusing are one-handed operations.

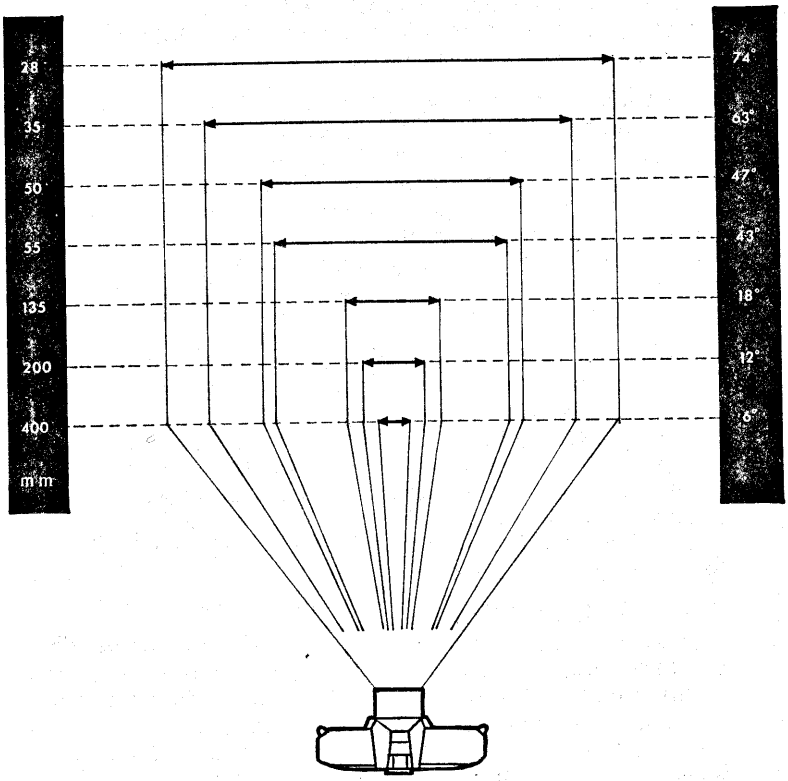
The zoom lens does not, however, entirely outmode lenses of a fixed focal length because its definition, covering power, contrast and flatness of field, while good, does not usually reach that of the fixed focal length lenses. Furthermore, the zoom lens is bulky, heavy and costly, and generally of a less wide maximum aperture than fixed focal length lenses.

While there is no zoom lens in the Mamiya Sekor range, there are numerous makes on the market with the standard Praktica/Pentax thread which will suit the Mamiya Sekor.

Alternative Standard Lenses

The standard lenses differ mainly in their maximum apertures. The table on page 55 gives full details of lenses specially designed for the Mamiya Sekor cameras.

Other makes of lenses can be used on the Mamiya Sekor



Lenses available for the Mamiya Sekor cover the range of focal lengths from 28 mm. to 400 mm. with angles of view from 74° to 6°. The arrowed lines above compare the angles of view (*right*) for each focal length (*left*).

cameras as it has the standard Praktica-Pentax thread. There are literally hundreds of lenses: wide angle, tele, zoom, macro, etc., on the market to choose from, with or without automatic coupling of the aperture.

Lens Changing

To remove a lens, simply unscrew it from the body. To insert a lens, screw it into the lens aperture of the camera body until it comes to a definite stop without using force.

The meter of the camera must be switched off when changing lenses (see green page 6).

Lenses which automatically couple internally with the preselector mechanism *must* have the protruding coupling pin protected from damage by use of a rear lens cover.

Focusing and Depth of Field

Focusing with a wide angle or telephoto lens is the same as when using a standard lens. The reflex screen enables the image to be focused accurately. At the same time, the reflex screen shows the exact field of view of the particular lens used. There is no parallax error, nor are supplementary finders required.

The alternative lenses have their own depth of field indicator. This works in the same way as with the standard lens.

Aperture Control Systems

Most Mamiya Sekor lenses are fitted with the automatic aperture, a design which closes the diaphragm automatically to the preselected aperture when the shutter release is depressed. The diaphragm automatically reopens immediately after the shutter has been released. Consequently the finder image is at its maximum brightness at all times except during the actual exposure.

There are a few Mamiya lenses which are non-automatic and which have a pre-set aperture setting (see table, page 55).

Depth of Field Preview

With the automatic aperture lenses, the resulting depth of field when stopped down can be previewed on the reflex

screen by setting the lens to the actual aperture to be used by turning the manual-automatic control on the lower part of the lens mount to "M". After observation, return it to "A" for conventional automatic aperture operation.

Mamiya Sekor Lenses

A range of lenses of high mechanical and optical standard is made for the Mamiya Sekor cameras. The table on page 55 shows their focal length and mechanical data. The meter of the camera *must* be switched off when changing lenses, see green page 6.

Standard Lenses

MAMIYA 55 mm. *f* 1.4, a seven element lens, focusing down to $1\frac{3}{4}$ ft. This is the fastest lens in the range, suitable for all general work and in addition for pictures in very poor available light.

MAMIYA 55 mm. *f* 1.8, a six element lens, focusing down to $1\frac{3}{4}$ ft. This is the standard fast lens for all general work including poor available light.

MAMIYA 50 mm. *f* 2, a six element lens, focusing down to $1\frac{3}{4}$ ft. This is the standard fast lens for all general work.

MAMIYA 50 mm. *f* 2.8, a four element lens, focusing down to $1\frac{1}{2}$ ft. This is the standard lens covering the average amateur photographer's needs.

Wide Angle Lenses

MAMIYA 28 mm. *f* 2.8, a seven element lens, focusing down to $1\frac{1}{2}$ ft. The extra wide angle of 74° is useful for indoor architecture, narrow streets, and to show wide expanses.

MAMIYA 35 mm. *f* 2.8, a six element lens, focusing down to 2 ft. The general wide angle of 63° is useful for semi-confined spaces while the great depth of field of this short focal length makes the lens an ideal "snapshot" type.

Converter Lenses for Mamiya Sekor 528 TL

These lenses are simply screwed on to the front of the camera lens.

The telephoto combined with the standard lens becomes a

62 mm. *f* 2.8 unit covering an angle of view of 38½° and giving a magnification of 1.25 as compared with the unaided standard lens. Its enhanced focal length tends to give better perspective in addition to the slightly bigger image size.

The wide angle combined with the standard lens becomes a 35 mm. *f* 2.8 unit, covering an angle of view of 63½°. This increase in angle is of value in confined spaces, indoors, narrow streets, etc.

Focusing is no different from that with the normal lens. However, the distance figures on the camera's distance scale become incorrect. This is only of interest if you want to know the actual distance at which you work with the converter. It can be ascertained by multiplying the scale figure by 1.38 in case of the tele, and 0.52 in case of the wide angle converter. The distance scale of the camera becomes in feet:

Distance on camera (feet)	∞	30	15	7	5	4	3
Actual distance with tele	∞	41	21	9.7	6.9	5.5	4.1
" " " wide angle	∞	15.6	7.8	3.6	2.6	2.1	1.6

Filters, 58 mm. screw-in type, should be mounted on the front of the converter. Using a filter on the standard lens would produce an image cut off with the converters.

The image at full aperture is soft and becomes sharper on stopping down to regain full crisp definition from *f* 5.6 on.

Telephoto Lenses

MAMIYA 135 mm. *f* 2.8, a six element lens, focusing down to 6 ft., with a most useful narrow angle of 18° for taking architectural details, shooting children from a reasonable distance, and improving perspective in portraits as well as isolating the subject from its background.

MAMIYA 135 mm. *f* 3.5, a four element lens, focusing down to 6 ft., of similar application to the 135 mm. *f* 2.8 but less suitable for poor light conditions owing to its lesser speed.

MAMIYA 200 mm. *f* 4.5 *and f* 3.5, four element lenses

focusing down to 10 ft., with an angle of view of 12°, bringing objects still closer—or permitting an increase of camera to subject distance—by about 50 per cent as compared with the 135 mm. focal length lenses.

MAMIYA 400 mm. *f* 6.3, a three element lens, focusing down to 30 ft. With its angle of only 6° this is a far distance lens giving 7½ to 8× linear magnification as compared with a standard lens; it acts like a binocular.

Special Lenses

MAMIYA 60 mm. *f* 2.8, a five element lens, focusing down to 9¼ in., has been designed for macro photography and enhances the scope of the camera in the field of close-up copying, e.g. stamps, photographing small objects such as coins, small details of objets d'art, in nature study, etc.

MAMIYA SEKOR INTERCHANGEABLE LENSES

Type of Lens	*Lens Construction Elements/ Groups*	*Angle of View*	*Aperture*	*Filter Size (mm.)*	*Minimum Focus Distance*	*Weight (g)*
Standard 55 mm. *f* 1.4	7/5	43°	Auto	55	0.5 m. (1.75 ft.)	305
Standard 55 mm. *f* 1.8	6/4	43°	Auto	52	0.5 m. (1.75 ft.)	225
Standard 50 mm. *f* 2	6/4	47°	Auto	52	0.5 m. (1.75 ft.)	215
Standard 50 mm. *f* 2.8	4/3	45°	Auto	52	0.5 m. (1.75 ft.)	154
Wide angle 28 mm. *f* 2.8	7/6	74°	Auto	58	0.45 m. (1.5 ft.)	250
Wide angle 35 mm. *f* 2.8	6/5	63°	Auto	49	0.6 m. (2 ft.)	225
Telephoto 135 mm. *f* 2.8	4/4	18°	Auto	55	1.8 m. (6 ft.)	390
Telephoto 135 mm. *f* 3.5	4/4	18°	Auto	49	1.8 m. (6 ft.)	375
Telephoto 200 mm. *f* 3.5	4/4	12°	Auto	67	3 m. (10 ft.)	750
Telephoto 200 mm. *f* 4.5	4/2	12°	Auto	55	3 m. (10 ft.)	485
Telephoto 200 mm. *f* 4.5	4/4	12°	Auto	55	3 m. (10 ft.)	485
Telephoto 400 mm. *f* 6.3	3/3	6°	Preset	72	9 m. (30 ft.)	935
Macro 60 mm. *f* 2.8	5/4	40°	Preset	58	0.235 m. (9¼ in.)	380

CLOSE-UPS WITH THE MAMIYA SEKOR

The single lens reflex camera is particularly suitable for close-up photography. When working with supplementary lenses, extension tubes, extension bellows, etc., the precise area covered as well as the exact definition can be controlled on the reflex focusing screen. Parallax, which makes close-up work with almost any other type of camera at least very difficult, or necessitates extensive auxiliary attachments, simply does not exist in the Mamiya Sekor cameras.

The standard Mamiya lens focuses down to 18 in. and at this distance covers a field of approximately $10 \times 6\frac{1}{2}$ in. To take photographs still closer to the subject, close-up lenses, extension tubes or extension bellows can be used.

Close-up Lenses

For working at distances below the shortest distance setting of the unaided lens, close-up lenses may be used. Two lenses, a +2 diopter and a +3 diopter are suggested. It is convenient to get these lenses of suitable diameter to fit into an interchangeable filter mount so that one mount only is required and a lens can be inserted in accordance with the working distance required.

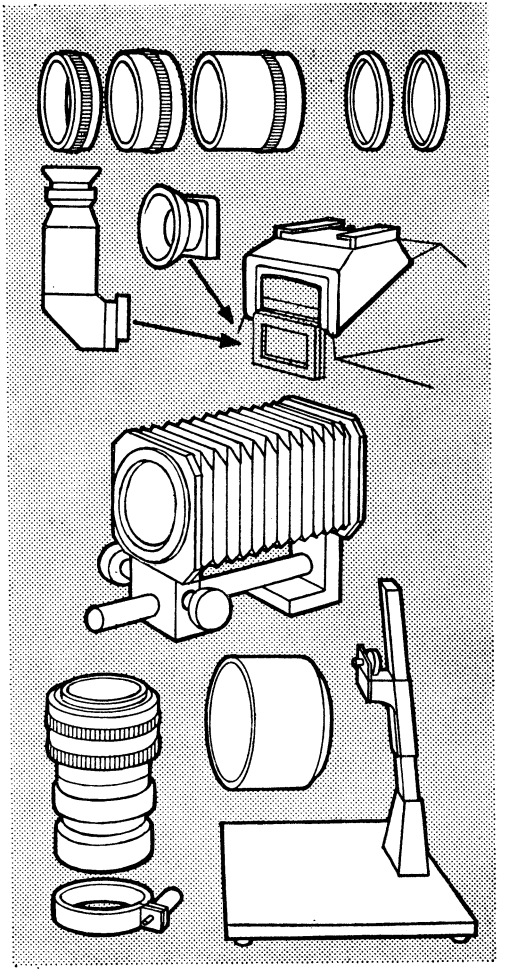
The +2 dioptre supplementary lens allows focusing at 9 to $19\frac{3}{4}$ in., depending on the setting of the camera lens. The +3 dioptre lens focuses from $7\frac{1}{2}$ to $13\frac{1}{8}$ in.

The field covered, the distance at which the lens has to be set, and the definition obtained, can be observed on the reflex ground glass. See table on page 66 for guide values.

No change in exposure time is required when working with close-up lenses. To obtain perfect definition, it is advisable to use a medium aperture.

Extension Tubes

For very close range work extension tubes can be used. They cover a subject to camera distance of approx. 15 in. to $2\frac{1}{2}$ in. There are extension tubes with or without automatic aperture operation and there are many sets on the market to



The wide range of accessories for the Mamiya Sekor cameras includes (*from top to bottom*) extension tubes and close-up lenses, angular viewfinder, rubber eyecup, eyepiece correction attachment, extension bellows, microscope attachment, lens hoods, and copying stand.

suit the Mamiya Sekor. Most consist of three tubes of 7½, 8, 15 and 30 mm. length. They can be used individually or combined.

Lens Reversing Mount

This mount allows the standard lens to be attached to the camera in a reversed direction (back to front). Many lenses give better results when used in that position for very close range work.

Extension Bellows

There are two extension bellows available, with or without coupling to the lens aperture. They are used between the camera body and the lens, and are primarily intended for ultra close-up work and directly magnified pictures of small objects.

Either bellows is attached to the camera in the same way as the lens. See table on page 67 for guide values.

With the standard lens a reproduction ratio of about 1 to 2.5× is available.

Copying Stand

The copying stand is for quick and accurate copying with the Mamiya Sekor. It maintains precise, parallel camera position for all close-up work, particularly with extension tubes, extension bellows and microscope.

The copying stand consists of a base-board and a column. A sliding arm is fixed to the column. The front of the sliding arm is fitted to hold the camera correctly aligned with the base, secured by the tripod bush. The column and arm can be removed from the base-board for easy storage.

Mamiya Sekor Accessories

In addition to the accessories and attachments described in the general text, such as filters, close-up lenses, extension tubes, bellows and copying stand, there are some further accessories available.

A *lens hood* is recommended to prevent stray light from outside the picture area entering the lens. This could produce glare and reflections and thus reduce the brilliancy of the image and should be used particularly in side light and against the light photography.

Lens hoods are available for all Mamiya lenses except the 28 and 35 mm. wide angles.

Lens caps, rear lens caps and body caps protect and keep lens and camera body dustfree when handled or stored separately.

An eyepiece correction attachment enables wearers of glasses to insert lenses of their own eye prescription.

The microscope adaptor is a two-piece tube which allows the Mamiya Sekor camera to be used in conjunction with any standard tube microscope.

An angular viewfinder fits to the Mamiya Sekor eyepiece and permits viewing at low level such as photographing children, general low angle shots, close-ups and photomicrography. It can be rotated so that it is equally useful in horizontal and vertical positions of the camera.

It can also be helpful in obtaining unobserved shots by holding the camera at right angles to the standing position.

CARE OF THE CAMERA

Storage

When not in use, the camera should be protected from damp and dust, preferably in its case and, as an additional precaution, inserted into a polythene bag.

Care should be taken to see that the camera is not kept in abnormally high or low temperatures—normal room temperature is best.

Take the precaution of removing any batteries because, however well made these may be, there is always a risk of deterioration and corrosion.

Exercise

Cameras (like most mechanical instruments) need to be exercised regularly to keep them in good condition. Store your camera where you can get at it easily and put it through its normal operations at least once a month:

1. Set the shutter release and fire several times.
2. Turn to a slow shutter speed and again set the shutter release and fire. Also operate delayed action device.
3. Examine the exposure meter for correct operation.
4. Check film transport.
5. Check the rangefinder or pentaprism viewfinder.

These exercises will keep the mechanism in good order, retaining the natural qualities of the lubricant—thus ensuring the camera is ready for instant use when required.

Running Test after Storage

Before embarking on a holiday where your camera will be your constant companion or, on an important assignment, make a few trial exposures. It is advisable to test the camera at least four weeks prior to your departure to give time for a test film to be exposed and processed. This will avoid a possibly spoiled holiday record.

Keeping the Interior Clean

When your camera is used on the beach, or other conditions where dust or sand can easily infiltrate into the

mechanism, take the precaution of putting the instrument with its case into a polythene or other container so that flying dust, sand, etc., particles are prevented from entering the camera. This applies particularly, of course, if it is laid down on a sandy beach. Furthermore, avoid leaving the camera in such a position that direct sunlight is allowed to fall upon it. This could ruin a camera.

Small chips of film can easily damage the mechanism, therefore always make sure that the inside of your camera is spotless. Check your camera every time it is loaded with film.

Treating the Camera with Care

Your camera is a fine, precision instrument. It has been produced with great care and attention to detail. Do not allow it to be swung by its shoulder strap, thrown into the back of a car, nor treat as if it were as robust as a battleship. If you protect the camera against possible damage due to a knock, you will be amply repaid by years of excellent and trouble-free service.

Coping with Tropical Conditions

High and widely varying temperatures with low humidity, as occur in desert regions and dry seasons, and very high humidity in rainy seasons, call for special precautions to protect the life and continued good performance of the camera. These conditions also cause the growth of moulds on organic matter. Sand, dust and insects may present problems.

The camera should be kept dry and clean. Leather parts should be wax polished, metal parts lightly greased. Never leave the camera unnecessarily exposed to heat. Always keep it in its case. The lens should be covered with the lens cap when not in use. Outer lens surfaces have to be kept clean, dirt and grit removed with an air-blower and by tapping. Wipe the lens surface with cotton wool or open mesh fabric (butter muslin) when required.

Store photographic equipment in an airtight metal box

or a tin which should be sealed with adhesive (e.g. medical) tape. In a humid atmosphere, add some desiccating agent, e.g. silica gel.

Condensation on the lens may occur when the camera is moved from a cool place into humid heat; this has to be removed before use and the whole camera carefully wiped before re-storing.

Films should not be kept longer than six months in their original airtight tins (tropical packing) at continual temperatures of 90°F (32°C). At continual 100°F (38°C), the life of most films is limited to a month or two. Keep films for as short a time as possible in the camera. Storing camera and film in the glove compartment of the car is inviting trouble.

Films should be processed as soon as possible after exposure—within a week or two or, in very hot humid climates, within a few days. Keep the film in an airtight container with desiccant (to absorb moisture). If possible, keep in a refrigerator, but only if you can dry out the exposed film and the container is sealed.

FACTS AND FIGURES

This section gives the more important Mamiya Sekor data for exposure, focusing zones, close-ups, films, etc., in handy tabular form for easy reference.

CONVERSION OF FEET AND INCHES INTO METRIC UNITS

Many cameras are marked only in either the metric or the British and American 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 and U.S. to Metric		*Metric to British and U.S.*	
$\frac{1}{8}$ in.	0.32 cm.	0.5 cm.	$\frac{3}{16}$ in.
$\frac{1}{4}$ in.	0.64 cm.	1 cm.	$\frac{5}{8}$ 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.	$4\frac{1}{2}$ 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.	$11\frac{13}{16}$ in.
3 ft.	91.4 cm.	40 cm.	$15\frac{3}{4}$ in.
4 ft.	1.22 m.	50 cm.	$19\frac{11}{16}$ 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.	$39\frac{1}{4}$ 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.

QUICK FOCUSING ZONES

Lens	*Zone*	*Focus on*	*Aperture*	*Extent of Zone*
Standard (55 mm.) ...	Near	10 ft.	*f* 8	7½–13 ft.
	Medium	20 ft.	*f* 8	11–100 ft.
Tele (100 mm.) ...	Medium	30 ft.	*f* 11	25–50 ft.
	Far	100 ft.	*f* 11	50 ft.–∞
Wide-angle (35 mm.) ...	Medium	15 ft.	*f* 5.6	7½ ft.–∞

CONVERSION OF FILM SPEED SYSTEMS

ASA & BS Arith. (New)	ASA Log (New)	DIN	BS Log
3		6	16°
6	1°	9	19°
12	2°	12	22°
25	3°	15	25°
50	4°	18	28°
100	5°	21	31°
200	6°	24	34°
400	7°	27	37°
800	8°	30	40°
1600	9°	33	43°

SHUTTER SPEEDS TO ARREST MOVEMENT WITH MAMIYA SEKOR

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	1/1000	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	1/1000	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 ...	—	1/1000	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 ...	—	1/1000	1/500	1/300	1/150	1/75
Slow train	1/500	1/300	1/200	1/100	1/75	1/40
Fast train	—	—	1/1000	1/500	1/250	1/100
Aeroplane	—	—	—	1/1000	1/400	1/200

The shutter speeds as listed above are applicable to motion which cuts right across the direction in which the lens is pointing, and are correct for the standard lens.

If the motion photographed is at an acute angle with the direction in which the lens points the exposure time can be longer, say 1/30 sec. instead of 1/60.

If the subject moves directly towards the lens (or for that matter away from it) the exposure time can be three or four times longer, say 1/8 sec. instead of 1/30.

Where the above table shows speeds not marked on the shutter use the next faster speed.

35 mm. COLOUR FILMS

Film	Type	Speed in ASA and BS Arithmetic	Processing
Negative Emulsions			
Agfacolor CN 17	Universal	40	U
Agfacolor CNS	Universal	80	U
Ferraniacolor N 27	Universal	40	U
Fujicolor N 100	Universal	100	U
Kodacolor X	Universal	64	U
Orwo Color NC 16	Universal	32	L
Reversal Emulsions			
Agfacolor CT 18	Daylight	50	M
Agfacolor CK 20	Artificial light	80	M
Anscochrome 64	Daylight	64	M
Anscochrome T 100	Artificial light	100	M
Anscochrome 200	Daylight	200	M
Anscochrome 500	Daylight	500	M
Ektachrome X	Daylight	64	U
H.S. Ektachrome	Daylight	160	U
H.S. Ektachrome B	Artificial light	125	U
Ferraniacolor CR 50	Daylight	50	U
Fuji Chrome R 100	Daylight	100	M
Kodachrome II	Daylight	25	M
Kodochrome II A	Artificial light	40	M
Kodachrome X	Daylight	64	M
Perutz Color C 18	Daylight	50	M

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

CLOSE-UP LENSES WITH MAMIYA SEKOR

+2 dioptre meniscus lens

Lens set to (ft.)	*Distance front of lens to subject (in.)*	*Scale of reproduction 1:*	*Subject field (in.)*
∞	19¾	11.1	10¾ × 15½
20	18	10	9 × 13½
10	17	9	8 × 12½
6	15½	8	7½ × 11
4	13½	7.5	6¾ × 10¼
3	12¾	7	6¼ × 9½

+3 bioptre meniscus lens

Lens set to (ft.)	*Distance front of lens to subject (in.)*	*Scale of reproduction 1:*	*Subject field (in.)*
1¾	13½	7.4	6⅞ × 10½
20	12⅞	7.0	6½ × 9½
10	11¾	6.7	6 × 9⅛
6	11⅛	6.2	5½ × 8½
4	10½	5.7	5⅛ × 7¾
3	9½	5.2	4¾ × 7⅛

CLOSE-UP DEPTH OF FIELD

f 3.5 ...	37¾	33¾	29	25 8/16	20½	19 1/16	15⅝	11⅞	10 11/16
	39½	35	30	26	21	19½	16	12	11
	41⅜	36½	31½	26 12/16	21 9/16	20	16½	12½	11 7/16
f 5.6 ...	36 9/16	32⅜	28 1/16	24⅜	20⅛	18¾	15⅜	11¾	10 11/16
	39½	35	30	26	21	19½	16	12	11
	42 7/16	37 7/16	31⅜	27 8/16	22	20⅜	16½	12 7/16	11 8/16
f 8 ...	35 7/16	31 11/16	27⅜	24 1/16	19¾	18 7/16	15 3/16	11 9/16	10 9/16
	39½	35	30	26	21	19½	16	12	11
	44⅝	38⅞	32 9/16	28	22½	20 12/16	16⅜	12⅜	11 7/16
f 16 ...	32⅛	29 1/16	25⅜	22½	18⅜	17 7/16	14½	11⅛	10 8/16
	39½	35	30	26	21	19½	16	12	11
	51¼	43⅜	35 9/11	30 7/16	24 3/16	22 5/16	17 11/16	13 3/16	12

The bold centre figures are subject distances from film plane, the upper and lower figures the near and far limits of sharpness. All values are inches.

CLOSE-UPS WITH BELLOWS UNIT (standard lens set to ∞)

Approximate values

Bellows extension	Subject size in.	Film-to-subject distance in.	Magnification	Exposure factor
Shortest	1.5 × 2.3	9.2	0.62	× 2.6
	1.2 × 1.8	8.8	0.8	× 3.2
	0.9 × 1.4	8.7	1.0	× 4.0
	0.8 × 1.2	8.7	1.2	× 4.8
	0.7 × 1.0	8.9	1.4	× 5.8
	0.6 × 0.9	9.1	1.6	× 6.8
	0.5 × 0.8	9.4	1.8	× 7.8
	0.5 × 0.7	9.8	2.0	× 9.0
	0.4 × 0.6	10.1	2.2	× 10.2
	0.4 × 0.6	10.4	2.4	× 11.6
Longest	0.4 × 0.6	10.5	2.45	× 11.9

CLOSE-UPS WITH EXTENSION TUBES (standard lens set to 18 in.)

Approximate values 7.5, 15, 30

Extension tube combination	Subject size in.	Film-to-subject distance	Magnification	Exposure factor
Not used	5.5 × 8.2	18.0	0.17	× 1.4
1	2.7 × 4.1	11.4	0.35	× 1.8
2	1.8 × 2.7	9.4	0.52	× 2.3
3	1.4 × 2.0	9.0	0.69	× 2.9
1+3	1.1 × 1.7	8.7	0.86	× 3.5
2+3	0.9 × 1.4	8.7	1.04	× 4.1

35 mm. BLACK-AND-WHITE FILMS

Make	Speed in ASA and BS Arithmetic
Adox—	
KB 14	40
KB 17	80
KB 21	200
KB 25	500
UKB-17 Reversal	80
Agfa—	
Agfapan	25
Isopan IF	40
Isopan ISS	100
Isopan Ultra	400
Agfapan 1000	1000
Dia-Direct 26 Reversal	50
Ansco—	
Super Hypan	500
Ferrania—	
P 24	20
P 30	80
P 33	160
P. 36	320
Ilford—	
Pan F	30
F.P.4	125
H.P.4.	400
Kodak—	
Panatomic X	40
Plus X	160
Tri-X Pan	400
Konica—	
Konipan S	100
Konipan SS	200
Konipan SSS	400
Orwo, Wolfen—	
NP 15	8
NP 20	80
NP 27	400
Perutz—	
P 14	40
P 17	80
P 21	200
P 25	500
Miniature Reversal	50
Tura—	
Pan 14	40
Pan 17	80
Pan 21	200
Pan 24	400

FILTERS FOR MAMIYA SEKOR

Colour	Name	Exposure Factor* for Sunlight	Exposure Factor* for Tungsten	Effects
Colourless	UV	1	1	Absorbs only ultra-violet rays. Used for black-and-white and colour photography. Also serves as a lens protector.
Light yellow	Y 1	1.5	1.3	Absorbs ultra-violet rays, purple and blue. For landscapes, portraits and snapshots. Assures proper contrast in brightness and dimensional effects. For black-and-white.
Yellow	Y 2	2	1.5	
Dark yellow	Y 3	2.5	2	
Orange	O 1	4	3	Produces powerful contrast due to its wide absorbing range. For mountains, distant scenes and architecture. For black-and-white.
Red	R 1	8	4	Extremely strong contrast. Daytime landscapes sometimes look as if they were night scenes. Can be used with infra-red film. For black-and-white.
Yellowish Green	PO	2.5	2	Brings film characteristics closest to the human eye. Shows colours naturally. For outdoor portraits as it has the same characteristics as the light yellow filter.
Light grey	ND 2	2	2	No effect on colours but reduces light. Used with both colour and black-and-white. Light is reduced 1/2 with ND 2, 1/4 with ND 4 and 1/8 with ND 8.
Grey	ND 2	4	4	
Dark grey	ND 8	8	8	
Light pink	SKYLIGHT	1	1	Like the UV filter, it absorbs ultra-violet rays. Prevents distant scapes with sky and shades from becoming bluish in colour pictures. For colour film.
Light amber	A 2	1.2	1.2	Absorbs blue light from shadows; also from cloudy scenes. Used to reduce colour temperature for daylight-type colour film.
Light blue	B 2	1.2	1.2	Absorbs red from scenes taken at sunrise and sunset. Raises colour temperature for daylight-type colour film.
Blue	B 8	2	2	Used with flashbulbs (clear bulbs) and daylight-type colour film to reduce red tone and raise colour temperature.
Dark blue	B 12	3	3	Used with photo-reflector lamp (3200°K) and daylight-type colour film to reduce red tone and to raise colour temperature.

* The exposure factor is automatically measured with the TTL meter of all DTL and TL Mamiya Sekor cameras.