Mamiya M645

Instructions

The Mamiya M645 is a newly developed 6×4.5cm SLR which is a result of Mamiya's technology and experience as a leading manufacturer of professional cameras. The M645 is designed to introduce the world of large-negative quality to camera users who are accustomed to the easy handling and compactness of 35mm SLR's.
Every care has been taken to assure that your Mamiya M645 will provide you with years of trouble-free service. However, to avoid possible mishandling, be sure to carefully read this instruction manual before using your new camera.

This camera is designed for use with either silver oxide or alkaline batteries. Although both types offer adequate performance, silver oxide batteries last much longer.
IMPORTANT: When using the PD Prism Finder, make it a point to use silver oxide batteries when available (in this instance, battery life is shortened if alkaline batteries are used).

CONTENTS

Special Features 3
Specifications 5
Names and Functions of Parts 7
Testing to See if the Camera Functions Properly 17
Interchanging Lenses 18
Focusing Screens 19
Interchanging Finders 20
Inserting a Battery 22
Battery Check 23
Loading the Film Insert 24
Film Loading 25
Film advancing 28
Shutter Speed Dial 28
Aperture Ring/Stop-down Operation 29
Focusing 30
Shutter Release and Film Transport Mechanism 31
Unloading Film 32
The Neck Strap 33
Holding the Camera 33
Using the AE Prism Finder 35
Using the PD Prism Finder S 42
Using the CdS Prism Finder 46
Using the Waist-Level Finder S 51
Mirror Lock-up 54
Depth-of-Field 55
Using Flash 56
Multiple-Exposures 57
Infrared Photography 57
Tripod Socket 58
Time Exposures 58
Interchanging the Film Advance Knob 59
The Mamiya Moving Coil Electronic Shutter 61

Trouble-Shooting 62
Precautions 63

Mamiya-Sekor C Lenses 64
Accessories 68
Care of the Camera 78

The Mamiya M645 is a 6×4.5cm large-negative SLR that is both extremely versatile and compact.

1. Large-Negative Quality

The 6×4.5cm format offers approximately 3 times more area than the 35mm format. Moreover, unlike the 6×6cm square negative, there is little waste of the negative area. For beautiful color enlargements everytime, the 6×4.5cm format is the ideal format.

2. Compact Design

Despite the large-negative it produces, the Mamiya M645 is designed to handle as easily as a 35mm SLR. Its compact size and light weight are perfectly suited for the action photographer. It fits so well into one's hands that it becomes an extension of his reflexes.

3. Mamiya's Moving Coil Electronic Shutter

Mamiya has developed a revolutionary Moving Coil Electronically Controlled Shutter for the Mamiya M645. Electrical consumption of this new shutter is approximately 1/10 that of previous electronic shutters. Furthermore, consumption remains constant regardless of the shutter speed being used. In addition to accuracy, long battery life is assured by this new shutter.

4. Large, Bright Viewfinder

It becomes easy to catch the peak of action when looking through the large, bright viewfinder. Because of the Mamiya M645's automatic diaphragm and quick-return mirror, the viewfinder never grows dim. It is always bright, ready for the next photograph.

5. Interchangeable Finders

- **Lightweight, dual-function Waist-Level Finder S**

A compact and lightweight finder which opens and closes with a single touch, the Waist-Level Finder S is ideal for copying, close-ups, low and high angle pictures, and working in dim light. Additionally, it is instantly convertible to an eye-level sports finder which accurately shows the fields for the 80, 110, 150, and 210mm lenses, allowing one to easily follow the quickest action.

- **Prism Finder**

The Prism Finder is well-suited for action photography. Whether the vertical or horizontal format is utilized, focusing and following action is as easy as on a 35mm SLR.

- **AE (Automatic Exposure) Prism Finder**

The AE Prism Finder combines an electronic shutter control mechanism and a TTL-type CdS exposure meter to provide aperture-priority, fully automatic exposure.

• **PD Prism Finder**

The PD Prism Finder employs silicon cells for full-aperture, center-weighted readings. It is your assurance that every negative will be properly exposed.

• **CdS Prism Finder with built-in meter**

Accurate through-the-lens exposure measurement is possible with the CdS Prism Finder which couples to the aperture of the lens and indicates the proper shutter speed to set on the camera.

6. Flatness of the Film Plane

Developed through Mamiya's long experience as a manufacturer of 120/220 roll-film cameras, the Roll-Film Inserts for the Mamiya M645 keep the film perfectly flat for edge-to-edge sharpness. Inserts are available for 120 or 220 roll-film.

7. Multi-Coated Lenses

Mamiya-Sekor lenses have achieved world-renown as professional lenses of exceptional contrast, high resolution, clear definition, and excellent color balance. All the lenses for the Mamiya M645, from wide-angle to telephoto, have been multi-coated to maintain their high standard of performance even under adverse lighting.

8. Unlimited Scope

A full range of accessories are available for the Mamiya M645 to assist the photographer in capturing virtually any type of image. Accessories include hand grips, interchangeable focusing screens, and auto extension rings complete with meter coupling.

• **Multiple-Exposure Provision**

Merely lowering the multiple-exposure lever allows the photographer to take as many multiple-exposures as he wishes. During multiple-exposures, the exposure counter does not move.

• **Mirror Lock-Up**

The Mamiya M645 is designed to have minimal mirror shock; nevertheless, when it is necessary to completely eliminate vibrations, all you have to do is lock the mirror in the up position. To do so, simply lower the mirror lock-up lever. Mirror lock-up provision makes close-up and telephoto photography possible even at slow shutter speeds.

• **Two Shutter Release Buttons**

The Mamiya M645 is equipped with two ideally located shutter release buttons, so that regardless of how you hold the camera, there is always a release button at your finger tips.

Specifications

● Camera Body

Camera Type:
6 × 4.5cm electronic focal-plane shutter SLR.

Film Type:
120 roll-film for 15 exposures.
220 roll-film for 30 exposures

Roll Film Insert:
Interchangeable, two types available for 120 and 220 size roll films. Actual negative size 56 × 41.5mm.

Standard Lenses:
Mamiya-Sekor C (multi-coated)
80mm f/1.9, automatic diaphragm,
with meter coupler, 67mm filter size
Mamiya-Sekor C (multi-coated)
80mm f/2.8, automatic diaphragm,
with meter coupler, 58mm filter size

Lens Mount:
Mamiya M645 bayonet mount

Shutter:
B, 8—1/500 sec.
Moving Coil Electronic Focal-Plane Shutter,
FP and X (1/60 sec.) synchronization,
Shutter release lock provision

Battery Type:
One 6V silver-oxide battery 4SR44
or 6V alkaline battery 4LR44

Focusing Method:
Each Mamiya-Sekor lens is equipped with its own helicoid focusing mount

Focusing Screen:
Microprism center spot (standard focusing screen), surrounding area is matte, with Fresnel lens, focusing screen interchangeable, 94% of the picture area visible

Mirror:
Instant return, with mirror lock-up provision

Film Transport:
Film transport by a single turn of the crank-equipped film advance knob. Provision to prevent double exposure.

Exposure Counter:
Progressive type, automatic reset, automatic changeover with insertion of 120/220 roll-film inserts

Battery Check:
Depressing B.C. button illuminates green L.E.D. if battery condition is satisfactory.

Multiple-Exposure:
Lowering multiple-exposure lever makes multiple-exposures possible; exposure counter does not move during multiple-exposures.

● Interchangeable Finders

Prism Finder:
The image in the Prism Finder is right-side up, laterally correct, and moves in the correct direction; magnification of 0.74X with the standard lens at infinity; built-on hot-shoe; comes with eyecup.

AE Prism Finder:
Aperture-priority, automatic exposure prism finder with

built-in electronic shutter control mechanism and CdS exposure meter. Through-the-lens, center-weighted, full-aperture metering with shutter speed in the viewfinder. Meter coupling range is EV2.85 – EV17 (f/1.9, 1/2 sec. – f/16, 1/500 sec.) with f/1.9 lens and ASA100 film. With the f/2.8 lens, the meter coupling range is EV4–EV18 (f/2.8, 1/2 sec. – f/22, 1/500 sec.) using ASA100 film. Camera battery serves as power source. Other features same as for Prism Finder.

PD Prism Finder S:

Prism Finder with built-in silicon cell, through-the-lens, full-aperture, center-weighted metering; 7 LED's visible in the viewfinder for correct or compensated exposure; with 100 ASA and f/1.9 lens, meter coupling range of EV –1.15 – +18 (f/1.9, 8 sec. – f/22, 1/500 sec.); with f/2.8 lens, EV 0 – 18 (f/2.8, 8 sec. – f/22, 1/500 sec.); camera body battery serves as power source; other features same as Prism Finder.

CdS Prism Finder:

Prism Finder with CdS through-the-lens full-aperture, center-weighted metering; zero method with indicator needle; couples to aperture and shutter speed manually set; power source, one 1.5V silver oxide battery SR44 or alkaline battery LR44; with 100 ASA and f/1.9 lens, meter coupling range of EV 2.85 – 17 (f/1.9, 1/2 sec. – f/16, 1/500 sec.); with f/2.8 lens, EV 4 – 18 (f/2.8, 1/2 sec. – f/22, 1/500 sec.), other features same as Prism Finder.

Waist-Level Finder S:

Opens and closes with a single touch, magnification of 1.3X (w/standard lens at infinity); diopter correction lenses interchangeable with standard magnifier; built-in sports finder shows field for standard lens and accepts a mask for 110, 150, and 210mm lenses, all fields showing approximately 80% of the picture-taking area.

Dimensions and Weight:

(width, height, depth, w/80mm f/1.9 lens)

(w/Waist-Level Finder S)	(w/1.9 lens)	(w/2.8 lens)
3-29/32" × 3-15/16" × 6-9/16"	54.7 oz	48.9 oz
(99.3 × 100 × 166.5mm)	(1550 g)	(1385 g)
(w/Prism Finder)		
3-29/32" × 4-27/32" × 6-9/16"	61.6 oz	55.7 oz
(99.3 × 122.7 × 166.5mm)	(1745 g)	(1580 g)
(w/AE Prism Finder)		
3-29/32" ×4-29/32"× 6-9/16"	66.1 oz	60.3 oz
(99.3 × 124.7 × 166.5mm)	(1875 g)	(1710 g)
(w/PD Prism Finder S)		
3-29/32" × 4-29/32" × 6-9/16"	65.8 oz	60.0 oz
(99.3 × 124.7 × 166.5mm)	(1865 g)	(1700 g)
(w/CdS Prism Finder)		
3-29/32" × 4-29/32" × 6-9/16"	66.5 oz	60.7 oz
(99.3 × 124.7 × 166.5mm)	(1885 g)	(1720 g)

Depth w/80mm f/2.8 lens; 6-1/16" (154mm)

Names and Functions of Parts (1)

❶ Focusing screen
Five different types are available.

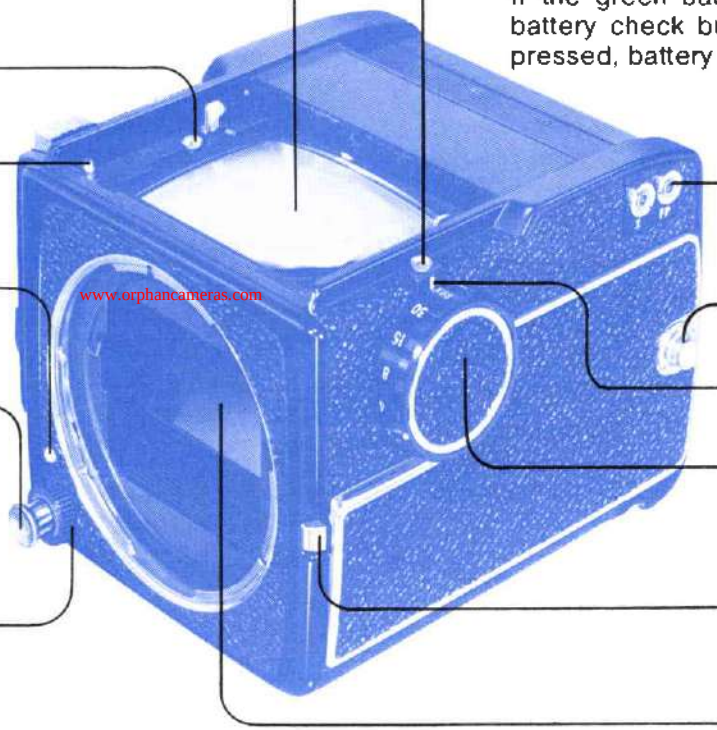
❷ Focusing screen lug

❸ Mounting guide pin for finder
Fits into the finder opening.

❹ Alignment dot
Alignment reference point for mounting lens.

❺ Shutter release button (front)
Built-in safety lock, locks release button if film has not been advanced. Equipped with cable release socket.

❻ Shutter release lock ring
Turn lock ring and align with red dot to simultaneously lock both shutter release buttons. To unlock, align with white dot.



❼ Battery check lamp
If the green battery check lamp glows when the battery check button on the opposite side is depressed, battery condition is good.

❽ Flash sync terminals
With safety cover, only the cover of the sync terminal being used is removed.

❾ Neck strap lug

❿ Shutter speed alignment mark

⓫ Shutter speed dial
Do not set dial to the ⊙ position unless using the PD or AE Prism Finder.

⓬ Lens release button
Push in and simultaneously turn the lens counterclockwise to remove.

⓭ Mirror
Never touch the surface of the mirror.

Back cover latch

While pushing in on the memo clip, simultaneously move the back cover latch in the direction of the arrow to open camera back.

Back cover

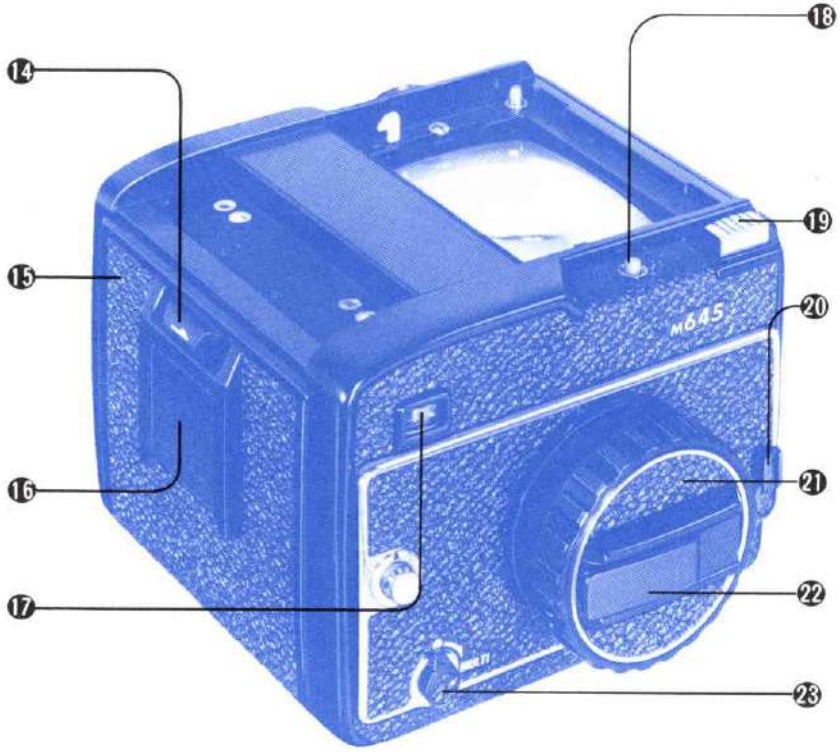
When closing, apply pressure firmly and evenly in the area of the back cover latch.

Memo clip

Holds the film box top as a reminder.

Exposure counter window

Automatic changeover upon insertion of 120 or 220 film insert. Goes up to 15 with 120 film and up to 30 with 220 film.



⑱ Battery check button

When depressed, the battery check lamp on the opposite side illuminates. Used to check the condition of the battery.

⑲ Shutter release button (upper)

⑳ Mirror lock-up lever

Push backward to lock mirror in the up position.

㉑ Film advance knob

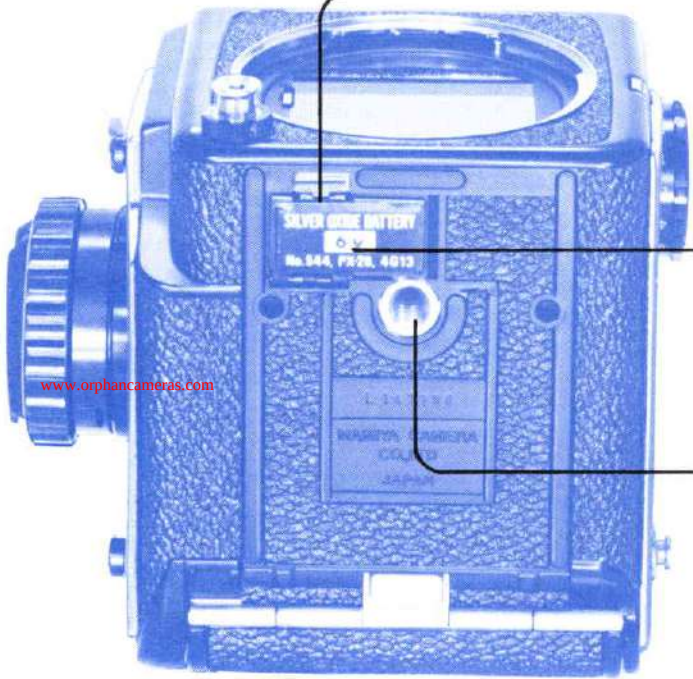
One complete turn cocks shutter and advances film.

㉒ Film advance crank

Pull out to use.

㉓ Multiple-exposure lever

Move the multiple-exposure lever to the "multi" position for multiple-exposures or to release the shutter when there is no film in the camera.



㉔ Battery chamber cover latch

Pull the latch toward the lens to open the battery chamber.

㉕ Battery chamber cover

Insert a battery into the battery chamber.

㉖ Tripod socket

1/4 inch tripod socket. To convert to a 3/8 inch socket, first remove the small screw in the base of the socket. Next, remove the inner socket by turning counterclockwise with a coin.

㉘ Focusing ring

㉙ Distance scale

㉚ Depth-of-field scale

㉛ Alignment dot

Align with matching alignment dot on camera body for rapid lens mounting.

㉜ Aperture ring

㉝ Exposure meter coupler

Couples the aperture ring to any prism finder with built-in meter.

㉗ A.M. Lever

Automatic diaphragm operation when "A" appears in the window. Diaphragm stopped down to preselected aperture when "M" appears in window.

Roll-Film Insert

(120 and 220 roll-film inserts are available)

Start Mark

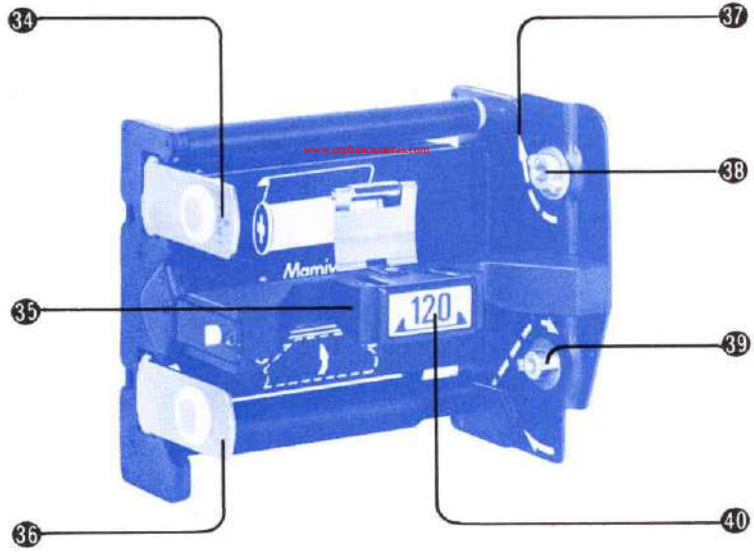
After aligning the start mark on the film's leader paper with this mark, the roll-film insert is ready for insertion into the camera.

Release latch

After squeezing in on both sides of release latch, the roll-film insert can be pulled out of camera.

Spool clip

Pull out and lower spool clip to insert or remove film spools.



Leader paper guide marks

Indicates the direction leader paper is to follow.

Film spool stud

Place film spool on film spool stud so that the black side of the leader paper faces up.

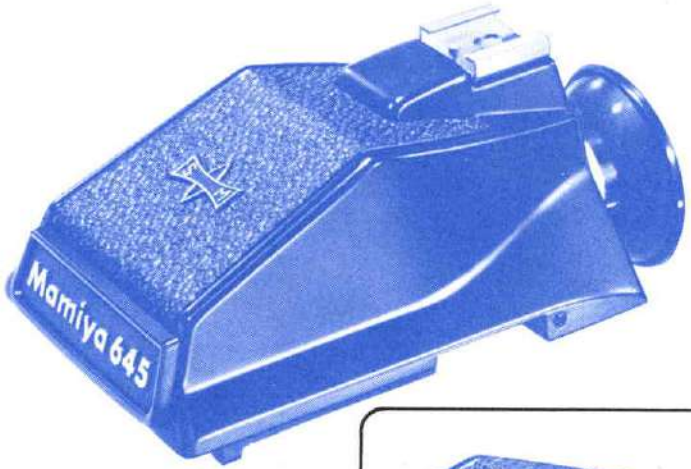
Take-up spool stud

Attach empty spool to take-up spool stud and insert the tip of the leader paper into the spool slot.

Film type index (120 or 220)

Insert roll-film insert into camera with the film type index upright. If the film type index is upside down, roll-film insert will not fit into the camera.

Prism Finder



Hot-shoe (with safety cover)
Automatically fires cordless flash units when the shutter release button is depressed.

Eyecup
Attach by sliding into the grooves of the eyepiece.

Eyepiece
Accessories such as eyecup, magnifier, and angle finder can be attached.

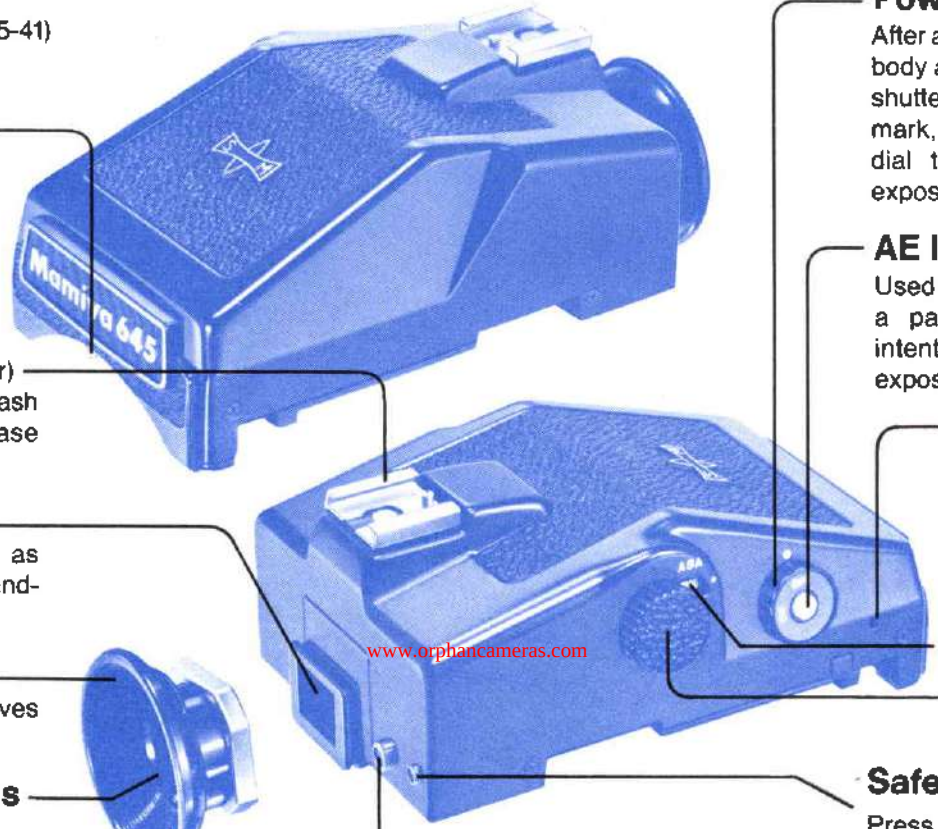
Diopter correction lens retainer ring
Remove by unscrewing in a counterclockwise direction. After inserting correction lens, replace retainer ring.

Finder release button
Turn clockwise until it stops, push in, and the finder can be lifted off the camera body.

Names and Functions of Parts (4)

AE Prism Finder

(Detailed Instructions on pp.35-41)



Aperture ring coupling pin
Couples to the exposure meter coupler on the aperture ring.

Hot-shoe (with safety cover)
Automatically fires cordless flash units when the shutter release button is depressed.

Eyepiece
Accepts accessories such as eyecup, magnifier, and angle finder.

Eyecup
Attach by sliding into the grooves of the eyepiece.

Diopter correction lens retainer ring
Remove by unscrewing in a counterclockwise direction. After inserting correction lens, replace retainer ring.

Power switch dial
After attaching the finder to the body and setting the camera's shutter speed dial to the ⊙ mark, turn the power switch dial to ON to activate the exposure meter.

AE lock button
Used to adjust the exposure to a part of a scene or for intentional under- or over-exposure.

500-1000 adjustment screw
Turn this screw to the left when the maximum shutter speed of the camera is 1/500 sec.

ASA window

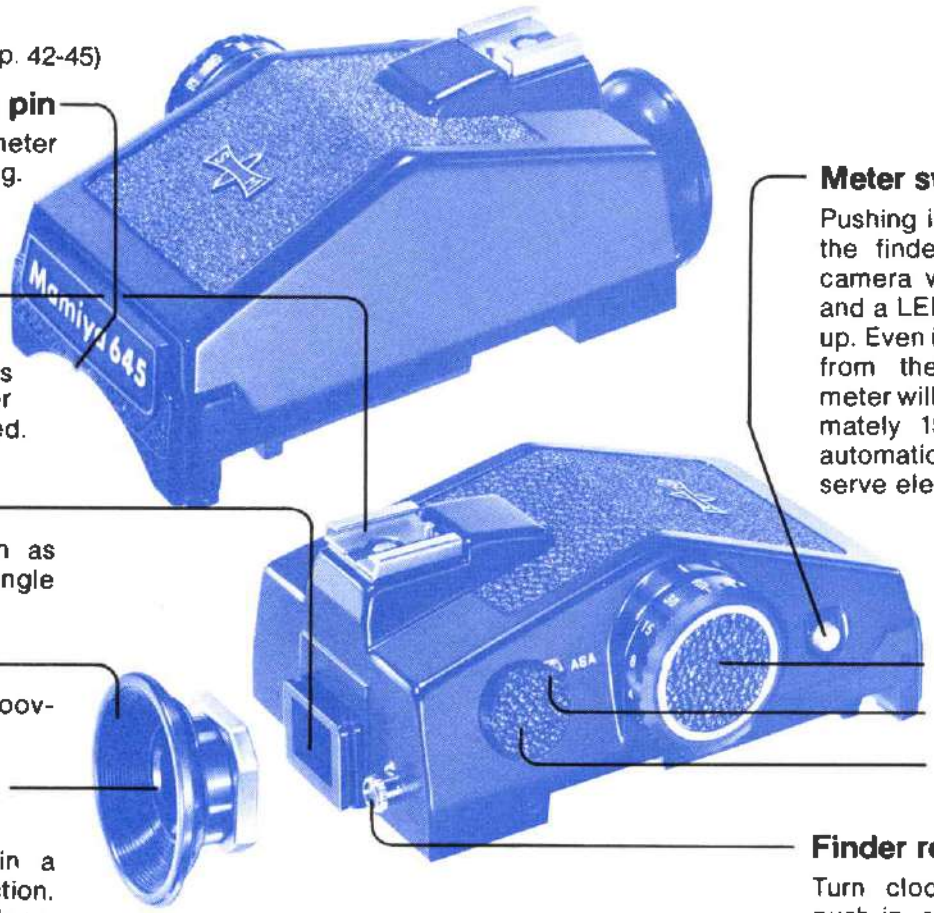
ASA dial
Pull out and then turn.

Safety button
Press the finder release button while holding in the safety button, and the finder can be lifted off the camera body.

Finder release button

PD Prism Finder S

(Detailed Instructions on pp. 42-45)



Aperture ring coupling pin
Couples to the exposure meter coupler on the aperture ring.

Hot-shoe
(with safety cover)
Automatically fires cordless flash units when the shutter release button is depressed.

Eyepiece
Accepts accessories such as eyecup, magnifier, and angle finder.

Eyecup
Attach by sliding into the grooves of the eyepiece.

Diopter correction lens retainer ring
Remove by unscrewing in a counterclockwise direction. After inserting correction lens, replace retainer ring.

Meter switch
Pushing in on this switch when the finder is attached to the camera will turn on the meter and a LED in the finder will light up. Even if you release pressure from the meter switch, the meter will remain on for approximately 15 seconds and then automatically turn off to conserve electricity.

Shutter speed dial

ASA window

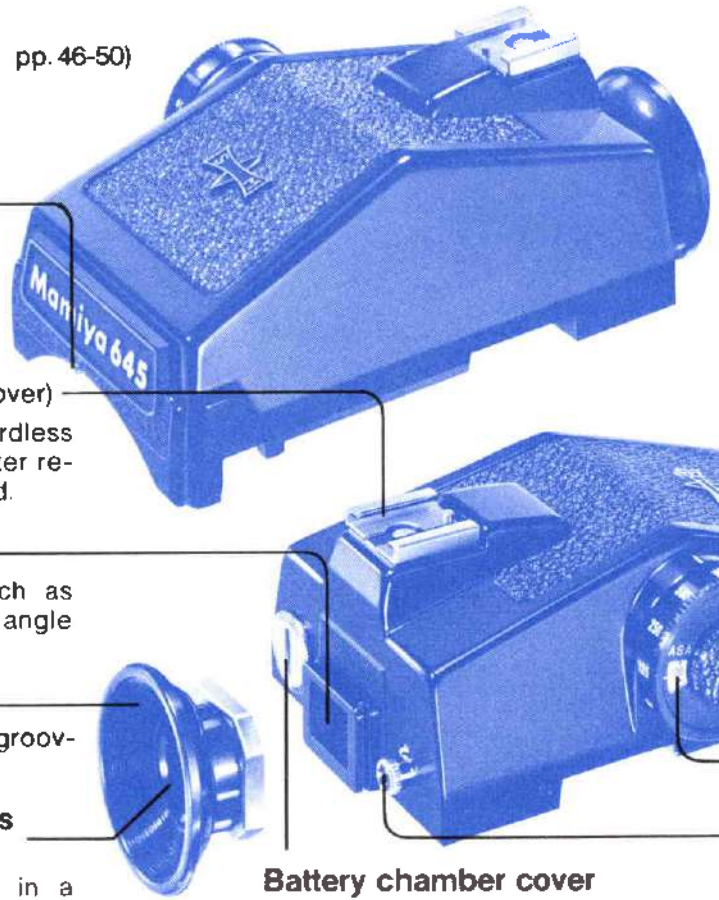
ASA dial
Pull out and then turn.

Finder release button
Turn clockwise until it stops, push in, and the finder can be lifted off the camera body.

Names and Functions of Parts (5)

CdS Prism Finder

(Detailed instructions on pp. 46-50)



Aperture ring coupling pin
Couples to the exposure meter coupler on the aperture ring.

Hot-shoe (with safety cover)
Automatically fires cordless flash units when the shutter release button is depressed.

Eyepiece
Accepts accessories such as eyecup, magnifier, and angle finder.

Eyecup
Attach by sliding into the grooves of the eyepiece.

Diopter correction lens retainer ring
Remove by unscrewing in a counterclockwise direction. After inserting correction lens, replace retainer ring.

Battery chamber cover
Remove the cover with a coin and insert a 1.5V battery into the chamber.

Shutter Speed Dial
Be sure to manually set the shutter speed dial of the camera body to the speed indicated by this dial.

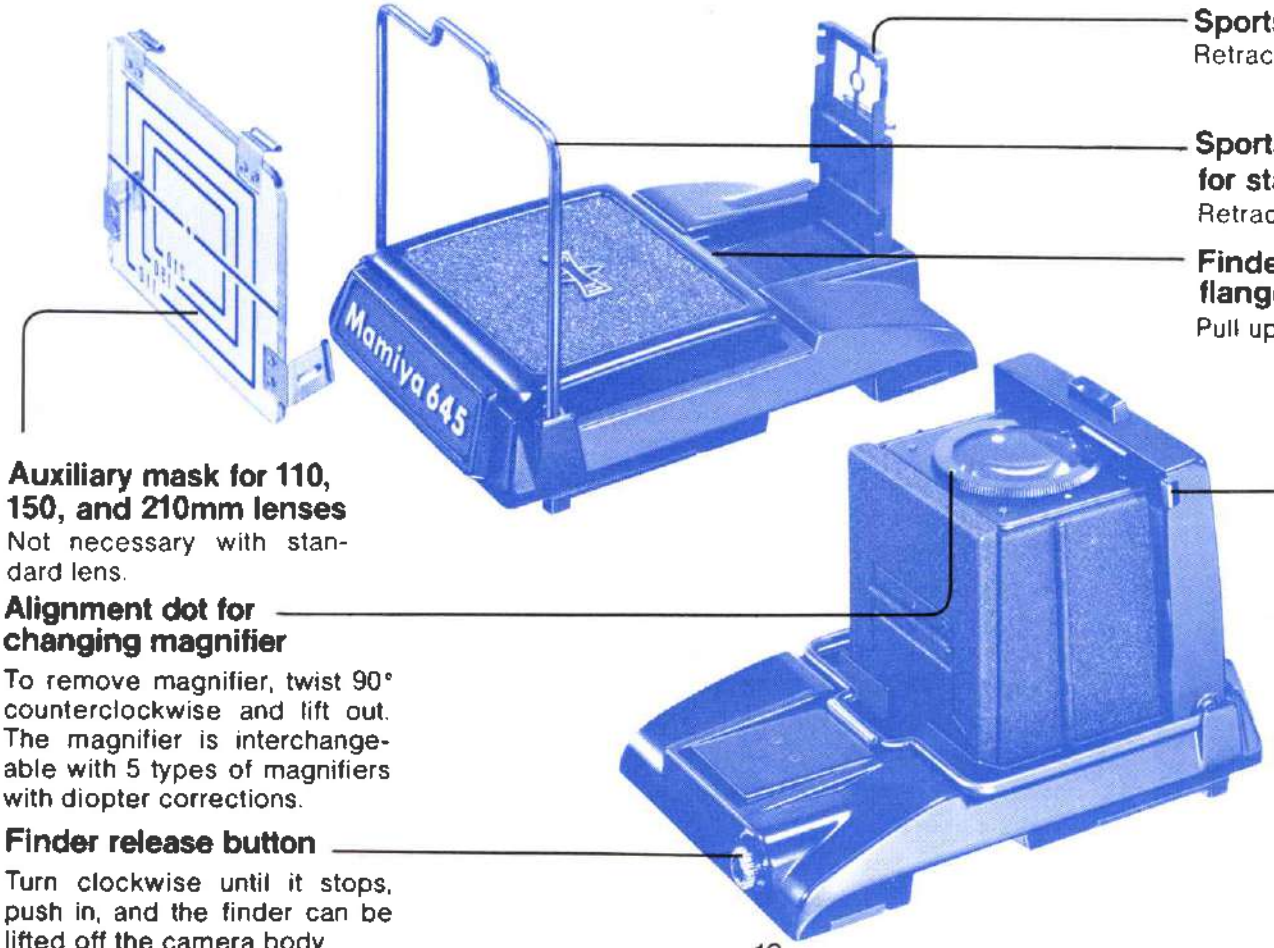
Power switch
Set to OFF when the meter is not being used.

ASA dial
Pull out and then turn.

ASA window

Finder release button
Turn clockwise until it stops, push in, and the finder can be lifted off the camera body.

Waist-Level Finder S (For detailed instructions, see pp.51-53)



Sports finder eyepiece
Retracted when not used.

Sports finder wire-frame for standard lens
Retracted when not used.

Finder hood opening flange
Pull up to open finder.

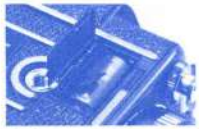
Auxiliary mask for 110, 150, and 210mm lenses
Not necessary with standard lens.

Alignment dot for changing magnifier
To remove magnifier, twist 90° counterclockwise and lift out. The magnifier is interchangeable with 5 types of magnifiers with diopter corrections.

Finder release button
Turn clockwise until it stops, push in, and the finder can be lifted off the camera body.

Magnifier release
Push in to raise the magnifier.

Testing to See if the Camera Functions Properly

1


2


3


4


5


To release the shutter when there is no film in the camera, proceed as follows. (For detailed instructions on particular points, refer to the page number shown in parentheses.)

1. Insert a battery into the camera (p.22)
2. Set the multiple-exposure lever to "MULTI" (p.57)
(If you have just purchased the camera and the vinyl tube is still on the take-up spool, there is no need to move the multiple-exposure lever.)
3. Set the shutter speed dial to any shutter speed other than the ⊙ red mark (p.28)
4. Turn the film advance knob until it stops.
5. Align the shutter release lock ring with the white dot and release the shutter (p.31)

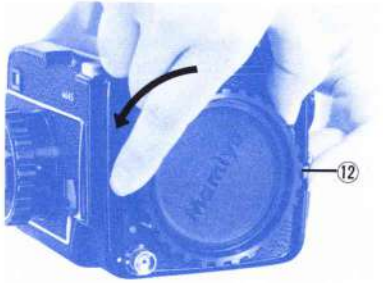
When ready to load the camera with film, return the multiple-exposure lever to its normal position. If this is not done, the film will not advance.

If the shutter is released without a battery in the camera, the mirror will lock in the up position. To return the mirror to its normal position, depress the battery check button (18) as far as it will go.

If the shutter is released with the shutter speed dial set to the red ⊙ position, the mirror will lock in the up position. To lower the mirror, turn the shutter speed dial in either direction (B or 1/500 sec.).

At times it may be necessary to rotate the film advance knob two full turns to cock the shutter when an empty take-up spool (without its original vinyl tube) is in the camera.

● Removing the Body Cap

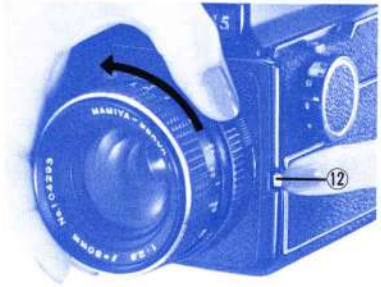


While depressing the lens release button (12), turn body cap counterclockwise until the red dots are aligned and lift out.

● Attaching Lenses

While aligning the two alignment dots (31 & 4), insert lens into camera body. Then twist lens clockwise until it clicks and locks into place.

● Removing Lenses



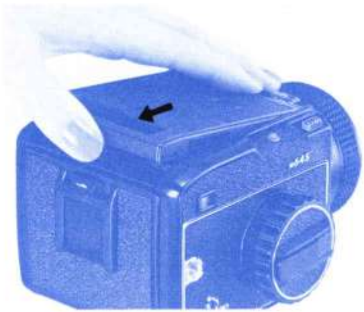
While depressing the lens release button (12), grasp the part of the lens barrel that has the depth-of-field scale (30) and alignment dot (31), and twist the lens counterclockwise until it stops. Then lift out.

★After removing a lens, be sure to place caps on both the lens and camera body.

★Never touch the surface of the mirror.

★After removing a lens, it is recommended to lock the shutter release button by setting the shutter release lock ring (6) in order to avoid accidentally releasing a cocked shutter when placing the camera body face down on a table.

● Upper Body Cover



Remove the upper body cover from the camera by sliding it to the rear and lifting up.

● Interchanging Focusing Screens

Five different focusing screens are available to suit various photographic conditions.

● **Removing the focusing screen**

Lift up the focusing screen using the two focusing screen lugs (2).

● **Attaching the Focusing Screen**

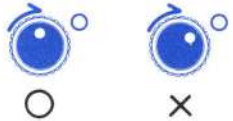
Insert the two tabs of the focusing screen into the slots at the back of the opening in the camera top and press lightly so that the screen clicks into place.

*The rear surface of the focusing screen is made of plastic so use care to prevent scratches when removing and attaching.

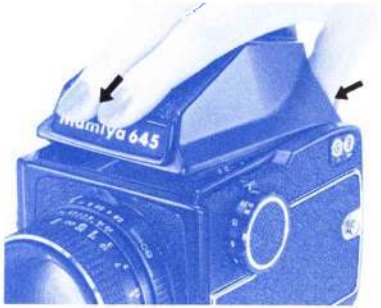
All of the finders are attached and removed in the same way, except for the AE Prism Finder which is removed by a different method.

Prior to attaching the finder to the camera, confirm that the white dot on the finder release button is pointing upward.

If the white dot on the button is aligned with the white dot on the finder, by depressing the button and removing your finger from it, the white dot on the button will automatically point upward. In this condition, the button cannot be depressed; consequently, the finder will not be accidentally detached from the camera.

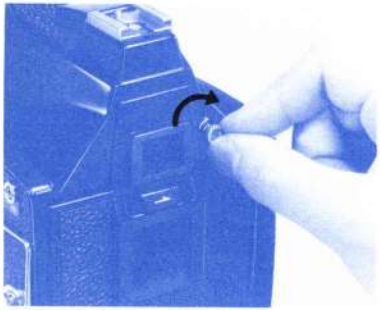


● **Attaching Finders**

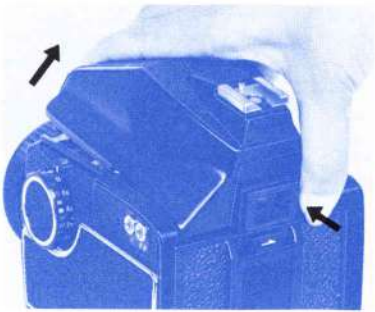


Place the rear part of the finder on the camera body while holding the front part of the finder slightly upward. Slide the rear part forward until it stops and gently lower the front part of the finder on to the camera body. It will then lock into place.

● Removing Finders



1. Turn the finder release button clockwise until it stops (about 60°). Then you will be able to push in on the release button.



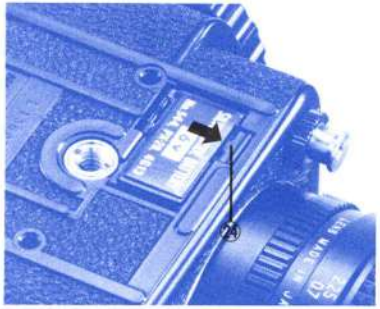
2. While pushing in on the release button with your thumb, lift the finder off the camera body.

Precaution:

Do not leave both white dots aligned by turning the button while the finder is attached to the camera. The finder may become detached when the button is occasionally depressed, possibly causing damage.

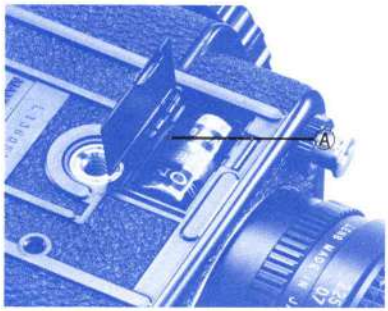
If you depress the button to point the white dot upward while the finder is attached to the camera, be sure to depress the finder against the camera body; otherwise the finder will not be locked into place.

Inserting a Battery



The Mamiya M645 uses one 6V silver-oxide battery 4SR44 (Eveready No. 544, UCAR 544, Mallory PX28 or equivalent) or alkaline battery 4LR44.

1. Pull the battery chamber cover latch (24) slightly toward the lens and the chamber cover will open.



2. Next, insert the battery, exercising caution that the ± poles match those shown on the diagram of the chamber. Battery removal will be simplified if the battery removal ribbon (A) passes under and over the battery.

CAUTION:

1. Carefully wipe the contacts of the battery before inserting it into the chamber. Failure to do so could result in poor electrical contact and consequent erratic functioning of the camera.
2. When the camera is not used for a long period of time, remove the battery and store it in a cool, dry place.
3. When replacing a battery, properly dispose of the used battery immediately as it is potentially dangerous. The batteries are explosive and should therefore never be thrown into a fire.
4. A battery that is not used for a long period, even if it is properly stored in a dry, cool place, may lose some of its charge. Consequently, check its condition after replacing it in the camera with the battery check button.

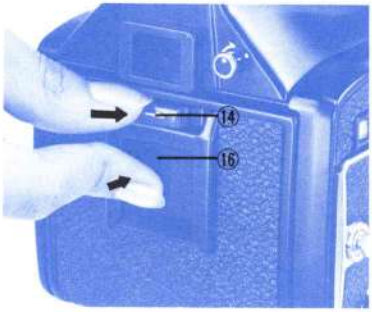
This camera is designed for use with either silver oxide or alkaline batteries. Although both types offer adequate performance, silver oxide batteries last much longer.
IMPORTANT: When using the PD Prism Finder, make it a point to use silver oxide batteries when available (in this instance, battery life is shortened if alkaline batteries are used).

When the battery check button (18, located above the film advance knob) is depressed, the battery check lamp (7, located above the shutter speed dial) illuminates. If the battery check lamp fails to go on, it is time to replace the battery.

★ When the battery is completely exhausted, the opened shutter will not close. At this time, **if the battery check button is pushed all the way down as far as it will go, the shutter will then close.**

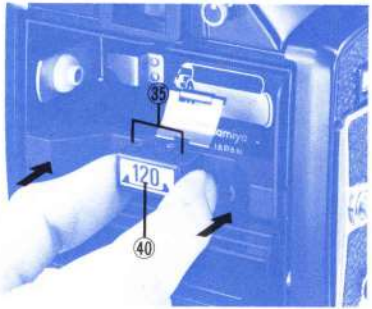
Loading the Film Insert

● Opening the Back Cover



While gently pushing in on the memo clip (16), move the back cover latch (14) in the direction of the arrow and the camera back cover will open.

● Removing the Film Insert

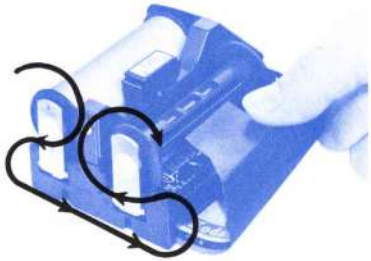


While squeezing in on both sides of the release latch (35), pull the roll-film insert out of the camera body.

● Insertion of the Film Insert

1. Grasp both sides of the release latch (35) of the film insert, making sure that the film type index (40) is not upside down, and place the film insert straight into the camera body. After the film insert has completely entered the camera body, let go of the release latch.

2. Press in on the outer edges of the release latch (indicated by the arrows in the photograph above) and the roll-film insert will lock into place. (If the roll-film insert does not go all the way in on the right-hand side, turn the film advance knob slightly while pushing in on the right side of the film insert.)



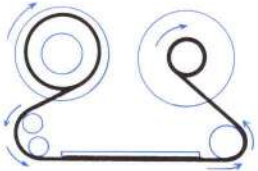
1. Load the film into the roll film insert. Two types of film inserts available for 120 and 220 roll films. Be sure to select the correct one for the film you normally use. Insertion of film is the same for either type. First, open both spool clips (36) toward the outside.

2. Align the right-hand side of an empty spool with the lower spool stud (39). Then return the spool clip (36) to its former position, making sure that the left-hand side of the spool is properly held by the spool clip.

3. In the same manner insert a roll of film in the upper compartment.

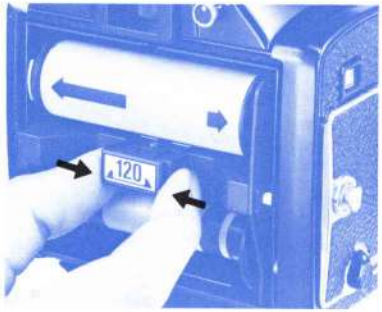
4. Make sure that the black side of the leader paper faces up.

5. Gently pull out some of the leader paper, pulling it over and around the pressure plate. Then insert the tip of the leader paper into the slot of the take-up spool.



6. Gently rotate the take-up spool in the direction of the arrow until the start mark of the film is aligned with the start mark on the spool clip (34).

*** The above step is to be completed before the roll-film insert is placed into the camera.**



Load the film insert into the camera in the aforementioned manner. Close the camera back cover by pressing it firmly.

* If the film advance knob moves slightly from the time the film insert is placed into the camera to the time the back cover is closed, there will be no ill effects. However, if the film advance knob moves too much, the first frame will be fogged.

● Memo Clip

The memo clip found on the camera back cover can be used to hold the film box top.

* The memo clip also doubles as a safety lock to prevent the camera back from accidentally opening. If excessively thick paper is placed in the memo clip, it will no longer simultaneously serve as a safety lock.

★ Never load film in direct sunlight. Load it in the shade or in your own shadow.

★ Roll-film inserts for both 120 and 220 film are loaded in the same manner. The exposure counter advances to 15 when the 120 film insert is used, and to 30 when the 220 film insert is used.

Make absolutely sure to match the film insert with the film type being used. If the wrong insert is used, the correct film plane will not be maintained and optimum sharpness will not be achieved. Moreover, if 120 film is used in the 220 film insert, there is the danger of the leader paper getting caught in the shutter causing damage to the camera.

★ Before placing the film insert into the camera, make sure the leader paper on the take-up spool is flat and lies evenly between the two edges of the take-up spool. The take-up spool should be wound sufficiently tight to make it impossible for the leader paper to ride over the edge of the take-up spool.

★ Always align the start marks of the film and spool clip before placing the film insert into the camera. (If the start marks are aligned within the camera with the aid of the film advance knob, the first frame will not be correctly positioned.)

● Using Roll-Film Designed for Six Exposures

If you wish to use roll-film designed for six 6 × 6cm exposures, follow the procedure outlined below.

1. Load the film in a 120 film insert and use in the normal way. The film will take 7 exposures.

2. After 7 exposures have been taken, set the shutter speed dial to 1/500 sec., wind the film advance knob and release the shutter 4 more times (the exposure counter will indicate "11").

3. Wind the film advance knob once again so that the exposure counter indicates "12", open the back cover, and remove the film insert. (Do not release the shutter when the exposure counter indicates "12".)

4. Completely wind the remaining leader paper around the film take-up spool.

★ If the film in the camera is completely wound onto the take-up spool, there is the danger of the tip of the leader paper getting caught in the shutter curtain and damaging the camera.