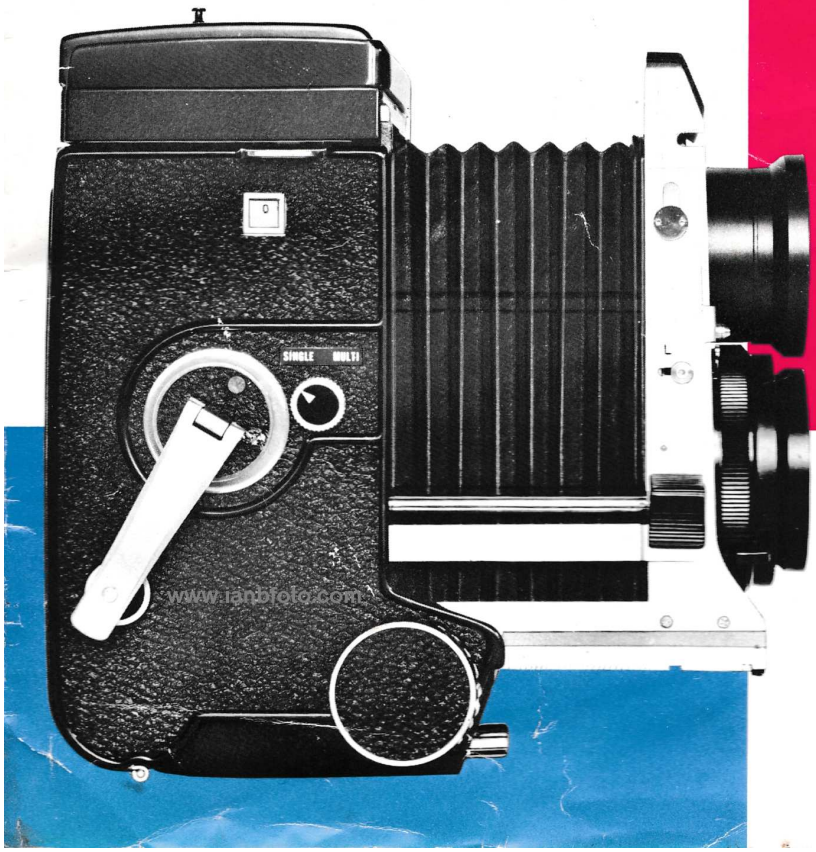
Mamiya C330



INSTRUCTIONS

Mamiya
CAMERA CO., LTD.
3-1, OTSUKA 3-CHOME, BUNKYO-KU, TOKYO, JAPAN

英 EFC. 50 70G 235

Printed in Japan

We are highly gratified that you have selected the MAMIYA C330 from among so many makes of cameras on the market. Before using the camera, please read these instructions very carefully, and learn the correct method of handling it. By becoming completely familiarized with the MAMIYA C330, you can make the most of the splendid opportunities this fine camera offers for many years to come.

This MAMIYA C330, an exceptionally high-grade camera, was designed by emphasizing further improvements on the popular MAMIYA C series. Retaining the many features of the MAMIYA C series cameras which have won highest praise from professional photographers the world over as unique twin-lens reflex cameras (2 1/4 in. square format) with interchangeable lenses, especially stressed was minimizing size and weight plus handling ease.

Final results reveal that this MAMIYA C330, an ideal camera for professional photographers, is also a wise choice for the many advanced amateurs who wish to take advantage of fine details in enlargements which only a large-format camera truly makes possible.

The MAMIYA C330 accepts all interchangeable lenses of the current Mamiya C series as well as all of the accessories except the single-exposure attachment.

In addition, various new accessories have been designed for this model. With the wide selection of all these interchangeable lenses and accessories, you can further widen your scope of photography by making the most of the unlimited versatility the MAMIYA C330 offers.

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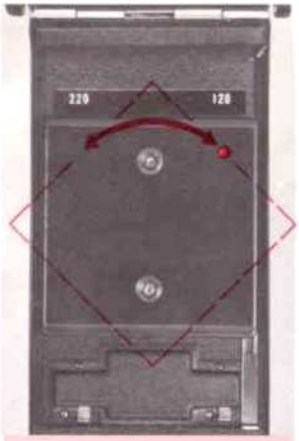
Read These Instructions Before Using Your MAMIYA C330



Adjust the direction of the pressure plate according to the film used (120 roll film or 220 roll film).

See page 8 for details.

When loading film, insert both film spools correctly.

See page 9 for details.

When closing the back cover, firmly press both sides of the back cover catch button.

See page 7 for details.

In coinciding the focal length of the lens to be used, set the parallax correcting dial. The amount of parallax correction and the exposure factor are readable on the focusing screen in the finder.

See page 14 for details.

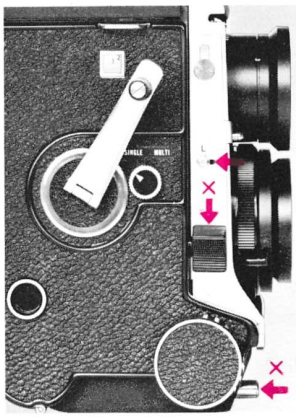
Read These Instructions Before Using Your MAMIYA C330 (cont.)

When this camera is under any of the conditions described as follows, the shutter release button cannot be depressed. In this case, absolutely do not use force.

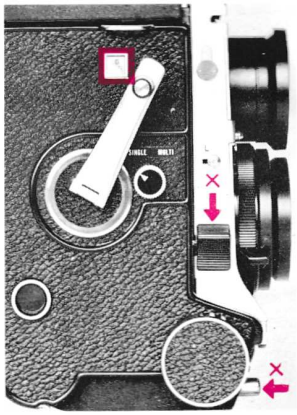
1. When lens change knob is set on "UNLOCK".

A red warning signal is visible on the focusing screen.

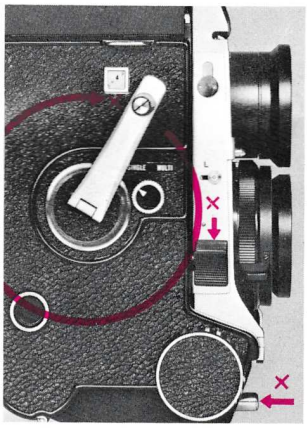
2. When shutter release lock button is set on the letter "L".



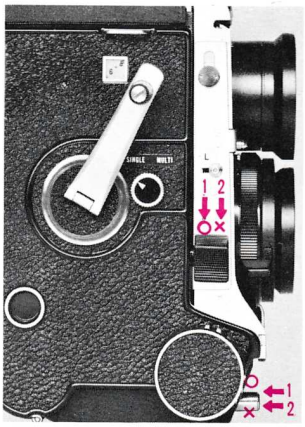
3. When multiple exposure button is set on "SINGLE," and ...



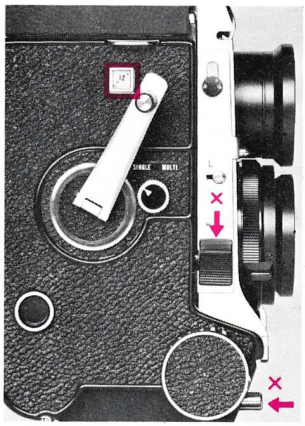
(1) When film is not loaded (exposure counter indicates "0").



(2) When the film has not been wound.

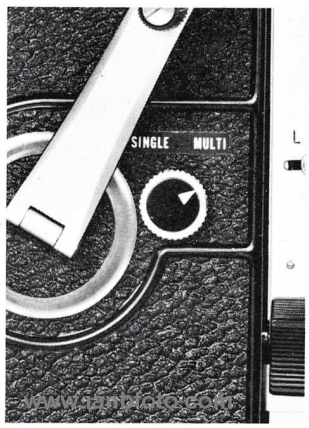


(3) When the shutter release button has already been pressed.



(4) When the last film in roll is exposed (after 12 or 24 exposures).

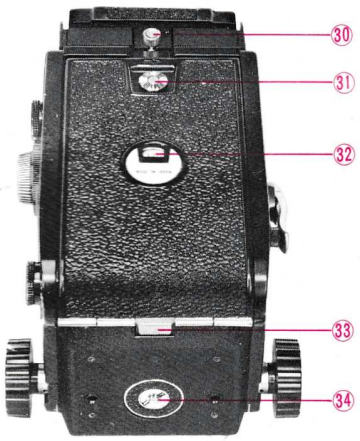
When taking ordinary pictures with roll film, set the multiple exposure selector triangular mark toward the word "SINGLE."



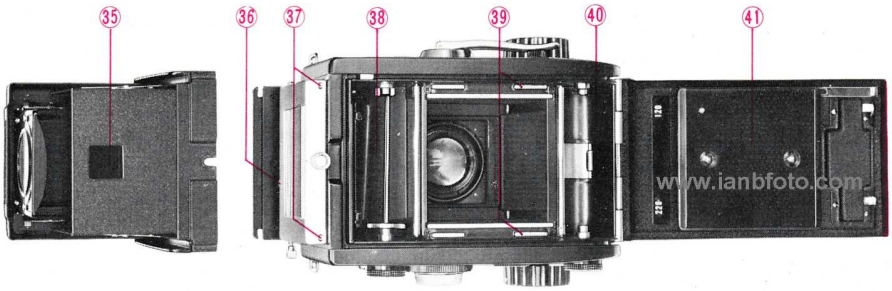
For multiple exposures, when the shutter is freely released without loading film, or when the single exposure attachment is used, set the triangular mark toward the word "MULTI."

Nomenclature of Operating Parts

1. Magnifying glass
2. Strap eyelet
3. Exposure counter
4. Shutter release lock button
5. Multiple exposure selector
6. Film wind crank
7. Shutter release button (upper)
8. Focusing knob
9. Sportsfinder frame (for 65mm lens)
10. Sportsfinder frame (for 80mm lens)
11. Sportsfinder mask stud
12. Sportsfinder flap
13. Synchroflash terminal

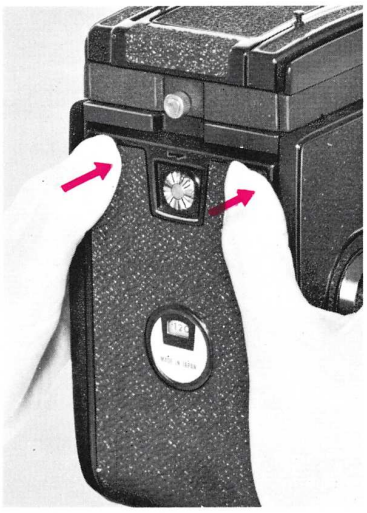


14. Synchroflash M-X selector
15. Shutter speed ring
16. Aperture ring
17. Shutter cocking lever
18. Aperture control knob
19. Shutter release button (lower) with cable release socket
20. Lens catch bracket
21. Accessory shoe
22. Spool change knob (upper)
23. ASA indication shifting lever
24. Lens change knob
25. Parallax correcting dial
26. Film type indication select lever
27. Distance scale window
28. Distance scale revolving knob
29. Spool change knob (lower)
30. Focusing hood lock screw
31. Back cover catch button
32. Film indicating window (120/220)
33. Back cover hinge release
34. Tripod socket
35. Eye opening for sportsfinder
36. Focusing screen frame catch
37. Focusing screen frame guide pin
38. Take-up spool chamber
39. Start mark
40. Film chamber
41. Film pressure plate



Opening and Closing the Back Cover

Twist the back cover catch button (31) until the red mark on the button faces upward. Then, by pressing the button in the direction indicated on the back cover, the back cover will open. The figure in the exposure counter automatically returns to "0" when the back cover opens.



When closing the back cover, firmly press both sides of the back cover catch button, making sure that neither side of the back cover is open or loose. Unless the back cover is closed tightly, the automatic film stopper will not work. Also, if only one side of the back cover is pressed when closing, the automatic film stopper may not function.

When the back cover is closed, by twisting the back cover catch button counterclockwise until the red mark of the button is on the left side, the back cover can be locked. If the button is twisted and the red mark moved to the left side before closing, the back cover will automatically lock when closed.

Before Loading Film

This camera accepts either 120 or 220 roll film. It has an automatic film stopper and a double exposure prevention device. Take the following steps before loading a film:

1. By turning the multiple exposure selector (5), set the triangular mark toward the word "SINGLE."

This action locks the shutter release button until the film is wound, preventing accidental double exposures.

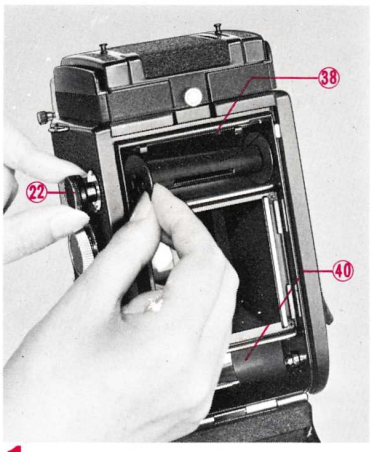
2. Adjust direction of the pressure plate according to the film used.

Open the back cover, twist the pressure plate (41) either to the right or left 90 degrees until the red mark on the pressure plate matches either 120 or 220.

Subsequently, when closing the back cover, the film stopper mechanism is automatically set to coincide with the film frame number.

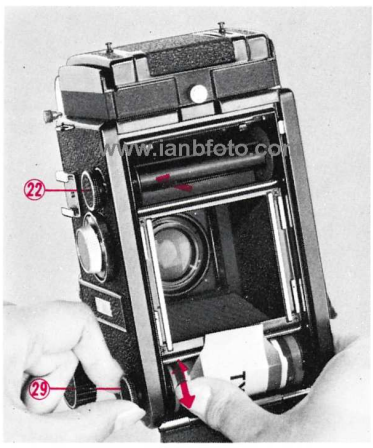
The figure 120 or 220 will appear in the film indicating window (32), informing the user of the loaded film size when the back cover is closed.

Loading Film



1. Open the back cover and pull out the spool change knob (22), then insert an empty spool into the take-up spool chamber (38) so that it engages the winding axis. Release the spool change knob.

Pull out the spool change knob (29), and insert a roll of film in the film chamber (40).

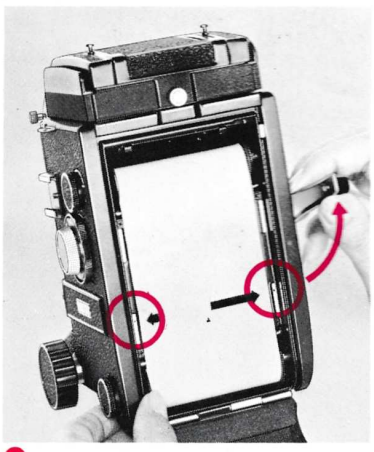


PRECAUTIONS

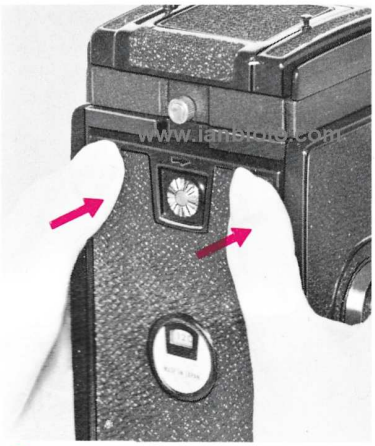
By turning the spool change knobs (22) and (29) either to the right or left after pulling them outward, the knobs stay at their protruded positions. Turn the knobs backward to reinsert them.

If both spool change knobs are not returned to their original positions after loading a film, unbalanced film winding will result.

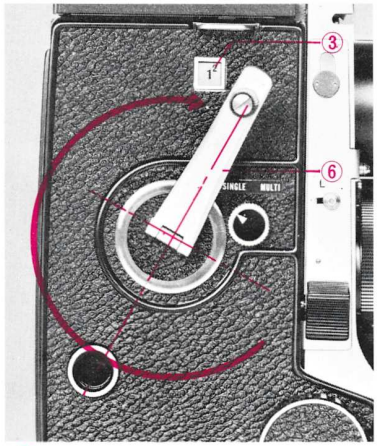
Should the spool change knob not return to its original position, move the spool slightly to the front and rear or up and down.



2. Pull out the leader paper of the film and guide it into the slit of the take-up spool, turn the film wind crank (6) clockwise until the start mark on the leader paper matches the start marks (39) on the camera.



3. Close the back cover. When closing the back cover, firmly press both sides of the back cover catch button. Twist the button counter-clockwise, so that the back cover does not open unexpectedly.



4. Turn the film wind crank (6) clockwise until it stops. Figure 1 appears on the exposure counter (3) at the position where the crank stops diagonally upward, and the shutter is automatically set. Now the camera is prepared for the first exposure.

The crank cannot be turned in reverse.

Turn the crank each time one picture is exposed. Regardless of the number of pictures taken, the crank always stops at a diagonally upward position. In this position, when folding the crank in the opposite direction, the crank can be recessed in the body.

Handling the Focusing Hood

Raising the Focusing Hood

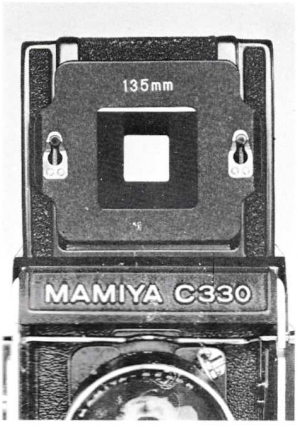
By pulling up the rear of the finder frame (9), the focusing hood automatically springs up into position.

By pushing in the top of the sportsfinder flap (12) at the center of the finder frame, the magnifying glass swings up into position. While looking into the ground glass focusing screen in this position, turn the focusing knob (8) to focus. After focusing, push down the magnifying glass, and decide the photo composition by using the entire view on the focusing screen as a guide.

Using the Focusing Hood as a Sportsfinder

1. By pulling up the magnifying glass and pushing down the sportsfinder flap, and by attaching the latter to the catch at the bottom of the focusing hood, the hood can be used as a sportsfinder for the 80mm standard lens.

2. After pushing down the flap (12), also fold down the finder frame (10) to obtain the field of view for the 65 mm lens.



3. When using the 105 mm, 135mm, 180mm, or 250mm lens, attach the respective sportsfinder mask for the lens used on the finder mask stud (11), adjusting for the change in field of view.

4. To return the finder frame (10) to its original position, by pushing and releasing the left side plate of the hood with a finger tip (left side when the camera is held for photographing), the finder frame will automatically return to its position.

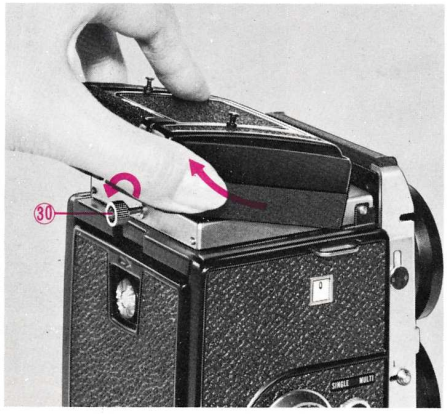
5. To return the sportsfinder flap (12), push the right side plate.

Folding the Focusing Hood

Return the sportsfinder flap, push down the magnifying glass, fold the side plates inward and the back plate downward, finally folding the finder frame (9).

Handling the Focusing Hood (cont.)

Changing the Focusing Hood



The focusing hood can be replaced with various finders available for this camera as accessories.

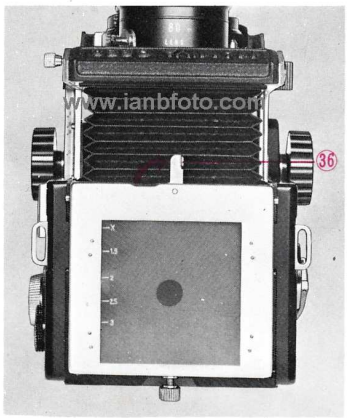
How to Remove the Focusing Hood

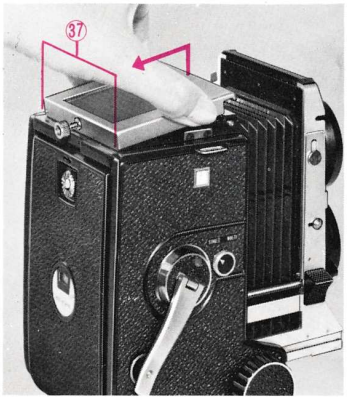
By turning the focusing hood lock screw (30) counterclockwise to loosen it, pull back the hood and move it upward; then the hood can be taken off.

How to Attach a Focusing Hood

Match the grooves on the hood's front both sides to the pins of the camera body, fit the groove on the hood's rear to the focusing hood lock screw, then fasten it.

Changing the Focusing Screen





Various focusing screens inserted in convenient individual frames are interchangeable for this camera as accessories. They can be freely exchanged when desired.

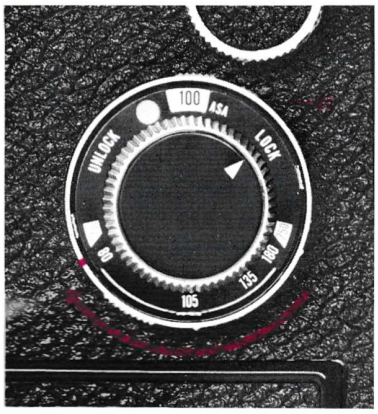
Removing the focusing screen

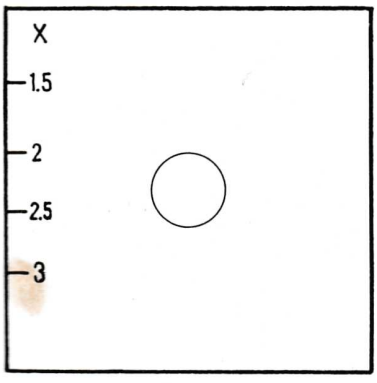
Initially remove the focusing hood, then extend the bellows by turning the focusing knob. Release the frame catch (36) by turning it in the direction of the arrow, as shown in the photo. Next, by pulling back the focusing screen frame after raising its front portion upward, the focusing screen frame can be removed.

Installing the focusing screen

After positioning the two holes on the rear side of the focusing screen over the two guide pins (37) on the body, depress the front portion. Return the frame catch to its original position while depressing the front portion of the focusing screen frame.

Before Taking Pictures





Setting the Parallax Correcting Dial

By turning the parallax correcting dial (25), set the dial index to the focal length of the lens used. Subsequently, while the lens is being extended, the pointer will appear on the upper, left portion of the focusing screen. The position of this pointer indicates parallax and the exposure factor.

Correcting parallax:

When the pointer appears on the focusing screen, the upper portion visible above the pointer will be cut off on the film. Be sure that the subject is satisfactorily appears under the lower portion of this pointer. When using the camera on a tripod, use the Paramender (parallax corrrecting device) to ensure that the camera photographs the same image viewed on the focusing screen through simple operations.

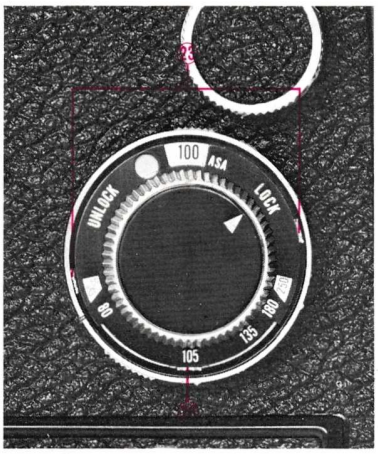
Compensating exposure:

As distance between the lens and film increases, image brightness on the film is reduced even though aperture size remains the same. Consequently, it is necessary to increase the exposure.

The figures on the focusing screen left side indicate the exposure factor. Compensate the exposure after reading the figure indicated by the pointer while focusing. For instance, assuming that the correct exposure value measured by an exposure meter is 1/125 sec. at f/11, compensate the exposure as follows:

If the pointer indicates 2, 1/125 sec., f/8
or 1/60 sec., f/11

If the pointer indicates 3, 1/125 sec., between f/8 and f/5.6
or 1/60 sec., between f/11 and f/8



Indicating Film Speed and Type on Respective Windows

By turning the ASA indication shifting lever (23) while pushing it against the camera body, the film speed (ASA) will appear in the window. Set it to the speed of the loaded film.

By turning the film type indication select lever (26), three types of identifying marks will appear in the window. Use these marks as a film memory guide (black and white, daylight color, and tungsten type color).

When using a 55mm or 65mm lens, set the dial (25) to 80 and attach the parallax correction plate for 55mm/65mm lenses to the focusing hood.

How to install the parallax correction plate:

Remove the focusing hood from the camera and turn it inside out. Also turn the correction plate inside out and insert its chamfered edge in the two catches on the hood, then fit the correction plate while pulling out the slide lock on the opposite side. When the slide lock is released, the plate is secured.

The figures visible on the left side of the correction plate after attaching the focusing hood to the camera reveal the exposure factor. Observe the line on the right for correcting parallax. When the pointer indicates 1.5, the upper portion of the first line will be cut off. In turn, this becomes a correcting scale when the exposure factor is 2, 2.5 and 3.

Distance Scale

A distance scale is provided on the left side (viewing the camera held for photographing). By turning the knob (28), set the distance scale to coincide with the lens used, so that the scale faces horizontally.

Distance scales for 55mm, 65mm, and 80mm lenses are indicated in red. Read these scales at the index position in the window.

Distance scales for 105mm, 135mm, 180mm, and 250mm lenses are indicated in black. Read these scales at the front end of the camera body side plate.

Since the flange-focal length varies between the 105 mm F3.5DS or 105mm F3.5D lens and the ordinary 105mm F3.5 lens, a distance scale is especially provided.

A distance scale marked 105D. DS is used for 105mm DS and 105mmD lenses (There are two types, scaled in feet or meters.).

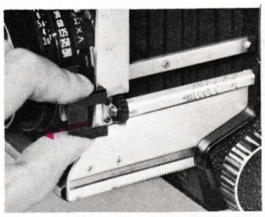
A distance scale marked 105 is used for ordinary 105 mm lens (There are two types, scaled in feet or meter.).

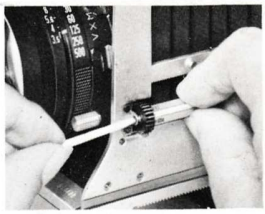
Distance graduations of lenses other than the 105mm lens are all the same.

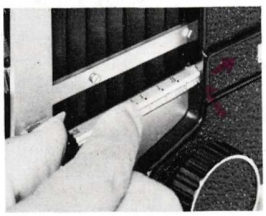
Replacing the Distance Scale

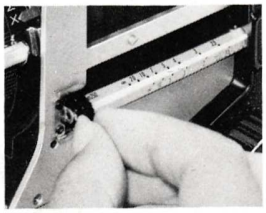
To remove the distance scale, at first, fully extend the bellows by turning the focusing knob, then remove the scale end cover by sliding it to the front. Next, pull out the distance scale after detaching it from the bearing, by holding the distance scale revolving knob portion while pressing in the distance scale shaft with a pointed, fine wire.

When installing the distance scale, insert the shaft tip opposite the revolving knob into the camera body bearing. In this case, insert the shaft tip while pressing the spring located near the bearing to the inner side, at the side of the scale. Next, fit the shaft to the bearing while pushing in the shaft tip with a finger nail; then install the cover as it originally was.









Taking Pictures

1. After focusing, turn the shutter speed ring (15) and set the shutter speed; then adjust the aperture of the lens by turning the aperture control knob (18). Now the camera is prepared for taking pictures.
2. Release the shutter by pressing the shutter release button (7) or (19). When a cable release is used, screw its tip into the cable release socket in the lower button (19).
3. After each exposure, wind the film by turning the film wind crank, then follow the same routine as mentioned above.

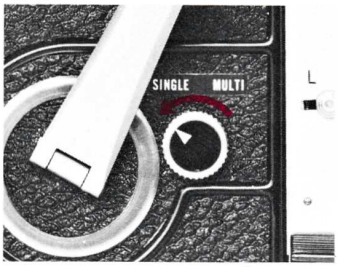
How to Remove Film

When all film frames have been exposed, the film winding stop mechanism is automatically released. Remove the film after winding the remaining leader paper on the film end.

Winding Up the Roll Film

To remove film before exposing the entire roll, or to wind up a short roll of film after exposure (6-exposure color films), turn the film wind crank while depressing the shutter button on the camera body after winding the exposed frame. In this manner, film can be completely wound without stopping.

Shutter Operations



Using the Multiple Exposure Selector

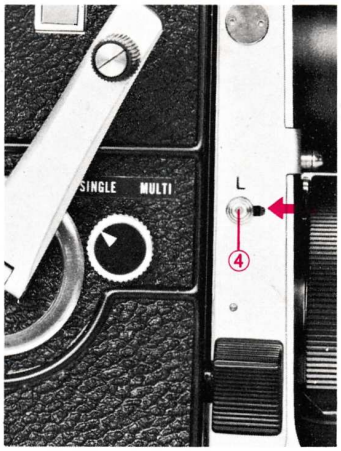
When the multiple exposure selector triangular mark is set toward the word "SINGLE," double exposures are prevented. Once the shutter button has been depressed, it cannot be redepressed without first advancing the film. When the multiple exposure selector triangular mark is set toward the word "MULTI," the shutter button can be depressed repeatedly regardless of advancing film. This proves convenient in the following cases:

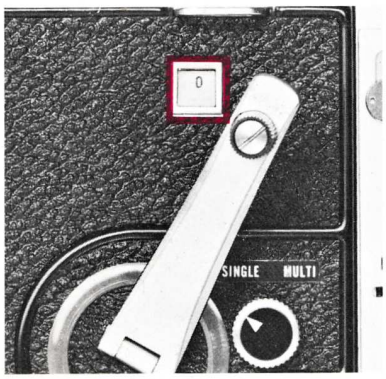
1. When multiple exposures are desired.
2. For operations without loaded film (such as shutter testing).
3. When photographing with the single-exposure attachment.

When photography is suspended by a missing chance to release the shutter in spite of deeply depressing the shutter button half way, it rarely happens that the shutter button cannot be depressed on the next attempt. In this case, by setting the mark on "MULTI," pictures can be taken without needlessly advancing the film.

Locking the Shutter Button

By shifting the lock button (4) toward the letter "L", the shutter button is locked. While suspending photography or the camera is stored in the case, even though the shutter has been cocked by film winding inadvertently releasing the shutter can be prevented.





When No Film is Loaded in the Camera

Even when the film wind crank is turned, the number in the exposure counter remains at "0". In this case, if the multiple exposure button is set on "SINGLE," the shutter release button cannot be depressed. However, when a take-up spool is in the take-up spool chamber, although no film is loaded, the counter may be advanced (depending upon the type of spool). In this case, roller connected to a film will run idle, causing wear on the roller and proving undesirable to turn the film wind crank in this condition.

For certain lens-shutter assemblies, the release lever for the shutter itself can be depressed many times even though the shutter is not cocked, the same as the 80mm f/3.7 lens. (When the shutter is not cocked, the shutter blades do not open).

When using this type of lens shutter, if the shutter button is depressed without cocking the shutter, no picture will be recorded on the film. Concerning the unopened shutter blades, even though the shutter is cocked manually, the shutter button will not operate due to action of the double-exposure-preventing device. In this case, also, set the multiple exposure button tiangular mark toward "MULTI" and depress the shutter button, or release the shutter by pushing the release lever on the lens-shutter assembly.

250mm f/6.3 and 80mm f/3.7 lenses :

Shutters of these lenses have no self-cocking system, requiring the shutter to be set manually after each film advance.

Photographing by Flash Unit

When photographing by flash, attach a flash gun to the accessory shoe (21) on the camera body and connect the cord to the flash synchro-terminal (13).

When M-class flash bulbs are used, set the synchroflash M-X selector (14) on M to synchronize flash at all shutter speeds.

When an electronic flash unit is used, set the synchroflash M-X selector on X to synchronize flash at all shutter speeds.

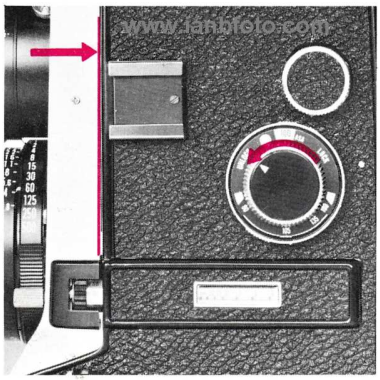
This synchroflash M-X selector can be changed even after cocking the shutter. When photographing without flash, keep the selector on X.

FLASH SYNCHRONIZATION TABLE

Contact	Bulb	Shutter Speed										
		B	1	1/2	1/4	1/8	1/15	1/30	1/60	1/125	1/250	1/500
M	M class	○	○	○	○	○	○	○	○	○	○	○
X	Electronic Flash	○	○	○	○	○	○	○	○	○	○	○
	F class	○	○	○	○	○	○	○	○	×	×	×
	M class	○	○	○	○	○	○	○	×	×	×	×

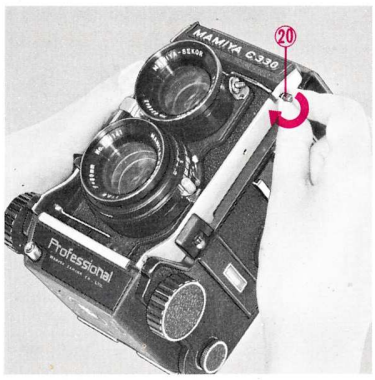
Combinations with the ○ mark synchronize.
Combinations with the × mark do not synchronize.

Changing Lenses

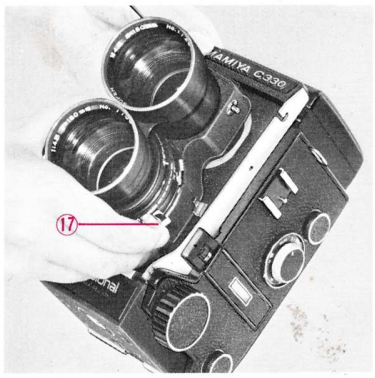


By turning the focusing knob, completely retract the bellows so that the lens mount portion contact to the body. Recess the film wind crank in the camera body.

Turn the lens change knob (24) so that the triangular mark points to the word "UNLOCK."



Tip the camera so that the lens faces upward, and while firmly grasping the lens barrel pinch the head of the lens catch bracket (20), press the head toward the camera body, push it down to release the lens catch, and remove the lens.



To attach another lens to the camera body, carefully position the lens so that the lens shutter cocking lever (17) connects with the cocking lever on the camera body. This operation is correctly performed by previously cocking the lens shutter with the fingers, first inserting the lens from the cocking lever side on the body. Clamp the lens catch (20) to its original position, and turn the lens change knob (24) clockwise to the "LOCK" position. With this operation, lens replacement is completed.

After changing a lens, set the parallax correcting dial (25) to the focal length value of the mounted lens. Regarding 55mm and 65mm lenses, set the parallax correcting dial to 80, then attach the parallax correction plate for 55mm/65mm lenses to the focusing hood. (Refer to p. 15 for handling method of the focusing hood).

Concerning the 250 mm lens, set the parallax correcting dial to 180.

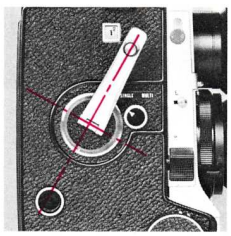
PRECAUTIONS

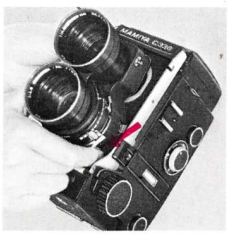
1. If the film wind crank is not kept positioned diagonally upward, (the same angle as the crank housing position), the cocking lever (17) cannot be connected with the cocking lever on the camera body.

2. Regarding the cocking lever on the 180mm lens, an auxiliary lever for connection is provided on the side of the lens barrel. Since this lever is constantly pushed upward by a spring, when mounting the lens, hold the auxiliary lever downward with a finger tip to prevent obstructing installation.

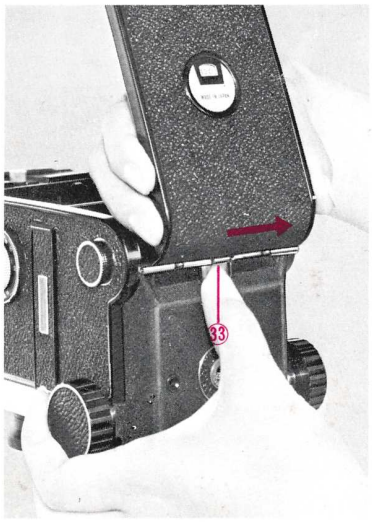
3. When the lens change knob (24) is in the "UNLOCK" position, the portion to which the picture taking lens (lower lens) is attached is protected by a cover from the camera interior to shield the film from exposure to light, and a red warning signal is visible on the focusing screen surface.
   Should this cover be pushed while removing the lens, light will strike the film. Never push it.

4. After changing a lens, turn the lens change knob (24) to the "LOCK" position; otherwise, the shutter release button cannot be depressed.





Changing the Back Cover



The back cover of this camera can be exchanged with the exclusive back cover for single exposure attachment. Release the back cover catch button and open the back cover halfway. In this condition, slide the back cover in the arrow direction (as shown in the picture) while depressing the back cover hinge release (33).

When the back cover is fully opened, the back cover also can be detached by sliding it horizontally while depressing the tip of the hinge release from the inner side of the back cover. When installing the back cover, press the hinge release with the hinge of the cover while inserting the hinged shaft of the back cover in the body receiver, sliding the back cover in the reverse direction from detaching it.

Tripod Socket

In addition to a tripod, a grip holder, pistol grip, paramender, and so forth can be attached to the tripod socket (34) on the camera base.

Those persons who own a tripod with a 3/8 in. tripod screw can attach their tripod as follows. First, remove the securing screw located in the interior of the tripod socket with a driver, turning the screw counterclockwise. Next, fit a coin to the groove of the tripod socket and remove the tripod screw by turning it counterclockwise; thus the screw receptacle on the camera body will accept a 3/8 in. screw.

Accessories

Filters

There are five different types of filters Y2, YG, O2, UV and SL) for each filter size described in the lens specifications table.

Precautions

There are two different diameters for the 80mm f/2.8 lens and the 105mm f/3.5 lens. When you order filters for these lenses, always specify the diameter of your lens.

Lenses with a 49mm filter diameter have a particular filter mount and do not accept other than Mamiya filters. When you order filters for these lenses, always specify the MAMIYA C type.

For attaching filters to lenses of 49mm filter diameter, put your palm on the protective ring screwed into the front barrel of the lens, turn the ring counterclockwise to remove it, then screw in the filter. When filters are not used, always replace the ring to protect the lens barrel.

Lens hoods

There are five different types of lens hoods available for interchangeable lenses.

† Lens hood for 55mm lens
† Lens hood for 65mm lens
Lens hood 42ϕ for 80mm f/3.7 80mm f/2.8* 105mm f/3.5*
Lens hood 48ϕ for 80mm f/2.8** 105mm f/3.5** 135mm f/4.5
† Lens hood for 180mm Super 180mm 250mm

Lenses marked * are chrome-finish type.

Lenses marked ** are black finish type.

Lens hoods marked † have a side plate which can be inclined.

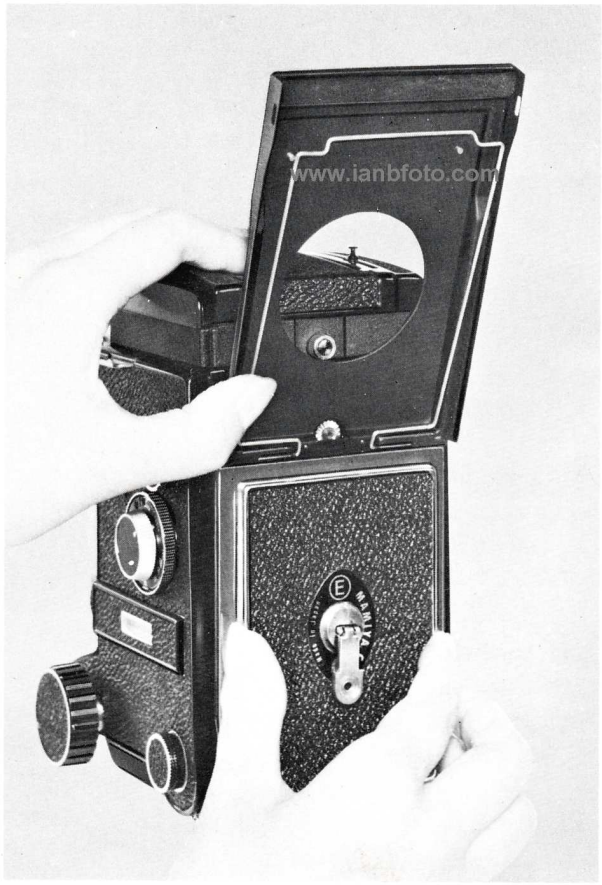
All of these lens hoods are the comparatively new type attached only to the taking lens. Old type lens hoods are also acceptable.

For the 80mm f/2.8 lens and 105mm f/3.5 lens, attach a 48mmϕ lens hood to lenses with black finish type, and a 42 mmϕ lens hood to lenses with chrome-finish type. Lens hood of 48mmϕ can also be attached to 135mm lenses. In the above table, lens hoods marked † are hoods whose a side plate can be inclined. Attach the hood to the lens with this plate upward. When reflected light from the lens hood to the viewing lens becomes annoying while focusing, due to a certain light condition, incline the plate so that the annoying reflection is eliminated.

Accessories

Single Exposure Attachment

By using the single exposure attachment provided, single exposures can be made of dry plates (2 1/2×3 1/2 in., 6.5×9cm) or cut films (4 3/4×6 1/2 in. cut film divided into four 1/4 sizes or 2 1/2×3 1/2 in.) When using 4 3/4×6 1/2 in. cut film divided into four one-quarter sizes, use a J-type film sheath. When using 2 1/2×3 1/2 in. film, use a D-type film sheath.



Installing Method

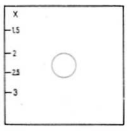
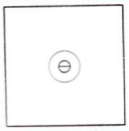
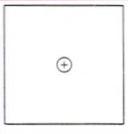
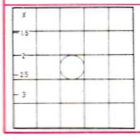
Replace the camera back cover with the exclusive back cover for single exposure. Always remove the spool in the camera. Install a holder containing a dry plate or cut film on the exclusive back cover, closing the outer frame of the back cover to complete preparation.

PRECAUTION

Since the position of its focusing surface differs, the conventional single exposure attachment for the MAMIYA C series cannot be utilized on this camera.

Focusing Screen

The following types of focusing screen are available, replaceable according to the photographing purpose. A metal frame is provided for all focusing screens.

Designation	Features	Application
 No. 1 Matte	Matted entire surface; Fresnel lens (except center circular portion); with exposure factor scale.	For general photography Suitable for any lens
 No. 2 Rangefinder Spot 4°	Matted entire surface (except center small circular split prism portion); Fresnel lens (except center circular portion); without exposure factor scale.	For general photography Quick, accurate focusing is possible through the matted surface and the split prism.
 No. 3 Rangefinder Spot 6°	Matted entire surface (except center small circular split prism portion); with Fresnel lens (except center circular portion); with exposure factor scale.	For general photography Focusing precision by the split prism is sensitive compared with the No. 2 Rangefinder Spot 4°
 No. 4 Microprism	Matted entire surface (except center micropirsm portion); with Fresnel lens (except center circular portion).	For general photography Focusing is performed through the matted surface and the center microprism portion.
 No. 5 Cross Hair	Matted entire surface (except center circular portion).	For special photography Suitable for close-up photography by largely extending the bellows; also for dim, distant views and astrophotography.
 No. 6 Checker	Matted entire surface; with Fresnel lens (except center circular portion); with sectional scale.	Sectional graduations are added to the No. 1 Matte. Convenient in arranging composition.

Accessories

Porrofinder

By attaching this Porrofinder instead of the regular focusing hood, the camera can be held at eye level. The image in the finder is right side up and correct right to left . . . actual visual focusing.

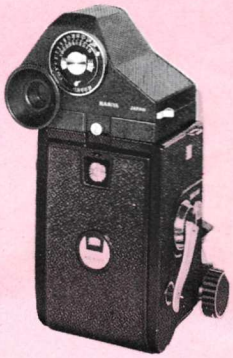
Magnification of this finder approximately doubles the image on the ground glass focusing screen.

Prism Finder

Through this prism finder, the image on the ground glass focusing screen appears exactly as the subject is seen. Really an indispensable accessory for eye level photo-journal photos or candid shots.

Magnification of this finder is approximately 2.5 times the image on the ground glass focusing screen, particularly bright and clear.

CdS Porrofinder



This is a Porrofinder with built-in CdS exposure meter. Match the index needles within the finder by turning the dial on the back of the finder, and read the dial scale. This device measures the amount of light traveling through the viewing lens, offering correct exposure setting even for amateurs.

Especially important . . . there is no need to worry over exposure correction on close-up shots by extending the bellows camera. However, when a filter is attached to the taking lens, the exposure must be adjusted according to the filter factor. An eyecup prevents disturbing light from entering the finder through the finder eyepiece.

Magnification of this finder approximately doubles the image on the ground glass focusing screen.

Eye Correction Lens

This lens, designed to correct visibility, is installed inside the eyepiece ring of the Porrofinder, CdS Porrofinder, or Prism Finder.

The image in the finder coincides with persons with ordinary eyesight who easily visualize objects without becoming fatigued. Persons who do not wear glasses in spite of their nearsightedness or farsightedness, or whose sight is not sufficiently corrected by glasses, usually find it very difficult to observe the finder image. Such persons may find this lens a boon to facilitating picture taking.

Nine types of lenses are provided from +2.5 to −2 diopter (each diopter is +2.5, +2.0, +1.5, +1.0, +0.5, −0.5, −1.0, −1.5, and −2.0).

The diopter has no relation to values such as 1.0 in a test of visual power, and cannot be converted to other values; therefore, have an optician determine the diopter suitable to your glasses.

Supposing that your glasses were +1.5 diopter, it would be very easy to view the finder image when using a lens having +1.5 diopter. Of course, if the individual wears glasses perfectly fitted to his eyes, this accessory lens is unnecessary.

When installing the lens on the finder, hold the milled portion of the eyepiece ring with the thumb and finger, and turn it counterclockwise to remove the ring. When the lens is a plus (convex) lens, position it with the flat surface outside, and when it is a minus (concave) lens, place the concave surface on the exterior, then screw the ring into its original position.

Magnifying Hood

This magnifying hood may be used instead of the focusing hood. By turning the knob on the side of this hood, either 3.5X or 6X magnification can be selected.

Magnifier

A very convenient accessory for accurate focusing, this magnifying glass, used by attaching it to the side plates of the focusing hood from above, magnifies the picture on the ground glass focusing screen 5.5 times. By turning the eye lens ring of the magnifier, visibility can be adjusted.

Accessories

Paramender

This is a parallax-correcting instrument used between the camera base and a tripod. Keep the part attached to the camera base downward while focusing, then raise the camera position by turning the handle until it stops just before releasing the shutter. Thus, the taking lens is lifted to the position where the viewing lens was, and parallax is hereby automatically corrected.

Grip holder

The grip holder is a very convenient accessory for hand-holding the camera while taking pictures or for carrying the camera. Its accessory shoe is attached on the top of the grip.

Pistol grip

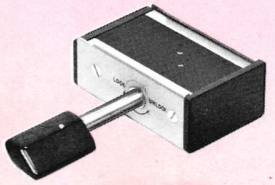
This grip, which supports the camera from the bottom, has a trigger type shutter release button which many persons prefer when following sports action.

Tripod Adapter Type P

This adapter can be attached to either a U 1/4 inch or 3/8 inch tripod screw. Also this adapter permits coupling with the quick-shoe, enables rapid camera mounting on the tripod.

Quick-shoe

The quick-shoe can be coupled with the tripod adapter type P, enabling the camera to be rapidly attached to the tripod.



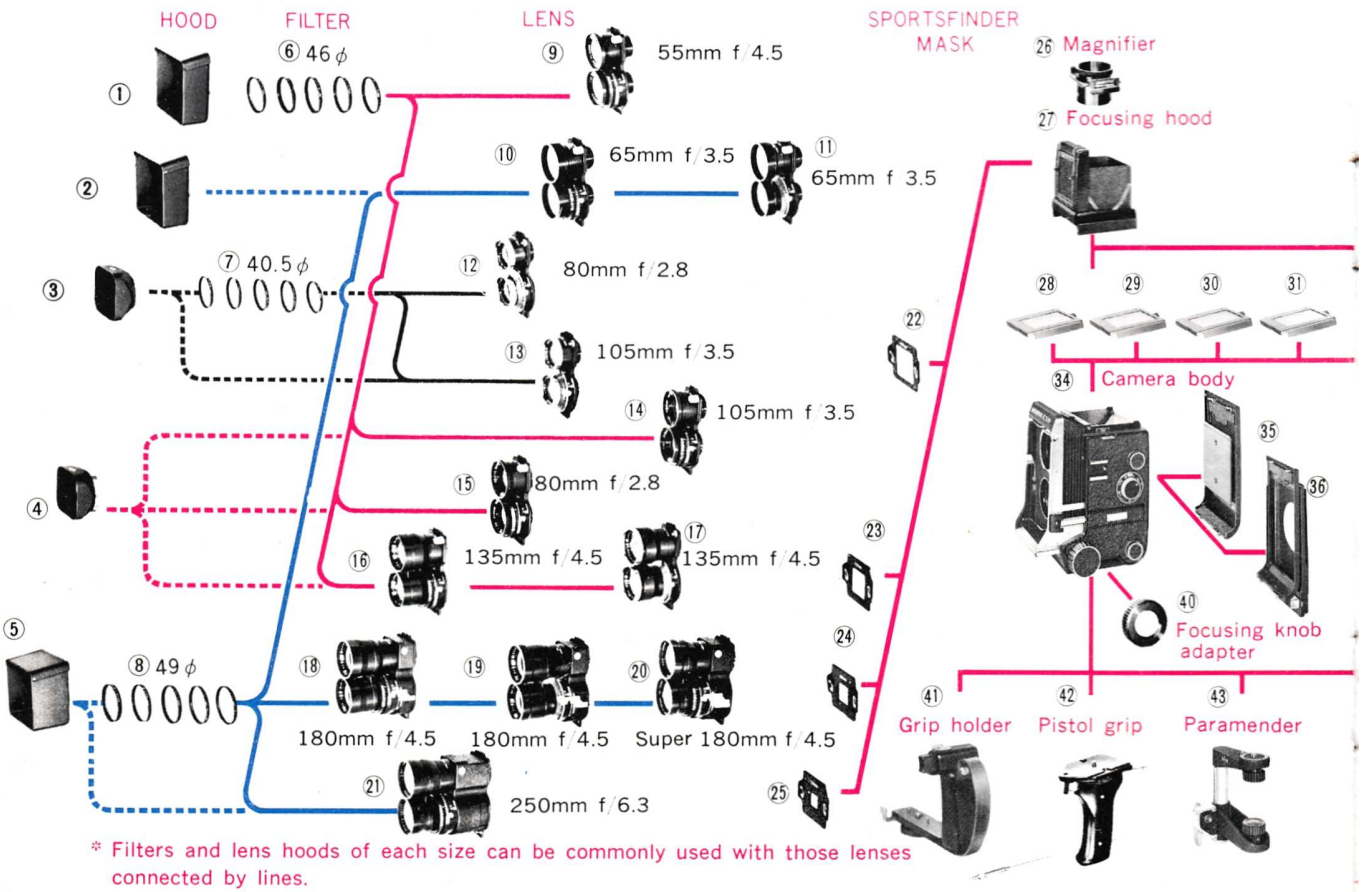
Focusing Knob Adapter

An adapter for attaching to the focusing knob to facilitate precise focusing.

Compartment Case

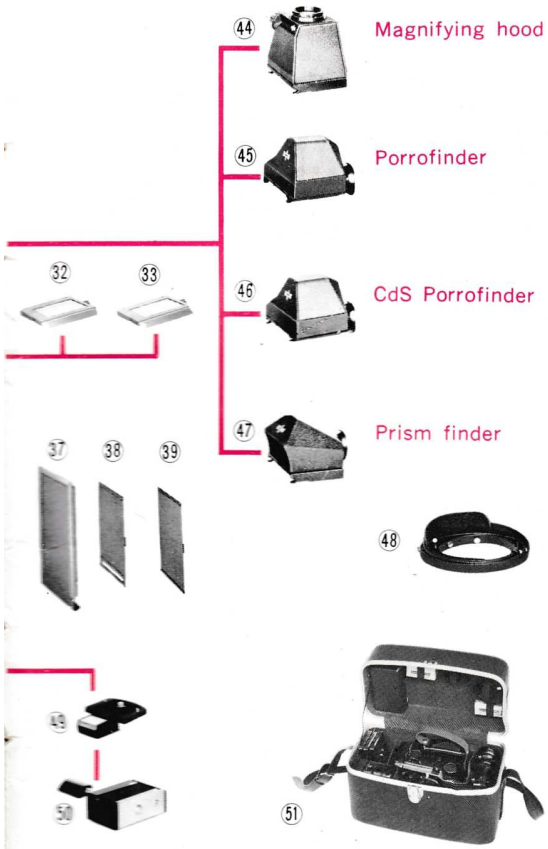
A roomy carrying case for active photographers, accomodating your Mamiya C330 with lens and grip holder, interchangeable lenses, lens hoods, and other accessories. Wonderfully convenient!

Interchangeable Lenses and Accessories for MAMIYA



* Filters and lens hoods of each size can be commonly used with those lenses connected by lines.

C 330



1. Lens hood for 55mm lens
2. Lens hood for 65mm lens
3. Lens hood 42φ for 80 and 105 mm lenses
4. Lens hood 48φ for 80, 105 and 135mm lenses
5. Lens hood for 180 and 250mm lenses
6. Filter 46mm diam
7. Filter 40.5mm diam
8. Filter 49mm diam
9. 55mm f/4.5 lens
10. 65mm f/3.5 lens (Black finish type)
11. 65mm f/3.5 lens (Chrome-finish type)
12. 80mm f/2.8 lens (Chrome)
13. 105mm f/3.5 lens (Chrome)
14. 105mm f/3.5 lens (Black)
15. 80mm f/2.8 lens (Black)
16. 135mm f/4.5 lens (Black)
17. 135mm f/4.5 lens (Chrome)
18. 180mm f/4.5 lens (Black)
19. 180mm f/4.5 lens (Chrome)
20. Super 180mm f/4.5 lens
21. 250mm f/6.3 lens
22. Sportsfinder mask for 105mm lens
23. Sportsfinder mask for 135mm lens
24. Sportsfinder mask for 180mm lens
25. Sportsfinder mask for 250mm lens
26. Magnifier
27. Focusing hood
28. Focusing screen No. 1
29. Focusing screen No. 2
30. Focusing screen No. 3
31. Focusing screen No. 4
32. Focusing screen No. 5
33. Focusing screen No. 6
34. Camera body
35. Back cover (standard)
36. Single exposure back for C330
37. Cut film/plate holder model 2
38. Film sheath type J
39. Film sheath type D
40. Focusing knob adapter
41. Grip holder for C330
42. Pistol grip
43. Paramender model 2
44. Magnifying hood
45. Porrofinder
46. CdS Porrofinder
47. Prism finder
48. Strap
49. Tripod adapter type P
50. Quick-shoe
51. Compartment case

Lens Specifications Table

* Indicates chrome-finish lens
** Indicates black finish lens

Lens	Composition	Picture Angle	Filter Diameter (mm)	Lens Hood Diameter (mm)	Close-Up Capabilities		Shutter
					Shortest Distance from Film to Subject	Subject Coverage	
55mm f/4.5	9 element 7 group	70°30′	46φ	48φ	9-1/2 in. (24.1cm)	2-17/32×2-17/32 in (6.4×6.4cm)	Seiko
65mm f/3.5	6 element 5 group	63°	49φ	50φ	10-11/16 in. (27.1cm)	2-21/32×2-21/32 in. (6.7×6.7cm)	Seiko
80mm f/2.8	5 element 3 group	50°40′	*40.5φ **46φ	*42φ **48φ	1 ft. 1-15/16 in. (35.4cm)	3-25/64×3-25/64 in. (8.6×8.6cm)	Seiko
105mm f/3.5	4 element 3 group	41°20′	*40.5φ **46φ	*42φ **48φ	2 ft. 1-25/64 in. (64.5cm)	8-19/32×8-19/32 in. (21.8×21.8cm)	Seiko
135mm f/4.5	4 element 3 group	33°	46φ	48φ	2 ft. 11-1/2 in. (90.2cm)	9-15/16×9-15/16 in. (25.2×25.2cm)	Seiko
180mm f/4.5	4 element 3 group	24°30′	49φ	50φ	4 ft. 2 in. (1m 27cm)	10-11/16×10-11/16 in. (27.2×27.2cm)	Seiko
Super 180mm f/4.5	5 element 4 group	24°30′	49φ	50φ	4 ft. 2 in. (1m 27cm)	10-11/16×10-11/16 in. (27.2×27.2cm)	Seiko
250mm f/6.3	6 element 4 group	18°	49φ	50φ	6 ft. 8-3/4 in. (2m 05cm)	1ft.1/4 in.×1ft.1/4 in. (31.1×31.1cm)	Seiko

Among interchangeable lenses, there are two different types of lenses for the same focal length: (1) Black finish lenses (Side Reading System) which indicate the shutter speed and aperture scale on side of the lens, observable from above the camera being hand held; (2) Chrome-finish lenses (Front Reading System) which indicate those scales on the front of the lens. Those of you who own older type lenses, of course, can use them with your Mamiya C330.

Filters and lens hoods can be commonly used between these different types of lenses except the 80 mm f/2.8 lens and 105 mm f/3.5 lens, because the diameter of the filters and of lens hoods for these two lenses differ according to the black finish type and chrome-finish type.

Angle of View Changes by Interchanging Lenses

All these pictures were taken from the same position, at on identical distance from the subject.

55mm

65mm

80mm

105mm

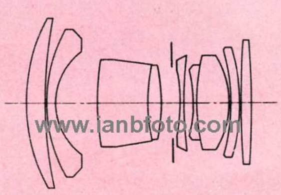
135mm

180mm

250mm

Depth of Field Table

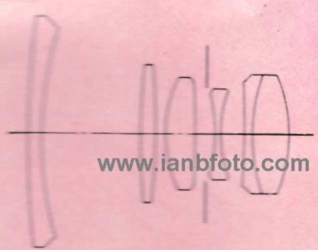
55mm f/4.5



Aperture	Distance (in feet)										
	∞	30	15	7	5	3	2.5	2	1.5	1	9½"
4.5	29' 1" ∞	14' 11" ∞	10' 30' 1"	5' 9" 9'	4' 4¼" 5' 11"	2' 9¼" 3' 3¼"	2' 4⅝" 2' 8¾"	1' 10⅞" 2' 1⅛"	1' 5½" 1' 6½"	11 13/16" 1' ⅛"	9 7/16" 9 9/16"
5.6	23' 2" ∞	13' 3" ∞	9' 3" 40' 8"	5' 6" 9' 8½"	4' 2½" 6' 2"	2' 8½" 3' 4¼"	2' 4¼" 2' 9½"	1' 10⅝" 2' 1½"	1' 5⅜" 1' 6¾"	11 13/16" 1' 3/16"	9 7/16" 9 9/16"
8	16' 5" ∞	10' 9" ∞	8' 145'	5' 1" 11' 7"	3' 11½" 6' 10"	2' 7½" 3' 6¼"	2' 3⅜" 2' 10¾"	1' 10⅛" 2' 2¼"	1' 5⅛" 1' 7"	11¾" 1' ¼"	9 7/16" 9 9/16"
11	11' 8" ∞	8' 6" ∞	6' 9" ∞	4' 6½" 16' 1"	3' 7¾" 8' 2"	2' 5⅞" 3' 9½"	2' 2¼" 3' ¾"	1' 9½" 2' 3¼"	1' 4¾" 1' 7½"	11⅝" 1' ⅜"	9⅜" 9 9/16"
16	8' 4" ∞	6' 8" ∞	5' 6" ∞	3' 11¾" 35' 10"	3' 3½" 11' 1"	2' 4⅛" 4' 3¼"	2' ⅞" 3' 4¼"	1' 8⅝" 2' 5"	1' 4¼" 1' 8¼"	11½" 1' ⅝"	9⅜" 9⅝"
22	5' 11½" ∞	5' 1" ∞	4' 5" ∞	3' 4¾" ∞	2' 10¾" 23' 8"	2' 1¾" 5' 1"	1' 11⅛" 3' 10¾"	1' 7½" 2' 7¾"	1' 3¾" 1' 9¼"	11 5/16" 1' ⅞"	9 5/16" 9 11/16"

Aperture	Distance (in meter)											
	∞	5	3	2	1.5	1.1	0.8	0.6	0.5	0.4	0.3	0.25
4.5	8.87 ∞	3.24 11.11	2.28 4.42	1.66 2.52	1.31 1.76	1.00 1.23	0.75 0.86	0.57 0.63	0.48 0.52	0.391 0.410	0.296 0.304	0.249 0.251
5.6	7.07 ∞	2.98 16.28	2.15 5.04	1.59 2.70	1.27 1.85	0.98 1.26	0.74 0.88	0.57 0.64	0.48 0.52	0.389 0.412	0.296 0.305	0.248 0.252
8	5.02 ∞	2.56 ∞	1.93 7.04	1.47 3.17	1.19 2.05	0.93 1.35	0.71 0.91	0.56 0.65	0.47 0.53	0.384 0.418	0.294 0.307	0.248 0.253
11	3.57 ∞	2.13 ∞	1.68 16.81	1.33 4.21	1.10 2.42	0.88 1.49	0.68 0.97	0.54 0.68	0.46 0.55	0.378 0.425	0.291 0.309	0.247 0.254
16	2.55 ∞	1.73 ∞	1.43 ∞	1.17 7.97	0.99 3.27	0.81 1.76	0.65 1.07	0.52 0.72	0.45 0.57	0.370 0.437	0.288 0.314	0.245 0.255
22	1.82 ∞	1.37 ∞	1.18 ∞	1.00 ∞	0.87 6.65	0.73 2.37	0.60 1.25	0.49 0.79	0.43 0.61	0.359 0.455	0.283 0.320	0.243 0.257

65mm f/3.5

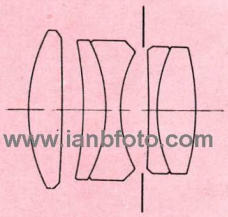


Aperture	Distance (in feet)										
	∞	30	15	7	5	3	2	1.75	1.5	1.25	1
3.5	50' 2¾" ∞	18' 11¼" 73' 1¼"	11' 8" 21' 1"	6' 2½" 8' ¼"	4' 7¼" 5' 5¾"	2' 10½" 3' 1¾"	1' 11¼" 2' ½"	1' 8 9/16" 1' 9 15/32"	1' 5 11/16" 1' 6 5/16"	1' 2 13/16" 1' 3 3/16"	11 29/32" 1' 3/32"
4	43' 11½" ∞	17' 11¾" 92' 1¼"	11' 3¾" 22' 4½"	6' 1½" 8' 2¼"	4' 6½" 5' 6¾"	2' 10¼" 3' 2"	1' 11¼" 2' ¾"	1' 8½" 1' 9 17/32"	1' 5 21/32" 1' 6 11/32"	1' 2 13/16" 1' 3 7/32"	11 29/32" 1' 3/32"
5.6	31' 5½" ∞	15' 6¼" 155' 9"	10' 3½" 27' 11"	5' 9¾" 8' 9¾"	4' 4¾" 5' 9¾"	2' 9½" 3' 3"	1' 11" 2' 1"	1' 8 9/32" 1' 9 25/32"	1' 5 17/32" 1' 6½"	1' 2 23/32" 1' 3 9/32"	11⅞" 1' ⅛"
8	22' 1" ∞	12' 10½" ∞	9' 1" 44' 5¾"	5' 5¼" 9' 11"	4' 2" 6' 3"	2' 8½" 3' 4½"	1' 10½" 2' 1½"	1' 8" 1' 10⅛"	1' 5 11/32" 1' 6¾"	1' 2 19/32" 1' 3 7/16"	11 13/16" 1' 3/16"
11	16' 1½" ∞	10' 7½" ∞	7' 11¼" 175' 8"	5' ¼" 11' 9¼"	3' 11¼" 6' 11"	2' 7½" 3' 6¼"	1' 10¼" 2' 2¼"	1' 7 21/32" 1' 10 19/32"	1' 5 3/32" 1' 7 1/32"	1' 2 15/32" 1' 3 19/32"	11¾" 1' ¼"
16	11' 1¾" ∞	8' 3" ∞	6' 6¾" ∞	4' 5½" 17' 2¼"	3' 7¼" 8' 5"	2' 5¾" 3' 10¼"	1' 9½" 2' 3½"	1' 7 3/32" 1' 11 13/32"	1' 4 23/32" 1' 7 9/16"	1' 2¼" 1' 3⅞"	11 21/32" 1' ⅜"
22	8' 2" ∞	6' 6¼" ∞	5' 5¼" ∞	3' 11¼" 39' ¾"	3' 3" 11' 5"	2' 4" 4' 3¾"	1' 8½" 2' 5"	1' 6½" 2' 15/32"	1' 4 9/32" 1' 8¼"	1' 1 31/32" 1' 4¼"	11 17/32" 1' 17/32"
32	5' 8¼" ∞	4' 10¼" ∞	4' 3" ∞	3' 3½" ∞	2' 10" 29' ¾"	2' 1½" 5' 5¼"	1' 7¼" 2' 8¼"	1' 5 9/16" 2' 2 9/16"	1' 3⅝" 1' 9 15/32"	1' 1 9/16" 1' 4 29/32"	11 11/32" 1' 25/32"

Aperture	Distance (in meter)											
	∞	5	3	2	1.2	1	0.8	0.65	0.6	0.5	0.4	0.3
3.5	15.31 ∞	3.81 7.32	2.54 3.68	1.79 2.27	1.12 1.29	0.95 1.06	0.77 0.83	0.63 0.67	0.585 0.616	0.490 0.510	0.395 0.405	0.298 0.302
4	13.40 ∞	3.68 7.84	2.48 3.80	1.76 2.31	1.12 1.30	0.94 1.06	0.77 0.84	0.63 0.67	0.582 0.619	0.489 0.512	0.394 0.406	0.298 0.302
5.6	9.59 ∞	3.33 10.16	2.32 4.26	1.68 2.47	1.09 1.34	0.92 1.09	0.75 0.85	0.62 0.68	0.576 0.627	0.485 0.517	0.392 0.409	0.297 0.303
8	6.73 ∞	2.92 18.35	2.12 5.21	1.58 2.75	1.04 1.42	0.89 1.14	0.73 0.88	0.61 0.70	0.566 0.639	0.478 0.524	0.388 0.413	0.296 0.304
11	4.91 ∞	2.53 ∞	1.91 7.25	1.46 3.21	1.00 1.52	0.86 1.20	0.71 0.92	0.59 0.72	0.554 0.655	0.471 0.534	0.384 0.418	0.294 0.306
16	3.40 ∞	2.07 ∞	1.64 20.27	1.31 4.30	0.93 1.73	0.81 1.33	0.68 0.98	0.57 0.75	0.536 0.684	0.459 0.551	0.378 0.426	0.292 0.309
22	2.49 ∞	1.71 ∞	1.41 ∞	1.16 8.48	0.85 2.09	0.76 1.52	0.64 1.07	0.55 0.80	0.516 0.723	0.446 0.573	0.370 0.437	0.289 0.313
32	1.73 ∞	1.32 ∞	1.14 ∞	0.98 ∞	0.76 3.21	0.68 2.00	0.59 1.28	0.51 0.91	0.486 0.801	0.425 0.616	0.358 0.457	0.284 0.319

Depth of Field Table

80mm f/2.8



Aperture	Distance (in feet)								
	∞	30	15	10	7	5	4	3	1. 5
2.8	102′ 7″ ∞	23′ 4¼″ 42′ ¼″	13′ 2″ 17′ 5″	9′ 2″ 11′	6′ 7¼″ 7′ 5½″	4′ 9¾″ 5′ 2½″	3′ 10½″ 4′ 1½″	2′ 11¼″ 3′ ¾″	1′ 5⅞″ 1′ 6⅛″
4	71′ 10½″ ∞	21′ 4″ 50′ 9¾″	12′ 6¼″ 18′ 8¾″	8′ 10½″ 11′ 5¾″	6′ 5¼″ 7′ 8″	4′ 8¾″ 5′ 3¾″	3′ 10″ 4′ 2¼″	2′ 11″ 3′ 1¼″	1′ 5⅞″ 1′ 6⅛″
5.6	51′ 5″ ∞	19′ 1½″ 70′ 4″	11′ 9″ 20′ 9½″	8′ 5¾″ 12′ 2½″	6′ 3″ 7′ 11¾″	4′ 7½″ 5′ 5½″	3′ 9¼″ 4′ 3¼″	2′ 10½″ 3′ 1½″	1′ 5⅞″ 1′ 6¼″
8	36′ ¾″ ∞	16′ 7″ 167′ 5¾″	10′ 9¼″ 24′ 11½″	7′ 11½″ 13′ 5¾″	5′ 11¾″ 8′ 5¾″	4′ 5¾″ 5′ 8″	3′ 8″ 4′ 4¾″	2′ 10″ 3′ 2¼″	1′ 5⅞″ 1′ 6⅛″
11	26′ 3½″ ∞	14′ 2½″ ∞	9′ 8¾″ 33′ 3¾″	7′ 5″ 15′ 6½″	5′ 8″ 9′ 2½″	4′ 3¾″ 5′ 11¾″	3′ 6¾″ 4′ 6¾″	2′ 9¼″ 3′ 3¼″	1′ 5⅞″ 1′ 6⅛″
16	18′ 1¾″ ∞	11′ 6″ ∞	8′ 5″ 76′ 3¼″	6′ 7½″ 20′ 10¼″	5′ 2½″ 10′ 9½″	4′ ¾″ 6′ 6¾″	3′ 4¾″ 4′ 10½″	2′ 8″ 3′ 5″	1′ 5½″ 1′ 6⅜″
22	13′ 3¼″ ∞	9′ 4½″ ∞	7′ 3″ ∞	5′ 10¾″ 35′	4′ 9¼″ 13′ 7″	3′ 9½″ 7′ 5¼″	3′ 2¾″ 5′ 4″	2′ 7″ 3′ 7½″	1′ 5⅛″ 1′ 7″
32	9′ 2¼″ ∞	7′ 2¼″ ∞	5′ 10¾″ ∞	5′ ∞	4′ 2¼″ 24′ 2¾″	3′ 5¼″ 9′ 7¾″	2′ 11½″ 6′ 3¾″	2′ 5″ 4′	1′ 4⅝″ 1′ 7½″

Aperture	Distance (in meter)								
	∞	10	5	3	2	1.5	1.2	1	0.45
2.8	31.27 ∞	7.62 14.57	4.34 5.90	2.76 3.29	1.89 2.12	1.44 1.56	1.16 1.24	0.98 1.02	0.447 0.453
4	21.91 ∞	6.92 18.13	4.11 6.40	2.66 3.44	1.85 2.18	1.42 1.59	1.15 1.26	0.97 1.04	0.446 0.454
5.6	15.67 ∞	6.16 26.92	3.84 7.21	2.55 3.65	1.80 2.26	1.39 1.63	1.13 1.28	0.95 1.05	0.444 0.456
8	10.99 ∞	5.30 99.80	3.49 8.91	2.40 4.02	1.72 2.39	1.35 1.70	1.10 1.32	0.94 1.07	0.442 0.458
11	8.01 ∞	4.51 ∞	3.14 12.65	2.23 4.62	1.64 2.57	1.30 1.78	1.07 1.37	0.91 1.11	0.439 0.462
16	5.53 ∞	3.62 ∞	2.69 42.83	2.00 6.14	1.52 2.97	1.22 1.96	1.02 1.46	0.88 1.16	0.434 0.467
22	4.04 ∞	2.93 ∞	2.30 ∞	1.78 10.25	1.39 3.64	1.14 2.21	0.97 1.59	0.84 1.24	0.429 0.474
32	2.80 ∞	2.23 ∞	1.85 ∞	1.51 ∞	1.23 5.90	1.04 2.84	0.89 1.87	0.79 1.40	0.420 0.486

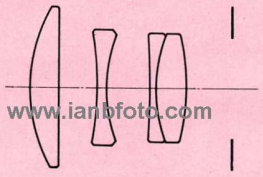
105mm f/3.5

Aperture	Distance (in feet)							
	∞	30	15	10	7	5	4.5	4	3
3.5	131′ 5¼″ ∞	24′ 7″ 38′ 6½″	13′ 6¾″ 16′ 9½″	9′ 4¼″ 10′ 8¾″	6′ 8¼″ 7′ 4″	4′ 10¼″ 5′ 2″	4′ 4½″ 4′ 7½″	3′ 11″ 4′ 1″	2′ 11⅝″ 3′ ⅝″
4	115′ ½″ ∞	23′ 11½″ 40′ 2″	13′ 4½″ 17′ 1″	9′ 3¼″ 10′ 10¼″	6′ 7¾″ 7′ 4½″	4′ 10″ 5′ 2¼″	4′ 4½″ 4′ 7¾″	3′ 10¾″ 4′ 1¼″	2′ 11⅝″ 3′ ⅝″
5.6	82′ 3¼″ ∞	22′ 2¼″ 46′ 6¼″	12′ 9¾″ 18′ 1¾″	9′ ¼″ 11′ 2¾″	6′ 6¼″ 7′ 6¾″	4′ 9¼″ 5′ 3″	4′ 3¾″ 4′ 8½″	3′ 10¼″ 4′ 1¾″	2′ 11⅝″ 3′ ⅞″
8	57′ 8¼″ ∞	19′ 11¾″ 60′ 11¾″	12′ 1″ 19′ 10½″	8′ 7¾″ 11′ 10½″	6′ 4″ 7′ 9¾″	4′ 8¼″ 5′ 4½″	4′ 3″ 4′ 9½″	3′ 9¾″ 4′ 2¾″	2′ 10⅜″ 3′ 1⅝″
11	42′ ½″ ∞	17′ 9¼″ 100′ ½″	11′ 3″ 22′ 7¾″	8′ 3″ 12′ 9¼″	6′ 1½″ 8′ 2¼″	4′ 6¾″ 5′ 6¼″	4′ 2″ 4′ 11″	3′ 8¾″ 4′ 3¾″	2′ 10⅜″ 3′ 1⅝″
16	28′ 11½″ ∞	15′ ∞	10′ 1½″ 29′ 7″	7′ 7¾″ 14′ 7½″	5′ 9¾″ 8′ 10½″	4′ 4¾″ 5′ 9¾″	4′ ¼″ 5′ 1½″	3′ 7½″ 4′ 5½″	2′ 9⅝″ 3′ 2⅛″
22	21′ 2¼″ ∞	12′ 8″ ∞	9′ ½″ 38′ 6½″	7′ ¼″ 17′ 9″	5′ 5½″ 9′ 10½″	4′ 2½″ 6′ 2¼″	3′ 10½″ 5′ 5″	3′ 6″ 4′ 8″	2′ 8⅜″ 3′ 3⅝″
32	14′ 8″ ∞	10′ 1″ ∞	7′ 8¼″ 5180′ 3¼″	6′ 2½″ 27′ 9¼″	4′ 11¾″ 12′ 2¼″	3′ 11¼″ 6′ 11¾″	3′ 7¾″ 5′ 11¾″	3′ 4″ 4′ ¾″	2′ 7¾″ 3′ 5⅝″

Aperture	Distance (in meter)									
	∞	10	5	3	2	1.5	1.3	1.2	1	0.65
3.5	40.06 ∞	8.05 13.21	4.48 5.67	2.81 3.22	1.92 2.09	1.46 1.55	1.27 1.33	1.17 1.23	0.98 1.02	0.645 0.655
4	35.07 ∞	7.84 13.85	4.41 4.78	2.79 3.25	1.91 2.10	1.45 1.55	1.26 1.34	1.17 1.23	0.98 1.02	0.644 0.656
5.6	25.08 ∞	7.21 16.38	4.21 6.16	2.71 3.36	1.87 2.15	1.43 1.58	1.25 1.35	1.16 1.24	0.97 1.03	0.642 0.659
8	17.58 ∞	6.45 22.59	3.95 6.85	2.60 3.55	1.83 2.21	1.41 1.61	1.23 1.38	1.14 1.26	0.96 1.04	0.638 0.663
11	12.82 ∞	5.70 43.09	3.66 7.96	2.48 3.81	1.77 2.31	1.37 1.66	1.21 1.41	1.12 1.29	0.95 1.06	0.634 0.667
16	8.84 ∞	4.77 ∞	3.27 10.92	2.30 4.35	1.68 2.48	1.32 1.74	1.17 1.47	1.09 1.34	0.93 1.09	0.627 0.676
22	6.46 ∞	4.00 ∞	2.90 19.91	2.12 5.26	1.59 2.74	1.27 1.85	1.13 1.54	1.07 1.40	0.90 1.12	0.618 0.686
32	4.47 ∞	3.16 ∞	2.44 ∞	1.87 8.08	1.45 3.30	1.19 2.08	1.07 1.69	1.00 1.51	0.87 1.19	0.605 0.704

Depth of Field Table

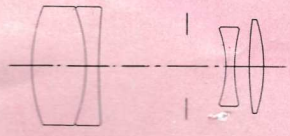
135mm f/4.5



Aperture	Distance (in feet)								
	∞	30	15	10	7	6	4	3.5	3
4.5	159' 3½" ∞	25' 4¾" 36' 8"	13' 9½" 16' 5¼"	9' 5¾" 10' 7"	6' 9" 7' 3¼"	5' 10" 6' 2¼"	3' 11¼" 4' ¾"	3' 5½" 3' 6½"	2' 11½" 3' ½"
5.6	128' ¾" ∞	24' 5¾" 38' 9¼"	13' 6½" 16' 10"	9' 4¾" 10' 9"	6' 8¼" 7' 4"	5' 9½" 6' 2¾"	3' 11" 4' 1"	3' 5¼" 3' 6¾"	2' 11½" 3' ½"
8	89' 8¾" ∞	22' 8½" 44' 4¼"	13' 17' 9"	9' 1¾" 11' 1¾"	6' 7" 7' 5¾"	5' 8¼" 6' 4"	3' 10½" 4' 1½"	3' 5" 3' 7"	2' 11¼" 3' ¾"
11	65' 4" ∞	20' 9¾" 54' 1¼"	12' 4½" 19' 1"	8' 9¾" 11' 9"	6' 5¼" 7' 8¼"	5' 7" 6' 5¾"	3' 10" 4' 2¼"	3' 4½" 3' 7½"	2' 11" 3' 1"
16	45' ¼" ∞	18' 3½" 85' 6¾"	11' 5¾" 21' 9½"	8' 4¼" 12' 5¾"	6' 2½" 8' ¾"	5' 5" 6' 8¾"	3' 9¼" 4' 3¼"	3' 4" 3' 8¼"	2' 10¾" 3' 1½"
22	32' 10" ∞	15' 11¾" 286' 2¼"	10' 6¾" 26' 3½"	7' 10½" 13' 9¼"	5' 11¼" 8' 6½"	5' 2¾" 7' ¾"	3' 8¼" 4' 4½"	3' 3¼" 3' 9¼"	2' 10¼" 3' 2"
32	22' 8" ∞	13' 2½" ∞	9' 3¾" 40' 2¾"	7' 2¼" 16' 8"	5' 6¾" 9' 6"	4' 11¼" 7' 8"	3' 6¾" 4' 7"	3' 2¼" 3' 10¾"	2' 9¼" 3' 3¼"
45	16' 2½" ∞	10' 9½" ∞	8' 1" 132' 8"	6' 5¾" 22' ½"	5' 1¾" 11' 2"	4' 7½" 8' 8¾"	3' 5" 4' 10½"	3' ¾" 4' 3¾"	2' 8½" 3' 4¾"

Aperture	Distance (in meter)								
	∞	10	5	3	2	1.75	1.2	1.0	0.95
4.5	48.55 ∞	8.34 12.49	4.56 5.53	2.85 3.17	1.93 2.07	1.70 1.80	1.18 1.22	0.99 1.01	0.94 0.96
5.6	39.03 ∞	8.02 13.30	4.47 5.68	2.81 3.22	1.92 2.09	1.69 1.81	1.17 1.23	0.98 1.02	0.94 0.96
8	27.35 ∞	7.39 15.51	4.27 6.03	2.74 3.32	1.89 2.13	1.67 1.84	1.16 1.24	0.98 1.02	0.93 0.97
11	19.92 ∞	6.74 19.56	4.05 6.54	2.65 3.46	1.85 2.18	1.64 1.88	1.15 1.25	0.97 1.03	0.92 0.98
16	13.72 ∞	5.87 34.79	3.74 7.61	2.52 3.73	1.79 2.28	1.59 1.95	1.13 1.28	0.96 1.05	0.91 0.99
22	10.01 ∞	5.09 566.22	3.41 9.49	2.37 4.10	1.72 2.40	1.54 2.04	1.11 1.31	0.94 1.07	0.90 1.01
32	6.91 ∞	4.17 ∞	2.99 16.18	2.17 4.94	1.62 2.65	1.46 2.21	1.07 1.37	0.92 1.10	0.88 1.04
45	4.94 ∞	3.39 ∞	2.58 217.48	1.95 6.75	1.50 3.05	1.37 2.47	1.03 1.46	0.89 1.15	0.85 1.08

180mm f/4.5



Super 180mm f/4.5

Aperture	Distance (in feet)											
	∞	60	30	15	12	10	8	7	6	5	4.5
4.5	299' ∞	50' 2" 74' 8"	27' 4½" 33' 2¼"	14' 4¼" 15' 8½"	11' 7" 12' 5¼"	9' 8¾" 10' 3½"	7' 10" 8' 2¾"	6' 10½" 7' 1½"	5' 11" 6' 1"	4' 11¼" 5' ¾"	4' 5½" 4' 6½"
5.6	240' ∞	48' 3" 79' 5"	26' 9¾" 34' ¾"	14' 2½" 15' 10¾"	11' 6" 12' 6½"	9' 8" 10' 4½"	7' 9½" 8' 2¾"	6' 10" 7' 2"	5' 10¾" 6' 1¾"	4' 11¼" 5' 1"	4' 5¼" 4' 6¾"
8	168' ∞	44' 6" 92' 3"	25' 7¾" 36' 2"	13' 10½" 16' 3¾"	11' 3½" 12' 9¾"	9' 6¼" 10' 6½"	7' 8½" 8' 3¾"	6' 9¼" 7' 2¾"	5' 10¼" 6' 2"	4' 10¾" 5' 1¼"	4' 5" 4' 7"
11	122' ∞	40' 7" 115' 7"	24' 4" 39' 2¼"	13' 6" 16' 10½"	11' ½" 13' 1½"	9' 4¼" 10' 9"	7' 7¼" 8' 5½"	6' ½" 7' 4"	5' 9½" 6' 2¾"	4' 10¾" 5' 1¾"	4' 4¾" 4' 7¼"
16	84' 2" ∞	35' 5" 200	22' 4¾" 45' 6½"	12' 11" 17' 10¾"	10' 8" 13' 8¾"	9' 1" 11' 1½"	7' 5" 8' 8"	6' 6¾" 7' 6"	5' 8¼" 6' 4"	4' 9¾" 5' 2½"	4' 4¼" 4' 8"
22	61' 3" ∞	30' 8" 1664	20' 5½" 56' 7"	12' 3½" 19' 3½"	10' 3" 14' 6¼"	8' 9¼" 11' 7½"	7' 2¾" 8' 11½"	6' 5" 7' 8¼"	5' 7" 6' 5¾"	4' 8¾" 5' 3½"	4' 3½" 4' 8¾"
32	42' 3" ∞	25' 2" ∞	17' 10¾" 95' 2"	11' 4¼" 22' 2½"	9' 7¼" 16' ½"	8' 3¾" 12' 6¾"	6' 11¼" 9' 5¾"	6' 2¼" 8' ¾"	5' 5" 6' 8¾"	4' 7½" 5' 5½"	4' 2½" 4' 10"
45	30' 1" ∞	20' 4" ∞	15' 4¾" 874'	10' 4½" 27' 8"	8' 10¾" 18' 7½"	7' 9½" 14' ½"	6' 7" 10' 3"	5' 11" 8' 7¼"	5' 2¾" 7' ¾"	4' 5¾" 5' 8"	4' 1¼" 5'

Aperture	Distance (in meter)										
	∞	20	10	7	5	4	3	2.5	2	1.7	1.5	1.3
4.5	91.00 ∞	16.46 25.49	9.05 11.18	6.53 7.54	4.76 5.26	3.85 4.16	2.92 3.09	2.45 2.56	1.97 2.03	1.68 1.72	1.48 1.52	1.29 1.31
5.6	73.14 ∞	15.78 27.32	8.84 11.51	6.42 7.69	4.71 5.33	3.81 4.20	2.90 3.11	2.43 2.57	1.96 2.04	1.67 1.73	1.48 1.52	1.29 1.31
8	51.22 ∞	14.47 32.42	8.43 12.30	6.21 8.03	4.59 5.49	3.74 4.30	2.86 3.16	2.40 2.60	1.94 2.06	1.66 1.74	1.47 1.53	1.28 1.32
11	37.27 ∞	13.12 42.28	7.96 13.34	5.95 8.50	4.46 5.70	3.65 4.42	2.81 3.22	2.37 2.65	1.92 2.09	1.65 1.76	1.46 1.54	1.27 1.33
16	25.65 ∞	11.35 85.96	7.29 16.00	5.58 9.42	4.25 6.09	3.51 4.65	2.73 3.33	2.32 2.72	1.89 2.13	1.62 1.79	1.44 1.56	1.26 1.34
22	18.68 ∞	9.77 ∞	6.62 20.67	5.18 10.84	4.02 6.63	3.36 4.95	2.64 3.48	2.25 2.81	1.85 2.18	1.59 1.82	1.42 1.59	1.25 1.36
32	12.87 ∞	7.94 ∞	5.74 40.37	4.64 14.46	3.69 7.79	3.14 5.55	2.50 3.75	2.16 2.98	1.79 2.28	1.55 1.88	1.39 1.63	1.22 1.39
45	9.17 ∞	6.39 ∞	4.90 ∞	4.08 25.69	3.34 10.10	2.88 6.60	2.35 4.18	2.04 3.23	1.71 2.41	1.50 1.97	1.35 1.69	1.19 1.43

Depth of Field Table

250mm f/6.3

Aperture	Distance (in feet)										
	∞	200	100	50	30	20	15	12	10	8	7
6.3	412′ ∞	135′ 385′	81′ 131′	44′ 11″ 56′ 5″	28′ 2″ 32′ 1″	19′ 2″ 20′ 10″	14′ 7″ 15′ 5″	11′ 9″ 12′ 3″	9′ 10″ 10′ 2″	7′ 11″ 8′ 1″	6′ 11½″ 7′ ½″
8	325′ ∞	125′ 513′	77′ 143′	43′ 8″ 58′ 6″	27′ 8″ 32′ 8″	19′ 21′ 1″	14′ 5″ 15′ 7″	11′ 8″ 12′ 4″	9′ 9½″ 10′ 2″	7′ 10½″ 8′ 1½″	6′ 11″ 7′ 1″
11	230′ ∞	108′ 1474′	70′ 4″ 174′	41′ 6″ 62′ 11″	26′ 10″ 34′	18′ 7″ 21′ 7″	14′ 3″ 15′ 10″	11′ 6″ 12′ 6″	9′ 8½″ 10′ 3″	7′ 10″ 8′ 2″	6′ 10½″ 7′ 1½″
16	163′ ∞	90′ 7″ ∞	62′ 9″ 252′	38′ 10″ 70′ 6″	25′ 9″ 36′	18′ 1″ 22′ 4″	14′ 16′ 2″	11′ 3″ 12′ 8″	9′ 7″ 10′ 5″	7′ 9″ 8′ 3″	6′ 10″ 7′ 2″
22	116′ ∞	74′ ∞	54′ 5″ 688′	35′ 7″ 85′ 2″	24′ 4″ 39′ 3″	17′ 5″ 23′ 6″	13′ 7″ 16′ 9″	11′ 2″ 13′	9′ 5″ 10′ 8″	7′ 8″ 8′ 4½″	6′ 9″ 7′ 2½″
32	82′ 1″ ∞	58′ 10″ ∞	45′ 11″ ∞	31′ 10″ 121′	22′ 7″ 45′ 2″	16′ 7″ 25′ 4″	13′ 1″ 17′ 7″	10′ 10″ 13′ 7″	9′ 2½″ 10′ 11″	7′ 6½″ 8′ 6″	6′ 8″ 7′ 4″
45	58′ 5″ ∞	45′ 9″ ∞	37′ 7″ ∞	27′ 9″ 303′	20′ 6″ 57′ 6″	15′ 6″ 28′ 7″	12′ 5″ 19′	10′ 5″ 14′ 3″	8′ 11½″ 11′ 4″	7′ 4½″ 8′ 9″	6′ 6½″ 7′ 6″
64	41′ 8″ ∞	34′ 11″ ∞	30′ 1″ ∞	23′ 6″ ∞	18′ 3″ 94′ 4″	14′ 3″ 34′ 11″	11′ 8″ 21′ 5″	9′ 10½″ 15′ 6″	8′ 6½″ 12′ 1″	7′ 1½″ 9′ 1½″	6′ 4½″ 7′ 9″

Aperture	Distance (in meter)										
	∞	50	30	20	15	10	7	5	4	3	2.5
6.3	125.6 ∞	35.97 82.30	24.37 39.08	17.37 23.59	13.49 16.90	9.33 10.78	6.68 7.36	4.84 5.17	3.91 4.10	2.95 3.05	2.47 2.53
8	99.02 ∞	33.44 99.75	23.20 42.57	16.78 24.80	13.14 17.50	9.16 11.01	6.60 7.46	4.80 5.21	3.88 4.13	2.94 3.06	2.46 2.54
11	70.12 ∞	29.43 170.3	21.22 51.56	15.73 27.55	12.50 18.80	8.86 11.49	6.45 7.67	4.73 5.31	3.83 4.18	2.92 3.09	2.45 2.56
16	49.69 ∞	25.17 ∞	18.94 73.65	14.46 32.70	11.70 21.02	8.46 12.26	6.24 7.98	4.62 5.45	3.77 4.27	2.88 3.13	2.42 2.58
22	35.24 ∞	20.91 ∞	16.45 188.4	12.99 44.55	10.73 25.26	7.96 13.54	5.98 8.48	4.49 5.66	3.68 4.39	2.84 3.19	2.39 2.62
32	25.03 ∞	16.90 ∞	13.89 ∞	11.36 92.02	9.61 3.55	7.35 15.91	5.64 9.31	4.31 5.99	3.57 4.57	2.77 3.28	2.35 2.67
45	17.81 ∞	13.32 ∞	11.41 ∞	9.67 ∞	8.39 83.74	6.63 21.20	5.23 10.82	4.08 6.54	3.42 4.86	2.69 3.41	2.30 2.75
64	12.70 ∞	10.29 ∞	9.13 ∞	8.00 ∞	7.13 ∞	5.84 40.55	4.74 14.09	3.79 7.54	3.23 5.36	2.58 3.62	2.23 2.87