MAMIYA C PROFESSIONAL

The Old Yet New Camera-6x6 Twin-Lens Reflex

• Big Format Produces High-Quality Photographs

There is greater interest recently in the so-called "bigger size cameras" producing pictures of 6X6 to 6X9 format. There are various reasons for this, depending on the individual, but they are generally the following two: (1) The large format, and (2) soul-satisfying photography.

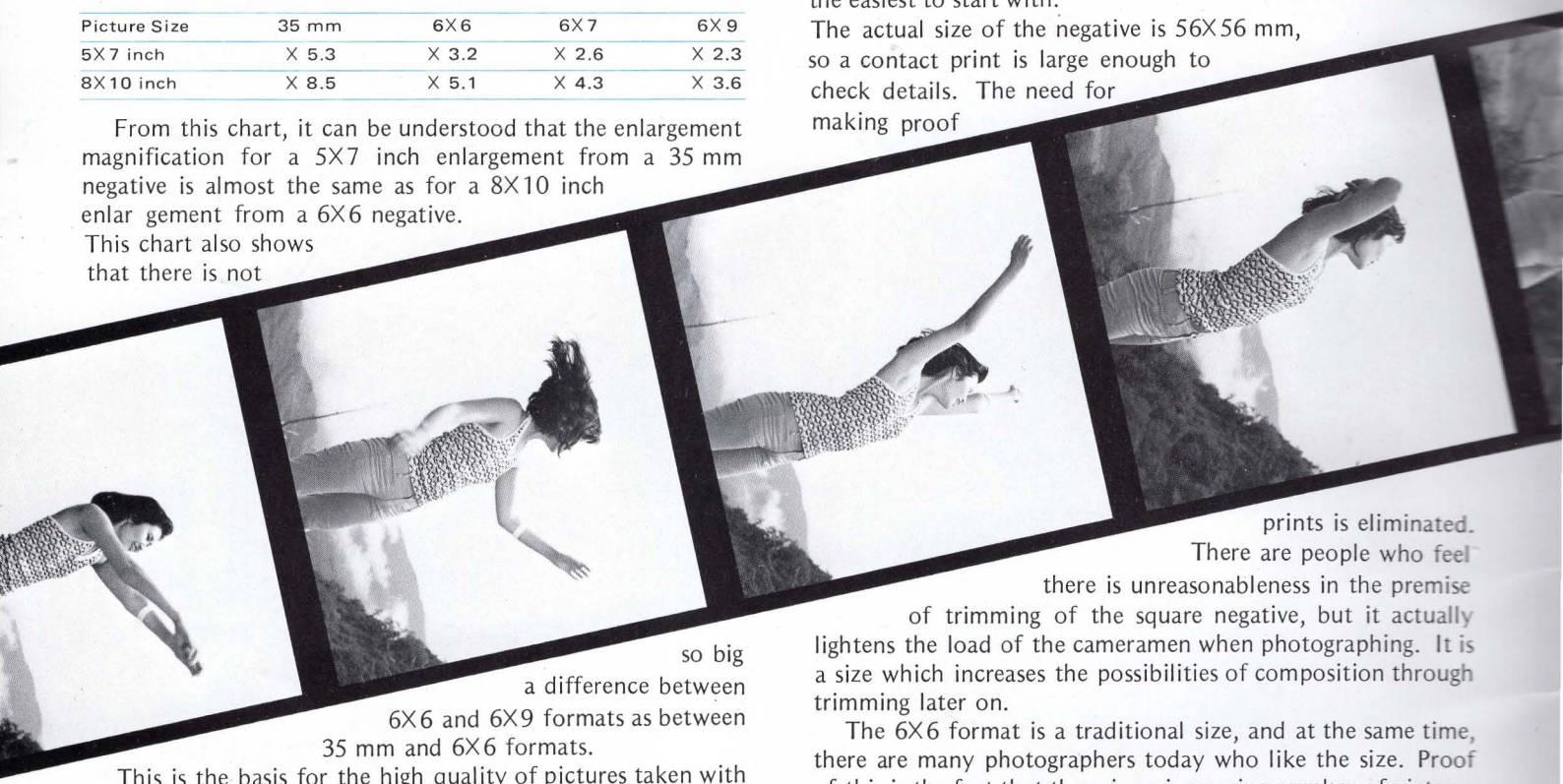
Comparison of format is not accurate unless the height-width proportion is unified. If the height-width proportion is 1:1.4 ($\sqrt{2}$) and the 35 mm format is 1, then the 6X6 format becomes 5/3 times, the 6X7 format 2 times and the 6X9 format 7/3 times. This figure is the ratio of the length of one side of the picture, and this will be called the size ratio here.

When enlargements are made without trimming the negative, the magnification becomes the reciprocal number of the size ratio. Consequently, the larger the size ratio, the higher is the quality of the picture.

Following is the magnification when enlarging to 5X7 and 8X10 size:

Picture Size	35 mm	6X6	6X7	6X9
5X7 inch	X 5.3	X 3.2	X 2.6	X 2.3
8X10 inch	X 8.5	X 5.1	X 4.3	X 3.6

From this chart, it can be understood that the enlargement magnification for a 5X7 inch enlargement from a 35 mm negative is almost the same as for a 8X10 inch enlargement from a 6X6 negative. This chart also shows that there is not so big a difference between 6X6 and 6X9 formats as between 35 mm and 6X6 formats.



This is the basis for the high quality of pictures taken with a bigger size camera, and the excellent results are particularly clear in color photographs.

• What's Lacking in the 35 mm Camera

The second reason for the popularity of the bigger size camera is a revolt against the convenience of the 35 mm camera. As a result of improvements in the 35 mm camera, photography has become more accurate and speedier.

On the other hand, the most basic feeling of taking worthy pictures has been weakened. Depending on the purpose, it is necessary to take plenty of time to create an outstanding picture. The feeling of true creation can really be enjoyed when the shutter release button is pressed after such preparations. The 35 mm cameras today, however, are too simple to satisfy such emotional needs.

If the 35 mm camera is appropriate for recording an actual subject, the bigger size camera is appropriate for recomposing and "creating an artistic picture" within the focusing screen.

At any rate, it is a fact that one 35 mm camera is inadequate. And it is a fact, too, that more people are beginning to consider that a combination of a 35 mm camera and a bigger size camera means a truly total system. The demand for cameras today has arrived at such a high level.

• 6X6 Format Has A Tradition

As pointed out before, there are three types of bigger size formats—6X6, 6X7 and 6X9. Of these three types, the 6X6 is the easiest to start with. The actual size of the negative is 56X56 mm, so a contact print is large enough to check details. The need for making proof prints is eliminated. There are people who feel there is unreasonableness in the premise of trimming of the square negative, but it actually lightens the load of the cameramen when photographing. It is a size which increases the possibilities of composition through trimming later on.

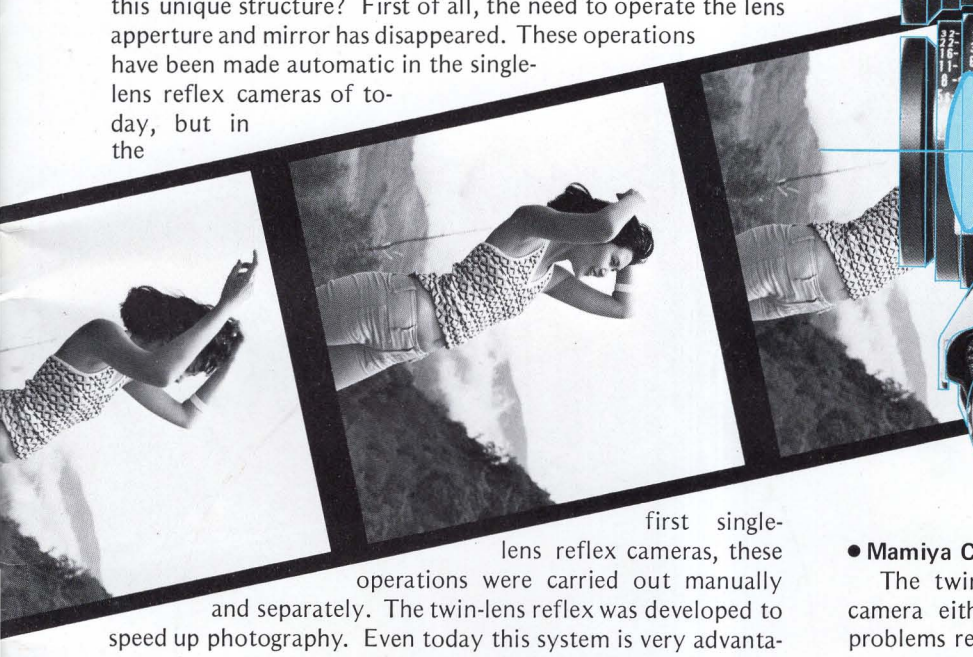
The 6X6 format is a traditional size, and at the same time, there are many photographers today who like the size. Proof of this is the fact that there is an increasing number of pictures close to regular squares in recent printed matter.

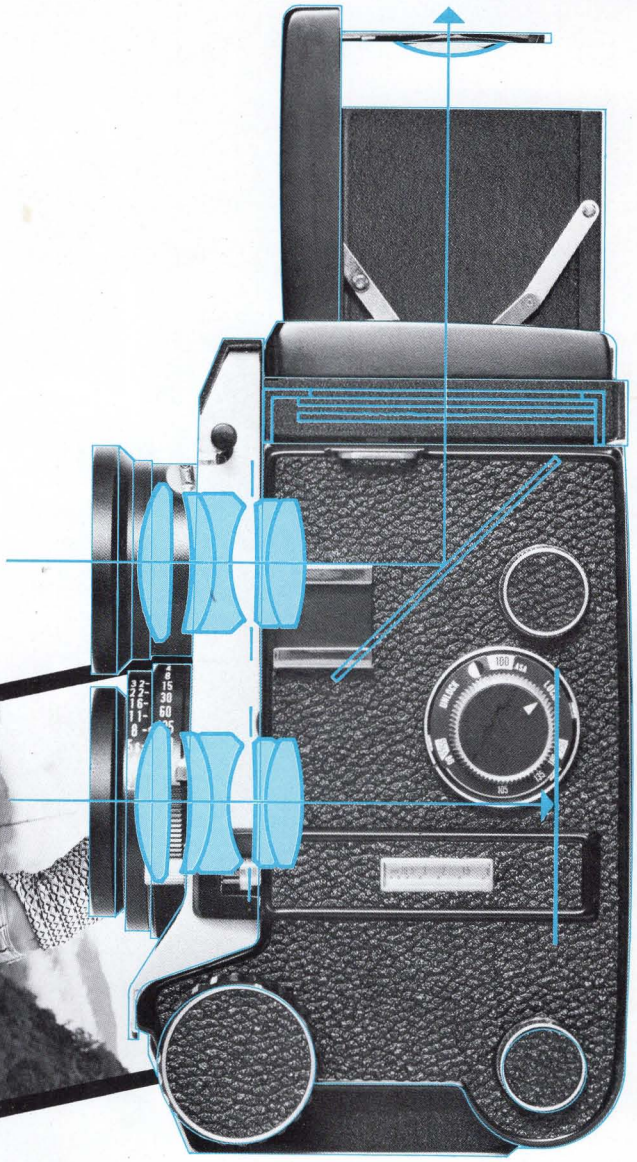
• The Twin-Lens Reflex As An Improved Version Of the Single-Lens Reflex

In bigger size cameras, there are various types according to the format as well as the structure of the camera. At the present time, the press cameras (6X7 – 6X9 format), single-lens reflex (6X6 – 6X7 format) and twin-lens reflex (6X6 format) are the three main types. As a result of appearance of the single-lens

reflex, it is generally considered that the twin-lens reflex has decreased in popularity. The twin-lens reflex, however, has an appeal sustained by history.

The twin-lens reflex camera was originally developed to overcome the defects of the single-lens reflex camera. Besides the taking lens, a viewing lens for the reflex finder was incorporated. A fixed mirror was placed behind it to bring the image caught by the lens to the focusing screen on the top of the camera. The lower part is the same as an ordinary camera, and there are only the film holding part and the taking lens with aperture and shutter. What are the results produced by this unique structure? First of all, the need to operate the lens apperture and mirror has disappeared. These operations have been made automatic in the single-lens reflex cameras of today, but in the first single-lens reflex cameras, these operations were carried out manually and separately. The twin-lens reflex was developed to speed up photography. Even today this system is very advantageous because there are no aperture and mirror vibrations and because of the reduction in breakdowns since there are few movable parts. As a reflex finder in which the image does not disappear even during exposure, it is superior to the single-lens reflex camera.





• Ideal Combination of 6X6 Format and Twin-Lens Reflex

Even if a rectangular format twin-lens reflex camera were made, it would become a camera for either horizontal or vertical pictures, because of the above-mentioned structure of the viewfinder. Thus, the square 6X6 format was incorporated into the twin-lens reflex camera. The square pictures can be made either horizontal or vertical through trimming. On top of that, it is not necessary to change the way of holding the camera either for horizontal or vertical pictures.

There was a time when the 6X6 twin-lens reflex completely dominated all other types of cameras and was at the peak of its popularity. This was because it was much easier to use than any other type of camera before the twin-lens reflex. On the previous page, it was said that "the 6X6 format has a tradition," but it would be more accurate to say that the 6X6 format twin-lens reflex has a tradition.

• Mamiya C—Not A Twin-Lens Reflex

The twin-lens reflex camera, however, was not a perfect camera either. An advantage can turn into a defect, and problems remained to be solved, particularly centered around the viewfinder. For instance, because of the use of two lenses, parallax naturally occurred. The image in the viewfinder had right and left interchanged. Furthermore, as the functions of the 35 mm single-lens reflex camera were improved, the inability to interchange lenses and to take close-up shots were added as new problems.

The Mamiya C challenged these problems. Of course, it is taking time to resolve all the problems. In the eary days, the camera was named the Mamiyaflex C, but ever since the Mamiya C3 in 1962, the "flex" has been cut off. This symbolizes the fact that the Mamiya C is completely different from the ordinary twin-lens reflex cameras and has developed into a "bigger size camera" in the most modern sense.

How the many problems were resolved is taken up in the following pages, but the Mamiya C today has grown into a camera which is in command of all the techniques possible with a 35 mm single-lens reflex camera. Also, when compared to other bigger size cameras, it has been made smaller in size and lighter in weight in proportion to its large format, and it is universally recognized as a very unique existence, a system camera with great mobility.


MAMIYA C330
MAMIYA-SEKOR

Lens Interchangeability Has Changed Twin-Lens Reflex

• Qualifications for A Bigger Size Camera

In the words "bigger size camera," there is a meaning over and above a camera with a format larger than that of the 35 mm camera. It is the camera which cameramen, who are no longer satisfied with the 35 mm single-lens reflex camera, use in the next stage when they want a camera with a bigger format.

Consequently, it is not enough that the format is bigger. It is necessary that system accessories are available and that it should be an allround camera through combination with various accessories. From this standpoint, practically all of the 6X6 twin-lens reflex cameras available now are not worthy of being called "bigger size cameras." The biggest reason for this is that their lenses are not interchangeable.

This is a concrete explanation of the "Mamiya C is not a twin-lens reflex" on Page 3. The Mamiya C, which is the only 6X6 twin-lens reflex with interchangeable lenses in the world, is a "bigger size camera" of today before being a twin-lens reflex camera.

• Simple, Accurate Mamiya C Lens Mount

The lens interchanging system of the Mamiya C is a completely unique one. Because it is a twin-lens reflex, the taking lens is in one piece with the shutter and viewing lens, and it is attached or detached together with the base plate. This base plate is held by a lens catch of special design at two points, one at the top and one at the bottom of the lens, and it is accurately locked in place by the flexibility of the lens catch. On the basis of simple construction and accurate holding, it can be called a lens mount without equal.

Attachment and detachment are outstandingly simple. Turn the lens change knob on the left side of the camera to "UNLOCK." The lens catch is unlocked, and the lens can be detached. At the same time, the shutter plate behind the taking lens moves up and prevents accidental film exposure. After changing the lenses, the lens catch should be returned to its original position, and the lens change knob should be turned to "LOCK." If this is not done, the shutter plate remains up; if the lens change knob is in the "UNLOCK" position, a red warning mark appears in the viewfinder, and the shutter release button is locked, thus activating the double safety device.

Changing of lenses on the Mamiya C is probably one of the fastest among the bigger size cameras; the speed of changing is equal to that of 35 mm cameras.

The shutter plate (behind the taking lens) is in the up position

The shutter plate (behind the taking lens) is in the down position

Simple, Accurate Mamiya C lens mount

Bellows Opens Up World of Close-Up Photography

● Professional Cameras Have Bellows

Focusing of the Mamiya C is carried out by turning the focusing knobs on both sides and extending the bellows. Most current cameras use the extension of the helicoid in the lens barrel, but the bellows is still used in 4X5 view cameras and in the bellows attachments of 35 mm single-lens reflex cameras. There are several major advantages to using bellows even today.

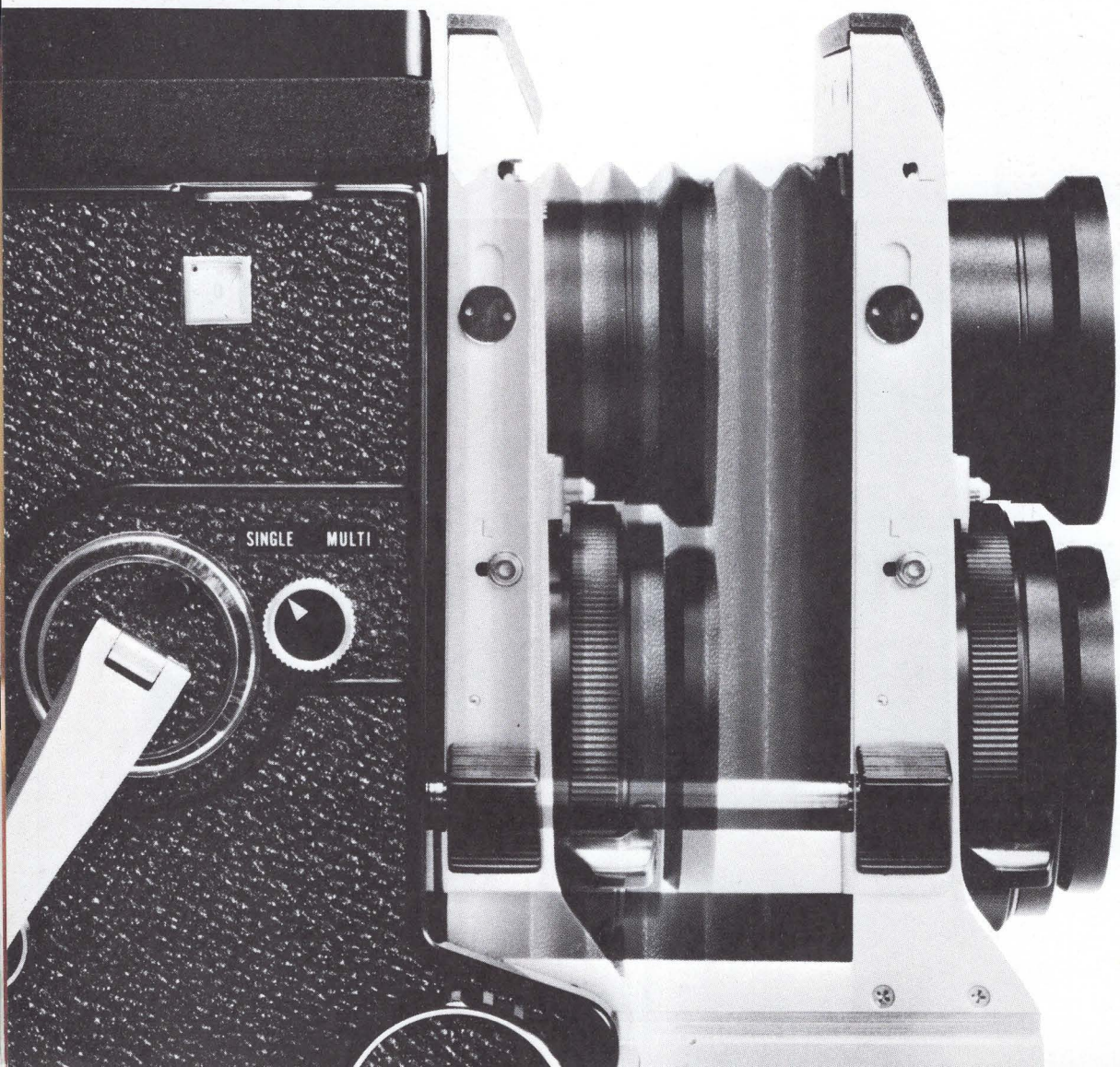
First of all, the extension length becomes longer, and in the case of the Mamiya C330 and Mamiya C220, it is 55 millimeters. It is as if the Mamiya C cameras had bellows for close-up photography built into them. The magnification particularly of the 55 mm to 80 mm lenses is similar to that of the macro lenses, and that is why extension rings are not included in the system for the Mamiya C cameras.

Second, the bellows has the effect of preventing internal reflection. Even in 35 mm cameras, wave-like folds are used, and the bellows is of the most ideal construction to prevent harmful internal reflections.

The third point is that compared to the metal helicoid, the material of the bellows is lighter in weight and can be folded, thereby making it possible to reduce the weight and size of the camera itself. It is because of the bellows that the Mamiya C cameras are unexpectedly lightweight as 6X6 cameras.

● Close-Up Photography Table of the Mamiya C

Focal Length	Closest Distance from Film to Subject	Minimum Subject Coverage	Magnification
55 mm	241 mm	64X 64 mm	X 1/1.14
65 mm	271 mm	67X 67 mm	X 1/1.2
80 mm	354 mm	86X 86 mm	X 1/1.5
105 mm	584 mm	184X184 mm	X 1/3.2
135 mm	902 mm	252X252 mm	X 1/4.5
180 mm	1,290 mm	275X275 mm	X 1/5
250 mm	2,050 mm	311X311 mm	X 1/5.6



• Distance Scale Is for Flash Photography

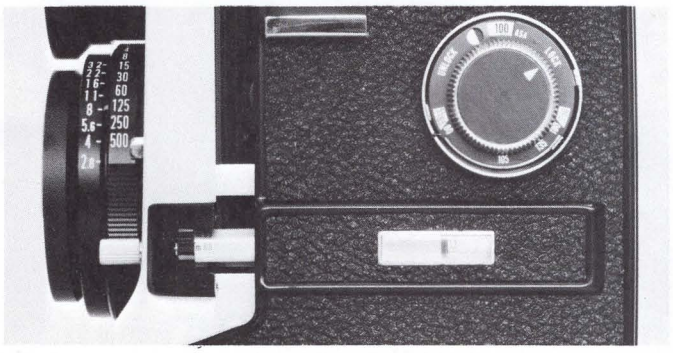
Since the image through the lens can be directly confirmed with the focusing screen in the 6×6 twin-lens reflex camera, actually there is almost no need for a distance scale. It is necessary only for flash photography. This is because the exposure is decided by the guide number of the strobe light or flash bulb and the shooting distance.

$$\text{F Number} = \frac{\text{Guide Number}}{\text{Shooting Distance}}$$

For instance, in the case of a strobe light with a guide number of 22 (Fm), if the shooting distance is four meters, the appropriate aperture is F5.6.

Since the Mamiya C cameras are equipped with bellows, a very unique method for showing the distance scale has been developed.

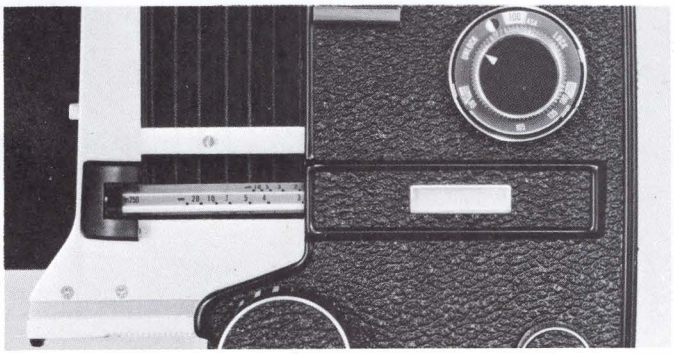
• Hexagonal Distance Rod—Mamiya C330



80mm lens, set at a distance of 1.2m

The Mamiya C330 is equipped with a hexagonal distance rod like a pencil on the left side of the body. This distance scale can be revolved and is set to fit the focal length of the lens used.

This indication method divides the seven interchangeable lenses into the wide-angle lens group (55 ~ 80 mm, red letters)

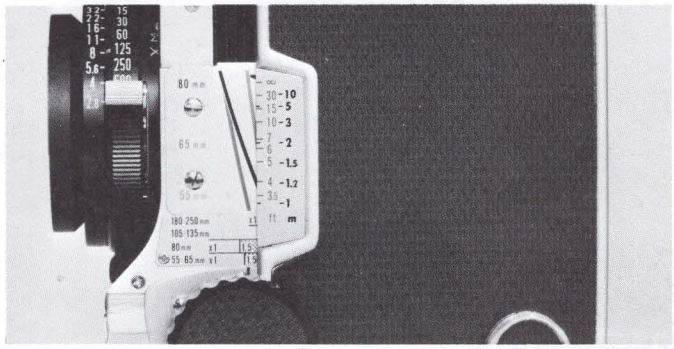


250mm lens, set at a distance of 3m

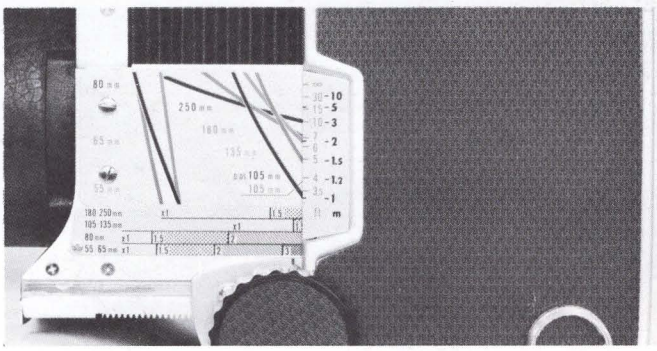
and the telephoto lens group (105 ~ 250 mm, black letters). The wide-angle lens group uses the distance scale window on the body, and the edge of the cover, which moves within the window, acts as the distance indicator.

Since the bellows extension length becomes big in the case of the telephoto lens group, the scales are read at the front end of the camera body side plate. In the case of the telephoto lens group, the bellows must be extended to a certain extent for infinity. At that time, the distance scale window for the wide-angle lens group is already completely covered, so that there can be no confusion between the two groups.

• Graph Type Distance Scale—Mamiya C220



80mm lens, set at a distance of 1.2m



250mm lens, set at a distance of 3m

A simplified distance scale is used in the Mamiya C220. It is on the left side of the body, and there is a graph of curves in different colors for various focal lengths. The distance scale is positioned on the front edge of the body, and the number indicated by the curve of the lens used shows the shooting distance. Under this system, there is no need for converting the distance scale even if the lens is interchanged.


Mitutoyo
MADE IN JAPAN
0 1 2 3 4 5 6
0 2 4 6 8 10
1/20mm

• Why Exposure Compensation Is Necessary for Close-Up Photography

The Mamiya C cameras are appropriate for close-up photography, and they are so designed that anyone can enjoy close-up photography with high quality, sharp pictures produced by a bigger size negative. There are, however, two technical problems involved in close-up photography. Solutions to both problems have been provided in the Mamiya C cameras.

The first problem is the exposure compensation. Why is it necessary to make exposure compensation in close-up photography?

The exposure is decided by the shutter speed and the F number of the lens. This F number is calculated as follows:

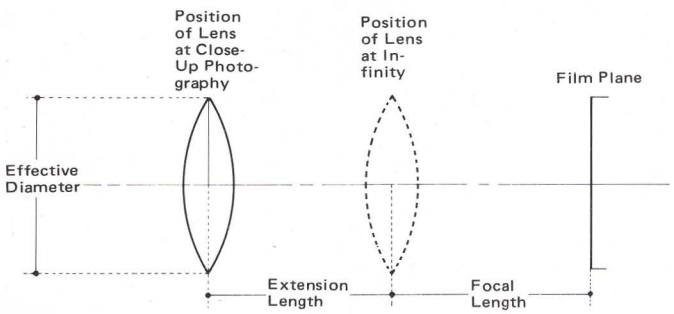
$$\text{F Number} = \frac{\text{Focal Length of Lens}}{\text{Effective Diameter}}$$

When the extension length of the lens becomes large as in the case of close-up photography, the exposure must be considered on the basis of the effective F number.

$$\text{Effective F No.} = \frac{\text{Focal Length + Extension Length}}{\text{Effective Dimeter}}$$

In other words, the F number is accurate only when the lens is focused at infinity, and exposure compensation must be carried out when focusing at a shorter distance.

When the distance is about one meter, the extension length is small, so there is no need for exposure compensation. In the case of a camera with a very short minimum distance like the Mamiya C cameras, exposure compensation must be carried out. Otherwise accurate close-up photography is not possible.



• Simple Method of Exposure Compensation

The figures X1.5, X2, X2.5 and X3 can be seen on the focusing screen of the Mamiya C330. If the scale of the lens change knob (explained on Page 5) is set to the focal length of the lens used, it is coupled to the extension of the bellows, and the needle inside the focusing screen moves up and down. The number indicated by this needle is the exposure factor for close-up photography at that time.

In the Mamiya C220, the exposure compensation scale is shown in graph form under the distance scale. Select the zone of the lens used. The number of the zone appearing on the front edge of the body becomes the exposure factor for close-up photography at that time.

Exposure compensation is carried out in accordance with the exposure factor read from the graph. For instance, if the exposure factor is X2, open the lens one stop or lower the shutter speed one step.

This exposure compensation for close-up photography is not directly connected with the focal length of the lens. It is decided by the magnification of image. For instance, if the subject coverage is 280X280 mm, the photography magnification is 1/5X, and at that time, the exposure factor is X1.5 (open lens half a stop). Consequently, if you note the size of the subject coverage just before shooting, you can learn the exposure factor for close-up photography.

Furthermore, there is the CdS Porrofinder in the Mamiya C system. If this interchangeable finder is used, the built-in TTL exposure meter directly indicates the correct exposure value for close-up photography.

Exposure Factor	Exposure Value to be compensated	Magnification	Subject Coverage
X1	0 EV	–	–
X1.5	1/2 EV	X 1/5	280X280 mm
X2	1 EV	X 1/2.5	140X140 mm
X3	1-1/2 EV	X 1/1.5	84X 84 mm
X4	2 EV	X 1/1	56X 56 mm

The exposure factor indicator

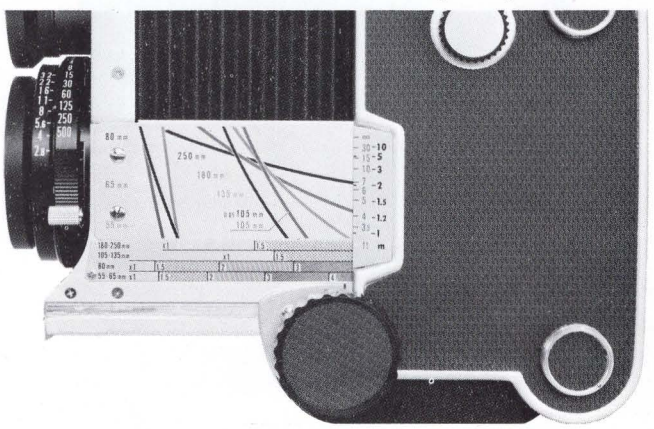


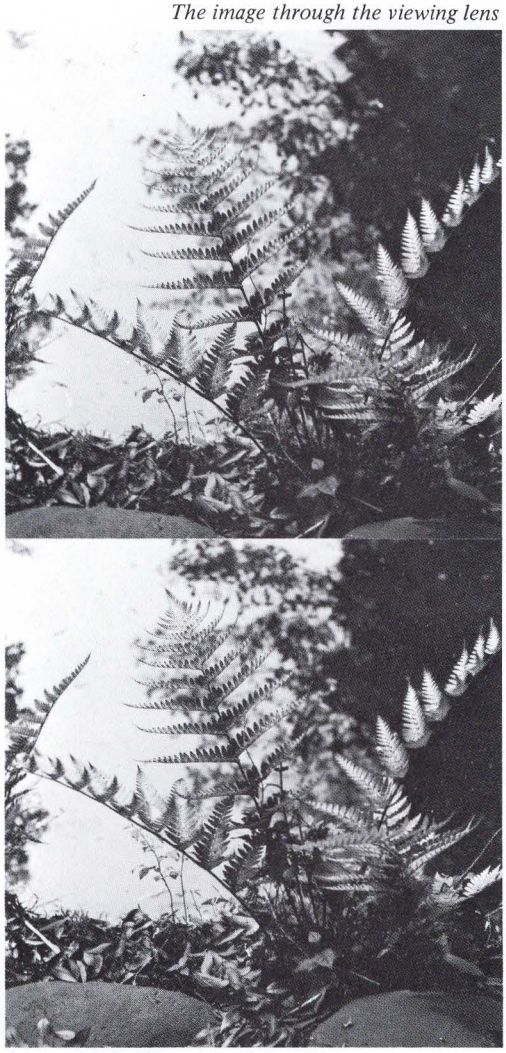
Photo: Keiichi Kimura MAMIYA-SEKOR 105mm F3.5 f8 1/4 sec.

No Parallax in Twin-Lens Reflex?

• Parallax Can Be Ignored in General Photography

The number of young cameramen who do not know about the golden age of twin-lens reflex cameras has increased since the single-lens reflex has occupied the top position among cameras for such a long period. Among such cameramen, there apparently are some who distrust the twin-lens reflex cameras. The reason is that the twin-lens reflex cameras inherently have parallax since two lenses are used.

The image through the viewing lens



The image through the taking lens without paramender

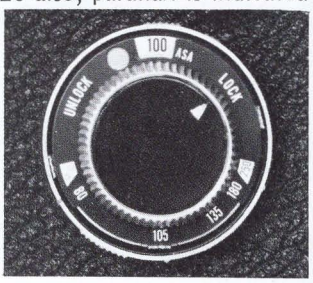
Is this true? Does the twin-lens reflex camera have parallax which is an actual problem? The sample photograph shows the results of an actual test. The distance between the optical axes of the viewing and taking lenses of the Mamiya C is 50 millimeters. When the shooting distance is far longer than the distance between the optical axes, i.e. more than one meter as in the case of general photography, the parallax is small enough that it can be completely ignored.

• Parallax Solution by Tie-Up with Exposure Factor

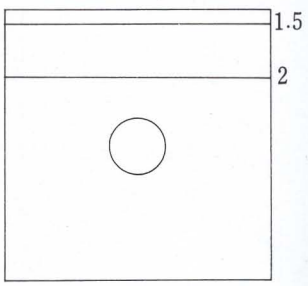
Still, parallax will naturally occur when high magnification close-up photography is carried out by making use of the features of the Mamiya C. The Mamiya C is prepared for this.

In the case of the Mamiya C330, the pointer in the focusing screen explained on Page 9 to learn the exposure factor is actually the parallax pointer. The part above the pointer, though it may be seen on the focusing screen, will not appear on the film. If the focal length of the lens used is set to the lens change knob, the pointer moves along with extension of the bellows. The pointer corrects parallax automatically, and at the same time it indicates the exposure factor.

In the case of the Mamiya C220 also, parallax is indicated along with the exposure factor. When the exposure factor is 1.5, the part in the focusing screen above the top line will not appear in the finished photograph because of parallax. In the same manner, the bottom line denotes parallax when the exposure is X2.



In this manner, the Mamiya C cameras are so designed that correction of parallax is carried out at the same time as the reading of the exposure factor for close-up photography. Since the cases where it is necessary to consider parallax are restricted to close-up photography where the exposure factor is a problem, it can be said that this system is the most rational from the practical standpoint.



• What Makes the Twin-Lens Reflex A Single-Lens Reflex

Although the parallax correction device built into the body will operate accurately, the field of vision which can be checked in the focusing screen becomes smaller in close-up photography with a wideangle lens because of the big parallax of the image. For such photographic conditions the Paramenders are available as Mamiya C system accessories.

The function of the Paramenders is to slide the camera up by 50 millimeters—the distance between the optical axes of the taking and viewing lenses. When using the Paramender, you can consider that there is no parallax and carry out accurate focusing and framing of the image through the viewing lens. Then you can raise the camera by the Paramender, and the taking lens will rise to the same position as the viewing lens. As a result, the exact image seen in the focusing screen is accurately recorded on film.

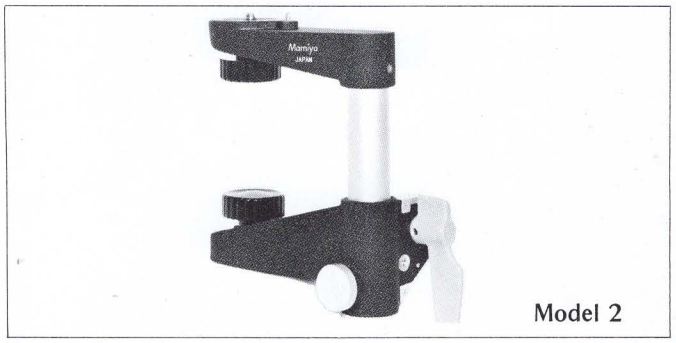
The Mamiya C camera combined with a Paramender makes possible the same accurate and rapid framing as a single-lens reflex or view camera. There are twin-lens reflexes with built-in automatic parallax correction, but this is restricted to

the photography scope. The Mamiya C system is the only one which can accurately check the overlapping with objects in front of or behind the subject. Some cameramen say the Mamiya C cameras are superior to the single-lens reflex cameras since there are the advantages of always bright image and no mirror action.

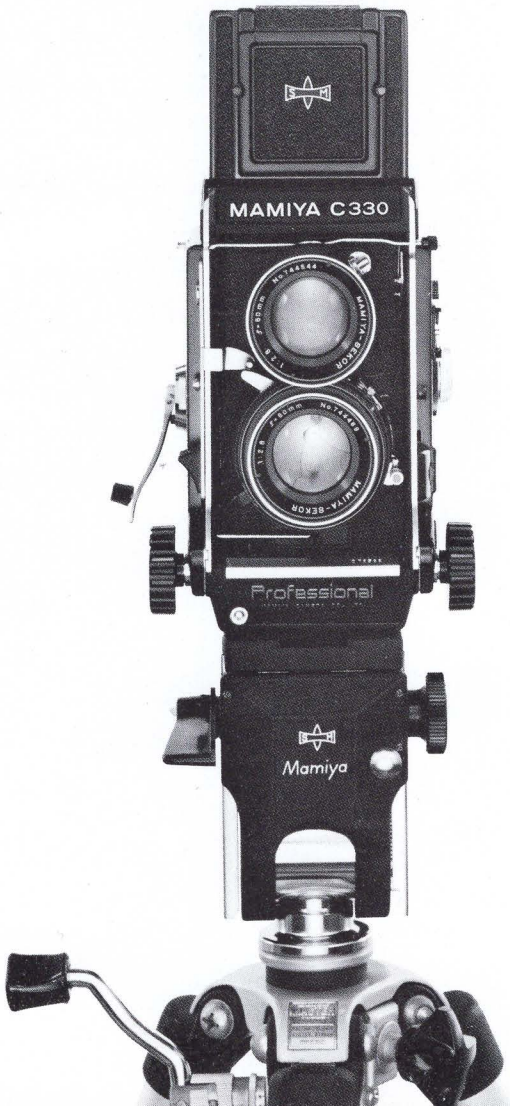
• Two Types of Paramenders

There are two types of Paramenders for use with Mamiya C cameras. Paramender Model 2 is a type attached between the camera base and a tripod. When the camera is raised through turning the lever, it is automatically locked at the shooting position. Since a camera position control pin is attached, there is no danger of a sideways twist.

Paramender Model 3 is a combination of a one-stop tripod head and a Paramender. The camera is held by stable supports on both sides. This Paramender Model 3 is convenient for those taking many close-up shots. Purchasing the Paramender Model 3 instead of an ordinary tripod head will save the Mamiya C owner money.



Model 2




250mm F6.3
180mm F4.5
135mm F4.5
65mm F3.5
105mm F3.5
80mm F2.8
55mm F4.5

The Unique World of Mamiya C Produced by The Big Family of Interchangeable Lenses

• World's Only Twin-Lens Reflex with Interchangeable Lenses

The Mamiya C cameras are the only 6X6 twin-lens reflex cameras in the world with interchangeable lenses. Interchangeable lenses are valuable and indispensable in photography today. What kind of effects do interchangeable lenses produce?

The first is the variety of angles of view. The longer the focal length of the lens, the narrower becomes the angle of view and the smaller becomes the subject coverage if the distance to the subject is the same.

Consequently, if you use a telephoto lens with a long focal length, you can take close-up shots of the subject even if you are some distance away from the subject.

Conversely, in the case of a wideangle lens with a short focal length, you can include a wide subject coverage within the picture even in cases where adequate shooting distance is not allowed.

• Depth of Field Decides Backgroud Detail

The second effect of interchangeable lenses is the variety in the depth of field. What appears sharply in focus in the picture is not just the one point of focus but a certain scope in front of and behind the point of focus. This is the depth of field. The more the aperture is closed down and the shorter the focal length of the lens, the deeper becomes the depth of field. This can be utilized to give depth to the picture.

For instance, when taking a picture of scenery, if you utilize the depth of field of the wideangle lens, pan-focus photography can be easily carried out. In portraiture you can use a telephoto lens with a shallow depth of field, and the background is appropriately eliminated and the main subject is spot-lighted.

• Interchangeable Lenses Create, Not Copy

The third effect, the variety in perspective, can be obtained only from interchangeable lenses. Photographs taken with a wideangle lens show nearby objects bigger and closer than they actually are, while far away objects look even smaller farther away. On the other hand, in photographs taken with a telephoto lens, the perspective is compressed, and the difference in distance does not affect the size of the subject. This is the variety in perspective. The reason why telephoto lenses are often used in portraiture is to weaken the perspective effect so that one part of the model's face is not distorted even if a photograph is taken from an extreme angle.

Conversely, there are cases where the subject is drastically deformed by utilizing the strong perspective of the wideangle lens in order to "create" a completely different image rather than to merely "copy" the actual subject.

• Completely Systematized Mamiya-Sekor Lens Family

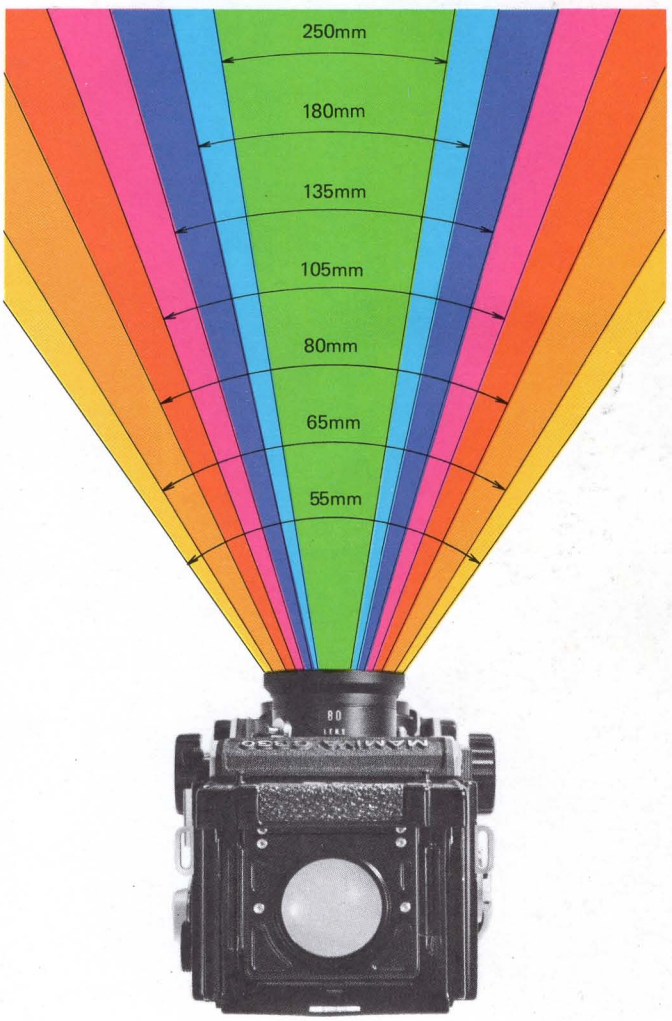
The Mamiya-Sekor lens family has been designed according to a consistent policy. All the lenses guarantee the same sharpness and faithful color reproduction to insure stable results. The viewing lens is of exactly the same construction as the taking lens, and the descriptive power of the lens can be checked beforehand through the focusing screen.

The Seiko No. 0 shutter (B, 1-1/500 sec., M-X synchronization) is incorporated into each of these lenses, and this enables Mamiya C to carry out strobe photography at all shutter speeds up to 1/500 sec. Thus, daylight synchronization is also easily possible.

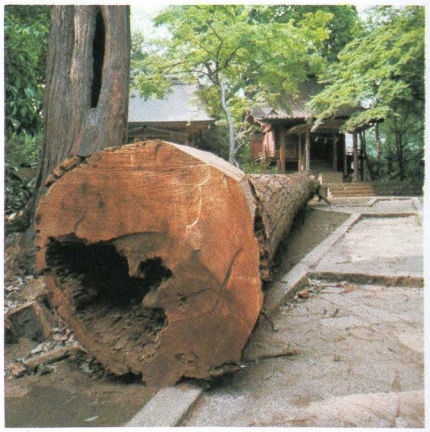
The feature of the Mamiya-Sekor lens family is not just the wide scope of lenses available, but the well-planned series of focal lengths. The various lenses are lined up at equidistant intervals, and you can select the lens with suitable focal length which perfectly matches your objective.

In the case of interchangeable lenses for bigger size cameras, it will be easier for you to select a suitable lens if you recalculate the focal length as lenses for 35 mm cameras. In this calculation, the size ratio taken up on Page 2 is utilized. Since the size ratio of the 6X6 format is 5/3, the standard 80 mm lens for the Mamiya C cameras can be calculated as follows:

$$80 \div 5/3 = 48$$
$$105 \div 5/3 = 63$$

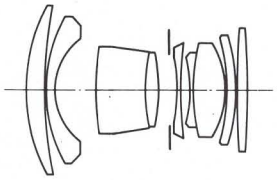


55 *WIDEANGLE LENS*
Mamiya-Sekor 55mm F4.5



● Multi-Purpose Wideangle Lens

The 55 mm F4.5 lens has the widest angle of view of the Mamiya C lenses. Computed in terms of a 35 mm camera, it is equivalent to a 33 mm lens, but it actually gives a visual effect close to that of a 28 mm wideangle lens. A wider angle lens is probably impossible from the standpoint of the construction of twin-lens reflex cameras. The perspective is fully stressed, and pictures with feelings of speed can be taken. The distortion is very small, less than 1%. If the bellows is fully extended, 1:1 magnification close-ups can be taken. It can be called a multi-purpose wideangle lens.



Construction: 7-group, 9-element
Angle of View: 70° 30′
Minimum Aperture: F22
Minimum Focusing Distance
from Film to Subject: 241 mm
Minimum Subject Coverage: 64×64 mm
Weight: 330 grams
Filter Size: 46 ϕ screw-in type

Photo: Keisuke Kumagiri MAMIYA-SEKOR 55mm F4.5 f11 1/125 sec.

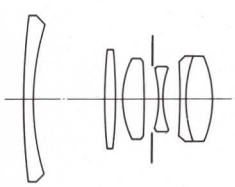
Photo: Isao Takahashi MAMIYA-SEKOR 65mm F3.5 f8 1/125 sec.

65 *WIDEANGLE LENS*

Mamiya-Sekor 65mm F3.5

- **Wideangle Lens for the Professional**

Calculated in terms of a 35 mm camera, it is a 39 mm lens, and the perspective effect is not too strong. It is particularly suited for photographs of architecture and of groups of people. With these purposes in mind, distortion has been reduced to a minimum. It can be called a standard lens for snapshots, and it is a wideangle lens favored by professionals in every field.



Construction: 5-group, 6-element
Angle of View: 63°
Minimum Aperture: F32
Minimum Focusing Distance
from Film to Subject: 271 mm
Minimum Subject Coverage: 67×67 mm
Weight: 340 grams
Filter Size: 49 ϕ screw-in type

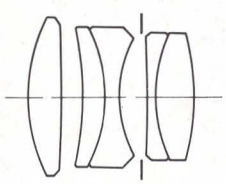
Photo: Kodansha LTD. MAMIYA-SEKOR 80mm F2.8 f11 1/250 w/flash.

80 STANDARD

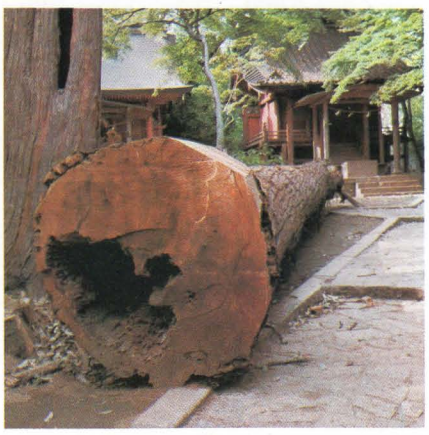
Mamiya-Sekor 80mm F2.8

• Standard among Standard Lenses

A lens with a focal length close to the diagonal of the negative is defined as a standard lens (79.1 mm in the 6X6 format), and in this sense this 80 mm lens is the standard among standard lenses. Calculated in terms of a 35 mm camera, it is a 48 mm lens. The lens construction is the so-called Tesser type with further improvements, so that there is uniform sharpness from corner to corner.



Construction: 3-group, 5-element
Angle of View: 50° 40′
Minimum Aperture: F32
Minimum Focusing Distance from Film to Subject: 354 mm
Minimum Subject Coverage: 86x86 mm
Weight: 310 grams
Filter Size: 46 ϕ screw-in type

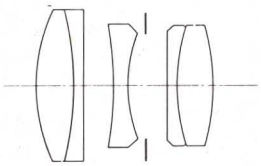


105 STANDARD

Mamiya-Sekor 105mm F3.5

• Standard Lens Created by Mamiya Policy

The focal length is equal to that of the 63 mm for the 35 mm camera, and it has a slightly narrow angle of view as a standard lens. With this focal length the lens eliminates deformation of the subject in portraiture and close-ups of merchandise. Yet it is not as narrow in angle of view as the telephoto lens. It can even be said that this lens established the position of the Mamiya C cameras. Ever since the birth of the first Mamiya C camera, it has been welcomed by cameramen as a lens with a very convenient focal length.



Construction: 3-group, 5-element
Angle of View: 41° 20'
Minimum Aperture: F32
Minimum Focusing Distance from Film to Subject: 584 mm
Minimum Subject Coverage: 184×184 mm
Weight: 336 grams
Filter Size: 46 ϕ screw-in type

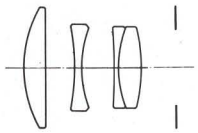
Photo: Eizo Ozaki MAMIYA-SEKOR 105mm F3.5 f8·f11 1/2 sec. 4 min. double exposure.

135 *TELEPHOTO*

Mamiya-Sekor 135mm F4.5

- **Specially Developed for Portraiture**

This is equivalent to the 81 mm lens for the 35 mm camera, and it was developed for use in taking studio portraits. Delineation ability is excellent. It is very compact for a 135 mm telephoto lens, and it is only 10 grams heavier than the 105 mm standard lens. Since the focal length is close to that of the unique 105 mm standard lens, there are not too many users of this 135 mm lens, but it is a lens convenient for telescopic close-up shots.



Construction: 3-group, 4-element
Angle of View: 33°
Minimum Aperture: F45
Minimum Focusing Distance from Film to Subject: 902 mm
Minimum Subject Coverage: 252x 252 mm
Weight: 370 grams
Filter Size: 46 ϕ screw-in type

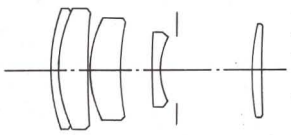
Photo: Akira Satō MAMIYA-SEKOR 135mm F4.5 f11 B, w/strobs.

180 *TELEPHOTO*

Mamiya-Sekor 180mm F4.5

● All-Purpose Telephoto Lens

Equivalent to the 108 mm lens for the 35 mm camera, it is the most popular telephoto lens in the Mamiya C interchangeable lens family. There is no subject which cannot be photographed with this lens, including portraits, scenery and snapshots. It has the longest focal length of the lens which can be used with the Mamiya C330 for self-cocking. The various abberations have been corrected, so that high-quality delineation is possible even at full aperture.

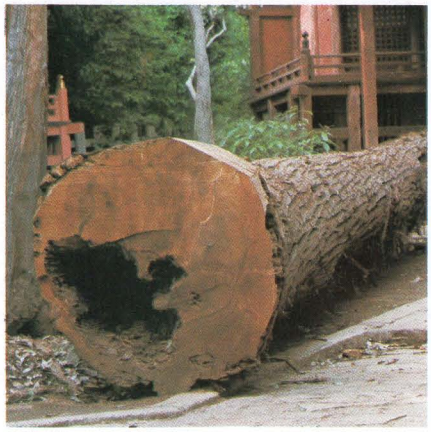


Construction: 4-group, 5-element
Angle of View: 24° 30′
Minimum Aperture: F45
Minimum Focusing Distance from Film to Subject: 1,290 mm
Minimum Subject Coverage: 275x275 mm
Weight: 620 grams
Filter Size: 49 ϕ screw-in type

Photo: Uwe Niehuus MAMIYA-SEKOR 180mm F4.5 f5.6 1/30 sec.

250 *TELEPHOTO*

Mamiya-Sekor 250mm F6.3



- **Most Powerful Telescopic Effect**

This is the telephoto lens with the longest focal length in the Mamiya-Sekor interchangeable lens family. It is equivalent to the 150 mm lens for the 35 mm camera. The far-near feeling is drastically compressed, and powerful pictures can be taken bringing faraway objects up very close. The design features high telephoto ratio, while it is compact and light-weight so that hand-held photography is easy.

Construction: 4-group, 6-element
Angle of View: 18°
Minimum Aperture: F64
Minimum Focusing Distance from Film to Subject: 2,050 mm
Minimum Subject Coverage: 311x311 mm
Weight: 630 grams
Filter Size: 49 ϕ screw-in type

Photo: Kakichi Hayashi MAMIYA-SEKOR 250mm F6.3

The Automatic Mamiya C330 and The Lightweight Mamiya C220

There are presently two types of Mamiya C cameras. One is the Mamiya C330, which has been extremely automated, while the other is the Mamiya C220 with the lightweight body.

The difference between the two types was plainly shown by the parallax correction method explained on Page 10. The Mamiya C330 has been made as automatic as possible to prevent operating mistakes, while the Mamiya C220 has been simplified to the point where there are no obstacles to practical use. Consequently, there are some experienced Mamiya C users who say that the C220 is better because operation is simple and easy.

There are 10 points on which the C330 and C220 differ, and they have been listed in a chart. On other parts, the two cameras are exactly the same, and all the system accessories, with the exception of focusing screens and some grips, can be used by both cameras.

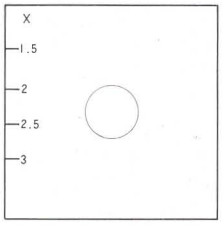
As for the features of the C220 which are not in the list, there is the point that the body is compact and lightweight. When the body alone is compared, it is about 500 grams lighter, so it appeals to cameramen requiring a second body for color film.

• Differences between Mamiya C330 and Mamiya C220

Item	Mamiya C330	Mamiya C220
Film Wind	Crank winding, 360°	Knob winding. Built-in folded crank
Shutter Charge	Self-cocking (except 250 mm lens)	Manual charging
Shutter Release Button	At bottom front of body and on side of front plate	On side of front plate
Focusing Screen	Can be interchanged	Fixed
Focusing Hood	With supporting columns with 65 and 80 mm frame finders	Without supporting columns, with 80 mm frame finder
Parallax Correction	Automatic	Scale in focusing screen
Distance Scale	Hexagonal rod (convertible according to lens)	Graph type
Exposure Conpensation	Automatically indicated in the finder	Read from distance scale plate
Film Counter	120/220 automatic conversion	120/220 manual conversion
Back Cover	Removable (single-exposure possible with cut film and dry plates)	Fixed

• Different Focusing Screens for Different Motives

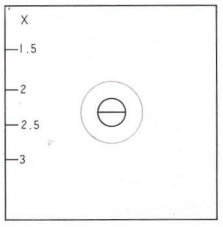
Six focusing screens, including the standard No. 1 Matte, are available for use with the Mamiya C330. They can be selected according to the photographic conditions and motives. All the focusing screens have 1.5X ~ 3X close-up exposure factor scales built into them.



No. 1 Matte

* Entire surface matted
* Fresnel lens attached (excluding the central part 10 mm in diameter)

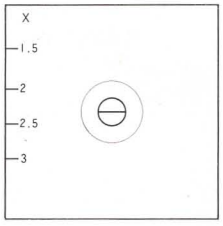
This is the standard focusing screen attached to the camera, and it can be used for general subjects. Focusing is possible, not only with just the center part, but with any part of the screen.



No. 2 Split-Image Spot 4°

* Split-image prism at center (deflection 4°)
* Entire surface matted
* Fresnel lens attached

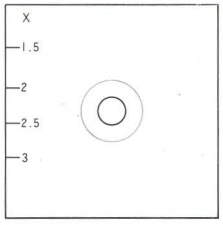
This is a type with a split-image prism built into the center of the matted screen. Focusing can be carried out more speedily and accurately. In the case of the 250 mm lens, focusing is carried out with the matte part.



No. 3 Split-Image Spot 6°

* Split-image prism at center (deflection 6°)
* Entire surface matted
* Fresnel lens attached

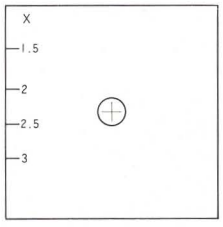
It has been designed for use with standard lenses, and focusing can be carried out more accurately. The split-image prism tends to become dark with interchangeable lenses, so focusing can be done with the matte part.



No. 4 Microprism

* Microprism at center
* Entire surface matted
* Fresnel lens attached

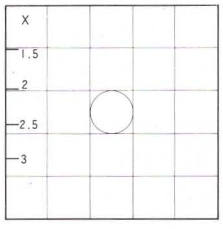
This is a type with a microprism instead of a split-image prism. Out-of-focus shows up more definitely than in the case of the No. 1 Matte, so that focusing can be carried out more speedily and accurately.



No. 5 Cross Hair

* Cross hair at center
* Entire surface matted
* No Fresnel lens

This is a type incorporating the cross hair for focusing while utilizing parallax. Focusing can be carried out in high magnification close-up photography. Since there is no Fresnel lens, concentric lines do not appear on the matted surface.



No. 6 Checker

* 10 mm sectional grid markings
* Entire surface matted
* Fresnel lens attached

It is the ideal focusing screen for architectural photography and copy work since it is possible to accurately check the straightness of picture and photography magnification. It can be used for general photography.

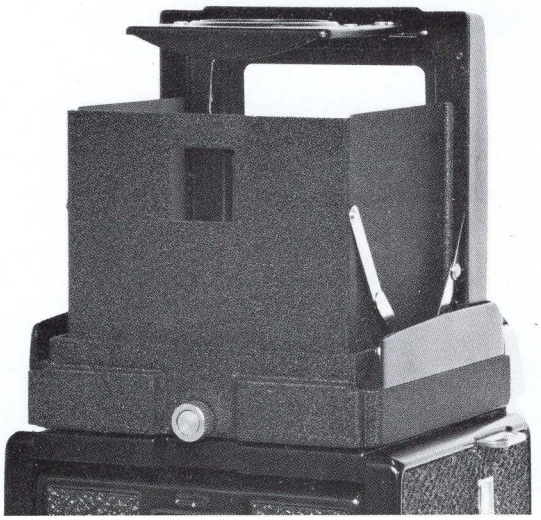
Interchangeable Finders Increase Versatility of Mamiya C's

• The Standard Focusing Hood With High Magnification

The standard finder for the Mamiya C is the folding type focusing hood same as other ordinary twin-lens reflex cameras. By turning the focusing hood lock screw in the back, the focusing hood can be removed.

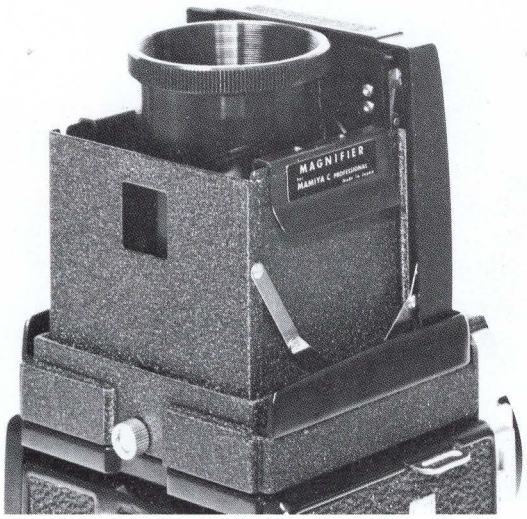
The standard focusing hood has a 3.4X magnifier. The subject at infinity is magnified 1.07 times with a 80 mm lens and 1.35 times with a 105 mm lens. It is a large finder image befitting a bigger size camera. The feature of this finder is that it is the folding type and becomes very compact. The weight is only about 160 grams (in the case of the one for the Mamiya C330).

If the sportsfinder flap in front is pushed in, it becomes a sportsfinder. The Mamiya C330 has both 65 mm and 80 mm and the Mamiya C220 has a 80 mm frame finder built in. By setting accessory masks or attachment lenses to the mask studs in front, it can be used as a sportsfinder for each interchangeable lens.



• Magnifier 5.5X for Accurate Focusing

The Magnifier 5.5X is not an interchangeable finder but is an accessory to be used with the standard focusing hood. The magnifier of the focusing hood is turned down, and this Magnifier 5.5X is attached to the side plates of the focusing hood. With magnification of 5.5 times, the image in the finder is 1.72 times with a 80 mm lens and 2.18 times with a 105 mm lens. Since only the central part of the picture can be seen, it is an accessory for accurate focusing. The weight is approximately 80 grams.

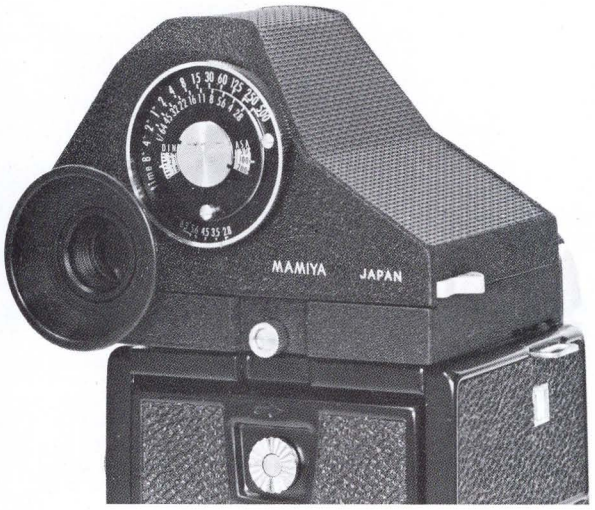


• Magnifying Hood Is Perfect for Waist-Level Focusing

The Magnifying Hood is a solid waist-level focusing hood. Extraneous light does not enter the Magnifying Hood even in bright surroundings, so that the image on the focusing screen is always clear.

The magnification can be changed to 3.5X or 6X by turning the knob on the right side of the hood. At 3.5X magnification, the entire picture can be seen, and the magnification is 1.10 times with the 80 mm lens and 1.39 times with the 105 mm lens. At high 6X magnification, the rate is 1.82 times for the 80 mm lens and 2.30 times for the 105 mm lens. In this case, only about 20 mm diameter in the center can be seen, so this is used exclusively for focusing. The weight is approximately 200 grams.

This is the bestseller among interchangeable finders, and its greatest advantage is that the image in the focusing screen is particularly bright and clear. It can also be used as a simple viewer for 6X6 color slides.



• Accurate Exposure with the CdS Porrofinder

The CdS Porrofinder has a TTL exposure meter built into it, utilizing the hollow construction of the Porrofinder. There is no need to dwell at length on the convenience of the TTL exposure meter, and this finder adopts the spot measuring at open aperture which permits very accurate light measurement.

When using this finder, the film sensitivity (ASA 12-6400, DIN 12-39) and the maximum aperture of the lens used (F2.8 ~ F6.3) are set on the dial on the right side. When the finder is switched on, an arm with a 5-mm-diameter light cell appears in the center. If the dial is turned to make the needle in the finder coincide with the fixed point, the correct combinations of the shutter speeds and apertures will appear on the side of the dial. The measuring range for ASA 100 film is EV3 ~ 18 for the F2.8 lens.

Since it is spot measurement of a very limited area, the meter operates accurately even under difficult lighting conditions. It can be used for such high-level techniques as measuring the lighting contrast between the dark and bright parts of the subject.

• Lightweight, Eye-Level Porrofinder

The eye-level finder has something that the waist-level finder does not have, and it is indispensable for shooting moving objects since the image in the finder is exactly as seen by the naked eye. When starting to use a bigger size camera, this eye-level finder will make you become accostomed to the camera faster.

The Porrofinder of Mamiya C consists of three surface mirrors in order to give the same results as a pentaprism, and yet it weighs only 210 grams. The magnification is two times, so that at infinity, the rate is 0.51 times for the 80 mm lens and 0.64 times for the 105 mm lens. It is a comparatively low-priced interchangeable finder, so it is quite popular along with the Magnifying Hood.

• Sharp Prism Finder for Moving Shots

The Prism Finder is a full-scale eye-level finder using the same pentaprism as is used in a 35 mm single-lens reflex camera. Compared to the Porrofinder, the image in the finder appears bigger and brighter, but its weight of about 430 grams is considered to be its disadvantage by some.

The magnification is approximately 2.5 times, and at infinity, the subject is magnified 0.70 times with a 80 mm lens and 0.88 times with a 105 mm lens.

Convert to A Custom Camera with System Accessories

The Mamiya C cameras are nearly complete in themselves, but through combinations with the ample exclusive accessories, they can be converted into even more functional cameras appropriate for your objectives. The Mamiya C cameras have been fully developed as system cameras (Refer to the system chart on Pages 30 and 31).

Following are simple explanations of the special system accessories, excluding the Paramender and finders which have already been described.

• Various Grips Promising Fast Camera Work

To those not used to a 6X6 twin-lens reflex camera, the vertically long body may seem hard to hold. For those with such apprehensions, various grips are prepared.

The Pistol Grip is attached to the bottom of the camera, and a cable release is used to connect the trigger to the shutter button. Since the shutter can be released with the left hand while holding the camera, the right hand can be used for focusing and film winding. So, speedy and continuous shooting can be done.

There is a special Pistol Grip for the Mamiya C330 which connects with the shutter release button on the bottom of the body without a release.

For those people who believe the camera will become too high if a Pistol Grip is used, the Grip Holder is convenient. There is no tie-up with the body shutter, but it is possible to firmly hold the camera with the left hand, and this insures speedy and steady camera work.

There is an accessory shoe at the top of the Grip Holder, so it is most convenient for flash photography with a small

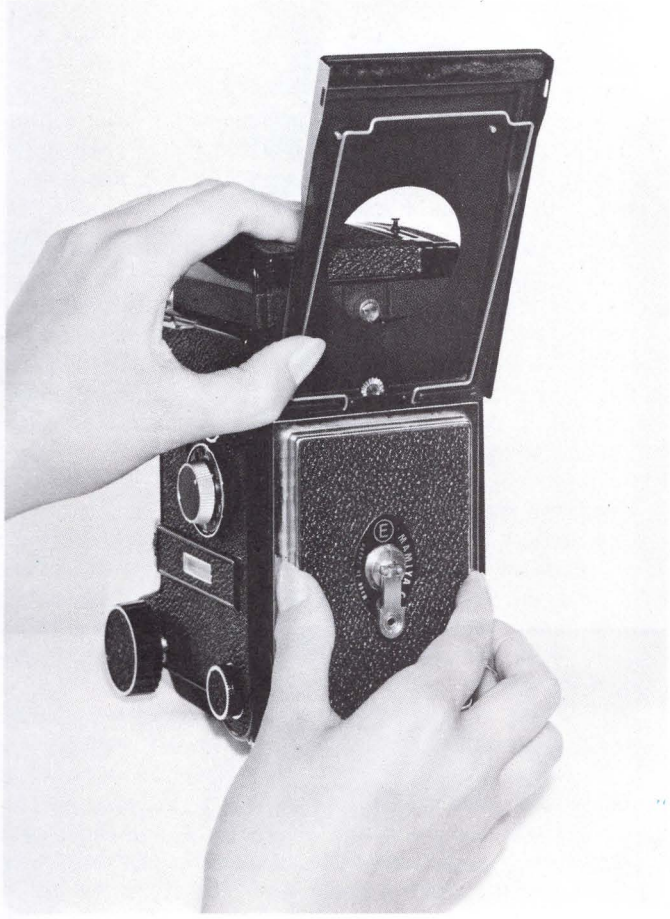
strobe light or flash gun.

The Flash Gun Adapter is an adapter for attaching the special Mamiya Flashgun Pro Deluxe II, and this Flashgun can be used just like the Grip Holder.

The L-shaped Grip Holder for the Mamiya C330 is connected to the shutter release button on the bottom of the body. It is an accessory having the advantages of both the Pistol Grip and Grip Holder. This L-shaped Grip Holder can also be used with the Mamiya RB67 Professional.

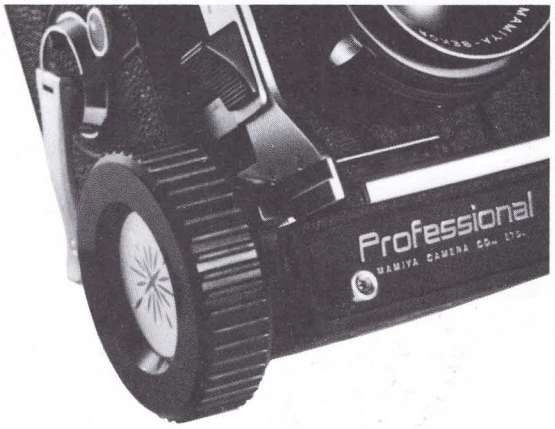
• Single Exposure with Dry Plates and Cut Film

The Single Exposure Attachment is for use by the Mamiya C330 only. The back cover of the C330 can be removed, and it is replaced with the exclusive back cover for single exposure. Cut film 2-1/2X3-1/2 inches in size or a holder containing a dry plate can be installed in the back cover. This set is most useful when the number of photographs to be taken is small or when in a hurry to process film immediately after shooting.



• Small but Effective Focusing Knob Adapter

The Focusing Knob Adapter is an attachment like a rubber tire 60 mm in diameter. It is attached to the focusing knob of the Mamiya C cameras. Since the revolving radius of the knob becomes bigger, extension of the bellows becomes lighter, and fine focusing becomes easy. It is an indispensable accessory when photographing with gloves on in cold weather. It is a small accessory with big results.



• Speed-Up of Attachment to Tripod

The Tripod Adapter Type P and Quick-Shoe are used as a set. If the Tripod Adapter is attached to the bottom of the camera and the Quick-Shoe to the tripod, attachment and detachment from the tripod becomes very easy and fast. It is convenient when carrying out hand-held and tripod photography with one camera.

These are the accessories that the Mamiya C system offers you so that you can take higher quality photographs with your Mamiya C cameras. The Mamiya C system expands along with the needs of users.

History of Mamiya C—More Automatic, More Practical

• Challenging the 35 mm Camera Boom

It was in the beginning of 1957 when the first model of the Mamiya C appeared. At that time the 35 mm camera boom had already started, but the Mamiya Company challenged this trend and placed the Mamiyaflex C Professional on the market.

Its predecessors were the Mamiyaflex Automat A (July 1949) and Automat B (January 1954). The Automat A was the first fully automatic twin-lens reflex camera in Japan. This line progressed from A and B to AII, BII and AIII, and the technical performances were concentrated to produce the Mamiyaflex C Professional.

For a camera maker to challenge the trend of the times is a hazardous adventure. However, the uniqueness of the world's first twin-lens reflex camera with interchangeable lenses has been recognized and favorably accepted by hundreds of thousands of cameramen. The Mamiya C cameras have recorded smooth development up to now.

Recently, interest in bigger size cameras has been gradually increasing, and it would not be an exaggeration to say that the Mamiya C cameras are the oldest in the group of bigger size cameras.

Let us take a brief look at the history of the Mamiya C cameras up to the present time.

1957 MAMIYAFLEX C

• No Change in Basic Ideas

The Mamiyaflex C Professional is of practically the same design as current Mamiya C cameras. The basic ideas are an interchangeable lens system with a special lens mount, big extension bellows and straight-line, stable holding of film. The improvements since then have all been concentrated to make the Mamiya C cameras easier to handle.

In the beginning veteran workers could produce only five sets of parts a day in order to insure smooth extension of the bellows by the rack and pinion system. At that time the interchangeable lenses available were the 80 mm F2.8, 105 mm F3.5 and 135 mm F4.5 lenses only, and from today's standpoint about the "bigger size cameras," they could not be called an interchangeable lens family.

An improved model, the Mamiyaflex C2 Professional, appeared the following year in June 1958. The main improvement was the attachment of focusing knobs on both the left and right sides, so that the camera could be operated with both hands.

1958 MAMIYAFLEX C2

Other improvements made at the same time were strengthening of the bottom of the camera, attachment of a distance scale and addition of a finder mask for a 105 mm lens.

The biggest changes came in the interchangeable lens family which included a series from the 65 mm wideangle lens to the 180 mm telephoto lens. This established the status of the Mamiya C cameras as the only lens interchangeable twin-lens reflex cameras in name and in fact.

• Breakaway from A Twin-Lens Reflex

In February 1962, Mamiya placed on the market an important model—the Mamiya C3 Professional. It was at this point that the Mamiyaflex C changed into the Mamiya C. Mamiya broke away from the ordinary 6X6 twin-lens reflex camera, which had continued from the first A model, to the "bigger size camera" in today's sense of the word.

First of all, the outward appearance changed completely. The leather-covered parts were colored a smart grey, while a film winding crank was attached. Up to then, the stopper had to be released for each shot. A completely automatic double-exposure prevention device was incorporated, and at the same time, a multiple exposure device was installed. The exposure counter is the automatic return type.

The maximum shutter speed has been raised from 1/400 to 1/500 sec.

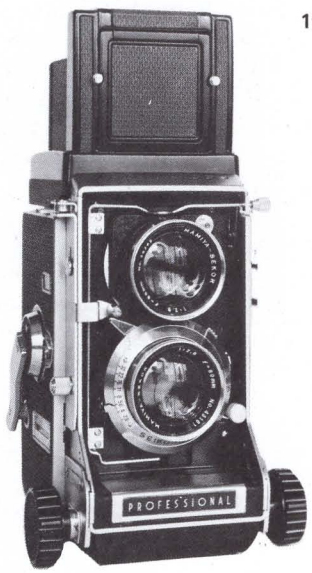
Three years later in April 1965, the Mamiya C took its second great step forward—development of the Mamiya C33 Professional.

1963 MAMIYA C3

It was a challenge against the 6X6 single-lens reflex, a fated rival. As a result of the adoption of the self-cocking device and automatic correction of parallax, the handicap existing between the single-lens reflex and the twin-lens reflex was eliminated.

Furthermore, the interchangeable back cover for Kodak 220 film, which has become increasingly popular, was made available from this model.

1965 MAMIYA C33



- **Self-Reflection to Reduce Weight**

The Mamiya C22 Professional, which appeared in March 1966, was a model embodying major self-reflection. Through developments from model to model the Mamiya C cameras had gradually become automatic, but on the other hand, they gradually became heavier.

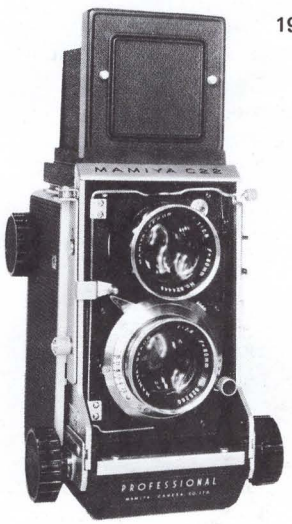
The C22 was a popular version of the C33, and at the same time, it was the fruit of efforts to reduce weight. The film winding crank, self-cocking device and automatic parallax correction were not included, and this resulted in a reduction of about 300 grams in weight.

The present Mamiya C220 Professional was developed in April 1968 by extending the efforts exerted on the C22. The body of the C220 is more compact and lighter than that of the C22. This C220 incorporates the film winding knob with a folding crank and the device permitting use of either 120 or 220 roll film by merely turning the film pressure plate.

The 55 mm wideangle and 250 mm telephoto lenses were added to complete the current family of interchangeable lenses.

The Mamiya C330 Professional appeared a year and a half later in October 1969. It is a model which is an improved version of the C33 and also incorporates the lightweight feature of the C 220.

1966 MAMIYA C22



There are also many functional improvements. The turn of the film winding crank is 360 degrees, and there is no need to return the crank for self-cocking. On top of that, the focusing screens have become interchangeable, while the exposure factors for close-up photography have been included in the focusing screen. As already explained, the two shutter release buttons and the unique distance scale rod have also been incorporated.

In this manner, the Mamiya C cameras have been progressing steadily and continuously. We sincerely believe that our Mamiya C's have been developed to the height where they are nearing perfection as "bigger size cameras" by breaking through the limits of the ordinary 6X6 twin-lens reflex camera. Still, we intend to continue to improve them in line with the demands of the times in the future.

THIS is the present as well as the past of the Mamiya C cameras. They will advance further in the future through your participation.


MAMIYA C330
1:2.8 f=80mm No.760219
MAMIYA-SEKOR
1:2.8 f=80mm No.755650
MAMIYA-SEKOR
Professional


MAMIYA C220
MAMIYA-SEKOR
1:2.8
f=80mm
MAMIYA-SEKOR
1:2.8
f=80mm
No.758048

Mamiya C Professional System Chart

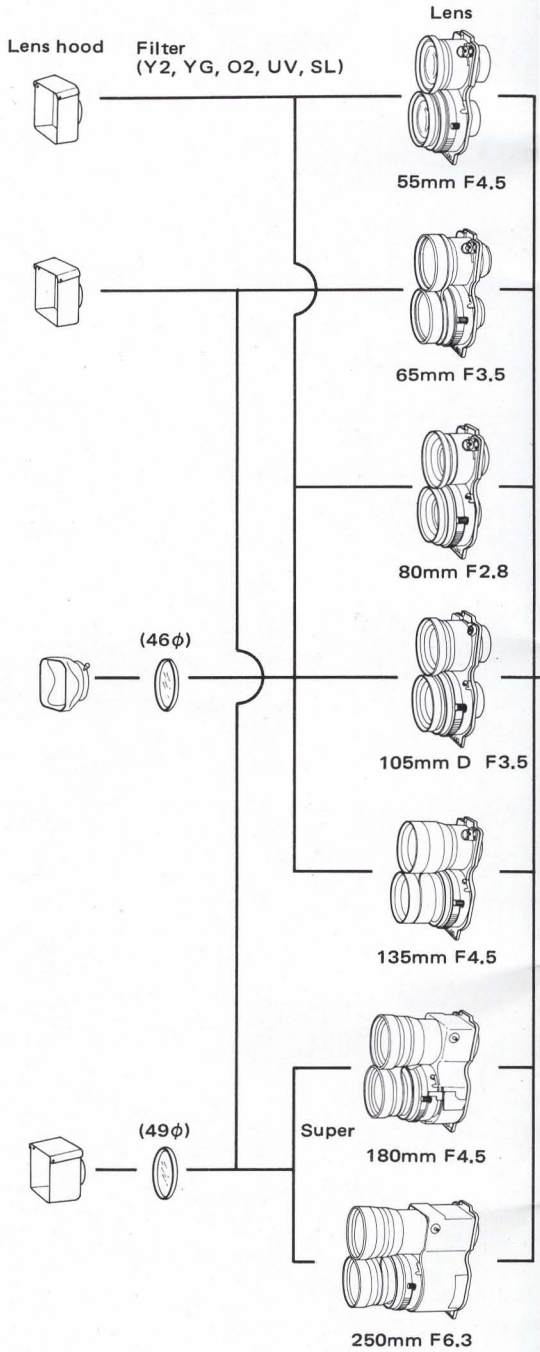
• Specifications of Mamiya C330 and C220

Mamiya C330

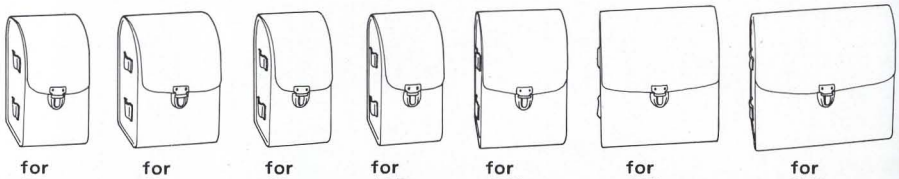
Films:	120 roll film (12 exposures, 6X6) 220 roll film (24 exposures, 6X6) Changeover by 90° turn of the pressure plate.
Lens (standard):	Mamiya-Sekor 80 mm F2.8 (5 elements in 3 groups, 50° 40')
Shutter:	Seikosha-S #0 (B, 1 ~ 1/500 sec, MX synchronization) Shutter is automatically cocked when film is advanced. Two shutter release buttons—one on side of body and another on front of body.
Focusing:	Front extension system by rack-and-pinion with dual focusing knobs. Automatic parallax compensation.
Viewfinder Hood:	Removable and replaceable by other types of finders. Interchangeable focusing screen.
Film Wind:	By winding crank, self-cocking type. Double exposure prevention device. (override possible)
Exposure Counter:	Automatic re-set.
Other Features:	Single exposure possible with interchangeable back cover. Revolving hexagonal type distance scale.
Dimensions:	122 (w) X 168 (h) X 114 (d) mm
Weight:	1,700 grams (with 80 mm lens)

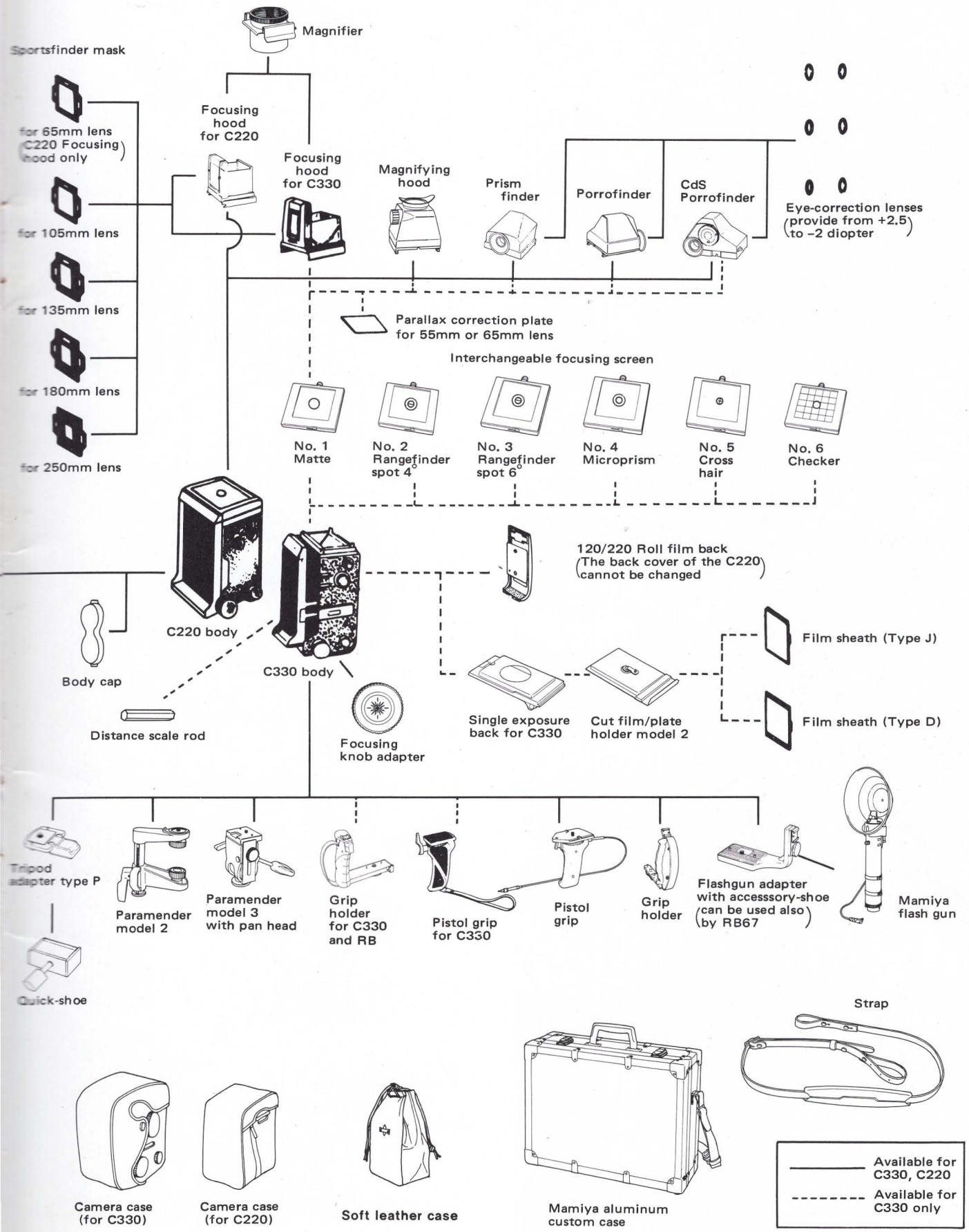
Mamiya C220

Films:	120/220 roll film (12/24 exposures, 6X6)
Lens (standard):	Mamiya-Sekor 80 mm F2.8
Shutter:	Seikosha-S #0
Focusing:	Front extension system by rack-and-pinion with dual focusing knobs.
Viewfinder Hood:	Removable and replaceable.
Film Wind:	By ratchet knob. Double exposure prevention device. (override possible)
Exposure Counter:	Automatic re-set.
Other Features:	Parallax and exposure compensation scale.
Dimensions:	118 (w) X 167 (h) X 113 (d) mm
Weight:	1,440 grams (with 80 mm lens)



Lens case




Magnifier
Sportsfinder mask
for 65mm lens (C220 Focusing hood only)
for 105mm lens
for 135mm lens
for 180mm lens
for 250mm lens
Focusing hood for C220
Focusing hood for C330
Magnifying hood
Prism finder
Porrofinder
CdS Porrofinder
Eye-correction lenses (provide from +2.5 to -2 diopter)
Parallax correction plate for 55mm or 65mm lens
Interchangeable focusing screen
No. 1 Matte
No. 2 Rangefinder spot 4°
No. 3 Rangefinder spot 6°
No. 4 Microprism
No. 5 Cross hair
No. 6 Checker
120/220 Roll film back (The back cover of the C220 cannot be changed
C220 body
C330 body
Body cap
Distance scale rod
Focusing knob adapter
Single exposure back for C330
Cut film/plate holder model 2
Film sheath (Type J)
Film sheath (Type D)
Tripod adapter type P
Quick-shoe
Paramender model 2
Paramender model 3 with pan head
Grip holder for C330 and RB
Pistol grip for C330
Pistol grip
Grip holder
Flashgun adapter with accesssory-shoe (can be used also by RB67
Mamiya flash gun
Strap
Camera case (for C330)
Camera case (for C220)
Soft leather case
Mamiya aluminum custom case
Available for C330, C220
Available for C330 only

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Mamiya
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SHIN MEIKEI Bldg. 3-1, OTSUKA 3-CHOME BUNKYO-KU, TOKYO, JAPAN

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