

70mm-210mm f3.5 Macro Focusing Auto Zoom Lens

Vivitar Series



Vivitar.

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OWNER'S MANUAL

Vivitar Series 1

Your new Vivitar Series 1 Macro Focusing Zoom Lens is part of an entirely new lens system, unique in concept and created to meet the challenge of tomorrow's photographer today. Its versatility is unlimited. As a telephoto lens its remarkable "one-touch" zoom and focus control lets you choose any focal length between 70mm and 210mm for exact framing at the moment of exposure. A simple turn of the wrist and your Series 1 Zoom becomes a Macro lens allowing you to explore the exciting world of close-up photography. To you, the photographer, this means total creative expression in nearly every photographic situation without ever removing the lens from your camera. And the Vivitar name is your assurance of superb computer-designed optics and the utmost in optical and mechanical reliability.



Getting Acquainted with Your Lens

- ① Filter Thread
- ② Zoom Focus Ring
- ③ Macro Focus Reference Mark
- ④ Distance Scales
- ⑤ Distance Index Line
- ⑥ Focal Length Scale
- ⑦ Infrared Index Line
- ⑧ Macro Index Line
- ⑨ Zoom/Macro Selector Switch
- ⑩ Selector Switch Lock Button
- ⑪ Aperture Ring
- ⑫ Aperture Index Point
- ⑬ Aperture Scale
- ⑭ Lens Mount
- ⑮ Auto/Manual Switch*



* Universal Thread Mount Lenses only.

Mounting Your Lens

Your Vivitar Macro Focusing Zoom has been designed to mount on your camera with the simplicity and ease of your normal lens. However, because it is longer than your normal lens, special care should be taken when aligning it to the camera.

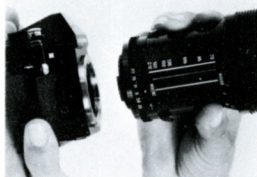
For best results, slide the Zoom Focus Ring (2) to the 70mm position on the Focal Length Scale (6) and grasp the lens firmly around the lens barrel as shown. This will enable you to achieve better balance during the mounting procedure.

Holding Your Lens

When using your lens it is best to support the camera/lens combination by placing your left hand underneath the lens as shown. This leaves your other hand free to operate the controls of your camera and assures proper balance and stability.

Aperture Control

The automatic diaphragm operation of your lens allows you to focus and compose your picture with the diaphragm at



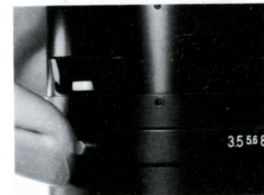
maximum aperture or "wide open." When shooting, the diaphragm will automatically stop down to the preselected aperture at the moment of exposure and immediately re-open as the exposure is completed.

EE Coupled Lenses

Some cameras (such as the Konica Autoreflex series) automatically determine the correct aperture for a given photographic situation when a specific shutter speed is selected. For a lens to operate automatically with these cameras it must be coupled to the camera's EE mechanism.

Vivitar Series 1 lenses designed with EE coupling mechanisms differ from other lenses as follows:

1. Aperture Scale — Since cameras with EE mechanisms work automatically to $f/16$ only, the aperture range of the EE coupled Vivitar Series 1 Lens goes to $f/16$ only.
2. EE Lock Button — To ensure that the lens is not accidentally removed from EE operation, the Aperture Ring locks with a positive click when placed in the "EE" position. When you wish to set aperture manually, press the EE Lock Button to move the Aperture Ring from the "EE" position.



Zoom Operation

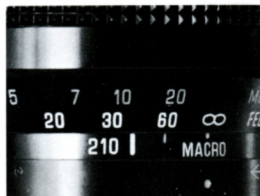
To set your lens for Zoom operation:

1. Slide the Zoom Focus Ring (2) towards the Lens Mount (14) until it stops at the 210mm position on the Focal Length Scale (6).
2. Press the Selector Switch Lock Button (10) and turn the Zoom/Macro Selector Switch (9) clockwise until the Distance Index Line (5) is opposite the Aperture Index Point (12).

CAUTION: Always make sure the Zoom Focus Ring is at the 210mm position before changing from Macro to Zoom operation. Do not force — lens will shift modes easily when set in the proper position.

Focusing and Zoom Control

Your Vivitar Macro Focusing Zoom Lens provides a "one-touch" focus and zoom system that lets you focus and compose your picture quickly and easily. Focusing and zooming are both controlled by the Zoom Focus Ring as follows:



1. To focus, turn the Zoom Focus Ring until your subject appears sharpest in the camera viewfinder.
2. To zoom from one focal length to another, slide the Zoom Focus Ring along the lens barrel to the desired position. The Focal Length Scale (6) is conveniently marked with the major focal lengths for easy reference.
3. Since zooming may cause you to turn the Zoom Focus Ring slightly, it's always a good idea to re-focus at the focal length you will be using.

Distance Scales

Your lens has two Distance Scales (4) which give you the distance from the subject in focus to the film plane. The white numbers denote this distance in feet while those in green represent distance in meters.

Distance Index Line

The Distance Index Line (5) is the reference point for the correct focus position of your lens. Reading the number of feet or meters indicated on the Distance Scales opposite this line allows you to estimate the distance from the subject in focus to the film plane.



Infrared Index Line

Your lens has an Infrared Index Line (7) engraved in red on your lens barrel for use with infrared film. When using infrared film, focus normally on your subject, select the zoom position you prefer, and read the distance on the Distance Scales as indicated opposite the Distance Index Line.

Without changing the zoom position, turn the Zoom Focus Ring (2) to the right until the distance reading is opposite the Infrared Index Line. Your lens will then be focused for average infrared photography. NOTE: Infrared radiation is variable by nature and therefore the Infrared Index Line should be used as an approximation only.



Depth of Field

Depth of field is the area in acceptable sharpness in front of and behind the subject in focus. This depth is determined by the aperture you have selected and the distance from the subject in focus to the film plane. As you get closer to your subject, or as you open your lens (e.g. from f22 to f3.5), the depth of field becomes shallower. By stopping your lens down (e.g. f3.5 to f22) or getting farther away from your subject, this depth of field or zone of acceptable sharpness can be increased.

Another factor in determining depth of field is the focal length at which you are shooting. As a rule, the longer the focal length of a lens the shallower the zone of acceptable sharpness becomes. Therefore, as you change the focal length of your Vivitar Macro Focusing Zoom from 70mm to 210mm, the depth of field becomes shallower. You can compensate for this by stopping your lens down. However, a shallow depth of field can add creative impact to your pictures by providing you with pleasing out-of-focus foregrounds or backgrounds. As illustrated on the next page, a soft, out-of-focus background provides "separation" and makes your subject stand out.



f3.5



f22



Depth of Field Preview

You can see the depth of field in your camera's viewfinder by using the Auto/Manual Switch (15) built directly into the Lens Mount — on Universal Thread Mount lenses only. To preview depth of field, set the Switch to the "M" (manual) position. This will stop the lens diaphragm down to the preselected aperture.

To return the lens to automatic diaphragm operation, set the Switch to the "A" (automatic) position.

Depth of Field Tables

If you need more precise depth of field information than can be obtained by looking through your camera's viewfinder, the tables on pages 14 and 15 will be helpful.



70mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	6.7-7.2	6.6-7.4	6.5-7.5	6.3-7.7	6.1-8.2	5.8-8.7
8	7.7-8.3	7.5-8.5	7.3-8.7	7.1-9.0	6.8-9.6	6.5-10.5
9	8.6-9.4	8.4-9.6	8.2-10.0	7.9-10.4	7.5-11.2	7.1-12.4
10	9.5-10.5	9.3-10.8	9.0-11.2	8.6-11.8	8.2-12.9	7.6-14.6
12	11.3-12.7	10.9-13.3	10.5-13.9	10.0-14.9	9.4-16.7	8.7-19.8
15	13.8-16.3	13.3-17.2	12.7-18.4	12.0-20.0	11.0-23.8	10.0-30.8
20	18.0-22.5	17.0-24.3	15.9-26.8	14.8-30.8	13.3-41.1	11.8-69.1
30	25.5-36.2	23.5-41.4	21.5-49.7	19.5-66.2	16.8-151	14.5-∞
60	44.1-93.4	38.2-141	33.1-339	28.3-∞	23.0-∞	18.7-∞
∞	163-∞	102-∞	71.4-∞	52.1-∞	36.0-∞	26.3-∞

85mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	6.8-7.1	6.7-7.2	6.6-7.3	6.5-7.5	6.3-7.8	6.1-8.1
8	7.8-8.2	7.6-8.3	7.5-8.5	7.4-8.7	7.1-9.1	6.8-9.6
9	8.7-9.2	8.5-9.4	8.4-9.6	8.2-9.9	7.8-10.4	7.5-11.2
10	9.6-10.3	9.5-10.6	9.2-10.8	9.0-11.2	8.6-11.9	8.2-12.8
12	11.5-12.5	11.2-12.9	10.9-13.3	10.5-13.9	10.0-15.0	9.4-16.6
15	14.2-15.9	13.7-16.5	13.2-17.2	12.7-18.3	11.9-20.3	11.0-23.5
20	18.5-21.7	17.7-22.8	16.9-24.4	16.0-26.6	14.7-31.5	13.4-40.3
30	26.7-34.2	25.0-37.3	23.4-41.8	21.6-49.1	19.2-69.5	17.0-140
60	47.7-80.3	42.5-101	37.9-144	33.3-310	27.8-∞	23.2-∞
∞	227-∞	142-∞	99.8-∞	72.7-∞	50.2-∞	36.6-∞

105mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	6.9-7.1	6.8-7.2	6.8-7.2	6.7-7.3	6.6-7.5	6.4-7.7
8	7.9-8.1	7.8-8.2	7.7-8.3	7.6-8.5	7.4-8.7	7.2-9.0
9	8.8-9.2	8.7-9.3	8.6-9.4	8.5-9.6	8.2-9.9	8.0-10.3
10	9.7-10.2	9.6-10.3	9.4-10.5	9.3-10.8	9.0-11.2	8.7-11.7
12	11.6-12.3	11.4-12.5	11.2-12.8	11.0-13.2	10.6-13.8	10.1-14.7
15	14.4-15.5	14.1-15.9	13.8-16.4	13.4-17.0	12.8-18.1	12.1-19.7
20	19.0-21.1	18.4-21.8	17.8-22.7	17.1-23.9	16.1-26.3	15.1-29.9
30	27.7-32.6	26.5-34.4	25.3-36.8	23.9-40.3	21.9-47.9	19.9-62.1
60	51.2-71.9	47.1-81.9	43.2-97.4	39.2-128	33.9-267	29.3-∞
∞	344-∞	215-∞	151-∞	110-∞	75.7-∞	55.3-∞

135mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	6.9-7.1	6.9-7.1	6.9-7.1	6.8-7.2	6.7-7.3	6.6-7.4
8	7.9-8.1	7.9-8.1	7.8-8.2	7.7-8.3	7.6-8.4	7.5-8.6
9	8.9-9.1	8.8-9.2	8.8-9.3	8.7-9.4	8.5-9.5	8.4-9.8
10	9.9-10.1	9.8-10.2	9.7-10.3	9.6-10.5	9.4-10.7	9.2-11.0
12	11.7-12.2	11.6-12.3	11.5-12.5	11.3-12.7	11.1-13.0	10.8-13.5
15	14.6-15.3	14.4-15.5	14.2-15.8	14.0-16.1	13.5-16.7	13.1-17.5
20	19.3-20.6	19.0-21.0	18.6-21.5	18.2-22.2	17.4-23.3	16.7-24.9
30	28.6-31.5	27.8-32.5	26.9-33.7	26.0-35.4	24.5-38.7	22.9-43.5
60	54.4-66.7	51.5-71.6	48.6-78.1	45.4-88.2	41.0-113	36.7-169
∞	570-∞	357-∞	250-∞	182-∞	125-∞	91.4-∞

150mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	7.0-7.1	6.9-7.1	6.9-7.1	6.9-7.1	6.8-7.2	6.7-7.3
8	7.9-8.1	7.9-8.1	7.9-8.1	7.8-8.2	7.7-8.3	7.6-8.4
9	8.9-9.1	8.9-9.1	8.8-9.2	8.7-9.3	8.6-9.4	8.5-9.6
10	9.9-10.1	9.9-10.2	9.8-10.3	9.7-10.3	9.5-10.6	9.3-10.8
12	11.8-12.1	11.7-12.2	11.6-12.4	11.4-12.5	11.2-12.8	11.0-13.1
15	14.7-15.2	14.5-15.4	14.4-15.6	14.1-15.9	13.8-16.3	13.4-16.9
20	19.5-20.5	19.2-20.8	18.9-21.2	18.5-21.7	17.9-22.6	17.3-23.8
30	28.8-31.2	28.2-32.0	27.5-32.9	26.6-34.2	25.4-36.6	24.0-40.0
60	55.4-65.3	53.0-69.0	50.5-73.8	47.6-80.9	43.6-96.3	39.6-125
∞	706-∞	441-∞	309-∞	225-∞	155-∞	113-∞

180mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	7.0-7.0	6.9-7.1	6.9-7.1	6.9-7.1	6.9-7.2	6.8-7.2
8	8.0-8.1	7.9-8.1	7.9-8.1	7.9-8.2	7.8-8.2	7.7-8.3
9	8.9-9.1	8.9-9.1	8.9-9.1	8.8-9.2	8.7-9.3	8.6-9.4
10	9.9-10.1	9.9-10.1	9.8-10.2	9.8-10.3	9.7-10.4	9.5-10.5
12	11.9-12.1	11.8-12.2	11.7-12.3	11.6-12.4	11.5-12.6	11.3-12.8
15	14.8-15.2	14.7-15.3	14.6-15.5	14.4-15.6	14.2-15.9	13.9-16.3
20	19.6-20.3	19.4-20.6	19.2-20.8	18.9-21.2	18.5-21.8	18.0-22.5
30	29.1-30.8	28.7-31.3	28.2-32.0	27.6-32.8	26.6-34.3	25.5-36.3
60	56.7-63.6	54.9-66.0	53.0-69.0	50.8-73.2	47.5-81.5	44.1-94.3
∞	1008-∞	630-∞	442-∞	322-∞	221-∞	161-∞

210mm

Feet	f3.5	f5.6	f8	f11	f16	f22
7	7.0-7.0	7.0-7.0	6.9-7.1	6.9-7.1	6.9-7.1	6.8-7.2
8	8.0-8.0	7.9-8.1	7.9-8.1	7.9-8.1	7.8-8.2	7.8-8.2
9	9.0-9.5	8.9-9.1	8.9-9.1	8.9-9.2	8.8-9.2	8.7-9.3
10	9.9-10.1	9.9-10.1	9.9-10.1	9.8-10.2	9.7-10.3	9.6-10.4
12	11.9-12.1	11.9-12.2	11.8-12.2	11.7-12.3	11.6-12.4	11.5-12.6
15	14.9-15.2	14.8-15.2	14.7-15.4	14.5-15.5	14.3-15.7	14.1-16.0
20	19.7-20.3	19.6-20.5	19.4-20.7	19.2-20.9	18.8-21.4	18.4-21.9
30	29.3-30.6	28.9-31.0	28.5-31.5	28.0-32.2	27.3-33.3	26.4-34.7
60	57.4-62.8	55.9-64.6	54.3-66.8	52.5-69.8	49.7-75.5	46.8-83.8
∞	1288-∞	806-∞	565-∞	411-∞	283-∞	206-∞

Macro Operation

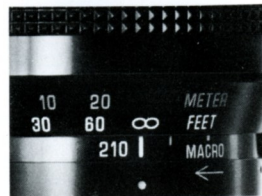
To set your lens for Macro operation:

1. Slide the Zoom Focus Ring (2) towards the Lens Mount (14) until it stops at the 210mm position on the Focal Length Scale (6).
2. Press the Selector Switch Lock Button (10) and turn the Zoom/Macro Selector Switch (9) counter-clockwise until the Macro Index Line (8) is opposite the Aperture Index Point (12).

CAUTION: Always make sure the Zoom Focus Ring is at the 210mm position before changing from Zoom to Macro operation. Do not force — lens will shift modes easily when set in the proper position.

Magnification

The remarkable Macro feature of your Vivitar Series 1 Macro Focusing Zoom lets you take pictures at magnifications up to approximately one-half times life size — without the need for lens extension devices or other supplementary close-up equipment.



The concept behind this unique macro focusing feature is quite basic. Magnification is defined as the ratio of the distance from the optical center of a lens to the film (lens-to-film distance) over the distance from the optical center of a lens to the subject (lens-to-subject distance). As the lens-to-film distance increases, magnification increases and you are able to focus closer to your subject.

In Macro operation, your Vivitar Series 1 Lens incorporates moving elements that change the position of the optical center of the lens. As you slide the Zoom Focus Ring away from the camera body, the lens-to-film distance increases allowing you to achieve a higher magnification. As you slide it towards the camera body, the lens-to-film distance is reduced and magnification decreases.

Macro Focusing

For optimum results in Macro operation, turn the Zoom Focus Ring (2) to the right until the Macro Focus Reference Mark (3) is opposite the Macro Index Line (8). Keep the Zoom Focus Ring in this position as you slide it along the lens barrel to change magnification and/or focus.

$$\text{Magnification} = \frac{\text{lens-to-film distance}}{\text{lens-to-subject distance}}$$



low magnification



higher magnification

● optical center

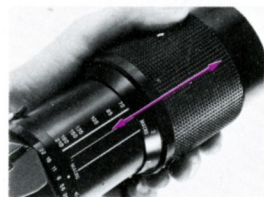


If your picture does not require a fixed magnification, slide the Zoom Focus Ring along the Macro Index Line until the subject appears sharpest in your camera's viewfinder. If you wish a larger image size, move the entire camera/lens combination closer to your subject and adjust the Zoom Focus Ring accordingly.

If your picture requires a fixed magnification, set the Zoom Focus Ring to the desired position and focus by moving the entire camera/lens combination back and forth until the subject appears sharpest in your camera viewfinder. The following table provides magnification information at the various positions along the lens barrel and is indexed in terms of the Focal Length Scale (6) for easy reference.

MAGNIFICATION SCALE

Lens set at Macro Mode	Field Size Diagonal	Object Distance from Front Element	Magnification
70mm	95mm	77.5mm	1:2.2
85mm	150mm	210mm	1:3.5
105mm	280mm	620mm	1:6.5
135mm	470mm	1560mm	1:11

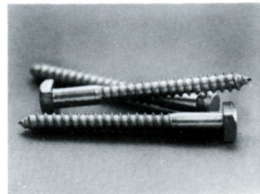


Depth of Field in Macrophotography

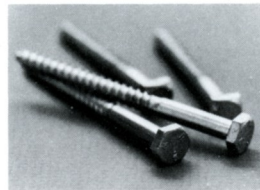
In close-up photography, depth of field is directly related to magnification and aperture.

As magnification increases, depth of field decreases drastically. In most cases you are working with a zone of acceptable sharpness that measures in inches and fractions of inches, particularly at higher magnification. Since depth of field increases as the aperture becomes smaller (e.g., from f3.5 to f22), you can compensate for this shallow depth of field by stopping your lens down as far as lighting conditions will allow.

If inadequate lighting conditions prevent you from stopping your lens down for satisfactory depth of field, add supplementary artificial lighting or adjust your shutter speed until the proper exposure can be obtained. If this is not possible, make sure you focus carefully on your subject and position it in a way that great depth of field is not critical to a good photograph. For example, if you place an elongated subject on a plane parallel to the film plane, the need for great depth of field is virtually eliminated.



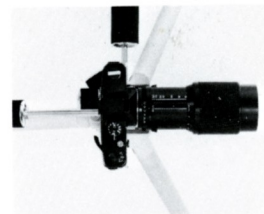
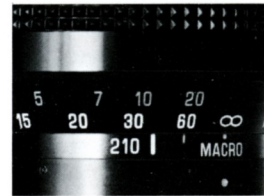
Great depth of field not required for sharp picture.



Requires great depth of field in order for entire subject to be in focus.

Helpful Hints

1. Always make sure the Zoom Focus Ring ② is at the 210mm position on the Focal Length Scale when changing from Zoom to Macro operation, or from Macro to Zoom operation. This will prevent any possibility of damage to your lens.
2. Because exposure in close-up photography is critical to getting the best possible picture, it's a good idea to shoot several pictures of the same subject varying the exposure slightly. This method, called "bracketing," involves shooting the pictures at the f/stop indicated by your TTL meter, underexposing by $\frac{1}{2}$ to 1 f/stop and overexposing by $\frac{1}{2}$ to 1 f/stop. The results will be well worth the few pennies it may add to your film cost.
3. In Macro operation, always try to use a tripod or other stable platform when shooting at higher magnifications to assure that slight movements do not degrade the picture quality. If for some reason a stable platform cannot be used, take the picture at the fastest possible shutter speed lighting conditions will allow.
4. In Macro operation, it's always a good idea to use a cable release to trigger the shutter of your camera. Even



the slight movement caused by your hand depressing the shutter release can affect the quality of pictures taken at high magnification. If your camera has a self-timer, you can use it to prevent this movement if a cable release is not available.

Taking Care of Your Lens

1. When attaching threaded accessories (filters, etc.) to your lens, align the accessory very carefully with the Filter Thread ① to prevent any possibility of damage.
2. Keep your lens dust-free by making sure both front and rear lens caps are in place when it is not in use.
3. Clean your lens with an air brush, anti-static brush, or wipe it lightly with a camel hair brush or lens tissue. In EXTREME cases use a clean, soft cotton cloth moistened with denatured alcohol.

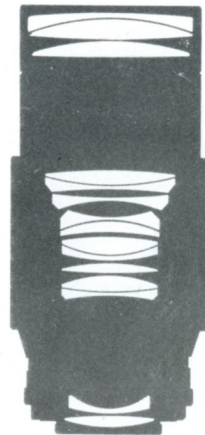
NEVER RUB THE LENS SURFACE WITH YOUR FINGER, CLOTHING OR ANY OTHER ABRASIVE MATERIAL. Cleaning your lens in this way will scratch the lens coating and can cause damage to the element surface.

4. Always store your lens in a cool, dry place. It's a good idea to store it with the silica gel packet supplied with your lens especially during humid or wet weather.



Specifications

Focal length	70mm to 210mm
Minimum Focal Length of Macro	54mm
Zoom Ratio	3:1
Angle of Acceptance	34° at 70mm; 12° at 210mm
Optical Construction	15 elements in 10 groups
Aperture Range	f3.5 to f22 (EE coupled lenses to f16 only)
Minimum Focusing Distance From Film Plane In Zoom	6 ft. 6½ in (2 Meters)
Minimum Focusing Distance From Front Element in Macro	3 in. (80mm)
Maximum Magnification In Macro	1:2.2
Length at ∞	6-1/8" (157.5mm)
Maximum Barrel Diameter	3-1/16" (77.8mm)
Weight	31 oz. (879 gr.)
Accessory Size	67mm
Accessories included	Front and rear lens caps, silica gel packet



Specifications subject to change without notice. Lengths and weights may vary slightly depending on lens mount.

Before you use your lens –

When changing from Macro operation to Zoom operation or from Zoom operation to Macro operation, the Zoom Focus Ring of your lens MUST BE SET TO THE 210mm POSITION.



70mm

INCORRECT



210mm

CORRECT

For best results, please read this Owner's Manual carefully!

NEED A LENS HOOD?

WE SUGGEST

Vivitar[®]

A lens hood can be a welcome addition to your equipment. It provides protection against extraneous light striking the lens and causing unwanted glare. This added protection is important in a sophisticated lens such as your *Vivitar Series 1 Zoom* because the increased number of lens surfaces make it more susceptible to flare . . . particularly in sidelit situations.

The *Vivitar 67mm Collapsible Lens Hood* is ideal for your new *Vivitar Series 1 Zoom*. Small baffling surfaces absorb the angular light and the soft rubber construction protects your lens from accidental blows that can damage the element surface.

Ask your *Vivitar Series 1* dealer about the *Vivitar 67mm Series 1 Slip-on Collapsible Lens Hood*. Stock No. 31-9740

NEED A LENS CASE?

WE SUGGEST

Vivitar®

UNIVERSAL LENS CASE/SIZE D

A sophisticated piece of optical equipment like your new *Vivitar* Series 1 Zoom lens deserves the protection a good lens case provides. The *Vivitar* Size D Universal lens case is fully padded to give positive protection against accidental bumps and scrapes and provides a safe and handy place to store your lens. For proper fit insert the lens into the case with the lens mount up, as shown in the illustration.

Ask your *Vivitar* Series 1 dealer about the *Vivitar* Size D Universal lens case.

Stock No. 68-6169

