200mm f3.0 Automatic Telephoto Lens

Vivitar Series 1

OWNER'S MANUAL

Your new Vivitar Series 1 telephoto lens has the unusual feature of being able to focus much closer than comparable telephoto lenses—without sacrificing image quality that would normally deteriorate using traditional optical designs.

A special compensating lens in the rear of the lens optimizes image quality at all focusing points whether at infinity, portrait distance, or just a few feet away.

Take advantage of this unique capability and discover the new perspectives that are now available to you because of the novel optical design of your new Vivitar Series 1 lens.

Getting Acquainted With Your Lens

1. Filter Thread
2. Retractable Lens Hood
3. Focusing Ring
4. Distance Scale Window
5. Distance Scales
6. Distance Index Mark
7. Depth of Field Scale
8. Aperture Reference Dot
9. Aperture Window
10. Aperture Scale
11. Auto/Manual Switch*
12. Infrared Index Mark

*Universal Thread Mount Lenses only

Mounting Your Lens

Your Vivitar Series 1 telephoto 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. Holding the lens firmly around the lens barrel 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.

Focusing

Your lens has been designed to provide you with the utmost in fast and easy focusing. To focus, simply turn the Focusing Ring (3) until the subject appears sharpest in the viewfinder.

Distance Scales

Your lens has two Distance Scales (5) 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.

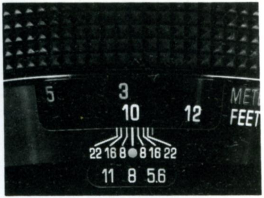
A Distance Scale Window (4) has been incorporated into the lens barrel to enable you to identify the correct focus position quickly and easily by showing only that portion of the Distance Scales being used at the time.

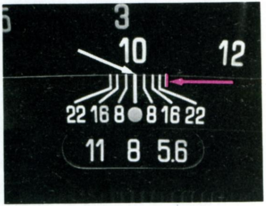
Distance Index Mark

The Distance Index Mark (6) 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 mark allows you to estimate the distance from the subject in focus to the film plane.

Infrared Index Mark

Your lens has an Infrared Index Mark (12) for use with infrared film. This mark is engraved in red at the right of the Distance Index Mark on the Depth of Field Scale (7). When using infrared film, focus normally on your subject and read the distance on the Distance Scales as indicated opposite the Distance Index Mark.





Then, turn the Focusing Ring ③ until the distance reading is opposite the Infrared Index Mark. Your lens will then be focused for average infrared photography. NOTE: Infrared radiation is variable by nature and therefore the Infrared Index Mark should be used as an approximation only.

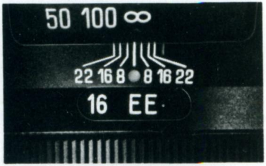
Aperture Control

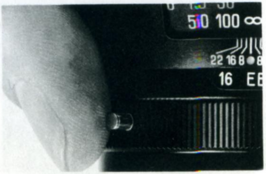
The automatic diaphragm operation of your lens allows you to focus and compose your picture with the diaphragm at maximum aperture or "wide open." When shooting, the diaphragm will automatically stop down to the pre-selected aperture at the moment of exposure and immediately re-open as the exposure is completed.

EE Coupled Lenses

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 EE coupled Vivitar Series 1 lenses 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" posi-





tion. When you wish to set aperture manually, press the EE Lock Button to move the Aperture Ring from the "EE" position.

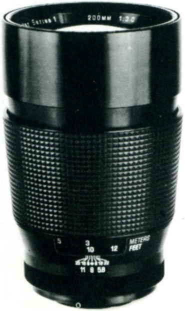
Depth of Field

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 f3.0) the depth of field becomes shallower. By stopping your lens down (e.g., from f3.0 to f22) or getting farther away from your subject, this depth of field or zone of acceptable sharpness can be increased.

f3.0

f22

Another factor in determining depth of field is the focal length of your lens. Because of its longer focal length, the depth of field of your Series 1 telephoto lens is shallow even when the lens is fully stopped down. Therefore, you should always take the time to focus properly. Creatively, the shallow depth of field can be used to add impact to your pictures by providing you with pleasing, out-of-focus foregrounds or backgrounds. As shown, in portraiture a soft, out-of-focus background provides "separation" and makes your subject stand out.



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Depth of Field Scale

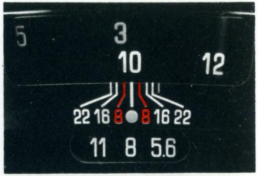
Your lens has a double series of numbers representing f/stops engraved on the Depth of Field Scale ⑦. Once you have focused on your subject, all objects within the distance range indicated between the marks for the aperture you have selected will be in the zone of acceptable sharpness.

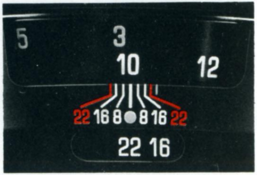
EXAMPLES: At f8 and the subject at 10 feet, your depth of field is from 9′ 10″ to 10′ 2″. At f22 and the subject at 10 feet, your depth of field is from 9′ 6⅝″ to 10′ 5⅞″.

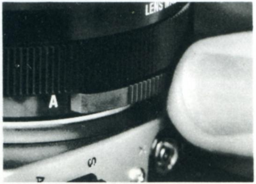
Depth of Field Preview

You can see the depth of field in your camera's viewfinder by using the Depth of Field Preview Control which is located on the camera body, or in the case of Vivitar Series 1 Universal Thread Mount Lenses, on the lens itself. To preview depth of field, set the Auto/Manual Switch ⑪ to the "M" (manual) position. This will stop the lens diaphragm down to the pre-selected aperture.

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







Depth of Field Table

If you need more precise depth of field information than can be obtained by looking through your camera's view-finder, the following table will be helpful.

Feet	f3	f4	f5.6	f8	f11	f16	f22
4	3'11⅞"– 4' 0"	3'11⅞"– 4' 0"	3'11⅞"– 4' 0⅛"	3'11⅞"– 4' 0¼"	3'11¾"– 4'0¼"	3'11⅝"– 4' 0⅜"	3'11½"– 4'0½"
4.5	4' 5⅞"– 4' 6⅛"	4' 5⅞"– 4' 6⅛"	4' 5¾"– 4' 6⅛"	4' 5¾"– 4' 6¼"	4' 5⅝"– 4'6⅜"	4' 5½"– 4' 6½"	4' 5¼"– 4'6¾"
5	4'11⅞"– 5' 0⅛"	4'11¾"– 5' 0¼"	4'11¾"– 5' 0¼"	4'11⅝"– 5' 0⅜"	4'11½"– 5'0½"	4'11¼"– 5' 0¾"	4'11" – 5'1"
5.5	5' 5⅞"– 5' 6¼"	5' 5¾"– 5' 6¼"	5' 5⅝"– 5' 6⅜"	5' 5½"– 5' 6½"	5' 5⅜"– 5'6⅝"	5' 5⅛"– 5' 7"	5' 4¾"– 5'7⅜"
6	5'11¾"– 6' 0¼"	5'11¾"– 6' 0¼"	5'11⅝"– 6' 0⅜"	5'11⅜"– 6' 0⅝"	5'11¼"– 6'0⅞"	5'10⅞"– 6' 1¼"	5'10⅜"– 6'1¾"
7	6'11⅝"– 7' 0⅜"	6'11⅝"– 7' 0½"	6'11⅜"– 7' 0⅝"	6'11⅛"– 7' 0⅞"	6'10¾"– 7'1¼"	6'10⅜"– 7' 1¾"	6' 9⅝"– 7'2½"
8	7'11½"– 8' 0½"	7'11⅜"– 8' 0⅝"	7'11⅛"– 8' 0⅞"	7'10¾"– 8' 1¼"	7'10⅜"– 8'1¾"	7' 9⅝"– 8' 2½"	7' 8¾"– 8'3½"
10	9'11¼"– 10' 0¾"	9'11" – 10' 1"	9'10⅝"– 10' 1⅜"	9'10" – 10' 2"	9' 9¼"– 10'2⅞"	9' 8⅛"– 10' 4⅛"	9' 6⅝"– 10'5⅞"
12	11'10⅞"– 12' 1⅛"	11'10½"– 12' 1½"	11' 9⅞"– 12' 2¼"	11' 9" – 12' 3⅛"	11' 7⅞"– 12'4⅜"	11' 6¼"– 12' 6⅜"	11' 4" – 12'9⅛"
15	14'10⅛"– 15' 1⅞"	14' 9½"– 15' 2½"	14' 8½"– 15' 3½"	14' 7⅛"– 15' 5⅛"	14' 5¼"– 15'7¼"	14' 2⅝"– 15'10⅝"	13'11⅛"– 16'3¼"
20	19' 8½"– 20' 3½"	19' 7⅜"– 20' 4¾"	19' 5⅝"– 20' 6¾"	19' 3⅛"– 20' 9⅝"	18'11¾"– 21'1¾"	18' 6⅞"– 21' 8⅛"	18' 0¼"– 22'5¼"
30	29' 4" – 30' 8⅜"	29' 1⅜"– 30'11¼"	28' 9⅜"– 31' 4"	28' 3½"– 31'11⅛"	27' 8" – 32'9⅜"	26' 9⅜"– 34' 1¾"	25' 8¼"– 36'1¾"
50	47'11¾"– 51'10¾"	47' 4¾"– 52' 7⅛"	46' 5¾"– 53' 9⅜"	45' 2⅜"– 55' 7½"	43' 6¾"– 58'4¼"	41' 3⅞"– 63' 0"	38' 8½"– 70'5⅞"
100	92' 1⅝"–108' 2¼"	89'11⅜"–111' 4½"	86' 7½"–116'11¾"	82' 2" –126' 3⅞"	76' 9⅝"–141'8⅝"	69'11½"–173' 7"	62' 7⅜"–247'5½"
∞	1213' –∞	913'10¾"–∞	653' 1½"–∞	460' 3" –∞	328' 6¼"–∞	230' 0¼"–∞	164'10⅜"–∞

Using the Lens Hood

Your lens has a built-in Retractable Lens Hood ② which should be used to protect against extraneous light striking the lens and causing unwanted glare. To extend or retract the Lens Hood, use a gentle, twisting motion.

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. For convenience, the threaded accessory size is indicated on the lens name ring preceded by the symbol Ø.

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.

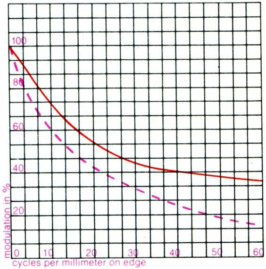
4. Always store your lens in a cool, dry place. It's a good idea to store it with the silica gel packet supplied with your lens especially during humid or wet weather.

Something on Modulation Transfer Function (MTF)

For a long time scientists have been dissatisfied with the conventional method of testing photographic lenses. Measuring lens performance by resolution testing is a serious disadvantage in that the procedure depends on an evaluation by the image detector (whether this is the human eye or a photographic material) and the fact that the image of the bar patterns tends to change in shape as it nears the resolution limit. From the standpoint of lens designers, there is an additional problem since it is very difficult to compare results with those calculated from the lens design data, and it is not easy to predict how the lens will perform with a different object.

Consequently, for many years scientists in the optical fields have been looking for a method of testing lens performance which would not be dependent on subjective interpretation, where the tests would be quantifiably reliable and repeatable, and where the interpretation would not depend on a wide variety of parameters.

The solution was found in electronic measurements called Modulation Transfer Function (MTF). After years of experi-



mentation and refinement, scientists now agree that this method is more accurate and more reliable than conventional resolution testing.

The MTF curves measure the ratio of contrast in the image plane to that in the object plane. It is actually contrast between light and dark that creates the appearance of "sharpness" in a photograph. This explains an old phenomenon where photographers used a lens that, according to resolution tests, was not supposed to be "sharp" but in actual practice produced very "sharp" pictures.

Of course, the MTF curve could be described more scientifically as illustrating the effect of diffraction by the lens aperture and the effects of lens aberrations on the image of a sinusoidal distribution of light intensity as the spatial frequency (cycles per unit length) of the object is varied.

From the standpoint of the designer of photographic lenses, he now can accurately describe in cycles per millimeter what should go into a lens, and objectively measure the lens in production to determine if the lens delivers what it should.

Specifications

Focal length	200mm
Angle of acceptance	12°
Optical construction	6 elements in 6 groups
Aperture range	f3.0 to f22 (EE coupled lenses to f16 only)
Minimum focusing distance from film plane	4 ft. (1.2m)
Length at ∞	4.7 in. (119mm)
Maximum barrel diameter	3⅛ in. (79mm)
Weight	27 oz. (766 gr.)
Accessory size	72mm
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.

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