

# Solid Catadioptric Telephoto Lens

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## Vivitar Series

# 1

600mm f8

Owner's Manual



Leave this page opened for easy reference while you read.

## About your Lens

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The development of Vivitar Series 1 Solid Catadioptric Telephoto Lenses represents a significant achievement in U.S. manufactured premium optics. Working in conjunction with the U.S. optical firm of Perkin-Elmer Corporation, Vivitar has incorporated the finest characteristics of intricate astronomical optics into a line of consumer and industrial lenses priced within reach of the advanced amateur or professional photographer.

With the introduction of Vivitar Series 1 Solid Catadioptric Lenses, Vivitar and Perkin-Elmer have made optical technology previously applied only in space exploration and other highly advanced sciences, available to the general public. The incredibly compact size is achieved using spherically shaped lens elements which are pieced together to form virtually a single solid element. This unique process results in three outstanding benefits for the photographer. First, the lens maintains its precise optical alignment throughout extreme temperature variations allowing you to move from freezing to blistering climates without losing maximum sharpness. Secondly, the amazingly short physical length of the lens reduces the horizontal and vertical travel of the front of the lens in relation to the film plane, thus increasing the sharpness of hand-held shots. Finally, the "solid" glass construction results in an extremely

high resistance to damage by shock, a major problem with conventional mirror optics. This combination of environmental resistance, short physical length, and shock resistance assures you of superb performance under the most demanding conditions.

Perkin-Elmer, a world leader in both global science and astronomical systems, brings invaluable experience to the area of consumer optics. Their involvement in Earth programs includes studies in aerial photography, remote sensing, night vision and pattern recognition as well as earth resource analysis using electro-optic systems. With the accelerating space programs of the 60's and 70's, Perkin-Elmer has become deeply involved with Astronomical Optics. Among the scientific instruments they have provided for space programs are a 32-inch ultraviolet telescope for the Copernicus Orbiting Astronomical Observatory and a 100-inch telescope for the Carnegie Institution of Washington Observatory in Chile. In addition, Perkin-Elmer provided solar observing telescopes for the Skylab project, capsule environment monitors for Apollo Spacecraft, internal cabin television camera zoom lenses for the Apollo-Soyuz Space Mission, and retro-reflectors left on the Moon for a laser ranging experiment.

## Description of Parts

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- |                                      |                                                                                                           |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 1 Detachable Lens Hood               | 7 Lens Mount                                                                                              |
| 2 Distance Index Mark                | 8 Tripod Socket                                                                                           |
| 3 Distance Scale                     | 9 Built-in Dust Filters                                                                                   |
| 4 Focusing Ring                      | 10 Filters: Red, Yellow,<br>Neutral Density, UV Haze<br>(The UV Haze Filter comes<br>mounted on the lens) |
| 5 Detachable Tripod<br>Mounting Ring |                                                                                                           |
| 6 Filter Thread                      |                                                                                                           |

## Mounting your Lens

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Your lens adapts to many different types of 35mm SLR cameras by means of heavy duty Vivitar Series 1 “T” mount adapters.

To mount the adapter on your lens, screw the adapter firmly onto the Lens Mount ⑦ at the rear of the lens (see photo “A”). (If you did not purchase one with your lens, see your local Vivitar dealer for the appropriate adapter to use with your camera.)

Due to the weight of the lens relative to your camera, it is recommended that you hold the lens stationary as you rotate the camera onto the lens/adaptor combination (see photo “B”). The adaptor mounts to your camera in the same manner as your normal lens.

For best results, when removing the lens, once again hold the lens stationary as you rotate the camera off the adaptor.

## Holding your Lens

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When shooting with long focal length telephoto lenses, it is always recommended that you mount the lens on a tripod. This is the most convenient way to support the camera and lens, and it stabilizes your equipment for maximum image sharpness.

Due to its compact design, your Vivitar Series 1 Solid Catadioptric lens may be hand-held with good results at shutter speeds as slow as 1/125 second. For best results with hand-held shots, rest the Tripod Socket ⑧ in the palm of your left hand. This leaves your right hand free to operate the controls of your camera and helps ensure proper balance. For maximum stability, brace your elbows against your torso and the camera against your forehead. (See photo “C”)

*NOTE: To prevent any possibility of damage to your camera mount, always support the weight of the lens on a tripod or in your hand. Never hold the camera/lens combination by your camera alone.*

## **Focusing**

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To focus your lens, turn the Focusing Ring ④ until the subject appears sharpest in the camera's viewfinder. If your camera has interchangeable focusing screens, use a screen recommended for use with extreme telephoto lenses. This will make focusing easier and more precise.

### **Distance Scales**

Your lens has two Distance Scales ③ engraved on the lens barrel to show you the approximate distance from the subject in focus to the film plane. The white numbers indicate the distance in feet while those in green represent the distance in meters (see photo "D"). The Distance Scales are especially useful in low light level photography when focusing through the viewfinder is generally more difficult.

## **Distance Index Mark**

The Distance Index Mark ② is the reference point for the correct focus position of your lens. Reading the distance indicated on the Distance Scales opposite this mark lets you estimate the distance from the subject in focus to the film plane. (See photo "E")

### *Note on Focus Over-travel:*

Your lens is designed with a focus over-travel that allows the Focusing Ring ④ to turn past the infinity ( $\infty$ ) setting slightly. This feature allows you to make more exact focusing adjustments under extremely hot or cold environmental conditions.

## **Using Infrared Film**

When shooting with infrared film, focus the lens in the normal manner. Due to the unique properties of your Vivitar Series 1 Catadioptric Lens, no separate infrared index markings are required.



## Exposure Control

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Since the aperture of your Vivitar Series 1 Solid Catadioptric Lens is fixed at f8, the amount of exposure with any given film speed is controlled by either varying your camera's shutter speed or by using filters.

### **A** — *Using cameras with built-in through-the-lens meters*

The meter in your camera will automatically “read” the changes in exposure effected by using filters or by altering the shutter speed. If your meter indicates under-exposure, select a slower shutter speed.

If your meter indicates over-exposure, select a faster shutter speed or use the Neutral Density Close-Tolerance Series 1 Filter to reduce incoming light a full two f-stops. (See page 9 for Filter descriptions)

### **B** — *Using hand-held or other auxiliary exposure meters*

If you are using a hand-held meter or auxiliary meter, set your meter to f11 (the effective f-stop [T-stop] of your lens for metering purposes only).

Read the corresponding shutter speed indicated by your meter and set this speed on your camera.

When using filters that reduce exposure, first determine the proper exposure without the filter, as described in the above paragraph. Then,

refer to the “Filters” section of this manual to find the filter factor for the type of film you are using. To compensate for the filter, decrease your camera’s shutter speed by the factor indicated on the chart.

*EXAMPLE:* Using black & white film, your hand-held meter (set to f11, the effective f-stop of your lens) indicates a shutter speed of 1/250 second. You select the 4X Neutral Density filter because you wish to shoot at a slower shutter speed without affecting the contrast of your negatives. The filter chart indicates a factor of 2 full f-stops with this filter. Therefore you must decrease your camera’s shutter speed to 1/60 second (the equivalent of 2 full f-stops). This allows enough extra light to reach the film and thus compensate for the light reduction caused by the filter.

*NOTE:* If the filter factor indicated on the chart is not a whole number (e.g., the yellow filter has a factor of 2/3 for tungsten film), it is theoretically impossible to set your camera’s shutter speed for the exact exposure (except in the case of cameras with electronic shutters). In such cases it is recommended that you “bracket” your exposure, shooting one frame at the specified shutter speed, one frame at the next slowest shutter speed and another frame at the next fastest shutter speed. This method generally ensures at least one well exposed negative.

## Filters

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Four Vivitar Series 1 Close Tolerance filters are provided with your lens, that may be used (one at a time) for a number of purposes depending on the type of film you are using. The chart in this section explains the applications of each filter and indicates the change in exposure caused by using the filter.

For optimum results, a Vivitar Series 1 Close Tolerance filter should be used with your lens at all times. (Standard 35.5mm filters are not recommended.) For this reason an all-purpose UV Haze filter has been mounted on your lens at the factory.

### *To change filters:*

1. Dismount the camera from your lens.
2. Remove the "T" adapter from the lens.
3. Remove the filter presently mounted on the Filter Thread ⑥ by carefully turning it counter-clockwise (see photo "F"). Avoid touching the glass surfaces of the filter as fingerprints will degrade the quality of your pictures and damage the lens coating.
4. Screw the desired filter into the Filter Thread until it stops. Do not force the filter any farther or you will have difficulty removing it.

5. Mount the “T” adapter back on the lens and attach the lens to your camera.

Filter Type	Color or Description	Filter Factor (in full f-stops)*: Daylight Film	Tungsten Film	Applications
<b>25(A)</b>	Red	3	2 $\frac{1}{3}$	Recommended primarily for use with black & white films. Darkens blue sky to create spectacular contrast with clouds. Simulates moonlight scenes in daytime with slight underexposure. Increases contrast between foliage and flowers. Used in special applications with infrared film. May be used with color films to achieve overall red cast for special effects.
<b>8(K2)</b>	Yellow	1	2 $\frac{2}{3}$	Recommended primarily for use with black & white films. Renders an accurate tonal reproduction of daylight scenes as the eye sees them. Natural rendition of contrast between sky & clouds, flowers & foliage. May be used with color films to achieve overall yellow cast for special effects.
<b>UV Haze</b>	Clear	0	0	Recommended for use with both black & white and color film. Can be used at all times under all conditions. Eliminates ultra-violet light to which film is sensitive. Has no effect on any light visible to the eye.
<b>ND-6</b>	4X Neutral Density	2	2	Recommended for use with both black & white and color films. Uniformly reduces the amount of light without changing color rendition. Allows use of slower shutter speeds with high speed films.

\*Refer to the “Exposure Control” section of this manual for details on using filter factors.

## Detachable Tripod Mounting Ring

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Your lens is equipped with a Detachable Tripod Mounting Ring ⑤ that allows you to mount your lens on a tripod for maximum stability when shooting. Always use this Tripod Mounting Ring rather than your camera's tripod socket when using a tripod, as it provides for maximum balance and convenience.

Attach the camera/lens combination to the tripod through the threaded socket on the Tripod Mounting Ring. After mounting, you can adjust the camera for vertical or horizontal framing by loosening the knurled knob on the Ring until the camera and lens swivel freely. They may be rotated 360° and locked at any position by tightening the knob securely. (See photo "G")

To remove the Tripod Mounting Ring, first dismount the camera from the lens. Then unscrew and remove the knurled knob on the ring, separate the base of the ring slightly and slide the ring off the rear of the lens.

## Detachable Lens Hood

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Your lens is supplied with a Detachable Lens Hood ① which should be used to protect against extraneous Light striking the lens and causing unwanted glare. The hood screws onto the threads at the front of the lens. (See photo "H")

## Built-in Dust Filters

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Your lens is designed with four Built-in Dust Filters ⑨ which prevent dust particles from entering the lens as the focusing ring turns.

## Caring for your Lens

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**A** — Protect your lens from dirt and dust when not being used by keeping it in the case with both the front and rear lens caps on. Always store your lens in a cool, dry place.

**B** — When attaching filters to your lens, align them very carefully with the Filter Thread to prevent damage to the threads. Avoid excessive tightening that may cause difficulty in removing the filter. For maximum picture quality, avoid touching the glass surfaces of your filters, and keep them free of fingerprints and smudges.

**C** — Clean yours lens and filters with an air-brush, anti-static brush, good quality camel-hair brush, or use a lens tissue to gently brush away loose particles. To remove fingerprints or smudges, use a small amount of lens cleaning fluid and gently swab the lens surface with a lens tissue on the end of a cotton swab. Never rub the lens elements with your fingers, clothing or other abrasive material which may scratch the lens coating and damage the glass surface.

**D** — Make sure the front lens cap is on the lens before setting it down to attach filters, the “T” Adapter or a camera, to prevent any possibility of damage.

## Specifications

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*Elements/Groups:* 9/7

*Angle of Acceptance:* 4°

*Aperture Range:* f8 (fixed f-stop)

*Minimum Focusing Distance:* 23' (7 m)

*Length:* 3-5/16" (8.4 cm)

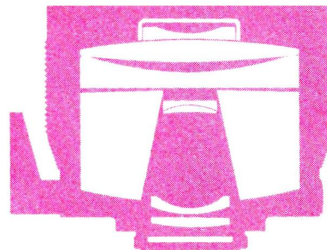
*Weight:* 3 lbs. (1.36 kg)

*Diameter:* 4-3/16" (10.6 cm)

*Filter Provision:* 35.5mm at the rear of the lens, inside the T-mount

*Accessories Included:* Screw-in hood, detachable tripod socket, lens case, 4 Vivitar Series 1 Close Tolerance filters [Red 25(A), Yellow 8(K2), 4X Neutral Density ND-6, UV Haze]

*Special Features:* Lens can be rotated 360° inside the tripod mounting ring and can be locked at any orientation. A safety catch holds the lens in place during rotation.



Specifications subject to change without notice.



## Depth of Field Tables

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<b>ft.</b>		<b>m</b>	
<b>23</b>	22'-11" ~ 23'-1"	<b>7</b>	6.97 ~ 7.02
<b>25</b>	24'-11" ~ 25'-1"	<b>8</b>	7.97 ~ 8.03
<b>30</b>	29'-10" ~ 30'-2"	<b>10</b>	9.95 ~ 10.04
<b>40</b>	39'-9" ~ 40'-3"	<b>12</b>	11.9 ~ 12.1
<b>50</b>	49'-7" ~ 50'-4"	<b>15</b>	14.9 ~ 15.1
<b>75</b>	74'-2" ~ 75'-10"	<b>25</b>	24.7 ~ 25.3
<b>100</b>	98'-5" ~ 101'-7"	<b>30</b>	29.6 ~ 30.5
<b>150</b>	146' ~ 154'	<b>50</b>	48.7 ~ 51.3
<b>200</b>	194' ~ 207'	<b>100</b>	95.0 ~ 105.6
<b>500</b>	463' ~ 544'	<b>150</b>	139 ~ 163
<b>1000</b>	861' ~ 1193'	<b>300</b>	259 ~ 357
$\infty$	6156' ~ $\infty$	$\infty$	1876 ~ $\infty$

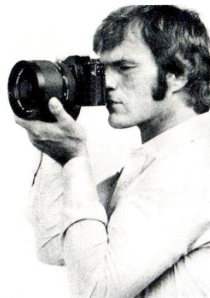
These figures are based on a 0.001" circle of confusion.



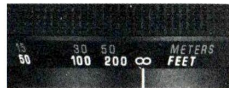
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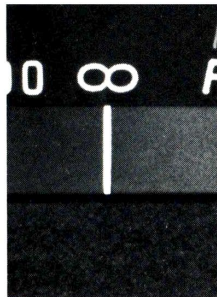
B



C



D



E



F



G



H

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