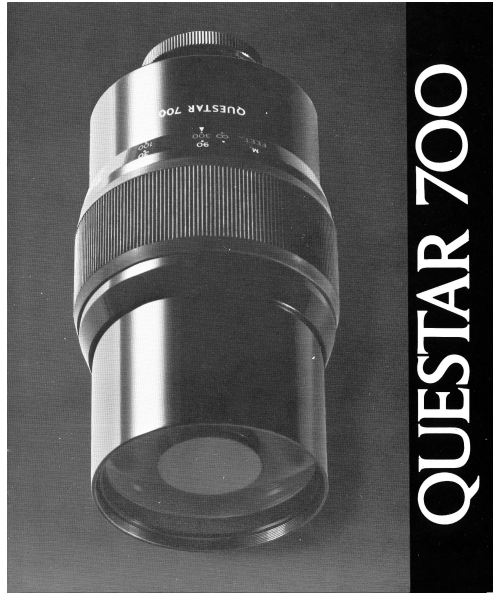


# Company Seven

## Astro-Optics Division



### Moderate resolution reprint of: "QUESTAR 700"

Instruction Manual as provided with Questar 700 lens. This scan of an original in Company Seven's archives.

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QUESTAR 700

Called by Modern Photography "the best" the Questar 700 is unique in bringing to the telephoto market a lens that guarantees theoretical optical perfection and flatness of field from edge to edge, with no linear distortion. Precise focusing from infinity down to 10 feet is accomplished with a single turn of the focusing ring, and at the 10-foot distance the image magnification is 1:4, an unheard-of ratio in telephoto lenses. Only Questar can deliver such performance. The Questar 700 can be connected to virtually every 35 mm SLR camera. Questar Corporation, New Hope, PA 18938.

#### Specifications

Number of Elements	4	Angle of Acceptance	3° 25'
Focal Length	700 mm.	Length	8 inches
Aperture Range	f8	Diameter	4 7/8 inches
Clear Aperture	88.9 mm.	Weight	4 pounds
Minimum Focusing Distance	10 feet	Filter Provisions	35 mm.

## USING THE QUESTAR 700

Shortly after Questar Corporation introduced its telephoto lens, the 700, one was acquired by Robert F. Perricelli to use in his travels in Kenya and for several other photographic projects. Later Mr. Perricelli wrote to us describing his experiences. Since he is not a professional photographer, yet has had considerable experience with photographic equipment of all sorts, we thought his comments would be helpful to the average photographer and particularly to those who are new to long-focus lenses.

"When I first attached my camera to the Questar 700 I had a number of questions in mind. Is it hand-holdable? Is it possible to focus and hold the lens at the same time? Will camera alignment be easy with the rotating mounting tube? In a short time and with a few rolls of film I found the answers to these and other questions.

"The ability to hand hold the 700 was beyond belief. I was able to support the lens at shutter speeds of 125 and above with little, if any, camera shake. A pistol-grip cable release system secured to the tripod socket of the lens provided me with an excellent and convenient support.

"Because my other lenses operate in an automatic mode, I found at first that focus-

ing the 700 was awkward, but it became easy with a little practice. The rubberized focusing ring proved to be an excellent surface to manipulate. Once accustomed to it, one can snap the image into focus quite easily, which was a radical change for me. I was pleasantly surprised to find how quickly I became accustomed to viewing the world at f8.

"The horizontal and vertical positions of the camera are controlled by a set screw which is in a convenient position and quite adequate. With a minimum amount of finger pressure, the camera can be released and then locked in the desired new position.

"The 700 allowed me to photograph such diverse subjects as wildlife roaming the plains of Kenya and the delicate close-up beauty of flowers. One is limited only by his or her imagination and not by the capabilities of this magnificent lens.

#### Film

"I used two types of film with the 700, Ektachrome 200 and Ektachrome 400. The 200 is an excellent film for most lighting situations and is fast enough to shoot with the lens hand held at a minimum shutter speed of 1/125 sec. However, on cloudy days or in shaded areas, a support such as a

tripod is needed to steady the lens when slower shutter speeds are needed. Even under these conditions shutter speeds can be increased by having Ektachrome 200 push-processed to one of three different ASA ratings, 400, 800 and 1600. On a cloudy dark day at Longwood Gardens, I photographed flowers by pushing Ektachrome 200 to ASA 800, operating at a shutter speed of 1/125 sec., with excellent and dramatic results. (Colors tend to be more brilliant on cloudy days.)

"In Kenya I used Ektachrome 200 at its normal rated speed for most of the lighting situations encountered, at shutter speeds of 1/125 or 1/250 sec. The results were quite sharp and detailed with excellent color qualities.

"The new Ektachrome 400, as expected, proved to be an excellent choice for the 700. It was quite easy to photograph subjects in bright light at shutter speeds of 1/500 to 1/1000 sec., and in limited light, from 1/125 to 1/250 sec. These speeds almost completely eliminate any need for tripod support. Ektachrome 400 can be push-processed to 800 by Kodak and all the way up to 2400 by independent photographic laboratories. Of course, with the remarkable increase in film speeds, the 700 can be used in many limited-light situations that previously would have required tripod support.

#### Light Baffling And Filters

"In Kenya the glare from dried-grass plains, volcanic dust and the white safari-car roofs can become quite a photographic headache. Usually I use rubber hoods on my lenses. However, its superb system of light baffling permits the Questar 700 to operate without a sunshade, and my photographs were amazingly free of glare.

"As with all my other lenses, an ultraviolet filter was used with the 700. This reduced the ultraviolet radiation and the

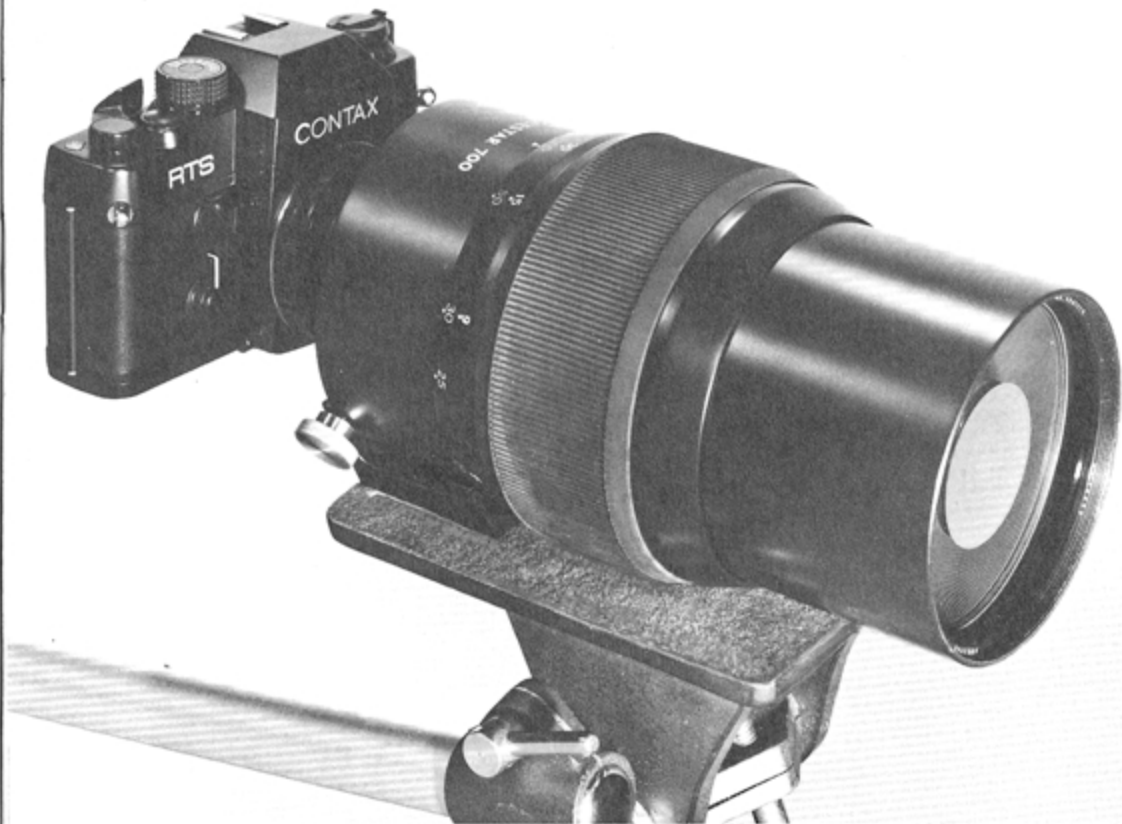
ground haze which is quite common on the African plains.

#### Safari And The Questar 700

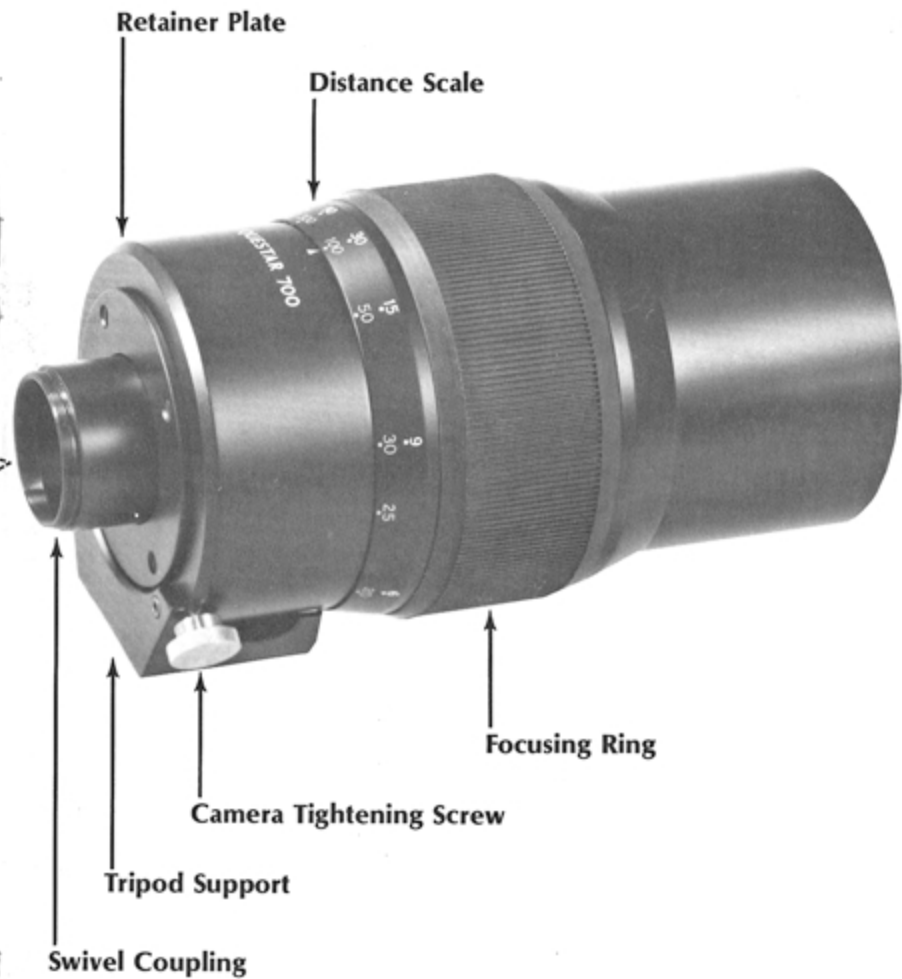
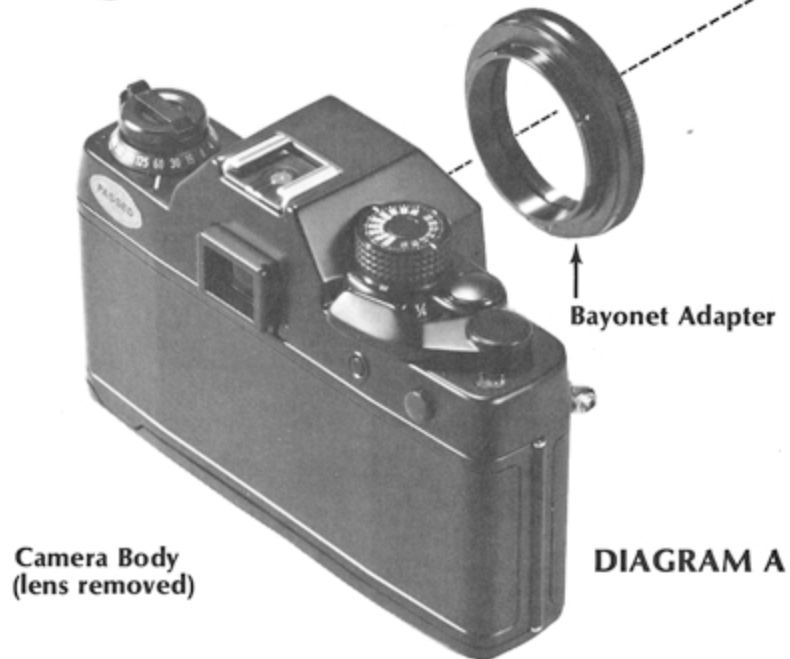
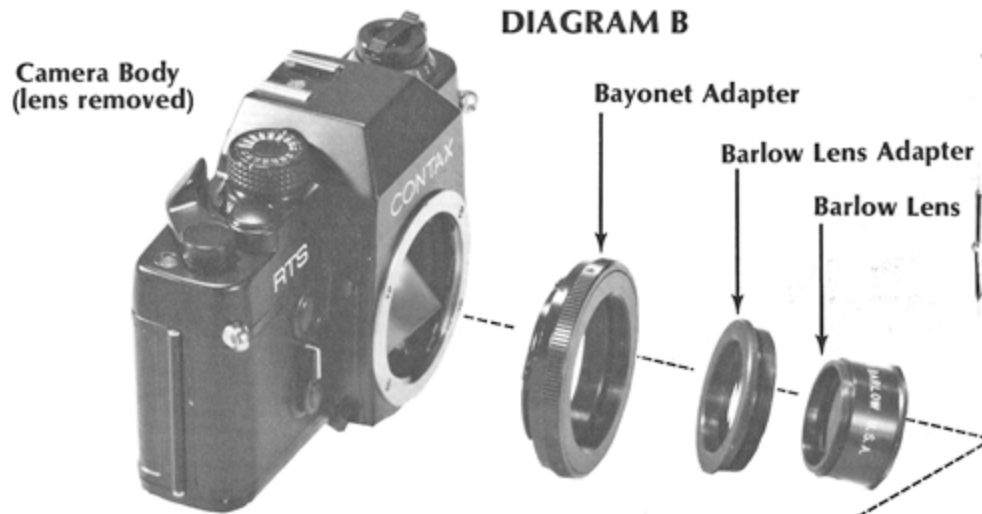
"Photographing wildlife in Kenya with the 700 was a most thrilling experience. With abundant animals, colorful birds, magnificent scenery and the 700, the photographic possibilities were limitless. And it was quite a challenge. I had to concern myself with mini-bus confinement, animal movement, distance of subjects, changing light condition, wildlife feeding habits, dust, and my own response to quickly paced situations. But the ability of the 700 to perform in such an environment is unquestionable. It provided me with the unique experience of being able to fill the viewfinder of my camera with either a distant herd of elephants or a small bird resting in a nearby tree with one turn of the focusing ring.

"The pistol-grip cable release combination secured directly to the tripod plate of the 700 provided the support and flexibility that was needed. This device enabled me to hold the lens and operate the camera with my right hand and focus with my left, thus allowing me free and easy movement within the confinement of the mini-bus. I was able to focus and trigger the shutter by the pistol-grip cable release without moving the camera from my eye. Standard telephoto lenses in the 400 mm., and above, range are just too large and unwieldy to maneuver within the confines of a small mini-bus. The 700 can be easily handled and provides sharp and identifiable images of distant wildlife without disturbing it.

"Photographs obtained with the 700 were sharp and well defined. The fine detail that can be achieved using the 700 as both a telephoto and close-up photographic tool is remarkable. Sharpness of the subject in relation to background highlights creates a striking and unique photographic effect."



Questar 700 with Contax camera mounted on small but rugged Davis and Sanford Field Tripod.



## THE QUESTAR 700 AND THE 35 MM. CAMERA

If your 35 mm. SLR camera has a removable lens and a focal-plane shutter, it can be used with the Questar 700. The camera's own lens is removed and the 700 takes its place, attached by means of a bayonet adapter. A camera with a fixed lens, twin lens, or range finder is not adaptable to the 700.

### Attaching The Camera (see center spread, diagram A)

1. Thread bayonet adapter into swivel coupling at rear of 700.
2. Attach camera body to adapter.
3. Loosen set screw at rear of 700 in order to rotate camera body for either vertical or horizontal position.
4. Lock camera in desired position with set screw.

### The Barlow Lens (see center spread, diagram B)

Another mode of adapting is shown in diagram B which includes a Barlow lens (negative achromat) and Barlow lens adapter. A Barlow increases the image size on your film, which improves both slide projection and print enlargement.

### The Many Focal Lengths Of The Questar 700

An extremely useful feature of the 700 is the manner in which the focal length of the lens can be varied for different applications. When the camera with its own adapter is attached to the swivel coupling, the focal length is 700 mm. A 1½X Barlow, used between camera and 700 lens, will increase the focal length to 1050 mm.; a 2X Barlow will double the basic focal length to 1400 mm.; and for the greatest enlargement of the image size, two Barlows in the system will in-

crease the focal length to 2800 mm.

### Photography With The Questar 700

If you are new to the field of telephotography there are three things you may encounter—for the first time you may become aware of heat waves over a long air path; second, you are apt to see the microscopic motion in your equipment magnified by long focal lengths at high powers; and, finally, you will realize how important exact focus becomes with the fine detail you are trying to capture on film.

These problems of "seeing", motion, and focus are discussed in detail here and are the whole secret of success or failure.

### The Problem Of "Seeing"

You may have heard the term "poor seeing"—a phenomenon that has always plagued the astronomer but is a term largely unknown to the photographer. This is not surprising because a terrestrial view through an ordinary camera lens of short focal length looks pretty much as the eye sees it, yet the same view through a high-powered telescope will often reveal heat waves in the air that make the image waver and dance, setting the whole scene in motion, as in the photograph below.



This phenomenon can occur all year around, in winter as well as summer, because it is the change in temperature, the heating or cooling of the air, that causes it. Astronomers, therefore, pray for nights of "good seeing"—nights when the air is quiet, and stars and planets appear to "stand still". And this favorable condition is just as important in long-distance terrestrial photography.

Experience will teach you that certain hours of the day are more suitable than others for taking pictures. In our particular area, high noon is a bad time—the air is shimmering all over the valley. Early morning or late afternoon, on the other hand, is often a quiet time when suddenly we can see bicycle spokes a mile away.

When you are taking long-distance field shots, one way to avoid shimmer is to keep your line of sight as high as possible above the earth and the turbulent mirage that you can see plainly with the unaided eye directly above any sunny field. Avoid the radiation from all black objects that absorb heat because of their color. Black-top roads, dark plowed fields, and black-shingled roofs will send up massive heat waves.

### The Questar 700 And The Tripod

Since any vibration when taking pictures is the enemy of a long-focus lens like the Questar 700, weak trembling tripods are useless. Although many people have success in using the 700 without a tripod of any kind, we want to point out that "hand holding" is not for everyone—it takes remarkably steady control to hand hold a lens of this focal length. We do recommend a strong, sturdy tripod for the steadiest, sharpest exposures.

When you do not want to be encumbered with a tripod, consider using the shoulder holster or gunstock mount. You will find the

Rowi, a very stable and easy to use mount, listed in our price catalog.

If you wish to try hand-holding the lens, try to support it against some solid object such as a tree branch or a fence, or even against your car. A shotbag is a handy device for cradling your lens on a solid surface, or even for soaking up the vibrations of a tripod. Carrying a small empty canvas bag with you that you can fill with sand or other available material when you need it, is good practice.

### Focusing The Questar 700

Just what is exact focus? A perfect long-focus lens produces the smallest point or "waist" at the cross-over point, where the converging rays meet and begin to diverge. To make a picture sharp, this focal point must come exactly at the film plane of the camera. The smallest error in focusing either way cuts off or truncates each one of the infinite number of ray cones, making it larger in cross section. These blunted cones then cover the emulsion with overlapping, large fuzzy circles, instead of small hard dots.

Focusing the 700 will take some practice. Just bear in mind that the object you will see in your viewfinder will not be as bright as the one you are accustomed to with a regular camera lens. Moreover, the clarity of the viewfinder groundglass varies from one camera to the next; some brands are quite grainy. You must change your groundglass to one that is intended for use with a telephoto lens. Your camera manufacturer will list the appropriate screen for this purpose.

Focusing is accomplished with the wide rubberized focusing ring. This provides internal focusing of the system from 10 feet to infinity with one smooth 360° turn.

## Optical Filters

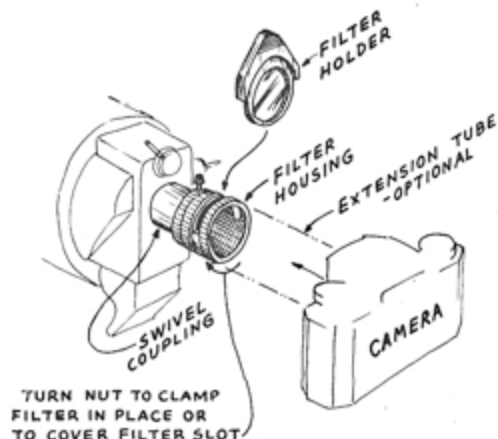
Most photographers are aware of the value of color filters for haze penetration in terrestrial photography. They help overcome image deterioration caused by the scattering of light in the atmosphere. They also help reduce irradiation, a phenomenon which actually originates within the observer's eye and is the effect of unequal brightness. The noticeable result of using filters is to reduce the effect of the luminous veil that scattered light imposes between the observer and his subject. Of course, the filters introduced into a fine optical system must be of the finest quality. For more about filters send for our special leaflet.

## Turn Your Questar 700 Into A Telescope

The Questar Televid, which is a star diagonal with an accompanying 24 mm. eyepiece, will convert your Questar to a 30X visual telescope for both terrestrial and astronomical use. The image it delivers is upright but reversed right to left.

To attach the Televid simply thread it into the swivel coupling at the rear of the 700.

This combination, of course, lacks the polar equatorial mounting of the astronomical telescope, but it is useful for short periods of general sky viewing. However, one



The Questar Quick-Change Filter Holder, shown here attached to the Questar telescope, also fits the Questar 700. The slot in the Filter Housing accepts the Filter Holder without disturbing the setup. The Housing extends the focal plane  $\frac{3}{4}$ " (19 mm), an increase in e.f.l. of 3" (76 mm.)

way that it can be used most effectively is to piggy-back it on a mounted telescope with a synchronous drive, such as the Questar Seven, where it can become a superb deepsky camera.

**WARNING:** Never look at the sun with your telescope unless it is protected with the Questar Solar Filter. This is the totally safe sun filter that is used with the Questar Telescope and will also fit the 700. It must be used to prevent the sun's blinding rays from damaging the eye.