

# Thurlow Binoculars - Instruction Manual



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## Bill Thurlow (1942 – 2004)

by Roy Bishop

Dr. William Harrison Thurlow IV possessed many traits: an enthusiastic spirit, a down-to-earth friendliness, a gentle sense of humour, a child-like curiosity, and a love of the outdoors in all aspects, especially the night sky. As a teenager he was consulted by news media for information on astronomical events. As a cadet in the U.S. Navy he sailed on the tall ship "Eagle". As a surgeon he saved lives, improved the quality of life of many people, and provided sound advice to his patients and friends. As an environmentalist he single-handedly took on the Newfoundland government and prevented the spraying of toxic chemicals on large areas of the forests of that province. As a pacifist he was a member of the Society of Friends (Quakers) and inspired others to examine their assumptions about politics and nationalism. As a marathon runner he encouraged people half his age to look after their health. As an amateur astronomer he was a keen observing companion and knew the sky intimately. He was the first member of the RASC Halifax Centre to complete the Messier List, and with his telescope "Big Red", the first to introduce Centre members to large-aperture observing.



Bill graduated from the University of Maine and from the University of Vermont Medical School, where he received his M.D. in 1969. He was a Fellow of the Royal College of Surgeons of Canada and served on the Board of Directors of the American College of Surgeons. His career as a general surgeon was spent in St. John's Nfld., Hamilton Ont., Gander Nfld., Digby N.S., and Summerside P.E.I. He retired from full-time medical work in 2002, sold his home, and with his wife Dana moved into residence at Saint Mary's University in order to pursue his lifelong dream of studying astronomy. He began an M.Sc. program in astronomy, an endeavour that was not to be.

The Thurlow Binoculars were purchased using donations that were made to the Halifax Centre in memory of Dr. Thurlow.

## **Caution – Safety First**

**While in possession of the binoculars, you are responsible for their safe and proper use. Never look directly at the Sun without properly certified solar filters installed. Permanent eye damage or blindness could result. Young children are only permitted to use these binoculars under the direct supervision of a responsible individual.**

**Once set up, the binoculars are never to be left unattended.**

**With fork mount set to the 45° orientation, the stability of the tripod/mount/binocular assembly decreases. It requires less force to knock over the binoculars when mounted in this orientation than when the vertical orientation of the fork is used.**

**If you notice any irregularities with the binoculars or their operation, please notify the Observing Chair of the Halifax RASC immediately.**

## Getting to Know the Binoculars

### Storage and Cold Weather

All optics, when exposed to significant temperature changes or high humidity have the potential to dew up. Allow the optics to slowly adjust to cold weather by storing the instrument in its case in a cold area for a few hours prior to use. When bringing the instrument back inside a warm space, open up the case, remove the binoculars, remove the lens caps and let everything dry out. The binoculars should be stored in their case in a cool dry location.

### Packed for Storage/Transport

The picture below shows the binoculars stored in their carrying case. Note the arrangement of the eyepieces. The high power eyepieces are placed in their compartment with the eye lens facing down, and the low power eyepieces are placed in the compartment with the field lens facing down. The captive bolt used to secure the binoculars to the mount is stored below the eyepiece compartment. The allen keys used to adjust the fork orientation are stored above the eyepiece compartment.



# Specifications

## Binoculars

Aperture	100 mm
Objective Type	Achromatic Doublet – Broadband Multi Coated
Limiting Magnitude	13
Lens Shade	Retractable
Focuser	Helical – Individually Focused
Focuser Travel	14.5 mm
Mass	7.5 kg
Prisms	BaK 4

## Eyepiece

	Low Power EP	High Power EP
Barrel Diameter	31.75 mm	31.75 mm
Magnification	20x	40x
Exit Pupil	5 mm	2.5 mm
Eye Relief	20.6 mm	14.6 mm
Apparent Field of View	42° 20'	43° 20'
Actual Field of View	2° 7'	1° 5'

## Tripod

Vixen Model AL150 Aluminum Tripod. Vertical height adjustment with spread legs to top of base is 30" to 53.25" / 76cm to 135.5cm. (Legs extend from 36.5" to 59" / 93cm to 150cm.) Mass: 4.2 Kg

## Mount

The Vixen fork mount is a heavy-duty Alt-Azimuth mount especially suited for the astronomical observation binoculars. The fork arms can be placed at a 45 degree angle or straight up. The mount and half pillar sit on a sturdy aluminum tripod, adjustable from 0.93m to 1.50m. A swing bracket fits between the arms and allows the mounting of the binoculars. The fork mount and tripod mass 7.5 Kg.

## Setting Up

### *Tripod*

Select a level area of ground for setting up the tripod. Extend the legs and clamp them securely. In normal use, it has been found that a tripod height of 1.0m works well for observation. This height can be achieved by loosening the tripod leg clamps and sliding the tripod legs out until the top of the sliding tripod leg is even with the tripod spreader bar.

### *Mount*

The mount consists of fork arms with a swing bracket mounted between them, and a short pillar which attaches to the tripod. The bottom of the pillar consists of a circular ring with a small flat section. This flat section must line up with the vertical protrusion on the tripod. See the photograph at right which shows the mount attached to the tripod.



The amount of effort required to move the fork in the azimuth is controlled by a knurled ring which is partially exposed on the front face of the mount just above the pillar.

The fork mount can be set to operate in one of two orientations, vertical or 45°. Usually the mount is stored in the vertical orientation. When using the mount you need to decide whether you wish to set it up in the vertical orientation or the 45 degree orientation. The primary difference in these orientations is that the binoculars will not point to the zenith if the vertical orientation is used.



**CAUTION** – Caution must be exercised when using the binoculars with the mount in the 45 degree orientation. In this configuration, the centre of gravity of the binoculars is behind the vertical axis of the tripod. While this is a reasonably stable configuration, if the binoculars are bumped with sufficient force, they could be knocked over.

To adjust the position of the fork, remove the small black rubber plug located on the top of the pillar and insert the allen key as shown in the picture at right.



While holding the fork with one hand, slowly loosen the set screw until the fork moves easily. Notice that the circular shaft which passes through the top of the pillar has index marks on the raised section of the shaft inboard of the two black O-rings. These detents indicate the 45 degree setting of the fork.



Once the set screw is loosened position the forks such that the 45 degree detent is under the set screw. Ensure that the shaft remains centered by observing that the black O-rings remain equidistant from each edge of the pillar. Slowly tighten the allen key while ensuring that the detent remains properly positioned underneath the set screw. Continue to tighten the set screw until secure. Remove the set screw and replace the back plug.

The amount of effort required to move the binoculars in altitude is adjusted by tightening the two knurled knobs overtop the swing bracket bearings. This is a finger tip adjustment. Avoid over tightening. Always store the binoculars with the pressure on these bearings released.

### ***Attaching Binoculars***

First remove the threaded rod and attachment bolt from the case. Remove the attachment bolt from the threaded rod. Holding the binoculars by the handle, turn them over, and screw the rod into the base of the binoculars as shown in the photograph at right. Screw the threaded rod into the base of the binoculars until it is “hand tight”.



Still holding the binoculars by the handle, insert the threaded rod into the hole in the swing bracket as indicated in the photograph at right. While holding the binoculars in place with one hand, centre the binoculars on the swing bracket so that they sit square with the mount. Secure the binoculars to the swing bracket using the attachment bolt. Do not let go of the binoculars until you have tightened the knob securely.



## ***Installing Oculars***

The binoculars are provided with two sets of eyepieces. One set provides a magnification of 20x, with a field of view just slightly larger than 2 degrees. The other set of eyepieces provide a magnification of 40x, with a field of view slightly larger than 1 degree.

The eyepieces are a friction fit in the binoculars. To install the eyepiece, grasp it firmly between your fingers and slowly slip it into the eyepiece focuser barrel. **Fit the eyepieces slowly.** Being a friction fit, (there are no captive screws) the clearance between the eyepiece and the focuser barrel is very small. When you insert the eyepiece, it will tend to compress the air in the focuser barrel. Pressing the eyepieces into place quickly does not allow the air time to escape, and you will find that the eyepiece will bounce back out of the focuser barrel.

## ***Adjusting Ocular Spacing***

With the eyepieces installed, hold the right and left focuser barrel with your hands. Place your thumbs on the tabs located just below the focuser barrels. While looking through the binoculars, adjust the interpupillary distance until one clear circle of the image is seen.



## ***Focusing***

The binoculars are fitted with individual helical focusers on each eyepiece. This makes the binoculars mechanically more rugged and generally maintains optical alignment better.

Best focus will be achieved by focusing on a bright star. Cover your right eye ( or cover the right objective lens of the binocular ) and focus the left eyepiece by rotating the left focuser barrel until the image appears sharp. Then cover your left eye ( or cover the left objective lens of the binocular ) and focus the right eyepiece by rotating the right focuser barrel until the image appears sharp.