

# Instruction Manual

zoomión®



***Pioneer 70 AZ***

English version 8.2014 Rev A

## The Zoomion® Pioneer 70 AZ

*Congratulations on the purchase of the new Zoomion® Pioneer 70 AZ. This small telescope will give you hours of fun, with its all optical glass lens and super compactness, and it is the ideal companion for travelling. With this telescope you will be able to see the craters on the Moon, star clusters, some nebulae and a glimpse of the Jupiter disc features and its Galilean moons and the rings of Saturn. We have included many accessories so it will be easy to use this telescope.*

### 1. Included parts

we have included several accessories that will make the use of the telescope easier and fun, please take a look at the list of the parts so you can identify them in the future.

1. 1.5x Erecting Lens;
2. 3x magnification Barlow Lens;
3. 5x Finderscope;
4. & 5. Two eyepieces 1.25" (31.75mm); a H20mm and a H6mm eyepiece;
6. 45 degree erecting diagonal.

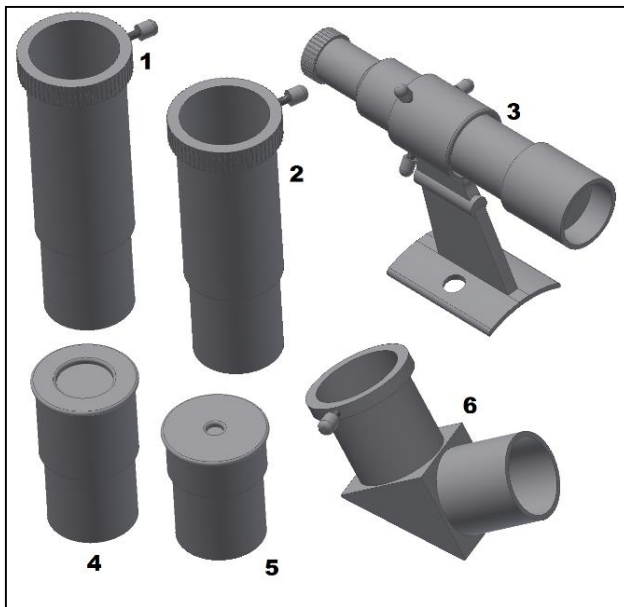


Figure 1. Parts List

### 2. Getting Started

It is very simple to get started. Here is how the telescope works. The telescope main lens should point to the object being observed. This lens will gather the light coming from the object and sends it through the telescope tube to the back of the telescope.

At the back there is the focuser. The focuser moves to get a precise focused image. At the focuser one can use the supplied accessories. Different accessories combinations give different results, such as different image magnifications or correct image. But all this will be explained in detail in the next pages.

### 3. Assembly

Start by setting the tripod. Open the tripod legs as shown in figure 2. Thread the supplied tripod handle (figure 3). Set the telescope on the tripod flat base. The base has a  $\frac{1}{4}$ " -20 photographic screw, this thread is also compatible with vast majority of cameras available in the market. Fix the telescope to the tripod. Make sure that the telescope is pointing to the right direction. The handle and the telescope main lens should be at the extremities. Placing the finderscope is the next step, the finderscope base fits the two protruding screws on the telescope tube (figure 4). Affix the finderscope with the two supplied thumbnuts as shown (figure 5). The telescope should look as shown (figure 6). Insert the diagonal and the lowest power eyepiece (H20) in the focuser tube. Use the focuser thumbscrew and the diagonal thumbscrew to get all parts securely tightened. The diagonal with the eyepiece should be pointing up (figure 7). Congratulations! We are almost ready to start using you telescope!

Questions? Please visit our website and drop us a line [www.astroshop.de](http://www.astroshop.de) \* nimax Gmbh Otto-Lilienthal Str. 9 D-86899 Landsberg am Lech



Figure 2. Prepare the tripod



Figure 3. Diagonal and Eyepiece placement.



Figure 4. Telescope ready to use.

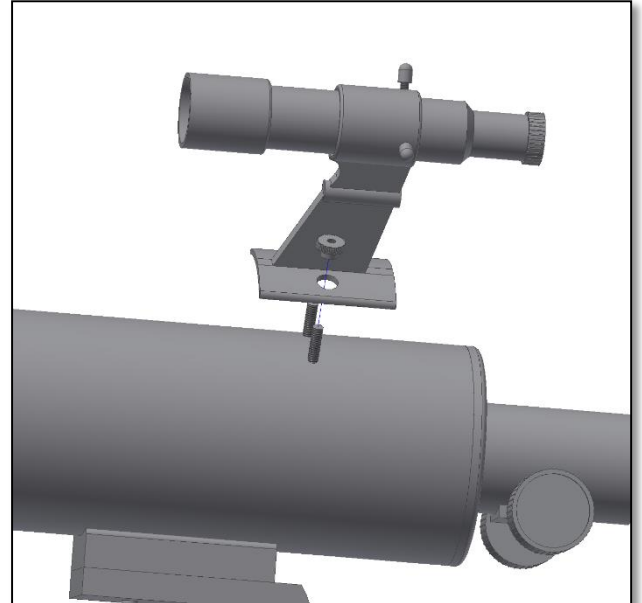


Figure 5. Finderscope should be tightened using the two thumbnuts.

You are almost ready to start using your Zoomion 70 AZ telescope. Before this a word of caution:

**ATTENTION!** Never look at the Sun through a telescope. Concentrated Sun light may cause serious eye injury. Children should use only with adult supervision



Figure 6. Optical tube and tripod set to use.

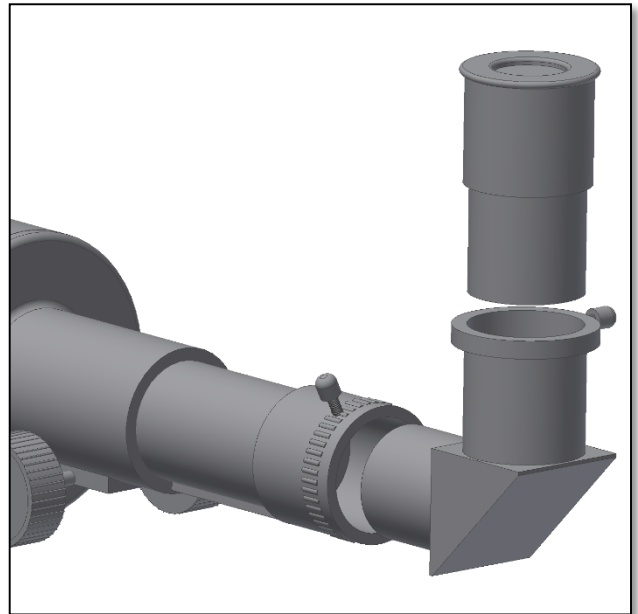


Figure 7. Insert Diagonal and Eyepiece.



Figure 8. Telescope ready to use.

#### 4. Start using your Zoomion 70 AZ

**telescope.** Point the telescope to a distant object during the day. It is important to do this during daylight so that you get familiarized with the telescope operation. A good target is a church tower a chimney or a distant mountain peak.

Rotate the focuser knob so that the focuser tube moves in and out. Do this slowly. We suggest that you start by racking the focuser all the way in and slowly move it out. With the H20mm eyepiece you should be able to get a focused image easily.

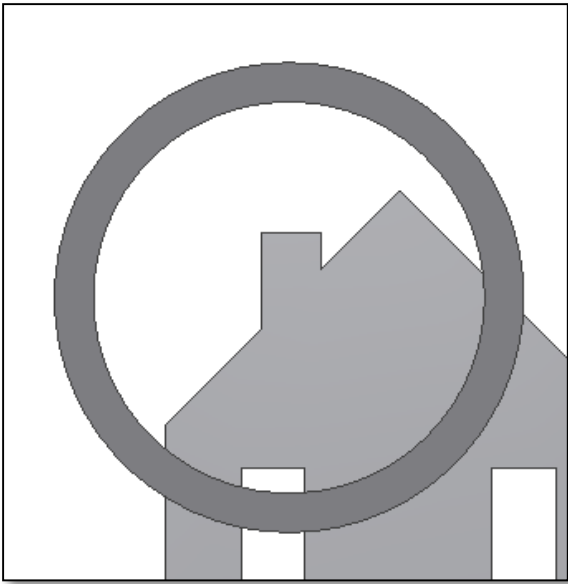
**4.1. The Finderscope.** Before we mentioned the Finderscope as a valuable tool to point the telescope at an object. To

operate properly, the telescope and the

finderscope, should be aligned. The image obtained through the finderscope has a much broader field of view than that of the telescope. Aligning means matching the telescope image to the image of the center of the finderscope. This way when looking through the finderscope one know the telescope is pointing exactly to the same point making looking at objects much more easier.

#### 4.2. How to align de finderscope?

You have the house chimney (example mentioned before) centered at the telescope eyepiece field of view. Now look through the finderscope. The small cross (recticle) at the center of the finderscope field of view should match the center of the telescope field of view. Adjust the three finderscope screws to get the cross pointing to the same object as the telescope (as shown in Figure).



**4.2.1.** A distant object is centered at the telescope's field of view. In this example we have a house with a chimney. The chimney is the reference point to place at the center of the field of view. We first look through the telescope with the lowest magnification possible (H20mm should be preferable). So we have the widest field of view.



**4.2.2.** Looking through the finderscope we see the same building but in this case the chimney is not centered. We adjust the finderscope using the three thumbscrews so that the finderscope moves slightly. This is enough to correct the objects position in the finderscope. Trial and error is required to get a satisfactory result. Make sure to tighten the 3 screws after finishing so that the finderscope tube does not move.



**4.2.3.** After playing with the three finderscope thumbscrews and some trial and error we get the finderscope reticle close to the center (in this case the chimney). The Finderscope is now ready to use!

$$\frac{360mm}{20mm} = 18 \text{ power}$$

## 5. Using the accessories, a bit of math to understand how all it works.

Using the accessories is easy and fun. To change magnification simple swap eyepieces. To get more magnification simply use the barlow lens. But how all of this work?

### 5.1. Power (magnification)

Your telescope as a focal length of 360mm. This is approximately the distance between the telescope lens to its focal point (very similar to the distance between the focus point of a loupe and the loupe lens). This is a very important feature that allows to determine several interesting facts such as magnification.

The magnification is determined by the telescopes focal length and the used eyepiece. You probably noticed that the two supplied eyepieces are H20mm and H6mm. This means that the H20mm is a 20mm focal length eyepiece while the H6mm is a 6mm focal length eyepiece.

To determine the magnification just divide the telescope focal length by the eyepiece focal length. Lets give an example for our telescope and the supplied eyepieces:

Telescope focal length is 360mm  
H20 eyepiece focal length is 20 mm

This means that the H20 eyepiece provides a 18x power (magnification). This seems low but try it, you will see a a bright image with some very good detail.

### 5.2. Barlow Lens

The barlow lens is a very interesting device. It is a negative lens that multiplies the telescopes focal length. So a 2x Barlow multiplies the original focal length by 2x, in this case  $360mm \times 2 = 720mm$ .

A 3x Barlow lens multiplies by 3x. Your telescope is supplied with a 3x Barlow lens. When used with the H20 eyepiece you get 3x the power obtained before  
 $18 \text{ power} \times 3x \text{ Barlow} = 54 \text{ power}$

### 5.3. Erecting lens

The erecting lens gets you a upright image view with the telescope. It also adds some power like the barlow lens. The supplied Erecting Lens provides and extra 1.5x power.

### 5.4. Diagonal Mirror

This diverts the light coming from the telescope to an angle of 45 or 90 degrees. It is useful because it provides a more comfortable position when observing.

Here are some examples on how to use the accessories.

### Some possible accessory combinations

	Terrestrial View	Moon	Deep Sky	Jupiter and Saturn
Erecting Eyepiece 1.5x	Yes			
Diagonal Mirror	Yes	Yes	Yes	Yes
Barlow Lens 3x				Yes
H6 Eyepiece		Yes		
H20 Eyepiece	Yes		Yes	Yes
Power	27x	60x	18x	54x

## 6. What can be seen with this telescope?

Below you will find some examples of what you can expect to see when using this telescope.



**6.1.** The Moon is one of the most spectacular objects to be seen through a telescope. Even a small telescope will reveal high detail of the Moon's surface. You will be able to see the craters on the Moon's surface and other features like the Mare. The moon is a very bright object. It is better observed when the Moon is not full. Try the crescent Moon and look for features along the terminator (between illuminated and dark surfaces).



**6.2.** Jupiter is the biggest planet of our solar system. It is also one of the favorite targets for beginners. Galileo was able to discover that the four tiny dots that turn around the planet were in fact part of Jupiter's system of moons. With this telescope you will be able not only to see Jupiter's planet disc with its two major discernible bands but also its biggest moons, Io, Europa, Ganymedes and Callisto.



**6.3.** The "lord of the rings" of the night skies, Saturn is by far the most popular target for small telescopes. Saturn's rings are discernible even at 60x magnification. In a very good night you will be able to see the Cassini's division (the darker band on the Saturn's rings).

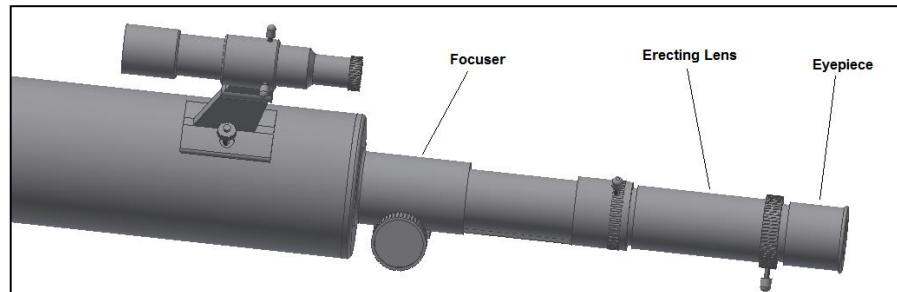
## 7. Troubleshooting and frequently asked questions

**Q: I can't get to focus my telescope, only get a bright circle.**

R: Make sure you have inserted the Diagonal and an eyepiece (start by the lowest power eyepiece – H20). Point to a distant object during the day and proceed as described in 4.

**Q: I get a mirrored view of the objects. Like if they were reversed, and R show up like Я**

R: This is caused by the Diagonal Mirror. It has a mirror inside. To get a corrected image it is necessary to use the Erecting Lens and the Eyepiece as shown below.



**Q: I use the finderscope to point to objects but I always miss the target.**

A: You probably need to realign the finderscope. Please proceed as described in 4.2.

**Q: When I use the barlow lens and the H6 eyepiece the image is so dark I can't hardly see anything.**

A: Power should be used with moderation. It depends on how stable the atmosphere is, too much turbulence causes image distortion. Usually the limit is 2x for each millimeter of the telescope aperture. In this case this telescope, the telescope has an aperture of 70mm so in a very good night you should be able to reach 140x. The more magnified the image is the darker it gets.

**Q: Is my telescope compatible with other eyepieces ?**

A: Zoomion telescopes are compatible with all telescope eyepieces from different manufacturers as long as the eyepiece is a 1.25" (or 31.75mm) size eyepiece. If you would like to test an eyepiece from a fellow astronomer go ahead. Different eyepieces provide different visual experiences.

**Q: I want to use my telescope to take pictures**

A: This telescope is designed for visual use. It doesn't mean it can't be used for photography, however it will be hard to get high quality pictures with this telescope. If you have a smartphone you can shoot the Moon or some terrestrial objects. Search online for digiscoping and afocal photography.

**Q: The stars only appear as points in the telescope**

A: Stars will always appear only as points, even in the largest telescopes in the world. It is more interesting for beginners to observe two-dimensional objects, such the moon or planets. Once you find these, you will be able to start learning about the astronomical calendar.

**Q: I would like to observe the Sun**

A: An appropriate solar filter, placed over the objective, is essential for observing the sun. These are available as plastic foil or glass filters. They allow only a tiny and harmless fraction of sunlight into the telescope when securely positioned over the objective, so allowing you to observe the sun in complete safety. Eyepiece solar filters (not available from us) should be avoided at all costs as they are considered unsafe. **Note: Never look directly at the sun through a telescope without an objective solar filter!**

**Q: I can't see anything when I look through my telescope**

A: The telescope is only suitable for astronomical observing and when used outside at night. Observing from inside the house or during the day is not usually possible. The dust caps must first be removed and an eyepiece inserted before you can start observing. Are you sure you have you removed all the dust caps, not just the small ones? If you have not, then no light will enter the telescope and everything will appear black.