Instruction Manual

Zoomion® Spaceboy 50 AZ

English version 2.2015 Rev A

The Zoomion® Spaceboy 50 AZ

Congratulations on the purchase of the new Zoomion® Spaceboy 50 AZ. This small telescope will give you hours of fun. With this telescope, you will be able to see the craters on the Moon and much more.

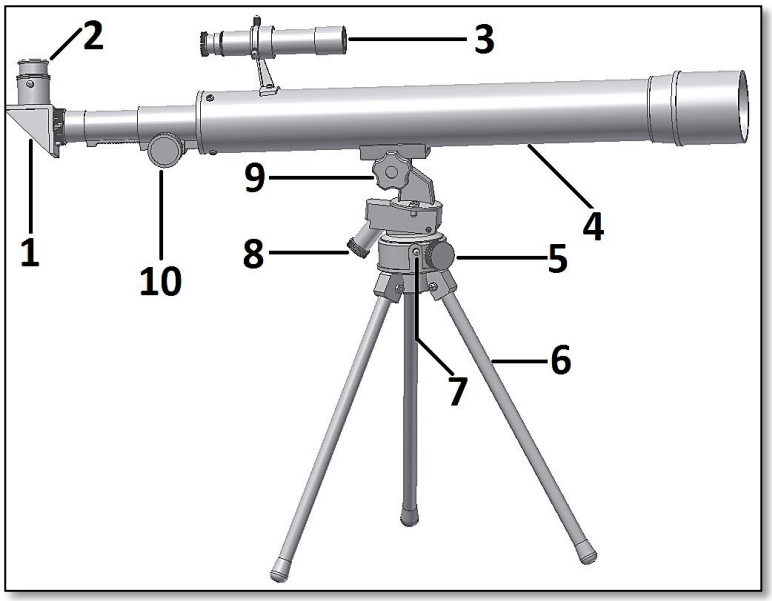


Figure 1. Parts list.

1. Included parts.

We have included several accessories, which will make the use of the telescope easier and fun. Please look at the list of the parts, so you can identify them in the future.

1. 90 degrees diagonal;
2. Two eyepieces 0.965" (24.5mm); an H20mm and an H12.5mm eyepiece;
3. 14x microscope/erecting eyepiece (not shown);
4. 6x finderscope;

2. Parts list description.

1- Diagonal mirror;
2- Eyepiece;
3- Finderscope;
4- Optical tube;
5- Azimuth adjustment;
6- Tripod leg;
7- Azimuth locking thumbscrew;
8- Altitude adjustment;
9- Fixing knob;
10- Focuser.

3. Getting started.

Extend the tripod as shown in figure 3. Insert the finderscope in bracket as shown in figure 4. Use the three finderscope screws to fix the finderscope tube. Place the tube on the tripod (figure 5). Use the supplied fixing knob to secure the tube. The mount has two precision adjustments: an altitude (figure 6) and an azimuth adjustment. When the altitude adjustment is rotated, the mount tilts in altitude (figure 7). The azimuth adjustment allows adjusting the mount in azimuth (figure 8). Both adjustments are used when pointing to an object to precisely center it in the field of view. To lock the azimuth adjustment, use the fixing knob (figure 9). It is important to align the finderscope with the telescope, so whenever you point the telescope, the image seen through the finderscope matches the one in the telescope's eyepiece. Additional instructions on how to align the finderscope can be found on the next pages.

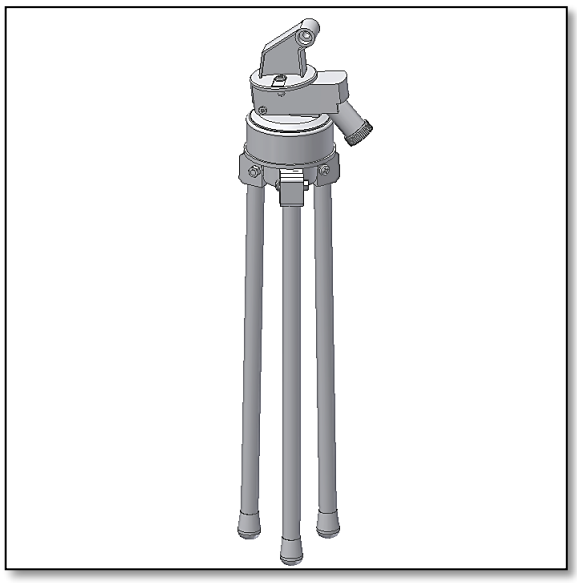


Figure 2. Tripod assembly.

Figure 3. Extended tripod..

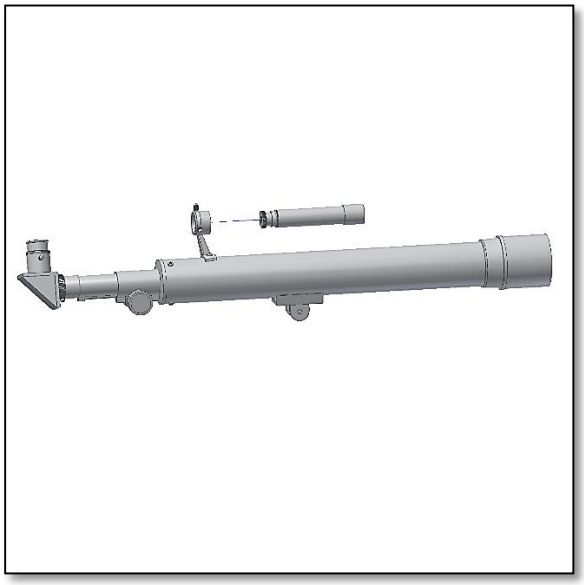


Figure 4. Insert finderscope.

Figure 5. Place the tube and fix it.

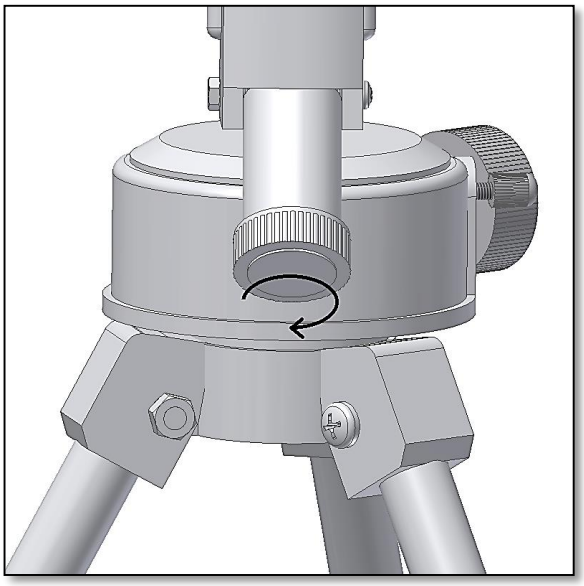


Figure 6. Altitude adjustment.

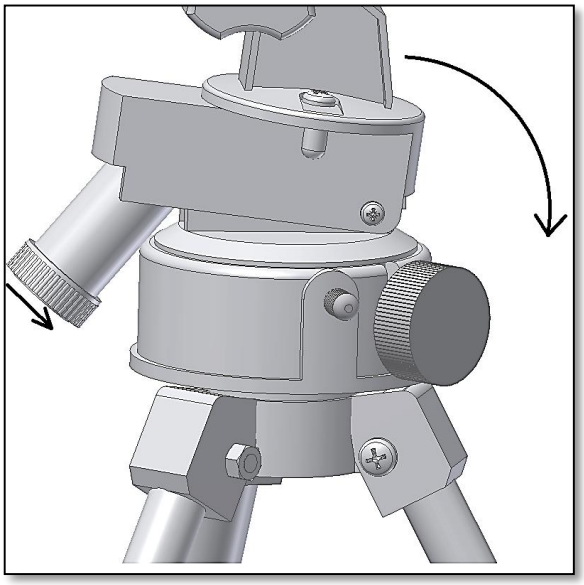


Figure 7. Tilt the mount by turning the altitude adjustment.

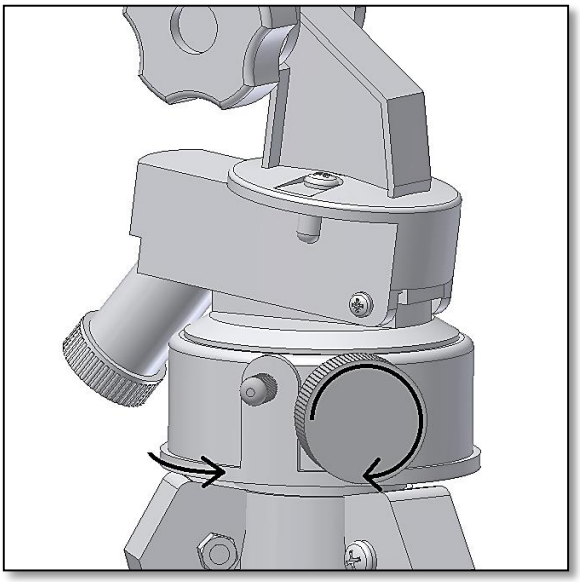


Figure 8. Turning the azimuth adjustment.

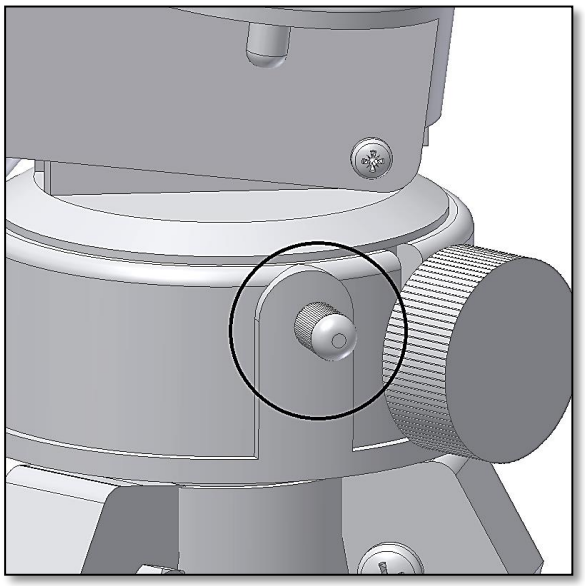


Figure 9. Azimuth locking knob.

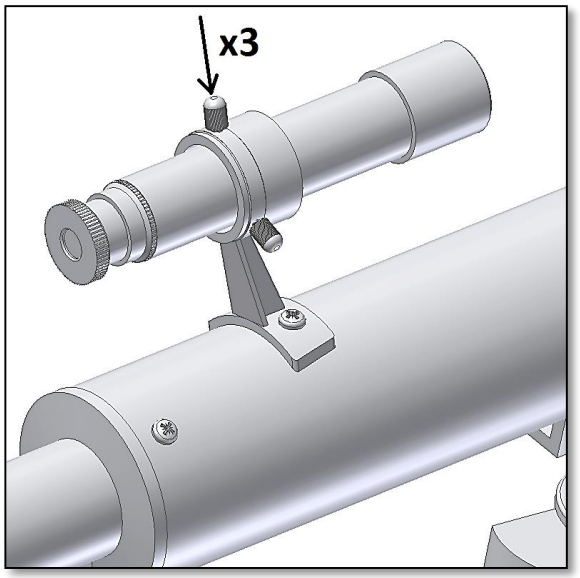


Figure 10. Adjusting the finderscope.

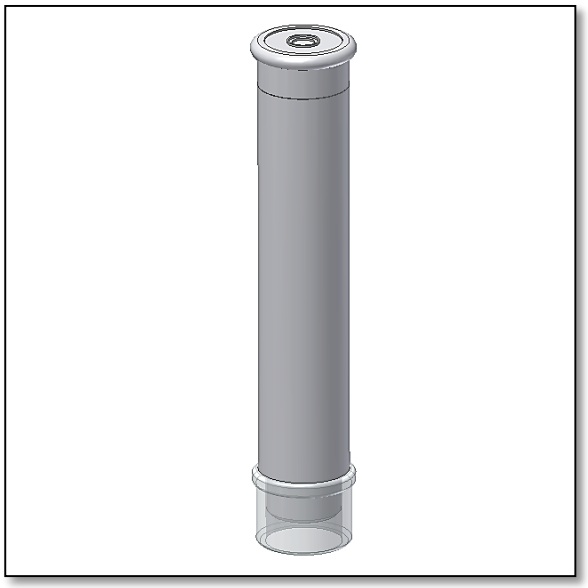
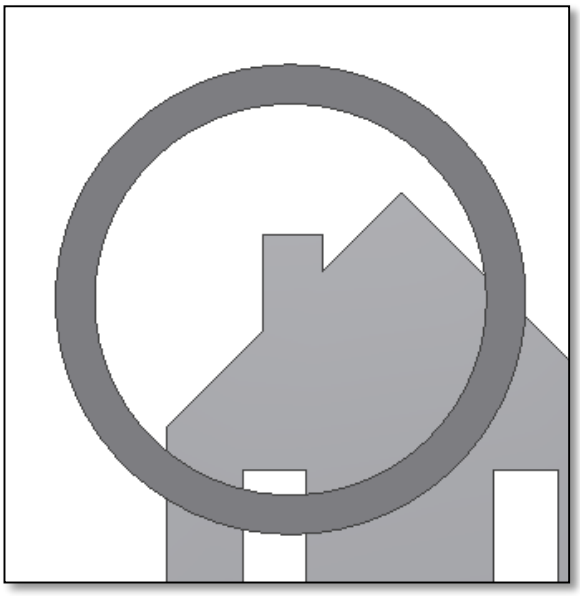


Figure 11. Microscope/erecting eyepiece.

3. Start using your Zoomion® Spaceboy 50 AZ telescope. Place both the diagonal mirror and the eyepiece in the focuser tube and use the existing thumbscrews to fix it. Now 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 20mm eyepiece you should be able to get a focused image easily.

3.1. The Finderscope. Before, we mentioned the finderscope as a valuable tool to point the telescope to 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. Please take a look on how the finderscope works on the next pages.



4. How to use and how to align the finderscope?

4.1. A distant object is centered at the telescope's field of view with an eyepiece. 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, so we have the widest field of view.

4.2. When 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.

4.3. After playing with the three findercope thumbscrews and some trial and error, we get the finderscope's recticle close to the center (in this case the chimney). The finderscope is now ready to use!

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

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

5.1. Power (magnification)

Your telescope has a focal length of 500mm. This is approximately the distance between the telescope lens and 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 telescope's focal length and the used eyepiece. You probably noticed that the two supplied eyepieces are 20mm and 12.5mm. This means that the 20mm is a 20mm focal length eyepiece while the 12.5mm is a 12.5mm focal length eyepiece.

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

Telescope's focal length is 500mm.
20mm eyepiece's focal length is 20mm.

$$\frac{500mm}{20mm} = 25\ power$$

This means that the 20mm eyepiece provides a 25x power (magnification). This seems low, but when you try it, you will see a bright image with some (very good) details.

5.2. Barlow Lens (not included)

The barlow lens is a very interesting device. It is a negative lens, that multiplies the telescope's focal length. So a 2x Barlow multiplies the original focal length by 2x, in this case $500mm\ x\ 2 = 1000mm$.
A 3x Barlow lens multiplies by 3x.
Your telescope is supplied with a 2x Barlow lens. When used with the 20mm eyepiece you get 2x the power obtained before
$25\ power\ X\ 2x\ Barlow = 50\ power$

5.3. Erecting lens

The erecting lens gets you an upright image view with the telescope. It also adds some power like the barlow lens. The erecting lens provides an extra 1.5x power.

5.4. Diagonal Mirror

This diverts the light coming from the telescope to an angle of 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
20mm Eyepiece	Yes	
12.5mm Eyepiece		Yes
Power	*25x*	*50x*

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 Marea. The Moon is a very bright object. It is better to observe it 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 circle around the planet were in fact part of Jupiter's system of moons. With this telescope, you will not only be able 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 sky, 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 of Saturn's rings).

7. Troubleshooting and frequently asked questions

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

R: This is caused by the telescope's digonal (#1 – figure 1).

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: 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 0.965" (or 24.5mm) 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 only.

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

A: Stars will always only appear as points, even in the largest telescopes in the world. It is more interesting for beginners to observe two-dimensional objects, such as 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: We do not recommend that you observe the Sun with this telescope. It is extremely dangerous to point a telescope to the Sun. Children should always be supervised when using the telescope during day-time.

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

A: The dust caps must first be removed and an eyepiece inserted before you can start observing. Are you sure you have removed all the dust caps, not just the small one? If you have not, then no light will enter the telescope and everything will appear black.

8. How to use the supplied Microscope/Erecting eyepiece

The erecting eyepiece can replace the diagonal and the eyepiece. Remove the diagonal and eyepiece and place the Microscope/Erecting eyepiece. Fix it using the existing thumbscrew. When looking through it, you will get an upright image. It is interesting for terrestrial viewing.

The Microscope/Erecting eyepiece can also be used as a hand-microscope. Place the microscope base on an object you would like to observe (like a plant leaf) and peak through the eyepiece.