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# NG114mm

## 114mm Newtonian Telescope w/ Equatorial Mount Instruction Manual

### Specifications

Optical design	Newtonian reflector
Magnification	19x-52x
Front lens (clear aperture)	114 mm
Focal length, focal ratio	500mm
Standard eyepieces	Plössl 26 mm and 9.7 mm
Accepts eyepiece barrel	31.7 mm (1.25")
Viewfinder	Red dot
Total weight (without packaging)	19.06 lb / 8.65 kg



**WARNING:**  
**CHOKING HAZARD** – Small parts.  
Not for children under 3 years.



**WARNING:**  
**SUN HAZARD** – Never look directly  
at the sun with this device.



## WARNING:

**Never attempt to observe the sun with this telescope. Make sure children do not attempt to observe the sun with the telescope. Observing the sun directly, even for a short time, may cause blindness. Packing materials, like plastic bags, should be kept out of the reach of children.**

### Risk to your child!

Never look through this device directly at or near the sun. There is a risk of **BLINDING YOURSELF!**



Children should only use this device under supervision. Keep packaging materials, like plastic bags and rubber bands, out of the reach of children, as they pose a choking hazard.

### Fire and burn risk!

Never subject the device, especially the lenses, to direct sunlight. Light ray concentration can cause fires and/or burns.

### Risk of material damage!

Never take the device apart. Please consult Customer Service if there are any defects. The dealer will contact our service center and send the device in for repair if needed.

Do not subject the device to temperatures exceeding 140° F.

### Tips on cleaning

Clean the lens (objective and eyepiece) only with a soft, lint-free cloth, like a microfiber cloth. Do not use excessive pressure - this may scratch the lens.

To clean a very dirty lens, dampen the cleaning cloth with eyeglass cleaning solution, and wipe the lens gently.

Protect the device against dirt and dust. Leave it to dry properly after use at room temperature. Then put the dust caps on and store the device in a suitable location.

### Respect privacy!

This device is meant for private use. Respect others' privacy. Do not use the device to look into other people's homes, or otherwise infringe on their privacy.

### Disposal

Dispose of the packaging materials as legally required. Consult the local authority on the matter if necessary.



#### DISPOSAL

Dispose of the packaging materials properly, according to their type, such as paper or cardboard. Contact your local waste-disposal service or environmental authority for information on the proper disposal.

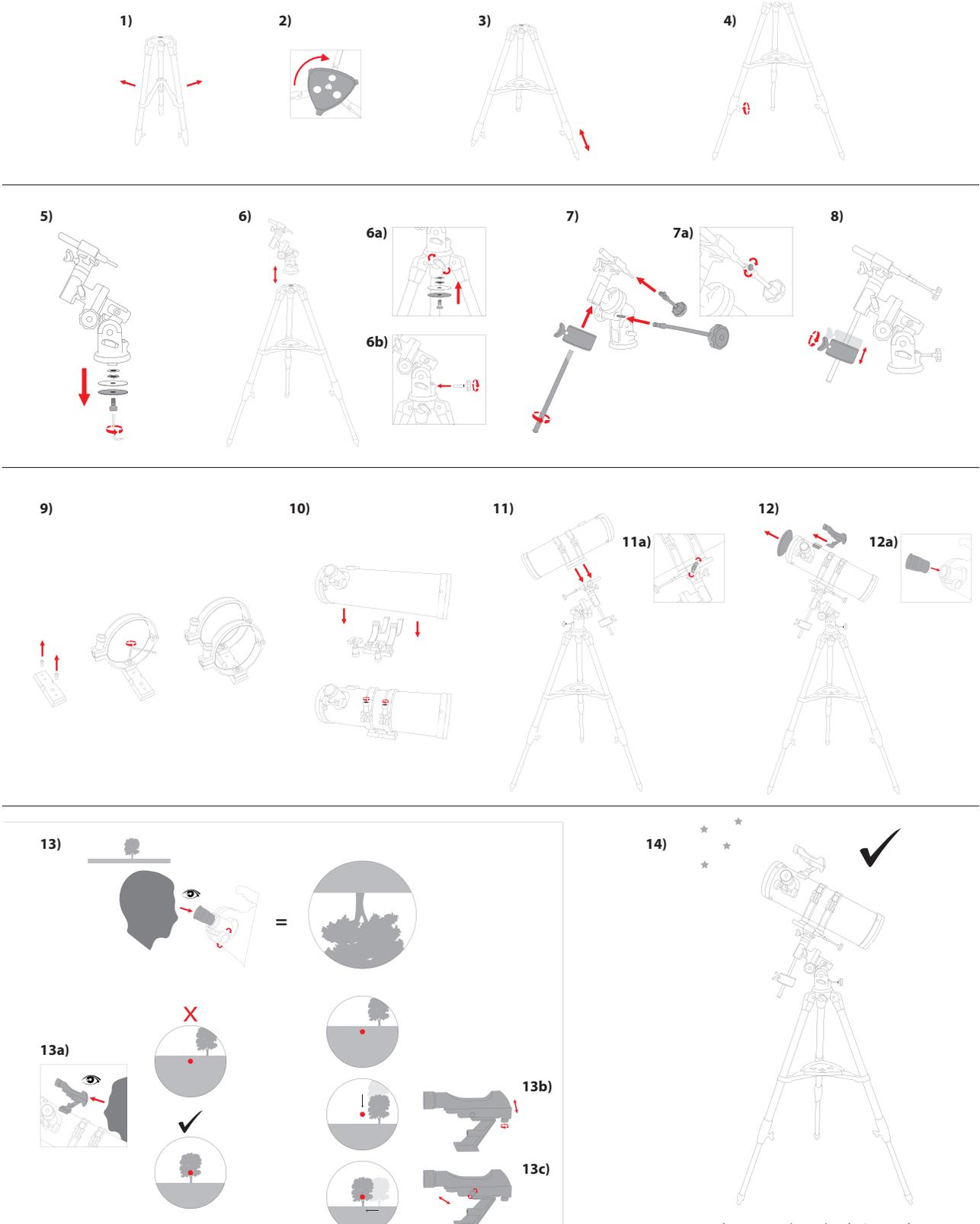
Please take the current legal regulations into account when disposing of your device.



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How to set up:



[www.exploreone.com/pages/product-manuals](http://www.exploreone.com/pages/product-manuals)



### List of parts:

Please check this list while unpacking your telescope to ensure all parts are present:

1. Objective lens
2. Tripod
3. Flexible shaft for right ascension adjustment
4. Flexible shaft for declination adjustment
5. Telescope
6. Red dot viewfinder
7. Plossl 26 mm & 9.7 mm
8. Focuser
9. Counterweight

### Technical data

Aperture: 114mm  
Focal length: 500m

### Magnifications

With 26 mm eyepiece: 19X  
With 9.7 mm eyepiece: 52X

### Hint:

**Don't forget to switch the red-dot viewfinder off after use!**

### Cleaning and maintenance

Your telescope should, like every optical instrument, be treated with care and stored dry. Doing so will maintain its optical performance for many years. After using the telescope, allow any moisture or dew that has accumulated to dry before storing the instrument inside the dust cover. The lenses can be cleaned with a soft brush, available at photography stores. Never use detergents, gasoline, or thinner to clean the optics!

The red-dot viewfinder is powered by a CR-2032 (3V) battery. If you need to replace the battery, remove the old battery by pressing the holding spring down. Make sure to insert the new battery positive-side down.



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**Possible objects for observation:**

The following section details several interesting and easy-to-find celestial objects you may want to observe through your telescope. The pictures at the end of the manual show what the objects will look like through your telescope's eyepiece.

**Terrestrial objects**

Take note of the examples below, including Mount Rushmore and the golf course. Start with the 26 mm eyepiece and focus until the image is clear. After mastering the 26 mm eyepiece, switch to the 9.7 mm eyepiece and practice scanning and focusing until the image is clear. Choose several terrestrial objects to practice focusing on, but never point your telescope at or near the sun, or you risk blindness.

**The Moon**

The moon is the Earth's only natural satellite.  
 Diameter: 3,476km  
 Distance from Earth: approx. 384,400 km (average)

The moon has been known to humans since prehistoric times. It is the second brightest object in the sky (after the sun). Because the moon circles the Earth once per month, the angle between the Earth, the moon and the sun is constantly changing; one sees this change in the phases of the moon. The time between two consecutive new moon phases is about 29.5 days (709 hours).

**Orion Nebula (M 42)**

M 42 in the Orion constellation  
 Right ascension: 05:35 (Hours: Minutes)  
 Declination: -5:22 (Degrees: Minutes)  
 Distance from Earth: 1,500 light years

Located about 1,500 light years from Earth, the Orion Nebula (Messier 42, abbreviation: M 42) is the brightest diffuse nebula in the sky – visible with the naked eye, and a worthwhile object for telescopes of all types and sizes, from the smallest field glass to the largest earthbound observatories and the Hubble Space Telescope.

When talking about Orion, we're actually referring to the main part of

a much larger cloud of hydrogen gas and dust, which spreads out over half of the Orion constellation. The expanse of this enormous cloud stretches several hundred light years.

**Ring Nebula (M 57)**

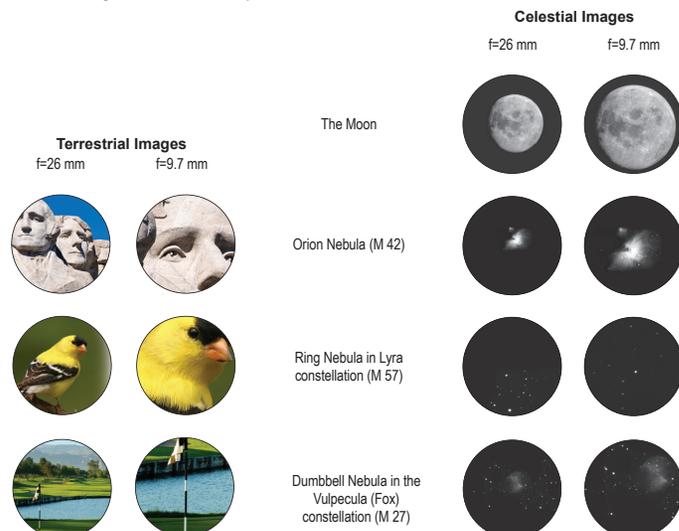
M 57 in the Lyra constellation  
 Right ascension: 18:53 (Hours: Minutes)  
 Declination: -33:02 (Degrees: Minutes)  
 Distance from Earth: 2,400 light years

The famous Ring Nebula M 57 in the constellation of Lyra is often viewed as the prototype of a planetary nebula; it is one of the magnificent features of the Northern Hemisphere's summer sky. Recent studies have shown that it is probably comprised of a ring (torus) of brightly shining material that surrounds the central star (only visible with larger telescopes), and not of a gas structure in the form of a sphere or an ellipsis. If you were to look at the Ring Nebula from the side, it would look like the Dumbbell Nebula (M27). When viewed from Earth, we are looking directly at the pole of the nebula.

**Dumbbell Nebula (M 27)**

M 27 in the Fox constellation  
 Right ascension: 19:59.6 (Hours: Minutes)  
 Declination: +22:43 (Degrees: Minutes)  
 Distance from Earth: 1,360 light years

The Dumbbell Nebula (M 27) in Fox was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new and fascinating class of objects. We see this nebula almost directly from its equatorial plane. If we could see the Dumbbell Nebula from one of its poles, we would see the shape of a ring, and we would see something very similar to what we know as the Ring Nebula (M 57). In reasonably good weather, we can see this object well even with low magnifications.



## Telescope ABC's

### What do the following terms mean?

#### Diagonal:

A mirror that deflects rays of light 90 degrees. With a horizontal telescope tube, this device deflects the light upwards so that you can comfortably observe by looking downwards into the eyepiece. The image in a diagonal mirror appears upright, but rotated around its vertical axis (mirror image).

#### Focal Length:

Everything that magnifies an object via an optic lens has a certain focal length (FL). The FL is the length of the path the light travels from the surface of the lens to its focal point. The focal point is also referred to as the focus. In focus, the image is clear. In a telescope, the FL of the telescope tube and the eyepieces are combined.

#### Lens:

The lens turns the light which falls on it around in such a way so that the light gives a clear image in the focal point after it has traveled a certain distance (focal length).

#### Eyepiece:

An eyepiece is a system made for your eye and comprised of one or more lenses. In an eyepiece, the clear image that is generated in the focal point of a lens is captured and magnified even more.

There is a simple formula for calculating the magnification:  
 $\text{focal length of the telescope tube} / \text{focal length of the eyepiece} = \text{magnification}$

In a telescope, the magnification depends on both the focal length of the telescope tube and the focal length of the eyepiece.

#### Magnification:

The magnification corresponds to the difference between observation with the naked eye and observation through a magnification apparatus such as a telescope. In this formula, observation with the eye is considered "single," or 1x magnification. Accordingly, if a telescope has a magnification of 30x, then an object viewed through the telescope will appear 30 times larger than it would with the naked eye.

#### Troubleshooting:

##### Problem:

##### Solution:

**No picture**

Remove dust protection cap and sun-shield from the objective opening.

**Blurred picture**

Adjust focus using focus ring.

**No focus possible**

Wait for temperature to balance out.

**Bad quality**

Never observe through a glass surface such as a window.

**Viewing object visible in the finder, but not through the telescope**

Align finder to telescope (see instructions).

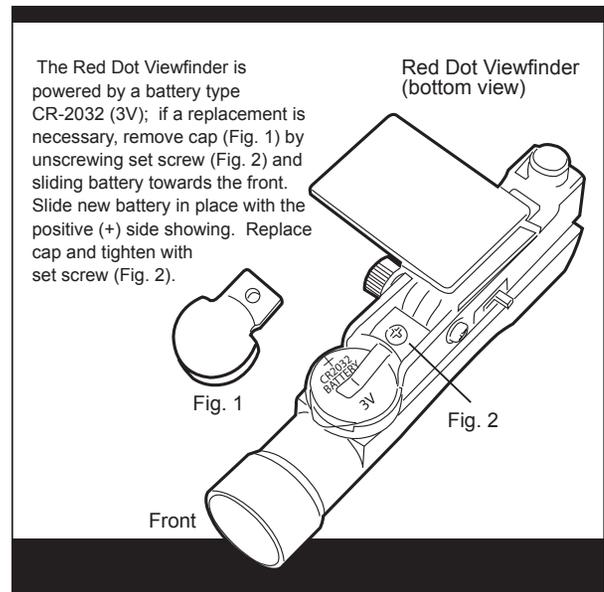
**Despite using star diagonal prism the picture is "crooked"**

The star diagonal prism should be vertical in the eyepiece connection.



#### DISPOSAL

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## Notes



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