NATIONAL GEOGRAPHIC™

40mm AZ Telescope Manual

Optical design	Achromatic refractor
Objective	40mm
Focal Length	400mm
Focuser	Rack And Pinion
Tripod	Table Top
Eyepieces	6mm and 20mm
Diagional	.965
Compass, Software and Star Chart	Included

NEVER look directly at the sun with this device!

AGE 10+

Visit our website: *nationalgeographic.com*

National Geographic's net proceeds support vital exploration, conservation, research, and education programs.

NATIONAL GEOGRAPHIC™

40mm AZ Telescope Manual

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 infiringe on their privacy.

Disposal
Dispose of the packaging material/s 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.

NATIONAL GEOGRAPHIC™

40mm AZ Telescope Manual

All Parts (Telescope)

1 Focus wheel
2 Diagonal mirror
3 Eyepieces (6 mm, 20 mm)
4 Telescope (Telescope tube)
5 Dew Shield
6 Objective lens
7 Locating screw for the vertical adjustment
(upward and downward motion)
8 Locating screw for the vertical axis
(for turning to the right and left)
9 Tripod legs

Your Telescope

Please look for a suitable location for your telescope before you begin. Use a stable surface e.g. a table.

Mount the Telescope to the Tripod with the locating screw for the vertical adjustment (7). Insert the eye piece into the diagonal mirror
(6 mm or 20 mm).

Azimuth mounting

Azimuth mounting just means that you can move your telescope up and down, left and right, without having to adjust the tripod.

Use the locating screw for the vertical fine adjustment (7) and the locating screw for the vertical axis (8) to locate and lock the position of an object. (to focus an object)

Which eyepiece is right?

First of all, it is important that you always choose an eyepiece with the highest focal width for the beginning of your observation. Afterwards, you can gradually move to eyepieces with smaller focal widths. The focal length is indicated in millimeters, and is written on each eyepiece. In general, the following is true: The larger the focal width of an eyepiece, the smaller the magnification! There is a simple formula for calculating the magnification:

Focal length of the telescope tube : Focal length of the eyepiece = magnification

You see: The magnification is also depends on the focal length of the telescope tube. This telescope contains a telescope tube with focal length of 360 mm. From this formula, we see that if you use an eyepiece with a focal width of 20 mm, you will get the following magnification:

400 mm / 20 mm = 20 x magnification

To make things simpler, I've put together a table with some magnifications:

Telescope tube focal width	Focal width of eyepiece	Magnification
400 mm	20 mm	20x
400 mm	6 mm	67x

Technical data:

- Design: achromatic
- Focal length: 400 mm
- Objective Diameter: 40 mm

Possible objects for observation:

We have compiled and explained a number of very interesting celestial bodies and star clusters for you but we suggest that you start practicing during the day focusing on terrestrial objects such as Birds and or Trees at varying distances from you. On the accompanying images at the end of the instruction manual, you can see how objects will appear in good viewing conditions through your telescope at varying powers (see pictoral examples below).

Terrestrial Views

Please note the example picture of Mount Rushmore. Start with the 20 mm eyepiece and focus until clear. After mastering the focus with the 20 mm change the 6 mm eyepiece and practice focusing and scanning until images become clear in the eyepiece. We have included some additional examples that are possible with your telescope such as a bird and a green on a golf course. **DO NOT POINT YOUR TELESCOPE DIRECTLY AT THE SUN OR BLINDNESS IS POSSIBLE.**

The Moon
The moon is the Earth's only natural satellite.
Diameter: 3.476 km
Distance: approx. 384 401 km

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: 05:32.9 (Hours: Minutes)
Declination: -05:25 (Degrees: Minutes)
Distance: 1.500 light years

With a distance of about 1500 light years, the Orion Nebula (Messier 42, abbreviation: M 42) is the brightest diffuse nebula in the sky – visible with the naked eye, and a rewarding object for telescopes in all 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 with over 10 degrees over the half of the Orion constellation. The expanse of this enormous cloud stretches several hundred light years.

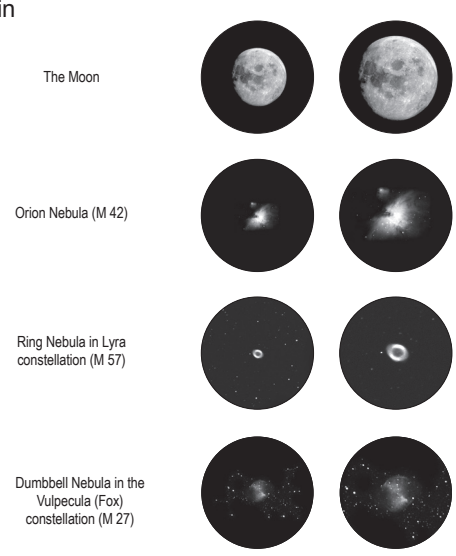
Ring Nebula in Lyra constellation (M 57)
M 57 in the Lyra constellation
Right ascension: 18:51.7 (Hours: Minutes)
Declination: -+32:58 (Degrees: Minutes)
Distance: 2.000 light years

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). With this object, we're looking directly at the pole of the nebula.

Dumbbell Nebula in the Vulpecula (Fox) constellation (M 27)
M 27 in the Fox constellation
Right ascension: 19:59.6 (Hours: Minutes)
Declination: -+22:43 (Angle: Minutes)
Distance: 1.250 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 object almost directly from its equatorial plane. If you could see the Dumbbell Nebula from one of the poles, it would probably reveal the shape of a ring, and we would see something very similar to what we know from the Ring Nebula (M 57). In reasonably good weather, we can see this object well even with small magnifications.

Terrestrial Images



NATIONAL GEOGRAPHIC™

40mm AZ Telescope Manual

Telescope ABC's

What do the following terms mean?

Diagonal:
A mirror that deflects the ray 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 the case of 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 still more.

There is a simple formula for calculating the magnification:
Focal length of the telescope tube / Focal length of the eyepiece = Magnification

You see: 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 (e.g. a telescope). In this scheme, 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. See also "Eyepiece."

Troubleshooting:

Mistakes:	**Help:**
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 picture	Never observe through a glass surface
Viewing object visible in the finder, but not through the telescope	Adjust finder
Despite using star diagonal prism the picture is "crooked"	The star diagonal prism should be vertical in the eyepiece connection

DISPOSAL
Dispose of the packaging materials properly, according to their type (paper, cardboard, etc). 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. You can get more information on the proper disposal from your local waste disposal service or environmental authority.

Customer Service Questions:

1-866-252-3811