

SUPPLIED WITH
**4MM AND
20MM
EYEPIECES**



WARNING! Do not view the sun through the telescope as this can cause serious damage to the eyes. To be used under the direct supervision of an adult.



Please retain the information on this manual for future reference.

Colour, designs and decorations may vary from those shown in the photographs.

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Discovery™

AGES
8+

EYEPIECES
PROVIDE
**18X AND
90X
MAGNIFICATION**



TELESCOPE
COMES WITH
**TABLE-TOP
TRIPOD**

VIEW THE
**NIGHT SKY,
LAND BASED
ANIMALS
AND
SCENIC VIEWS**
WITH THIS OPTICAL
TELESCOPE

Inspired by Discovery
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Item no. **TDK35**

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50mm Telescope
Instruction Manual

ALUMINIUM BODIED TELESCOPE, 360MM FOCAL LENGTH AND 50MM OBJECTIVE LENS

Components



Using Your Telescope

1. Carefully remove all parts from the cardboard cartons and lay them on a table or floor.
2. Stand the tripod vertically and spread the three legs fully apart, pressing down on the center of the tripod supports until they lock into place.
3. Place the telescope tube over the altazimuth mount. Lower the telescope tube onto the mount so that the plastic tongue on the mount slips into the bracket underneath the telescope tube. (Pic 1)
5. Tighten the azimuth lock knob on the tripod mount clockwise until it stops. The telescope is now securely attached to the tripod.
6. Loosen the small chrome screw on the side of the focus tube by turning it counterclockwise. Insert the end of the 45° prism into the focus tube so that the opposite open end is facing upward. Tighten the small chrome screw on the side of the focus tube to hold the 45° prism securely in position. (Pic 3)



4. One of the short bracket arms has a hexagonal shaped cutout around its opening. Insert the nut from the altitude lock knob into this cutout. Insert the altitude lock knob through the bracket and tongue as shown in Pic 2. Turn the altitude lock knob clockwise into this nut until it stops.



7. Loosen the small chrome screw located on the side of the 45° prism by turning it counterclockwise.
8. Insert the low power eyepiece marked "H20mm" into the 45° prism. It is recommended that you start viewing the moon and stars with the 20mm eyepiece because it gives you the widest angle with the brightest and sharpest views. Tighten the small chrome set screw by turning it clockwise to hold the eyepiece securely in place. (Pic 4)



The Altazimuth Mount

This telescope is fitted with an Altazimuth mount. Altitude (Alt) refers to the vertical, or “up and down” movement of the telescope, while azimuth refers to the horizontal, or “side-to side” movement.

About Magnification

The magnification power of a telescope indicates how much an image is enlarged or how big and close it appears to the viewer. The focal length of the eyepiece, combined with the focal length of the telescope, determine the magnification power. To calculate the power of your telescope with any particular eyepiece, simply divide the focal length of the telescope (360mm) by the focal length of the eyepiece (indicated in “mm” on the eyepiece collar).

Example $\frac{360\text{mm focal length (tube)}}{20\text{mm focal length eyepiece}} = 18\text{X magnification power}$

The two eyepieces included provide the following magnification:

20mm eyepiece = 18X
4mm eyepiece = 90X

The level of magnification required depends on the object being observed.

A lower magnification power with a wider field of view is good for observing galaxies and nebulae. Higher magnification powers should only be used for highly detailed observations of the moon, Jupiter, and Saturn, or any object that is extremely bright.

MODERN TELESCOPES LIKE NASA'S HUBBLE SPACE TELESCOPE PROVIDE EVIDENCE OF BILLIONS OF GALAXIES, EACH CONTAINING BILLIONS OF STARS LIKE OUR SUN.



TELESCOPES HAVE BEEN USED FOR HUNDREDS OF YEARS. IT WAS EARLY VERSIONS THAT SHOWED THAT EARTH WAS NOT THE CENTRE OF THE UNIVERSE, AS WAS PREVIOUSLY BELIEVED.

Helpful Hints

1. Take your telescope outside. Viewing objects through closed or open windows is not recommended. Your view can be distorted by reflections in the glass of a closed window or by air currents, of differing temperatures, passing through an open window.
2. Let your telescope adjust to the outside temperature. Your telescope will perform much better if the lenses and the air inside the tube are the same temperature as outside. It may take up to 30 minutes to equalize the temperatures when the difference in temperatures is extreme.
3. Find a location far from glaring light. If you live in an urban area, your viewing will probably improve the farther you move away from the city lights. The skyglow of a town or city can dramatically reduce the telescope's performance and viewing capabilities.

When possible, avoid sudden temperature changes, as the moisture in the air will condense on the objective lens. Should this occur after bringing your telescope inside, leave the lens cap off the objective lens, tilt the objective (front) lens face down, and wait until the telescope reaches room temperature.

With the 45° prism already attached and in place, we recommend starting your viewing with the low power 20mm eyepiece because it gives you the widest angle with the brightest and sharpest views. To adjust the angle of the telescope, loosen the azimuth lock knob by turning it counterclockwise. Adjust the telescope to the desired angle, then tighten the azimuth lock knob.

Care and cleaning of optics

Optical components of a telescope get dirty over time. Dirt or dust on a lens should be removed only with the utmost care. A considerable amount of dirt or dust would have to accumulate on the optical surface before your view would be compromised.

1. Keeping any dust caps on during storage and transport will reduce dust collection.
2. Condensation may collect on the optical surfaces when the telescope is not in use. Remove the dust caps and allow the moisture to evaporate naturally. Point the telescope downwards to minimize the accumulation of airborne dust.
3. Once all moisture has evaporated, replace the dust caps.
4. Filtered compressed air may be used to remove surface dust from lenses and mirrors. Remove the dust cap and the dew shield. Once removed, point the can away from the lens and gently expel some air and any condensation or dust that has accumulated on the discharge tube. Spray the lens or mirror with short bursts of air to carefully remove the dust particles.

DO NOT HOLD THE TRIGGER OF THE COMPRESSED AIR CAN FOR EXTENDED PERIODS BECAUSE PROPELLANT FROM THE CAN MIGHT ESCAPE AND DAMAGE THE OPTICAL SURFACE.

If, after several attempts, you cannot remove the particles, take the telescope to an optical professional for cleaning.

If you keep the dust caps on your telescope when it is not in use and avoid handling the lenses or mirrors, only minimal optical maintenance of your telescope should be required. Extensive cleaning is usually only necessary every few years.

What to look for in the sky

There is a whole universe of objects you could view at night, so where do you start? We recommend starting with the most prominent objects first.

The moon

The moon is the easiest target to find at night. When the moon is in full position, it bathes the night with a silvery light that washes the sky of all but the brightest objects. The best time to view the moon is not when it is full, but rather when it is less than half full. The dividing line between dark and light on the moon, called the terminator, shows the best detail in the craters and mountains.

The planets

The planets, our solar system companions, range in size from moon-size rocky bodies to giant gas balls, which could hold Earth 1000 times over. To find the planets, you will need information about their times of visibility. An astronomy magazine will give you the locations of the planets, as they change position from month to month. The Internet is also an excellent source of information, starcharts, maps, and more!



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The popular and more familiar constellations often provide the easiest landmarks to help find the planet's locations and paths of orbit. Most people have looked up at night and seen some of the planets without even realizing it. A planet appears like a bright star but does not twinkle like a star; it will look like a tiny ball. Venus, Mars, Jupiter, and Saturn, are the easiest planets to view. Mercury is dimmer, usually below the horizon, and is more challenging to find.

Each of the planets provides interesting views. Venus is covered with clouds so all that is visible is an extremely bright light, the brightest next to the moon. Venus, like the moon, goes through phases, however. As it travels around the sun, different areas of the planet's surface are illuminated, producing crescent shapes of varying size. Mars is the red planet. When it is above the horizon, it is noticeably red and stands out like a beacon in the night sky. The apparent brightness of Mars varies as the planet orbits around the sun and throughout its period of visibility, it will brighten and dim depending on how near or far it is from Earth.

THE BEST TIME TO LOOK AT THE MOON IS WHEN IT IS LESS THAN HALF FULL, BECAUSE THE DIVIDING LINE BETWEEN THE DARK AND LIGHT OF THE MOON (CALLED THE TERMINATOR) SHOWS THE **BEST DETAIL IN THE CRATERS AND MOUNTAINS.**

Jupiter is the largest planet in our solar system and the second brightest next to Venus. Jupiter has many moons, four of which are often visible through your telescope, when viewing conditions permit. As you watch them throughout the evening, you will see that they change position relative to each other and to Jupiter. It is possible with careful planning to actually see one of the moons disappear either in front of or behind Jupiter as it orbits around the planet.

Saturn, the second largest planet, is not as bright as Jupiter and so its moons are not as visible through small telescopes. The large rings that encircle Saturn are spectacular to observe, however. The planet and its rings appear pale yellow.

Frequently asked questions:

1. How far can I see?

If you stand outside and look up at the night sky on a clear evening, you can see hundreds of stars with the unaided eye. The telescope is a light-gathering instrument which magnifies the view—providing significantly more detail and unveiling more stars, nebulae, and celestial objects. With the aid of a telescope, you will be able to enjoy exciting views of Saturn's rings, Jupiter's major moons, the Orion Nebula, and much more.

2. Why can't I see anything?

If you see only gray or black when looking through your telescope, even after searching for an object to view, it is very likely that you are using an eyepiece that is too powerful. To solve this problem: Always start with the lowest power eyepiece first, and only insert the higher power eyepiece after you have found an object. Also, be sure to remove the dust cap from the lens.

3. When I use my high power eyepiece, everything looks much darker. Why?

As magnification in a telescope increases, brightness diminishes. Conversely, brightness increases when magnification is reduced. If an image appears too dark or unclear, use a lower-powered eyepiece. Views of small, bright objects are better than those of large, dark or blurry ones! Atmospheric conditions, air currents, as well as light and air pollution also affect viewing quality.

4. As I look through my telescope, objects in the sky appear to move. Why is that?

The constant rotation of the earth makes things appear to move. Lower-power eyepieces will reduce this effect of movement considerably and allow you to observe an object for a longer duration before you have to readjust your telescope.