TS1010

ElectroTech Instruments

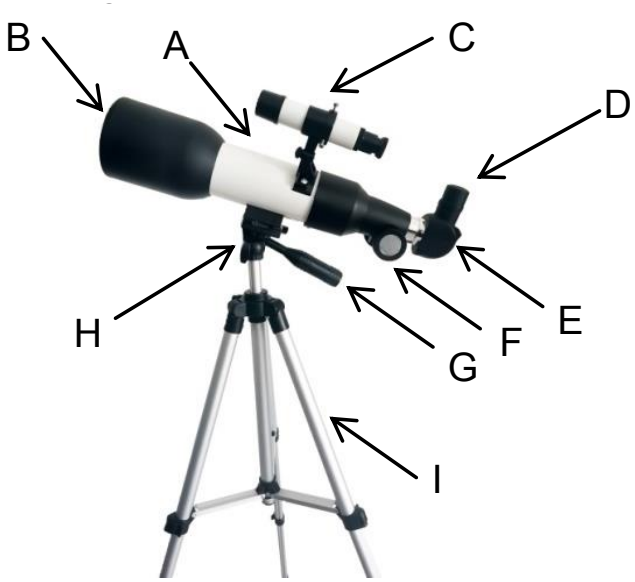
Refraction Telescope

60mm Lens Aperture, 360mm Focal Length

OWNER'S MANUAL

ElectroTech Instruments

Parts of your **TS1010** Telescope



A. Telescope Tube	**F. Focus Knob**
B. Objective Lens	**G. Horizontal Motion Lock**
C. Finder Scope	**H. Mount Lock Knob**
D. Eyepiece	**I. Tripod Legs**
E. Diagonal Mirror	

Because of our ongoing program of product improvement some colours, features, or contents shown in this manual may differ slightly from the actual product.

WARNING!

NEVER aim your telescope at the sun or even close to the sun!
Instant and irreversible damage can occur,
including blindness!

Do not let young children use any telescope without adult supervision.

WARNING!
CHOKING HAZARD
Small parts, Not suitable for children under 3 years.

Introduction

Congratulations on your purchase of a precision-crafted telescope. With proper care and handling of your telescope, you will enjoy the pleasure of looking at nature's wondrous sights through the eye of this instrument for many years.

The TS1010 has been designed to provide views of the moon's craters, Jupiter's major moons, and Saturn's rings, in addition to dozens of galaxies, star clusters, and nebulae.

As a terrestrial (land)telescope, the TS1010 delivers great views of mountains, valleys, and many other features of the world around us. You can also use the TS1010 to study animals and landscapes at a distance. To obtain the best performance from your telescope, please read this manual carefully and completely.

Assembly

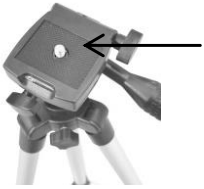
1) Carefully remove all parts from the cardboard cartons and lay them on a table or on the floor in order to take an inventory of all the pieces. Keep your box for storage or in case you ever need to ship your telescope.

2) Spread the three legs of the tabletop tripod apart until they lock into place.

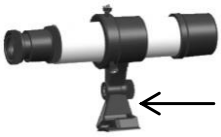
3) Attach the telescope to the tripod by inserting the ¼" x 20 bolt on the top of the tripod into the threaded hole on the underside of the telescope tube. Tighten this bolt by turning the knurled plastic knob on the tripod(see Fig.1).

4) Remove the screw, install the star finder as shown in the figure, and lock the screw(see Fig.2).

5) Install one of the two lenses included (F=6mm and F=20mm) into the focus tube and secure it by tightening the screw. Make sure not to over tighten it. For easy viewing, you can first install the Diagonal Periscope Viewer into the Focus Tube (see Fig.3).

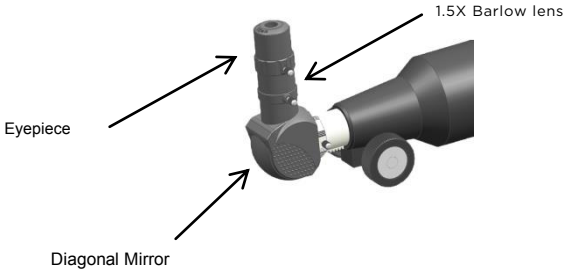


(Fig.1)



(Fig.2)

(Fig.3)



(Fig. 4)

6) 1.5X Barlow lens is supplied to triple the basic magnifying power provided by an eyepiece. In viewing situations where very high magnifying powers are desired, insert the 1.5X Barlow lens between the eyepiece (See Fig. 4).

The Altazimuth Mount

The TS1010 telescope is fitted with an altazimuth mount. "Alt" refers to altitude, the vertical movement of the telescope, while "azimuth" refers to the horizontal 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, determines the magnification power. To calculate the power of your telescope with any particular eyepiece, simply divide the focal length of the telescope (360 mm) by the focal length of the eyepiece (indicated in "mm" on the eyepiece collar).

EXAMPLE: $\frac{\text{360mm Focal Length (tube)}}{\text{20mm Focal Length (eyepiece)}}$ = 18X Magnification Power

The 1.5X Barlow lens and interchangeable eyepieces provide the following magnification values:

EYEPIECE	POWER	POWER WITH 1.5X BARLOW LENS
20mm	18X	27X
6mm	60X	90X

The level of magnification required depends on the object being observed. Optimal performance is obtained if the magnification is typically not more than approximately 20X for every 10 mm of objective lens diameter. Magnification of around 100X or less is ideal for a telescope with a 50-mm diameter objective lens and is best for observing most celestial objects. A lower magnification power and a wider field of view are advisable for the observation of galaxies and nebulae. The highest magnification power should be used for highly detailed observations of the moon, Jupiter, Satum, or any object that is quite bright.

Finder Scope Alignment

Since a telescope has a narrow field of view by design, it can be challenging to locate a particular star or planet. For this reason the telescope is fitted with a low-power, wide- field miniature telescope called a finder scope. Always use your finder scope to locate the object you want to view FIRST

The finder scope should be aligned with the
main telescope tube before you begin using the telescope, in order that both scopes are positioned to always provide exactly the same angle and view.

Note: Objects in the finder scope are upside down. This is normal and is common to all astronomical telescopes.

Complete the following settings in daylight:

1) Insert the 20-mm eyepiece into the diagonal mirror. Look at an easily recognizable, stationary object that is at least 300 feet away. Bring the image into focus.

2) Firmly tighten the tilt and pan arm so that the finder scope is locked in position.

3) Look through the finder scope. If the object is not visible or centered in the finder scope, simply release one of the three small adjusting screws holding the finder scope and reposition the finder scope until the object is centered within the X-shaped crosshairs.

4) All screws should be completely tightened as soon as the view through the finder scope coincides with the view of the main telescope.

5) You may need to repeat this procedure to ensure a perfect alignment.

Using Your Telescope for Terrestrial Viewing

You'll notice that when you look at the main body of the ground on land or in water, the images are the same up and down, upside down, left and right, which is a normal phenomenonof telescopes.

Using Your Telescope for Astronomical Viewing

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 temperature of the lenses and the air inside the tube are the same as the outside temperature. 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 sky glow of a town or city can dramatically reduce the telescope's performance and viewing capabilities.

4) Remove the objective cover from the front of your telescope.

5) We recommend starting your viewing with the 20-mm eyepiece because it gives you the widest angle and brightest, sharpest views. To adjust the angle of the telescope, loosen the altitude locking knob by turning it counterclockwise. Then loosen the tilt and pan arm by turning it counterclockwise. You can then hold the tilt and pan arm and aim the telescope in the desired direction. Then tighten the altazimuth locking knob and the tilt and pan arm.

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 facedown, and allow the telescope to reach room temperature.

Care and Cleaning of Optics

Optical components of a telescope get dirty over time. Dirt or dust on a lens should be removed 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 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, downward 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 SPRAY COMPRESSED AIR DIRECTLY ONTO THE OPTICS FOR EXTENDED PERIODS. PROPELLANT MAY ENTER THE TELESCOPE AND DAMAGE THE OPTICS

SPRAY ACROSS THE SURFACE AT AN ANGLE ONLY!

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 at in the Night 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 full, 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 and substance from moon-size rocky bodies to giant gas balls, which could hold Earth 1,000 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, offering star charts, maps, and more!
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 the sky at night and seen some of the planets without even realizing it. A planet looks like a bright star but does not twinkle like a star does; it looks like a tiny ball. Venus, Mars, Jupiter, and Saturn are the easiest planets to view.
Mercury is dimmer, usually below the horizon, and 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. However, Venus, like the moon, goes through phases. As it travels around the sun, different areas of its surface are illuminated, producing crescent shapes of varying sizes. 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 look brighter or dimmer depending on its distance from Earth.
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. Another great feature of Jupiter is its cloud belt. Jupiter is alive with weather activity and its clouds have formed over time into belts.
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.
Beyond our solar system there are many more objects to be found. Galaxies, nebulae, and star clusters abound!

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 without the aid of your telescope. The telescope is a light-gathering instrument that 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 through my telescope

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 located an object.

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 superior to 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.

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