INSTRUCTION MANUAL

FunScope

76mm TableTop Reflector Telescope

#10033

ORION
TELESCOPES & BINOCULARS
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Congratulations on your purchase of the Orion FunScope telescope. Your new FunScope is easy to use and arrives from the factory almost fully assembled! Only the finder scope and eyepieces need to be installed. If you have never owned a telescope before, we would like to welcome you to amateur astronomy. Take some time to familiarize yourself with the night sky. Learn to recognize the patterns of stars in the major constellations. With a little practice, a little patience, and a reasonably dark sky away from city lights, you'll find your telescope to be a never-ending source of wonder, exploration, and relaxation.

These instructions will help you set up and use your FunScope telescope. Please read them thoroughly before getting started. Please save all original packaging. This will help protect your FunScope if you wish to transport it or in the unlikely event to need to return it for repair.

Warning: Never look directly at the Sun through your telescope—even for an instant—without a professionally made solar filter that completely covers the front of the instrument, or permanent eye damage could result. Young children should use this telescope only with adult supervision.

. Included items

Remove and identify all included items, using the list below for reference.

- FunScope telescope with base
- Red dot finder scope
- 20mm Kellner eyepiece
- 6mm Kellner eyepiece
- 2x Barlow lens
- MoonMap 260

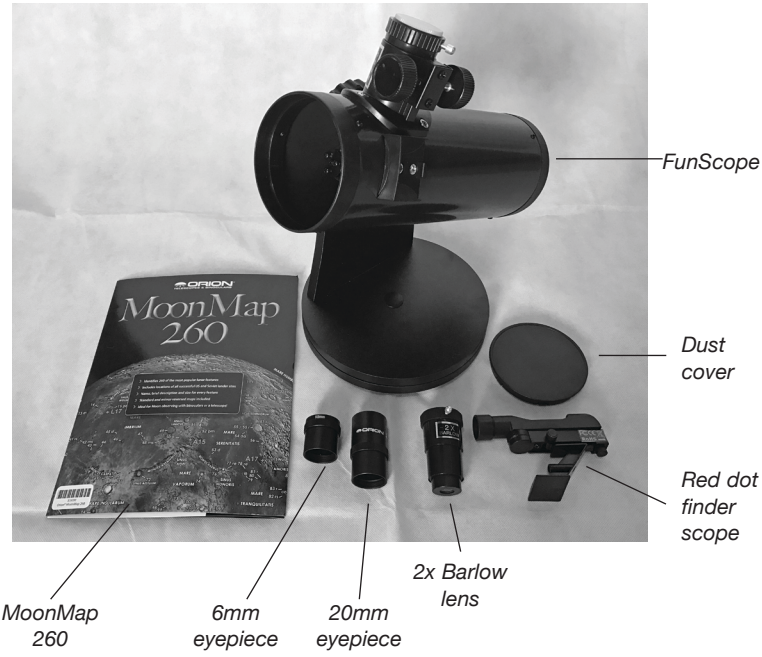

Figure 1. *Items included with the FunScope.*

2. Getting familiar with the FunScope's features

1. Optical tube - This is the main component of the telescope. It houses the 76mm-diameter *primary mirror* at the bottom end and a small *secondary mirror* at the front end, which deflects light out the side of the optical tube through the focuser (2).
2. Focuser - This is where the eyepiece (5) is inserted, and how sharpness is adjusted.
3. Focus wheels - The focus wheels are used to bring objects into focus. By turning them you move the rack-and-pinion focuser (4) in and out until sharp focus is achieved.
4. Eyepiece securing thumbscrew - Used to keep the eyepiece (5) secure in the focuser (2).
5. 20mm eyepiece - The eyepiece is the part of the telescope that you look into to see things. It magnifies the image. Its magnifying power is determined by

the focal length of both the eyepiece and the telescope. Magnification is discussed in more detail in the *Using Your Telescope* section. The FunScope comes with two eyepieces: one has a focal length of 20mm for low-power views, and the other has a focal length of 6mm for higher-power views.

6. Red dot finder scope - A non-magnifying sighting device that is used to locate celestial objects and "aim" the telescope. It superimposes a tiny LED red dot on the sky (it is not a laser!), showing exactly where the telescope is pointed.
7. Finder scope base - The finder scope base is attached to the main telescope. To attach the red dot finder scope to the telescope you simply slide the bracket of the finder scope into the base.

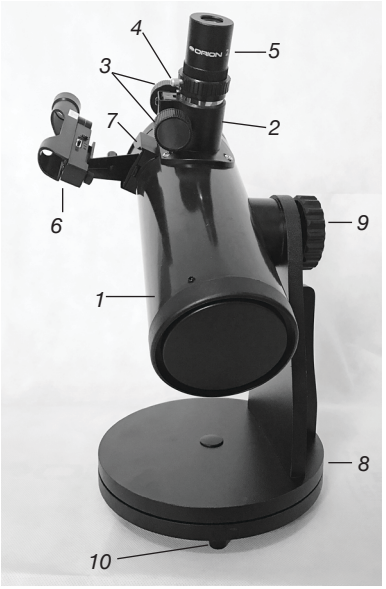

Figure 2. *Key parts of the FunScope.*

8. Altazimuth base - The base provides a stable mounting for the telescope. Made of wood composite material finished with a water-resistant laminate, it allows you to easily move the telescope in altitude (up/down) and azimuth (left/right).
9. Altitude tension knob - This knob couples the optical tube to the vertical strut of the altazimuth base. It allows you to adjust the amount tension in the altitude (up/down) motion of the telescope to the desired level.
10. Feet - Three feet provide stability and ground clearance for the FunScope. They have skid-free rubber grip pads on the underside.

***The following items are also included and are shown in* Figure 1.**

• ***Dust cover*** *- As its name suggests, the dust cover keeps the internal optics of the telescope free of dust and other particulate matter when the telescope is not in use.*

• ***6mm eyepiece*** *– Used for higher-magnification (50x) viewing.*

• ***2x Barlow lens*** *- Doubles the magnifying power of any eyepiece it is used in combination with.*

• ***MoonMap 260*** *- With over 260 identified craters, mountains, valleys, "seas" and more, this laminated map can be used to plan what to look at on the Moon,*

and to learn the official names of all the interesting lunar landscape features you see with the FunScope.

3. Getting started

Setup

Your FunScope arrives assembled from the factory; you just need to install the visual accessories. These will be found in a box within the main box.

1. Attach the red dot finder scope (6) to the optical tube (1) by inserting the finder scope's bracket into the finder scope base (7), as shown in Figure 3, until it clicks. (To remove the finder scope, press the small tab at the back of the base and slide the bracket out.)
2. Now you will insert an eyepiece (5) into the focuser. We recommend starting with the 20mm eyepiece, which provides lower power and a wider field of view than the 6mm eyepiece. Loosen the eyepiece securing thumbscrew (4), then insert the chrome barrel of the 20mm eyepiece into the focuser (2) and secure it with the thumbscrew.

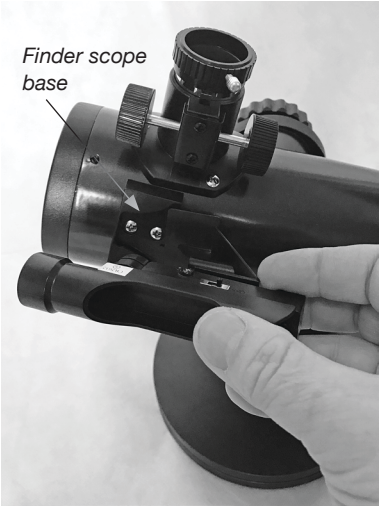

Figure 3. *Attaching the red dot scope to the telescope.*

It's best to get a feel for the basic functions of the FunScope during the day, before observing astronomical objects at night. This way you won't have to orient yourself in the dark! Find a spot outdoors where you'll have plenty of room to move the telescope, and where you'll have a clear view of some object or vista that is at least 1/4 mile away. It is not critical that the telescope be exactly level, but it should be placed on a relatively flat surface to ensure smooth movement.

The FunScope was designed specifically for visual observation of astronomical objects in the night sky. Like all Newtonian reflector telescopes, it is not suited for daytime terrestrial usage because the image in the eyepiece is rotated (upside-down).

One of the great assets of the FunScope is its extremely portable size. Due to its overall short height, you will find that viewing while sitting next to the telescope is the most comfortable. If you wish to raise the telescope off the ground so that it can be used while standing or sitting in a chair, then a platform such as a milk crate or table can be used.

Altitude and Azimuth (Aiming the Telescope)

The FunScope altazimuth base (8) permits motion along two axes: altitude (up/down) and azimuth (left/right) (**Figure 4**). Moving the telescope up/down and right/left is the "natural" way people search for objects; which makes pointing the telescope intuitive and easy.

Simply grasp the front of the optical tube and move the telescope left or right so that the base rotates. Move the optical tube up or down in the same manner. Both motions can be made simultaneously and in a continuous manner for easy aiming. This way you can point to any position in the night sky, from horizon to horizon. If the base tips when you are moving the telescope, just place your other hand on the base to stabilize it. You may also want to loosen the altitude tension knob (9) a little.

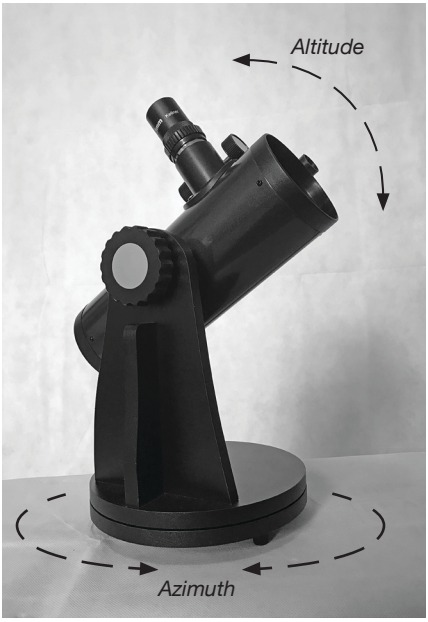

Figure 4. *The FunScope has two axes of motion: altitude (up/down) and azimuth (left/right).*

Focusing the Telescope

With the 20mm eyepiece (5) inserted into the focuser (2) and secured with the thumbscrew (4), aim the optical tube (3) so the front (open) end is pointing in the general direction of an object at least 1/4-mile away. With your fingers, slowly rotate one of the focus wheels (3) until the object comes into sharp focus. Go a little bit beyond sharp focus until the image starts to blur again, then reverse the rotation of the knob gradually, until you've nailed the exact focus point.

Aligning and Using the Red Dot Finder Scope

The included red dot finder scope (6) (**Figure 5**) makes pointing your telescope almost as easy as pointing your finger! It permits easy object targeting prior to observation in the higher-power main telescope.

Before you can use the red dot finder scope, you must remove the small plastic tab sticking out from the battery compartment (**Figure 5**). Doing so will allow the pre-installed 3V CR-2032 button cell battery to make contact with the finder scope's electronic circuitry to power the finder's red LED illuminator. The tab can then be discarded.

To use the red dot finder scope properly, it must be aligned with the main tele-

scope. This is easiest to do during daylight hours, before observing at night. Follow this procedure:

1. First, remove the dust cover from the front of the telescope.
2. With the 20mm eyepiece already installed from step 2 above, point the telescope at a well-defined land target (e.g., the top of a telephone pole) that's at least a quarter mile away.
3. Center the target in the eyepiece.

Note: The image in the eyepiece will appear rotated (upside down). This is normal for reflector telescopes.

4. Turn on the red dot finder scope by sliding the power switch to ON (refer to **Figure 5**). The "1" position provides dim illumination while the "2" position provides brighter illumination. Typically the dimmer setting is used under dark skies and the brighter setting is used under light-polluted skies or in daylight. Position your eye at a comfortable distance from the rear of the unit. Look through the rear of the finder scope with both eyes open to see the illuminated red dot. The target object should appear in the field of view

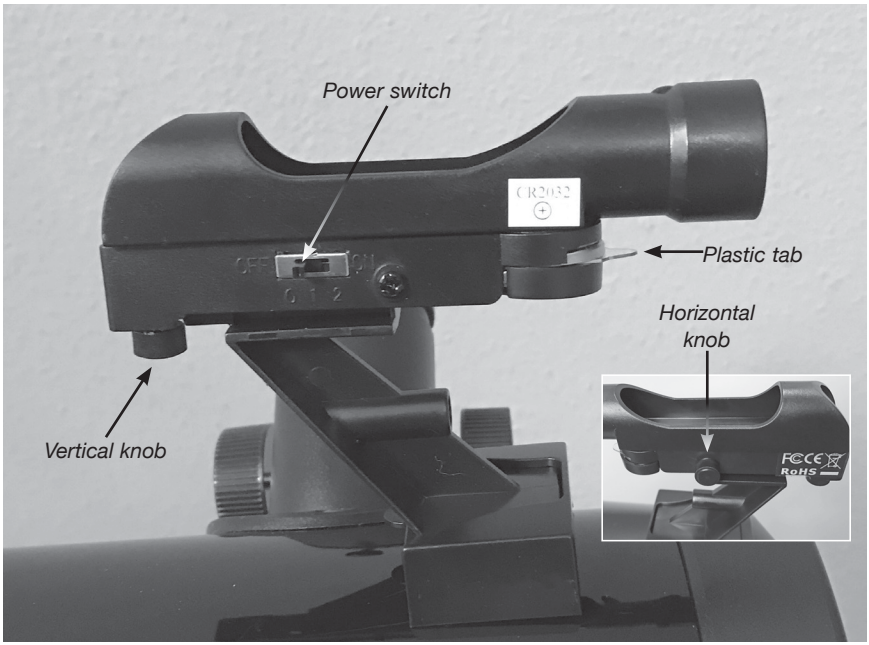

Figure 5: *The red dot finder scope has vertical and (inset) horizontal adjustment knobs for aligning it with the telescope.*

somewhere near the red dot.

5. You'll want to center the target object on the red dot. *Without moving the telescope*, use the finder scope's vertical and horizontal adjustment knobs (shown in **Figure 5**) to position the red dot on the object.
6. When the red dot is centered on the distant object, check to make sure the object is still centered in the telescope's eyepiece. If it isn't, re-center it then adjust the finder scope's alignment again. When the object is centered in the telescope eyepiece and on the finder scope's red dot, the finder scope is properly aligned with the telescope. The red dot finder scope's alignment should be checked before every observing session.

At the end of your observing session, be sure to slide the power switch to OFF to preserve battery life.

4. Using your telescope

Choosing an Observing Site

When selecting a location for observing, get as far away as possible from direct artificial light such as street lights, porch lights, and automobile headlights. The glare from these lights will greatly impair your dark-adapted night vision. Avoid viewing over rooftops and chimneys, as they often have warm air currents rising from them. Similarly, avoid observing from indoors through an open (or closed) window, because the temperature difference between the indoor and outdoor air will cause image blurring and distortion.

If at all possible, escape the light-polluted city sky and head for darker country skies. You'll be amazed at how many more stars and deep-sky objects are visible in a dark sky!

Cooling the Telescope

All optical instruments need time to reach "thermal equilibrium." The bigger the instrument and the larger the temperature change, the more time is needed. Allow at least 20 minutes for your telescope to acclimate to the temperature outdoors before you start observing with it.

Let Your Eyes Dark-Adapt

Don't expect to go from a lighted house into the darkness of the outdoors at night and immediately see faint nebulas, galaxies, and star clusters—or even very many stars, for that matter. Your eyes take about 30 minutes to reach perhaps 80% of their full dark-adapted sensitivity. As your eyes become dark-adapted, more stars will glimmer into view and you'll be able to see fainter details in objects you view in your telescope.

To see what you're doing in the darkness, use a red-filtered flashlight rather than a white light. Red light does not spoil your eyes' dark adaptation like white light

does. A flashlight with a red LED light is ideal. Beware, too, that nearby porch, streetlights, and car headlights will ruin your night vision.

"Seeing" and Transparency

Atmospheric conditions vary significantly from night to night. "Seeing" refers to the steadiness of the Earth's atmosphere at a given time. In conditions of poor seeing, atmospheric turbulence causes objects viewed through the telescope to "boil." If you look up at the sky and stars are twinkling noticeably, the seeing is poor and you will be limited to viewing at lower magnifications. At higher magnifications, images will not focus clearly. Fine details on the planets and Moon will likely not be visible.

In conditions of good seeing, star twinkling is minimal and images appear steady in the eyepiece. Seeing is best overhead, worst at the horizon. Also, seeing generally gets better after midnight, when much of the heat absorbed by the Earth during the day has radiated off into space.

Especially important for observing faint objects is good "transparency"—air free of moisture, smoke, and dust. All tend to scatter light, which reduces an object's brightness. Transparency is judged by the magnitude of the faintest stars you can see with the unaided eye (5th or 6th magnitude is desirable).

Tracking Celestial Objects

The Earth is constantly rotating about its polar axis, completing one full rotation every 24 hours; this is what defines a "day". We do not feel the Earth rotating, but we see it at night from the apparent movement of stars from east to west. When you observe any astronomical object, you are watching a moving target. This means the telescope's position must be continuously adjusted over time to keep an object in the field of view. This is easy to do with the FunScope because of its smooth motions on both axes. As the object moves off towards the edge of the field of view, just lightly nudge the telescope tube to re-center it. Objects appear to move across the field of view faster at higher magnifications. This is because the field of view becomes narrower.

Eyepiece Selection

By using eyepieces of different focal lengths, it is possible to attain many magnifications or powers with the FunScope. Your telescope comes with two 1.25" eyepieces: a 20mm, which gives a magnification of 15x, and a 6mm, which provides 50x magnification. Other 1.25" eyepieces can be purchased to achieve higher or lower powers. It is quite common for an observer to own five or more eyepieces to access a wide range of magnifications. To calculate the magnification of a telescope-eyepiece combination, simply divide the focal length of the telescope by the focal length of the eyepiece.

$$\frac{\text{Telescope Focal Length (mm)}}{\text{Eyepiece Focal Length (mm)}} = \text{Magnification}$$

For example, the FunScope, which has a focal length of 300mm, used in combination with the 20mm eyepiece, yields a magnification of:

$$\frac{300\text{mm}}{20\text{mm}} = 15\text{x}$$

Whatever you choose to view, always start by inserting your lowest-power (longest focal length) eyepiece to locate and center the object. Low magnification yields a wide field of view, which shows a larger area of sky in the eyepiece. This makes finding and centering an object much easier. Trying to find and center objects with a high power (narrow field of view) eyepiece is like trying to find a needle in a haystack! Once you've centered the object in the eyepiece, you can switch to a higher magnification (shorter focal length) eyepiece, if you wish. This is recommended for small and bright objects, like planets and double stars. The Moon also takes higher magnifications well.

The best rule of thumb with eyepiece selection is to start with a low power, wide-field eyepiece, and then work your way up in magnification. If the object looks better, try an even higher magnification eyepiece. (You can purchase additional 1.25" eyepieces, if desired.) If the object looks worse, then back off the magnification a little by using a lower-power eyepiece.

Magnification Limits

Every telescope has a useful magnification limit of about 2x per millimeter of aperture. This comes to 152x for the FunScope. Some telescope manufacturers will use misleading claims of excess magnification, such as "See distant galaxies at 640X!" While such magnifications are technically possible, the actual image at that magnification would be an indistinct blur. Moderate magnifications are what give the best views. It is better to view a small, but bright and detailed image than a dim, unclear, over-magnified image.

Using the 2x Barlow Lens

The included 2x power-boosting "Barlow" lens (see **Figure 1**) doubles the magnifying power of any 1.25" eyepiece it is used with. For the FunScope, when you use the 20mm eyepiece by itself you get a magnification of 15x. But when the 20mm eyepiece is used in combination with the Barlow lens, the magnification is doubled to 30x. And when the Barlow is used with the 6mm eyepiece, it yields a magnification of 100x, instead of 50x without the Barlow.

Simply insert the Barlow lens into your telescope's focuser, and then insert the eyepiece into the Barlow, gently securing it in place with the thumbscrew on the Barlow lens (**Figure 6**). Then, adjust the telescope's focus wheels to enjoy double the magnification of the eyepiece used.

Using the MoonMap 260

The MoonMap 260 is a great observing aid to use when viewing the Moon with your FunScope. With it you will be able to identify a myriad of lunar features. Because the view in the FunScope is upside down, you may find it useful to rotate the MoonMap so the image on the map matches what you see in the telescope. Concentrate each evening on the "terminator", where the illuminated portion of the lunar surface meets the dark portion. Due to the low angle at which sunlight strikes this portion of the moon, shadows cast by crater walls and other high-elevation features are elongated, thereby making such features stand out more vividly. Using a red flashlight (sold separately) to read the MoonMap in the dark will be helpful; the red light will not spoil your eyes' dark adaptation.

Figure 6. *The 2x Barlow lens is inserted in the focuser, then an eyepiece is inserted into the Barlow, as shown. The Barlow lens double the magnification of any eyepiece used.*

What to Expect

So what will you see with your FunScope? You should be able to see bands on Jupiter, the rings of Saturn, myriad craters on the Moon, and many bright deep-sky nebulas and star clusters. Do not expect to see color as you do in astrophotographs, since those are taken with long-exposure cameras that can record faint color. Our eyes are not sensitive enough to see color in faint deep-sky objects except in a few of the brightest ones. Remember that you are seeing these objects using your own telescope with your own eyes! The object you see in your eyepiece is in real-time, and not some conveniently provided image from an expensive space probe or astrophotography rig. And if you take the initiative to learn a little about what you are looking at, that will greatly enhance your observing experience.

Objects to Observe

A. The Moon

With its rocky surface, the Moon is one of the easiest and most interesting targets to view with your telescope. Lunar craters, marias, and even mountain ranges can all be clearly seen from a distance of 238,000 miles away! With its ever-changing phases, you'll get a different view of the Moon every night. The best time to observe our one and only natural satellite is during a partial phase, that is, when the Moon is NOT full. During partial phases, shadows are cast on the surface, which reveal more detail, especially right along the border between the dark and light portions of the disk (called the "terminator"). A full Moon is

too bright and devoid of surface shadows to yield a pleasing view. Make sure to observe the Moon when it is well above the horizon to get the sharpest images. Use an optional Moon filter to dim the Moon when it is very bright (see Useful Accessories section below). It simply threads onto the bottom of the eyepieces (you must first remove the eyepiece from the focuser to attach a filter). You'll find that the Moon filter improves viewing comfort, and also helps to bring out subtle features on the lunar surface.

B. The Sun

Never point the unfiltered FunScope at the Sun — this is not only dangerous to your eyes, but it will damage the FunScope.

Warning: Do not look at the Sun with any optical instrument without a professionally made solar filter, or permanent eye damage could result

You can change your nighttime telescope into a daytime Sun viewer by installing an optional full-aperture solar filter over the front opening of the FunScope. The primary attraction is sunspots, which change shape, appearance, and location daily. Sunspots are directly related to magnetic activity in the Sun. Many observers like to make drawings of sunspots to monitor how the Sun is changing from day to day.

C. The Planets

The planets don't stay put like the stars, so to find them you should refer to the Monthly Star Charts in the Community page of the Orion website (telescope.com), or to charts published monthly in Astronomy, Sky & Telescope, or other astronomy magazines. Venus, Jupiter, and Saturn are the brightest objects in the sky after the Sun and the Moon. Your FunScope is capable of showing you these planets in some detail. Other planets may be visible but will likely appear star-like. Because planets are quite small in apparent size, you'll need relatively high power for detailed observations. Use the power-boosting 2x Barlow lens included with your telescope! Note that not all the planets are generally visible at any one time.

JUPITER: The largest planet, Jupiter, is a great subject for observation. You can see the disk of the giant planet and watch the ever-changing positions of its four largest moons – Io, Callisto, Europa, and Ganymede.

SATURN: The ringed planet is a breathtaking sight when it is well positioned. The tilt angle of the rings varies over a period of many years; sometimes they are seen edge-on, while at other times they are broadside and look like giant "ears" on each side of Saturn's disk. A steady atmosphere (good seeing) is necessary for a good view. You may see a bright "star" close by, which is really Saturn's brightest moon, Titan.

VENUS: At its brightest, Venus is the most luminous object in the sky, excluding the Sun and the Moon. It is so bright that sometimes it is visible to the naked eye during full daylight! Ironically, Venus appears as a thin crescent, not a full disk, when at its peak brightness. Because it is so close to the Sun,

it never wanders too far from the morning or evening horizon. No surface markings can be seen on Venus, which is always shrouded in dense clouds.

D. The Stars

Stars will appear like twinkling points of light. Even powerful telescopes cannot magnify stars to appear as more than a point of light. You can, however, enjoy the different colors of the stars and locate many pretty double and multiple stars. The gorgeous two-color double star Albireo in the constellation Cygnus is a favorite. Defocusing a star slightly can help bring out its color.

E. Deep-Sky Objects

Under dark skies, you can observe a wealth of fascinating deep-sky objects, including gaseous nebulas, open and globular star clusters, and different types of galaxies. Most deep-sky objects are very faint, so it is important you find an observing site well away from light pollution.

To find deep-sky objects with your telescope, you first need to become reasonably familiar with the night sky. Unless you know how to recognize the constellation Orion, for instance, you won't have much luck locating the Orion Nebula. A simple planisphere, or star wheel, can be a valuable tool for learning the constellations and seeing which ones are visible in the sky on a given night (see Useful Accessories section below). Once you have identified a few constellations, a good star chart, atlas, or astronomy app will come in handy for helping locate interesting deep-sky objects to view within the constellations.

5. Telescope care and maintenance

If you give your telescope reasonable care, it will last a lifetime. Store it in a clean, dry, dust-free place, safe from rapid changes in temperature and humidity. Do not store the telescope outdoors, although storage in a garage or shed is OK. Small components like eyepieces and other accessories should be kept in a protective box or storage case. Keep the dust cover on the front of the telescope when it is not in use.

Your FunScope telescope requires very little mechanical maintenance. The optical tube has a smooth painted finish that is fairly scratch-resistant. If a scratch does appear on the tube, it will not harm the telescope. If you wish, you may apply some auto touch-up paint to the scratch. Smudges on the tube can be wiped off with a soft cloth and household cleaning fluid.

Cleaning Optics

You should not have to clean the telescope's mirrors. Covering the telescope with the dust cap when it is not in use will help prevent dust from accumulating on the mirrors. Even a little dust on the mirror surfaces will not affect the optical performance in any way. If you feel the mirrors need to be cleaned, please contact Orion

Customer Service at ***800-676-1343*** for guidance.

To clean the eyepiece lenses, any quality optical lens cleaning tissue and optical lens cleaning fluid specifically designed for multi-coated optics can be used. Never use regular glass cleaner or cleaning fluid designed for eyeglasses. Before cleaning, remove any loose particles or dust from the lens with a blower bulb or soft brush. Then apply some cleaning fluid to a tissue, never directly on the optics. Wipe the lens gently in a circular motion, then remove any excess fluid with a fresh lens tissue. Oily fingerprints and smudges may be removed using this method. Use caution; rubbing too hard may scratch the lens. On larger lenses, clean only a small area at a time, using a fresh lens tissue on each area. Never reuse tissues. When bringing the telescope inside after an evening's viewing it is normal for moisture to accumulate on the optics due to the change in temperature. We suggest leaving the telescope and eyepieces uncovered overnight to allow the condensation to evaporate.

6. Collimation – Aligning the optics

Collimation is the process of aligning the telescope's two mirrors. Your telescope's primary and secondary mirrors were precisely aligned at the factory, and should not need any adjustment unless the telescope was jarred while in transit. Accurate mirror alignment is important to ensure the best images from your telescope, so it should be checked regularly. Collimation is a relatively easy process and can be done in daylight or darkness.

To check the collimation, remove the eyepiece and look down the focuser drawtube. You should see the secondary mirror centered in the drawtube, as well as the reflection of the primary mirror centered in the secondary mirror, and the reflection of the secondary mirror (and your eye) centered in the reflection of the primary mirror, as in **Figure 7a**.

If the entire primary mirror reflection is not visible in the secondary mirror, as in **Figure 7b**, you will need to adjust the tilt of the secondary mirror with the three Philips alignment setscrews surrounding the center screw (**Figure 8**). Using a small Philips screwdriver, first loosen one of the three alignment setscrews by, say, a half turn, and then tighten the other two to take up the slack. Is the primary mirror reflection more centered in the secondary mirror now? You may need to loosen a different screw then tighten the other two to better center the primary mirror in the secondary. It's a matter of trial and error. The goal is to center the primary mirror reflection in the secondary mirror, as in **Figure 7a**, by adjusting these three screws in this fashion. Do not adjust the center screw.

Aligning the Primary Mirror

The primary mirror of the FunScope is fixed in place, so no adjustments are necessary. The view down the focuser drawtube should now resemble **Figure 7a**. A simple star test will indicate how well the telescope optics are collimated.

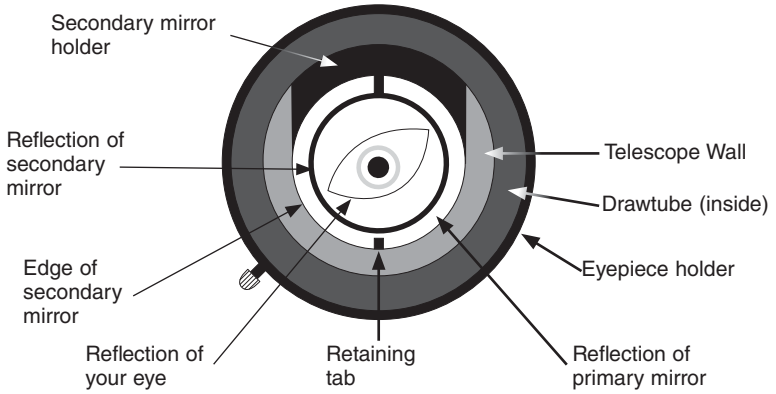

Figure 7a. *Collimating the optics. When the mirrors are properly aligned, the view down the focuser should look something like this.*

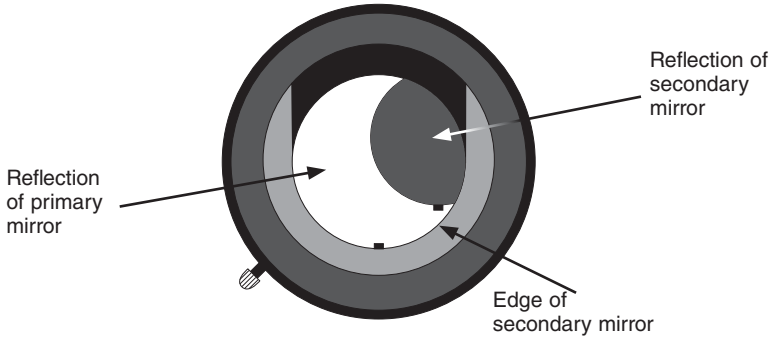

Figure 7b. *Here, the secondary mirror is centered under the focuser, but it needs to be tilted so that the entire primary mirror is visible.*

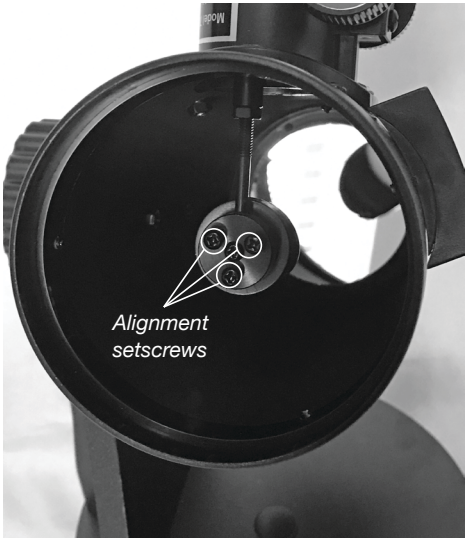

Figure 8. *Adjust the tilt of the secondary mirror with the three Philips screws surrounding the center screw.*

Star-Testing the Telescope

When it is dark, point the telescope at a bright star and accurately center it in the eyepiece's field of view. Slowly de-focus the image with the focusing knob. If the telescope is correctly collimated, the expanding disk should be a perfect circle (**Figure 9**). If the image is unsymmetrical, the scope is out of collimation. The dark shadow cast by the secondary mirror should appear in the very center of the out-of-focus circle, like the hole in a donut. If the "hole" appears off-center, the telescope is out of collimation. If you try the star test and the bright star you have selected is not accurately centered in the eyepiece, the optics will always appear out of collimation, even though they may be perfectly aligned. It is critical to keep the star centered, so over time you may need to make slight corrections to the telescope's position in order to keep the star in the center of the field of view. A good star to point at for a star test is Polaris, the North Star, because its position does not move significantly over time.

7. Useful acessories

• **Orion Moon Filter –** A 1.25" Moon filter will cut down the strong glare of sunlight reflected from the Moon, making Moon viewing more comfortable and revealing more surface detail. The filter threads into the bottom of the Kellner eyepieces that came with your telescope.

• **Orion Star Target Planisphere –** A nifty "star wheel" that shows what stars and constellations are visible in the sky at any time of any night. Just set the date and

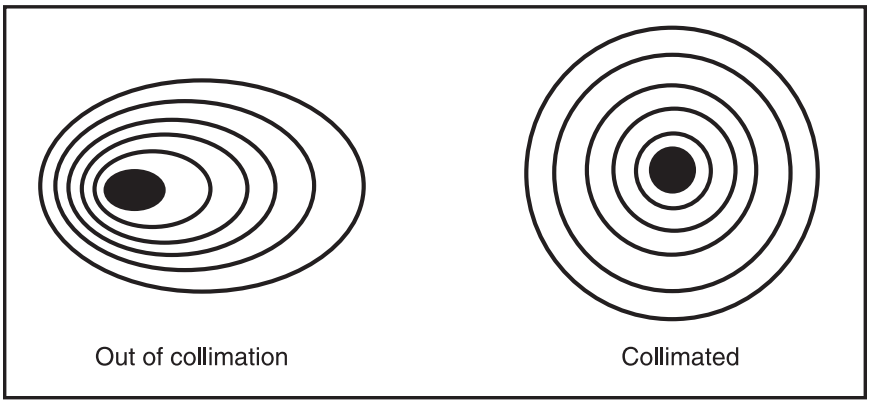

Figure 9. *A star test will determine if the telescope's optics are properly collimated. An unfocused view of a bright star through the eyepiece should appear as illustrated on the right if the optics are perfectly collimated. If the circle is unsymmetrical, as illustrated on the left, the scope needs collimation.*

time see a mini representation of your local night sky. Great for identifying what you see and planning an evening's observing session.

• **Orion Telescope Observer's Guide (book) –** This book will help you explore amazing celestial objects including nebulas, double and multiple stars, star clusters, the Andromeda Galaxy, and more. With a full page of information dedicated to each interesting object, author Richard J. Bartlett leads you on a detailed tour of the night sky as he describes over 60 fascinating astronomical objects that can easily be seen with a small telescope.

Orion carries these and many other useful accessories to help enhance your viewing experience with your telescope. Visit our website at ***www.OrionTelescopes.com***.

8. Specifications

Primary Mirror:	76mm (3") diameter, spherical
Focal Length:	300mm
Focal Ratio:	f/3.9
Focuser:	1.25" Rack and Pinion
Eyepieces:	20mm and 6mm Kellner, multiple antireflection coatings
Magnification with supplied eyepieces:	50x, 15x
Assembled weight:	3 lbs., 11 oz

One-Year Limited Warranty

This Orion product is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights. It is not intended to remove or restrict your other legal rights under applicable local consumer law; your state or national statutory consumer rights governing the sale of consumer goods remain fully applicable.

For further warranty information, please visit **www.OrionTelescopes.com/warranty.**

ORION
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