



DT Series
Dobsonian Telescope

Assembly Instructions and User's Guide



CAUTION!



NEVER ATTEMPT TO LOOK AT THE SUN WITH YOUR APERTURA™ DOBSONIAN TELESCOPE **UNLESS** YOU HAVE A **FULL-APERTURE SOLAR FILTER** (NOT INCLUDED WITH TELESCOPE) INSTALLED OVER THE OPEN END OF THE OPTICAL TUBE. NEVER USE AN EYEPIECE-MOUNTED SOLAR-FILTER ALONE AND ALWAYS COVER THE FINDERSCOPE EYEPIECE WITH A PLASTIC DUST CAP. WITHOUT A FULL-APERTURE SOLAR FILTER INSTALLED, YOU RISK SEVERE EYE DAMAGE AND PERMANENT BLINDNESS!



Please take a few minutes to read over the assembly instructions to familiarize yourself with the individual parts and procedures before attempting to assemble your Apertura™ DT Series Dobsonian Telescope.

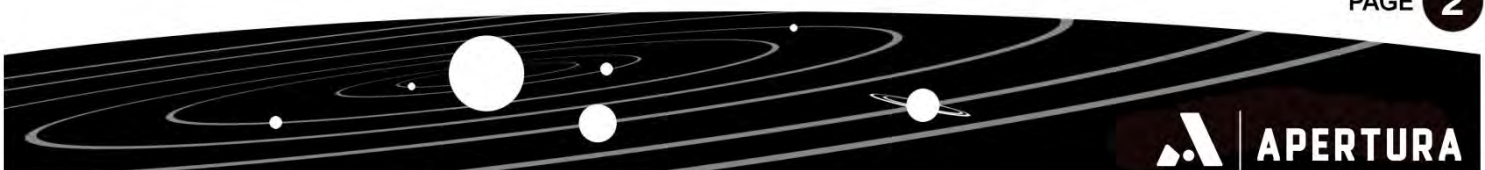


Unpacking your Apertura™ DT Dobsonian Telescope

Parts List:

Optical Tube Box (package 1 of 2)

- Telescope optical tube with 2" focuser 8x50 finder scope & bracket
- Two tension adjustment springs
- Two black altitude knobs with hardware
- 25 mm Plossl Eyepiece - 1.25"
- 2" to 1.25" Adapter (shown in focuser)
- Dust cover for front of telescope



Base Mount Box (package 2 of 2)

Wood Components

- 1 small panel – front
- 1 large panel – right
- 1 large panel – left
- 6"-10" DT - 2 large round base plates
- 12" DT - 2 large base plates, 1 round & 1 triangle

Adjustment Knob Assembly

- 1 bolt with knob head
- 1 large washer
- 1 small bearing washer
- 1 small washer
- 1 axle sleeve

Hardware

- 1 Four-hole eyepiece tray
- 1 handle
- 3 black plastic feet
- 1 Allen wrench
- 10 long black Allen screws (8 for 6"/8" model)
- 2 medium silver Allen screws
- 3 medium Phillips screws
- 2 short black Phillips screws



Assembling the DOBSONIAN BASE HOUSING

STEP 1

Attach handle to the BASE FRONT with two medium silver Allen screws. The curved edge of the board is the top of this part when vertical.

! IMPORTANT ! Make sure the flat face of the embedded T-nuts are on the BACK side of the board (opposite the handle).



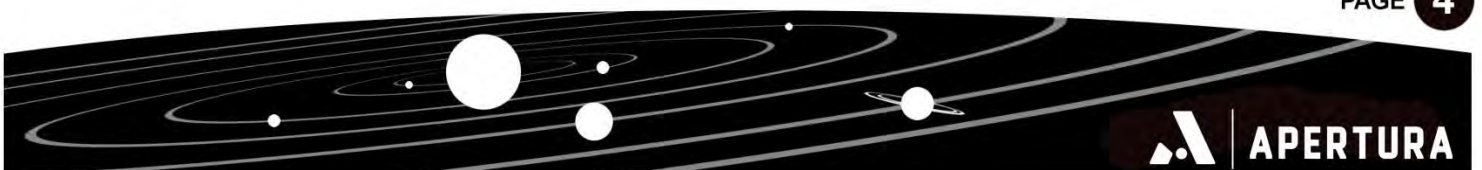
STEP 2

Attach BASE RIGHT to BASE FRONT with two long black Allen screws. (The BASE RIGHT is the one with two smaller pre-drilled holes for the eyepiece tray)



STEP 3

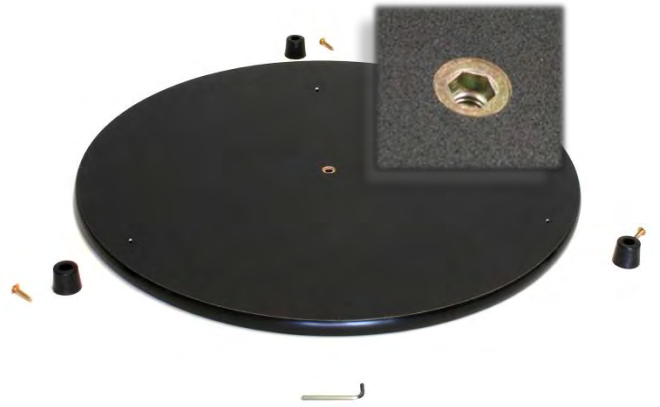
Attach BASE LEFT to BASE FRONT with two long black Allen screws. Be sure all three sides are secure.



STEP 4**4**

Locate the **BOTTOM BASE PLATE**.

The **BOTTOM BASE PLATE** for the 6" - 10" DT is round as shown and has 3 holes around its edge and a brass fitting in the center hole. The **BOTTOM BASE PLATE** for the 12" DT is shaped like a triangle.



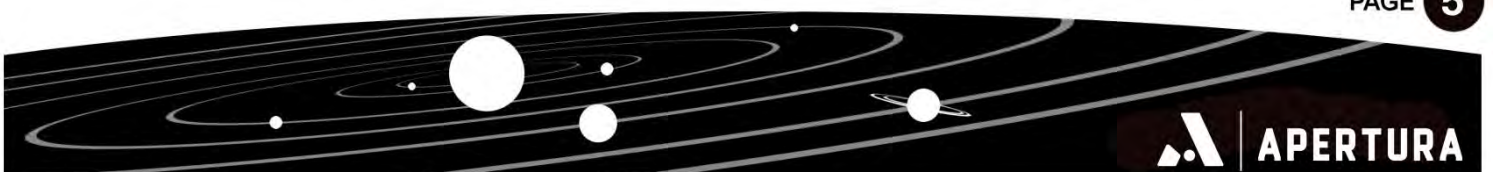
Attach the 3 feet to the **BOTTOM BASE PLATE**'s bottom side with 3 medium Phillips screws, with the wider side of the feet facing the board. (*The bottom side of this plate has the brass fitting almost flush with the surface – see inset picture*)

**STEP 5****5**

Locate the **TOP BASE PLATE**. It has several holes around its edge (not counting center hole).

Model **DT6 & 8** = 4 holes
 Model **DT10 & 12** = 6 holes

Turn the completed **BASE HOUSING** upside down. Align the holes of the **UPPER BASE PLATE** with the holes of the **BASE HOUSING**.



STEP

6

Screw long black Allen screws through the **BOTTOM BASE** into the **BASE HOUSING** making sure the side with the recessed holes is facing away from the **BASE HOUSING**.



STEP

7

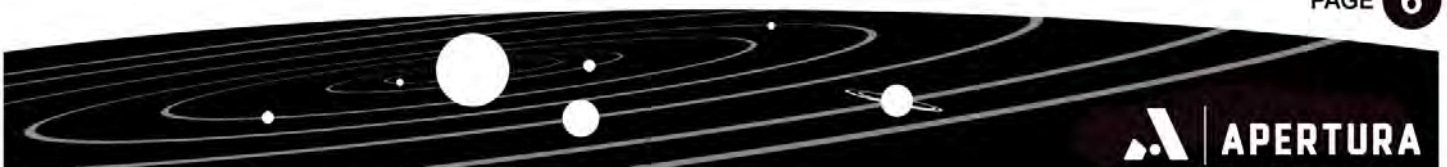
Place **BOTTOM BASE PLATE** with feet facing down. Insert **AXLE SLEEVE** into the Center hole and place Teflon pads on plate as shown in next photo.



STEP

8

Place some of the **AZIMUTH AXLE SPACERS** over the **AXLE SLEEVE**. These washers will control the "feel" of the azimuth motion. Telescope movement is a very important aspect of using a telescope but preferences as to what that motion should feel like varies from person to person. The use of the spacers allows you to set the amount of resistance you like best. Use fewer spacers for a stiffer motion and more spacers for a more fluid motion with less resistance. It really is that easy.



STEP 9

Pick up the **BASE HOUSING** with **UPPER BASE PLATE** already attached and place it onto the **AXLE SLEEVE** of the **BOTTOM BASE PLATE**.



STEP 10

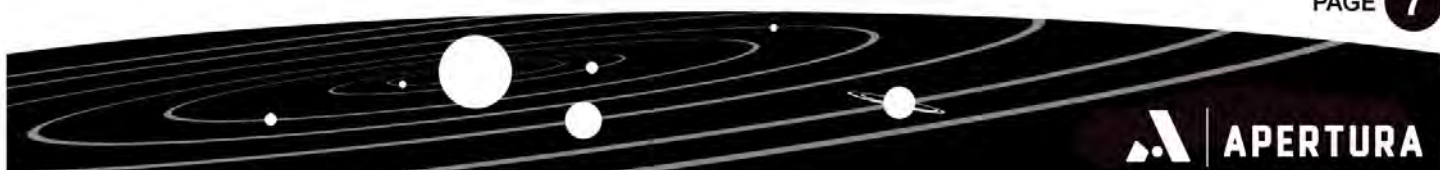
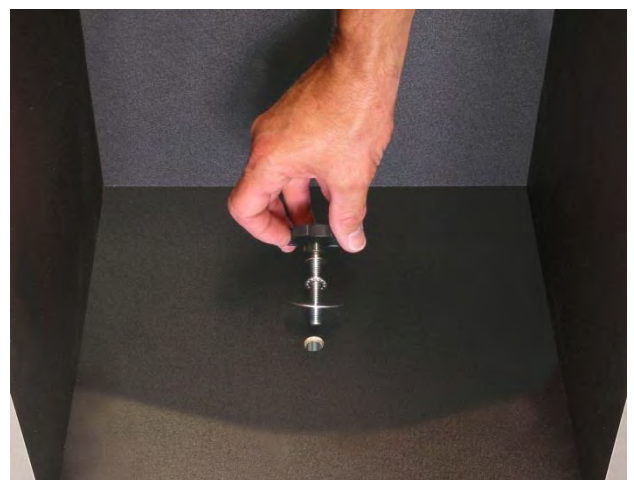
Assemble washers onto the **ADJUSTMENT BOLT** in this order:

- Small washer
- Ball bearing washer
- Larger washer



Thread the **ADJUSTMENT BOLT** through all of the assembled base parts. Tighten the knob until it feels firm but not too tight.

TIP: Tightening or loosening this knob is how you will adjust the amount of effort it takes to rotate your Apertura™ Dobsonian telescope on its base.



- STEP 11** Attach the 4-HOLE EYEPIECE TRAY to the BASE RIGHT panel of the BASE HOUSING ASSEMBLY using the two pre-drilled holes and two small black Phillips screws.

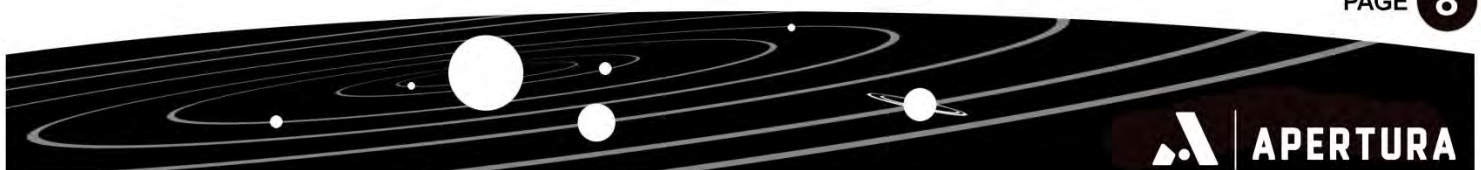


Assembling the OPTICAL TUBE

- STEP 1** Attach SPRING SPACERS to each of the BASE SIDE BOARDS.



- STEP 2** Attach ALTITUDE KNOB, SPACER and SPRING to each SIDE BEARING, as shown.

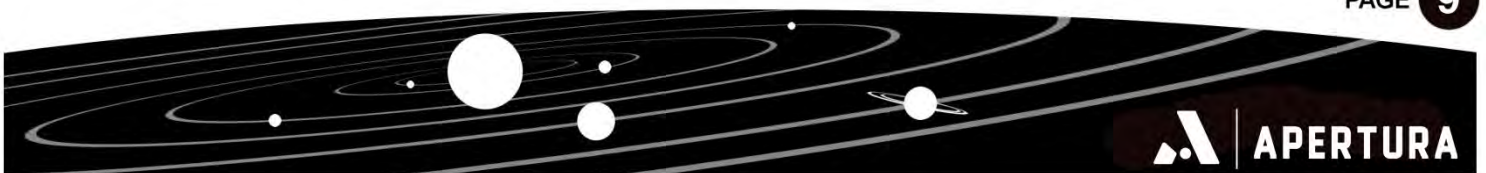


STEP 3

Next, place the TELESCOPE TUBE into the BASE, with the large SIDE BEARINGS seated into the corresponding semi-circular cut outs in the side boards.



Then attach a SPRING to each of the SPRING SPACERS that you installed on the side boards of your Dobsonian telescope's base.

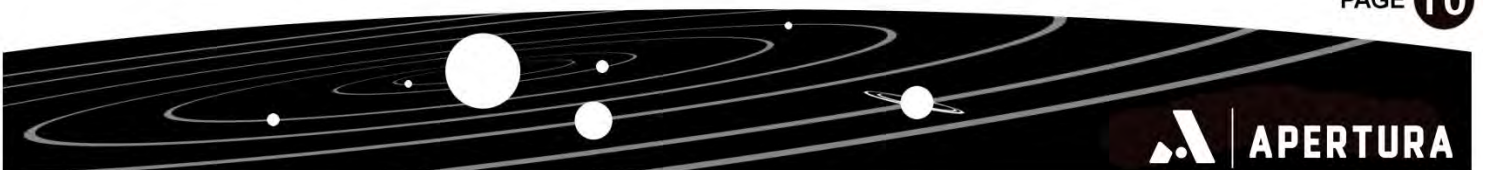


Continue Assembling the OPTICAL TUBE

STEP 4

Locate the 8x50 FINDERSCOPE and attach it to the dovetailed FINDERSCOPE BRACKET BASE on the side of the OPTICAL TUBE, located near the FOCUSER.

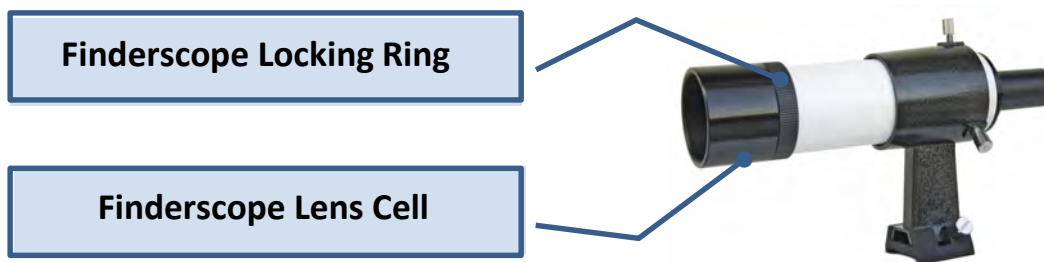
Use the thumbscrew to tighten the FINDERSCOPE into place.



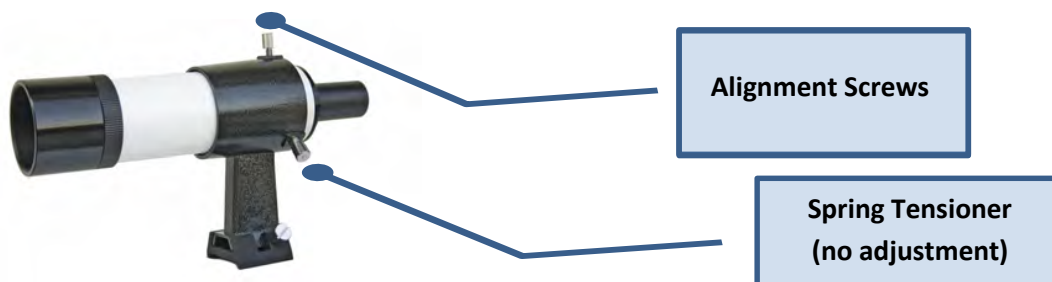
Aligning Your Finderscope

When first attached, the finderscope will not be perfectly aligned with the telescope's optics. Once the finderscope is properly aligned with the main telescope's view, the finderscope's extra-wide field of view will help you easily center the main telescope on objects you wish to view.

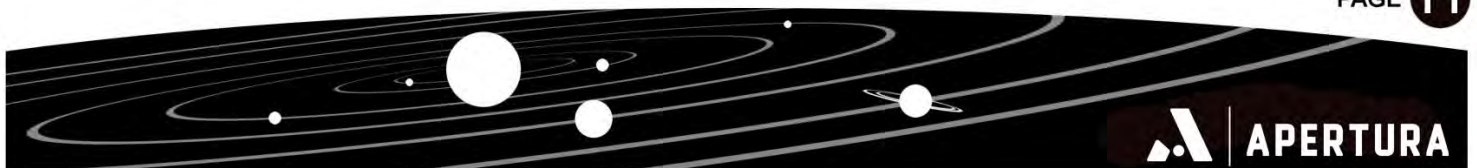
- 1 Start by inserting your 25 mm eyepiece into the focuser and then point the telescope at a large, distant and stationary object (such as the detail on a billboard at least 250 yards away). Now look through the finderscope. To focus the finder, first loosen the lens cell by unscrewing it a half-turn. Then turn the locking ring the other way, to pull it back from the lens cell and expose the maximum number of threads on the finderscope body. Turn the lens back and forth to focus your view. Once the lens is focused, then tighten the locking ring to hold the lens cell in place. You may need to make a slight focus adjustment the first time you use the finderscope on the night sky, but once the focus is set on the sky you should not need to adjust it again.



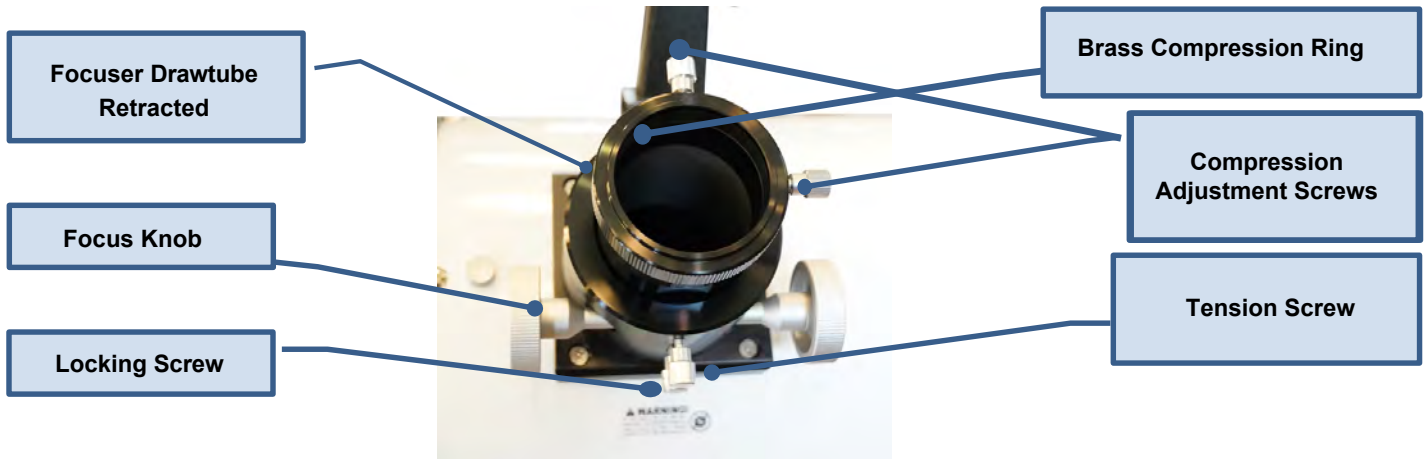
- 2 Once focused, align your finderscope by gently adjusting the two thumbscrews on the finderscope bracket (the silver "knob" contains a spring that gives back-pressure to the thumbscrews and does not need adjustment). Carefully align the finderscope body until its cross-hairs are centered on the object that is currently centered in the main telescope's eyepiece.



- 3 If you bump the finder during transport or use and disturb its alignment, it will only require a quick and easy adjustment of the two thumbscrews to realign the finderscope to the main telescope's view.

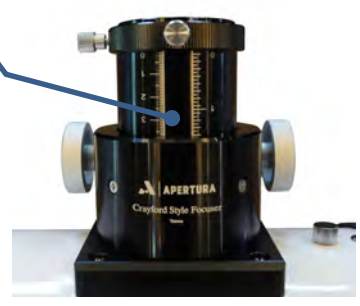


2" Crayford Style Focuser Your Apertura Dobsonian Telescope comes standard with a 2" Crayford style focuser and a 2" to 1.25" eyepiece adapter which allows you to use both 2" and 1.25" eyepieces. It is pictured here with the draw tube fully retracted.



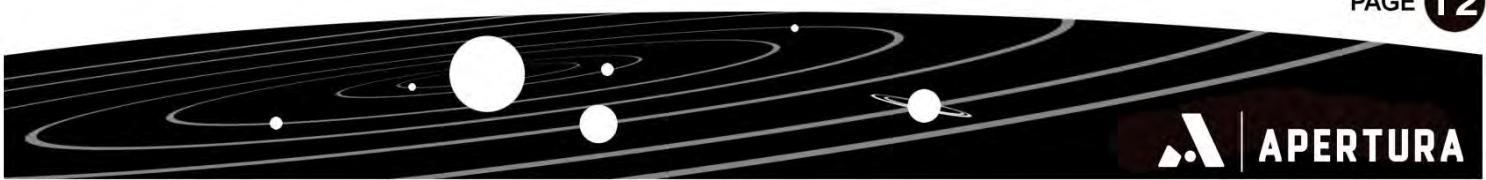
This image shows the focuser draw tube fully extended to 4 cm or 1.5 inches.

!! IMPORTANT !!
Locking screw (under tensioning screw) must be backed out to allow full drawtube travel.



The Apertura focuser will accept 2" and 1.25" eyepieces (with included adapter) and other common hardware. The amount of focusing required for each eyepiece will vary, therefore retract or extend the drawtube to bring the image into best focus. For lower power, wide field-of-view (FOV) eyepieces, it may be necessary to increase the focal length by fitting the 35mm Extension Tube (sold separately) into the focuser as an adapter to achieve focus.

The movement of the focuser tube is a result of tension inside the focuser which can be adjusted by the tensioning screw. In general, use the lightest amount of tension that will work with the installed components for smooth action. But as heavier eyepieces are used, especially in conjunction with other components, increase the tension to compensate for the extra weight. Once you achieve focus, you may decide to use the locking screw to hold the focuser in place even if the adjustment wheels are moved. This is helpful when exchanging parfocal eyepieces or having other viewers come to the eyepiece, but is not necessary.



Eyepiece Selection

Your Apertura™ DT Dobsonian Telescope comes one eyepiece: a 1.25” diameter medium-power eyepiece with a 25mm focal length. Over time you will want to collect three or four extra eyepieces to achieve a variety of magnifications. To get the best results from your telescope, always start with your widest field (lowest power) eyepiece, then work your way up to the higher power eyepiece, keeping the image centered throughout.

Deep-sky objects are best observed with low or medium magnifications due to their dimness at higher magnifications. Astronomical points of interest within our solar system are good candidates for higher magnification because they are generally brighter than deep sky objects. Of course, experimentation is always the most rewarding approach to determining eyepiece selection.

Observation Tips

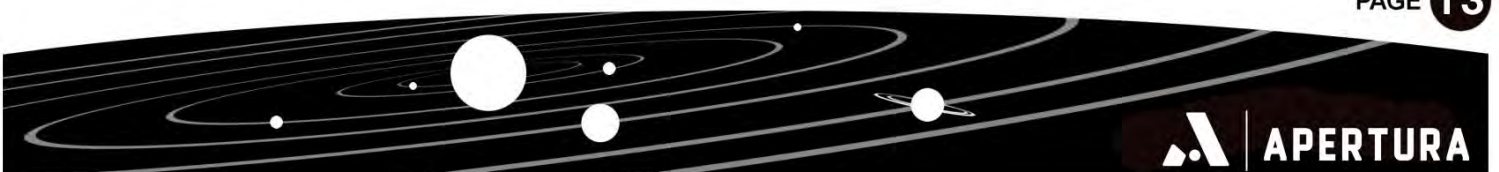
Your telescope will perform best when local artificial lighting is kept to a minimum. Nearby streetlights and lighted buildings cause a lot of light pollution and will degrade the quality of your view with your telescope.

When choosing a viewing location, try to find a spot far away from tall structures with a wide view of the open sky.

Allow your eyes time to adjust to the darkness before attempting to view any faint objects in the night sky. Usually 30 minutes is long enough for your eyes to totally adapt to the dark. Preserve your dark-adapted vision by avoiding looking at sources of light (street lights, cell phones, computers, etc.). If you are exposed to a light source, the adjustment period will begin again. After your eyes have reached their dark-adapted state you'll want to consider using a red-lens light source for activity in the dark.

Acclimating Your Telescope

Before using your telescope, you should allow its temperature to equalize to that of the ambient outside air temperature. Larger scopes take longer to equalize and should be given a half- to one full hour depending on the temperature difference (one hour for a difference of 40 degrees Fahrenheit is a good rule of thumb). Keeping your telescope and optics in an outside or non-environmentally controlled building such as a garage or shed can decrease the time it takes for the temperature differential to stabilize.



Viewing Conditions

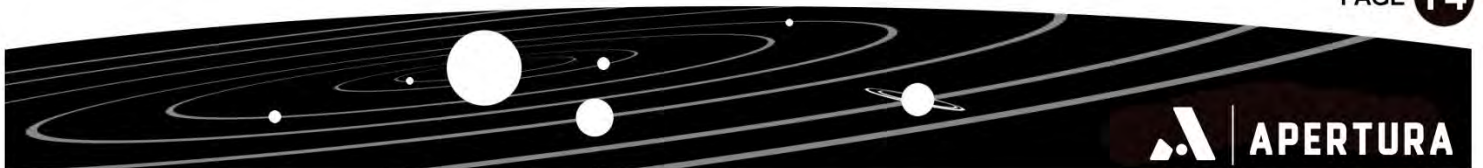
The quality of the conditions for viewing are referred to as “seeing,” usually rated on a scale of 1 to 10, with 10 as perfect seeing and 1 as very poor. There are two major conditions to notice in evaluating viewing conditions on any given night: *atmospheric disturbance* and *air transparency*. The best conditions for astronomical viewing are when atmospheric disturbances are at a minimum. Lower your expectations when trying to use your scope too early in the night or trying to focus on objects close to the horizon as this will impair your ability to view clearly. Generally, you want to set your telescope up on the highest point possible as it affords the highest quality viewing and isn’t as subject to atmospheric disturbances. A good way to determine how well you will be able to see on any given night is to look at bright stars about 40 degrees above the horizon and look for twinkling of stars. Twinkling is caused by atmospheric disturbances and is an indicator that quality viewing may be difficult. However, often stars that twinkle near the horizon will become steadier later in the evening as they move higher in the night sky.

Also affecting the viewing quality is the transparency (clarity) of the air. Remember that our viewing of the universe from the ground begins by looking through many miles of air that is full of particles and water which is in constant motion and changes regularly.

Tracking Celestial Objects

Since the Earth is always rotating, astronomical objects will appear to move across the night sky. When using your Apertura™ Dobsonian Telescope for a little while, you need to manually track the observed objects by carefully moving the scope’s tube to keep the object relatively centered in the eyepiece. Using higher magnification requires you to make more frequent tracking adjustments than you would when using lower magnification.

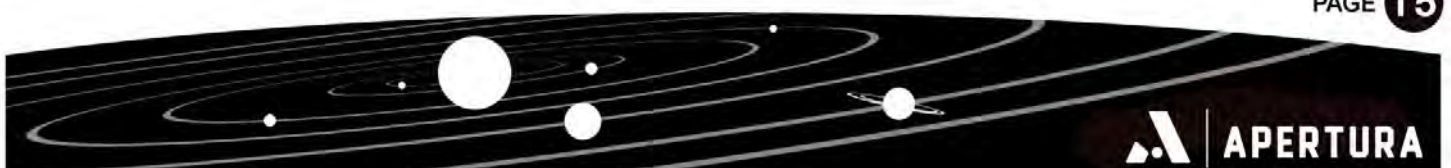
A popular method for locating night sky objects is called “star-hopping.” Using a simple planisphere or star chart, zero in on your target of interest by jumping, or hopping, from one bright star to another until you reach the closest star to your destination. Then put in a lower power eyepiece and start scanning the sky around that nearby star until you find the galaxy, star cluster, or nebulae you are looking for. Learning to star-hop makes object location much quicker and gets you to where you want to be without much fuss. You can also experiment with online resources including apps, software you can load on your computer, etc. Use the method that you like best and then get out there and practice! You’ll be an avid amateur astronomer in no time!



This telescope comes collimated from the factory and is ready to use. Should you need to re-collimate in the future, we have included a basic collimation procedure for a standard laser collimator (sold separately).

CAUTION: If you use a laser collimator, Do NOT allow the laser to shine in your eyes (either directly or indirectly off the telescope's mirrors) as it may very well damage your eye sight permanently. Do not allow children to use your collimator or any other laser, and even with adults, make sure and supervise until you are sure they understand the proper handling of laser products.

1. Remove any eyepiece that may be installed in the focuser.
2. Look into the focuser and confirm that you see the secondary mirror centered in the hole. Reflected in the secondary mirror, you should be able to see the primary mirror and the three small clips around the edge of the primary mirror. If not, you will need to rotate the secondary mirror assembly with your hand (be careful not to TOUCH the reflective surface of the secondary mirror itself) until the reflection of the primary mirror is centered in the secondary mirror. In addition, although the shape of the secondary mirror is actually oval, when properly aligned it will appear to be circular as viewed through the focuser.
3. Insert a 2" laser collimator into the 2" adapter sleeve (or a 1.25" collimator into the 2" to 1.25" focuser adapter) and then insert that into the focuser. Secure the laser collimator with the thumbscrew. Turn on the laser collimator and rotate its target face toward the back end of the scope (the primary mirror end).
4. Hold up a piece of paper in front of the telescope to see if the laser is missing the secondary mirror on reflection. If the laser isn't reflected onto the paper, then most likely it is hitting the secondary mirror as it should.
5. Carefully peer into the tube to see where the laser is hitting the primary mirror below. **CAUTION: Do NOT** allow the laser to shine directly into your eye from the telescope's mirrors. The laser should be shining in the middle of the small donut ring in the middle of the primary mirror. If it is not, adjust the tilt of the secondary mirror using the three small screws on the top of the secondary mirror assembly until the laser is centered in the donut ring on the primary.
6. Now view the target face on the laser collimator to see if the laser is hitting anywhere on the target face. If not, then this simply means that the primary mirror is far enough out of adjustment that the laser is outside the target face on the collimator. In either case, you will need to move to the bottom end of the scope and loosen the large white locking knobs. Then adjust the angle of the primary mirror with the large black adjustment knobs until the laser becomes centered in the hole in the middle of the laser collimator's target face.
7. Once accomplished, lock the primary mirror assembly with the white knobs. This may cause some minor movement of the mirror, so continue fine adjustments until all six knobs are firm and the laser is centered on its target.



Keeping your Telescope Clean

Do not touch, rub, brush, wipe or otherwise contact the primary mirror or secondary mirror. Over time a thin layer of dust will accumulate on the surface of these mirrors. This is normal and is best left alone. If it is absolutely necessary, use only an optical lens brush and lens bulb puffer to remove dust from your mirrors.

The outside of your Apertura™ DT Dobsonian Telescope is easily cleaned with a dust cloth or sponge for fingerprints, dust, etc.

Clean other components ONLY when absolutely necessary and then ONLY with a mild soap solution and lint-free cloth by gently blotting. Do not use any harsh cleaning chemicals to avoid damaging the finish on your telescope and components.

Use a dry soft cloth to remove condensation from the outside of you telescope before storing it. Do not try to dry the eyepiece or finderscope lenses but rather let them dry naturally.

Avoid leaving your telescope in an excessively hot environment such as the inside of a car as high temperatures can damage your telescope in several ways.

