

Vixen®

Instruction Manual for Vixen PORTA II Altazimuth Mount Telescopes



Preface

Thank you for your purchase of a Vixen astronomical telescope from the "PORTA II" series of altazimuth mounted telescopes.

*This manual is prepared in common with all the PORTA II mount series telescopes. You may occasionally find descriptions in the text not relevant to your model. The manual explains usage of the PORTA II mount by mainly using pictures of the PORTA II A80Mf by way of example. *Be sure to refer to an instruction manual of the optical tube assembly unit, if available, in conjunction with this manual.

Read carefully the instructions before use, and follow them precisely.

*Always keep the instruction manual near your mount or telescope to enable any operational queries to be easily answered.

*This instruction manual describes necessary precautions for the safe use of the product to prevent yourself and others from possible injuries as well as damages to the equipment. Only use the mounting/telescope after you are completely sure that you understand all the features.



WARNING!

Never look directly at the sun with your naked eyes or through any telescope or its finder scope or guiding scope. Permanent and irreversible eye damage may result.

Caution

- ⊗ Do not leave the telescope's optical tube uncapped in daytime. It may cause a fire by sunlight passing through the objective lens or mirror of the optical tube or finder scope.
- ⊗ Do not use the product while transporting or walking, where injuries could arise from collision with objects or stumbling or falling.
- ⊗ Keep caps, desiccant, or vinyl packing materials away from children, to avoid danger of swallowing or suffocation.

Handling and Storage

- ⊗ Do not leave the mounting or telescope inside a car in the scorching sun or, in front of any heat sources, particularly radiators of high temperature.
- ⊗ When cleaning, do not use organic solvents such as paint thinners or similar cleaners.
- ⊗ Prevent the product from being exposed to rain, water droplets, heavy dew, mud or sands.
- ⊗ Avoid touching any lens or mirror surface directly with fingers. If the lens or mirror becomes dirty with fingerprints or general smears, gently wipe it using commercially available lens cleaner and lens cleaning paper or consult your dealer.
- ⊗ Blow off dust on lens or mirror using commercially available blower brush.
- ⊗ For storage, keep in a dry place, where it is not exposed to the direct rays of the sun.

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Before Use

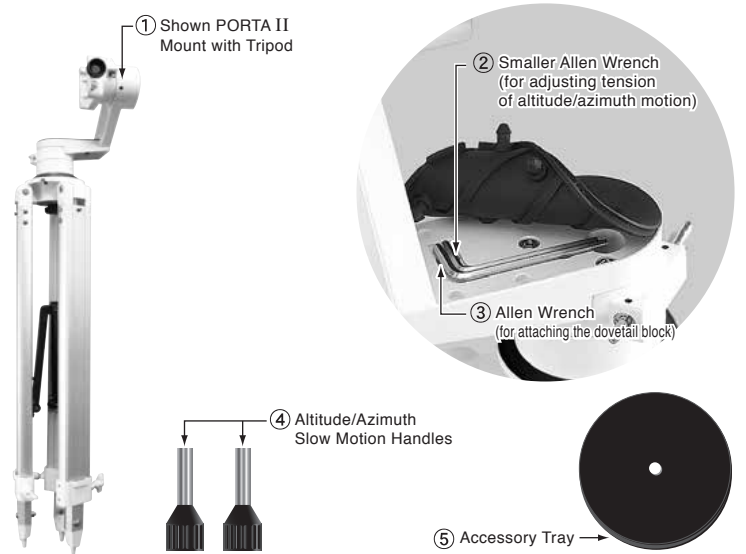
◎ Parts List

The PORTA II altazimuth mount and tripod box contains the parts listed below. Make sure that your shipment contains all the parts.

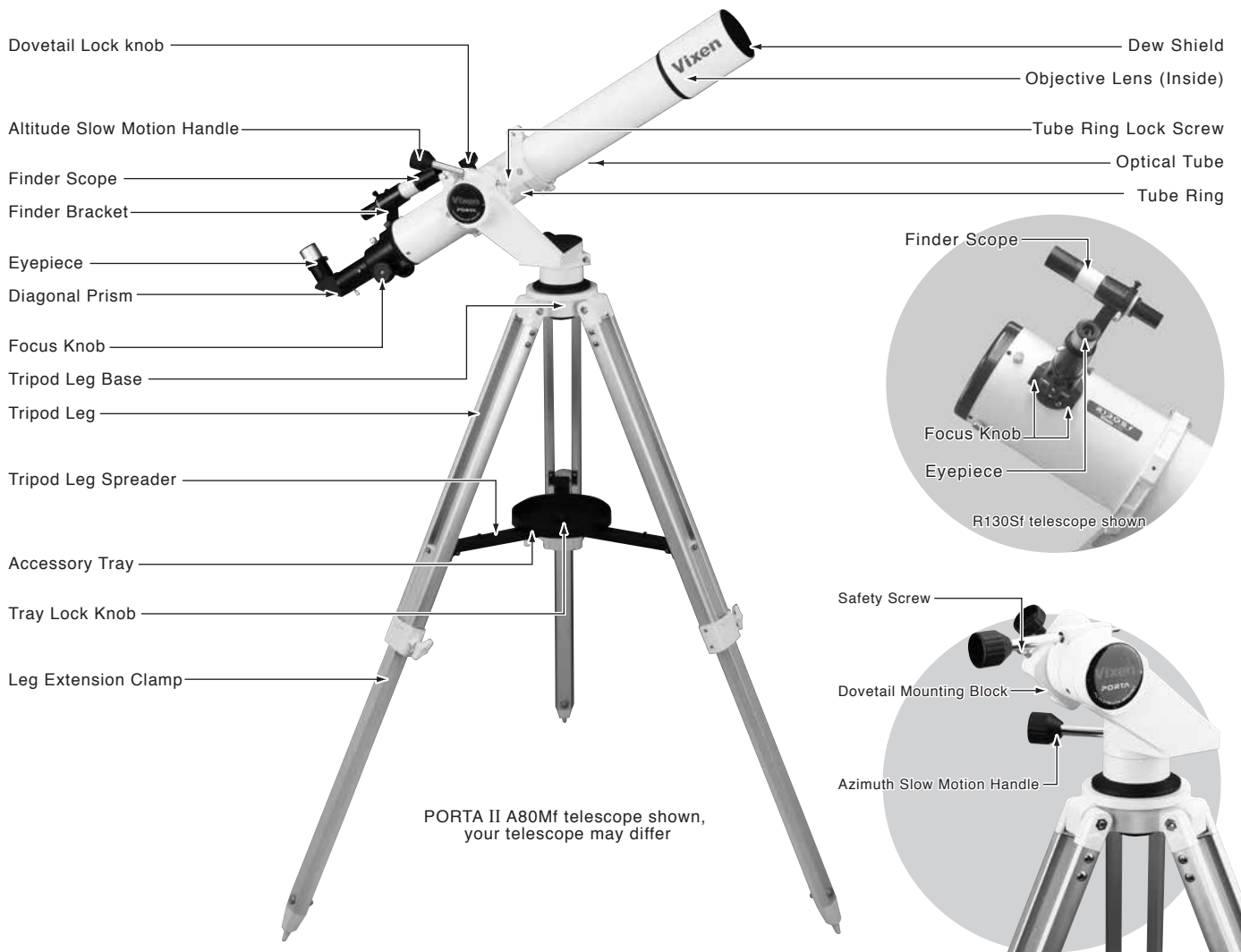
Contents of the PORTA II

- ① PORTA II Mount and Aluminum Tripod Legs Set
 - ② 4mm Allen Wrench(PORTA II)
 - ③ 3/16" Allen Wrench(PORTA II)
 - ④ Altitude/Azimuth Slow Motion Handles
 - ⑤ Accessory Tray
- Instruction Manual (This booklet.)

For contents other than the above parts (instruments such as optical tubes), refer to a list on a facing page.



◎ Parts Descriptions



Before Use

⊙ Specifications

Mount	PORTA II Altazimuth Mount
Altitude (Vertical) Motion	Whole-circle Fine Motion and Quick Slewing Motion
Azimuth (Horizontal) Motion	Whole-circle Fine Motion and Quick Slewing Motion
Optical Tube Attachment	Dovetail Tube Plate Attachment System with Safety Screw
Max. Loading Weight	About 5 Kgs.(11 lb)
Tripod	Two-section Aluminum Legs with Accessory Tray
Adjustable Length	Adjustable from 90cm to 130cm in length
Total Weight (Inc. Tripod)	5.7 Kgs.(12.5 lb)

The PORTA II altazimuth mount features simple altitude (vertical) and azimuth (horizontal) motion controls designed to easily point a telescope tube to the object you want to view.

⊙ Optical Tubes (Your optical tube may differ.)

Model	VMC95L	VMC110L	A70Lf	A80Mf	R130Sf	ED80Sf	ED100Sf
Objective Design	Precision Spherical Mirror	Precision Spherical Mirror	Achromatic Lens	Achromatic Lens	Parabolic Mirror	Apochromatic Lens	Apochromatic Lens
Effective Aperture	95mm	110mm	70mm	80mm	130mm	80mm	100mm
Focal Length	1050mm	1035mm	900mm	910mm	650mm	600mm	900mm
Focal Ratio	f / 11	f / 9.4	f / 12.9	f / 11.4	f / 5.0	f / 7.5	f / 9.0
Light Gathering Power	184x	247x	100x	131x	345x	131x	204x
Resolving Power	1.22"	1.05"	1.66"	1.45"	0.89"	1.45"	1.16"
Limiting Magnitude	11.7	12.0	11.0	11.3	12.3	11.3	11.8
Drawtube Diameter	-	-	40mm	44.5mm	40mm	64mm	64mm
Threads on Focusing Tube	42mm	42mm	42mm	42mm	42mm	60mm, 42mm	60mm, 42mm
Eyepiece Push-fit	31.7mm	31.7mm	31.7mm	31.7mm	31.7mm	50.8mm, 31.7mm	50.8mm, 31.7mm
Optical Tube Length	355mm	360mm	865mm	860mm	572mm	570mm	880mm
Optical Tube Diameter	106mm	119mm	76mm	90mm	160mm	100mm	100mm
Optical Tube Weight	1.9 Kgs	2.1 Kgs	1.9 Kgs	2.5 Kgs	4.0 Kgs	3.4 Kgs	3.7 Kgs
Finder Scope	Dot Finder	Dot Finder	6x24mm	6x30mm	6x30mm	9x50mm	9x50mm
Eyepiece (Lower Power)	NPL20(53x)	NPL20(52x)	PL20 (45x)	PL20 (46x)	PL20 (33x)	-	-
Eyepiece (Higher Power)	NPL6(175x)	NPL6(172x)	PL6.3 (143x)	PL6.3 (144x)	PL6.3 (103x)	-	-
Flip Mirror	-	-	-	-	-	⊙	⊙
Diagonal Prism	-	-	⊙	⊙	-	-	-
Tube Rings	-	-	⊙	⊙	⊙	⊙	⊙
Dovetail Tube Plate System	⊙	⊙	⊙	⊙	⊙	⊙	⊙

⊙ = Supplied

Note : The above specifications are subject to change without notice.

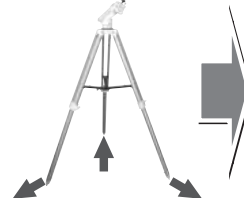
I Setting Up the Tripod / Attaching the Slow Motion Handles

- ① Stand the tripod on an even and solid ground. Adjust the height of the tripod as the occasion demands.

※ To change the height, loosen the leg extension clamp of each tripod leg. Be sure to tighten all the leg extension clamps securely after adjusting the height of the tripod.



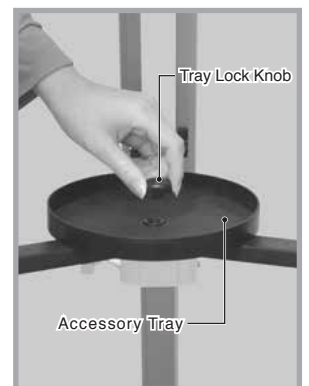
- ② Pull the tripod legs apart until the tripod leg spreader has been fully extended to let the tripod stand by itself



- ③ Take off the tray lock knob at the center of the tripod leg spreader and reveal the screw bolt.

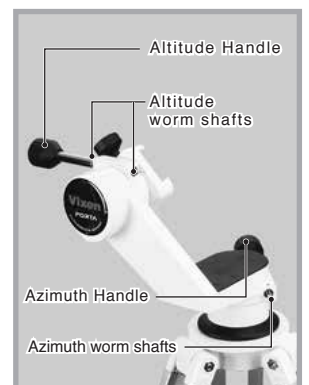
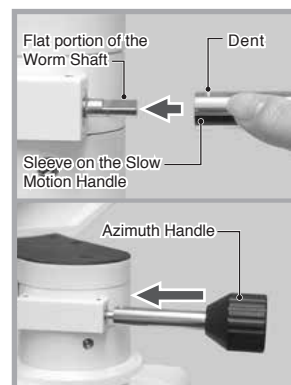


- ④ Place the accessory tray over the tripod leg spreader and position it so the screw bolt on the tripod leg spreader fits the matching hole at the center of the accessory tray. Then, fix the accessory tray with the tray lock knob.



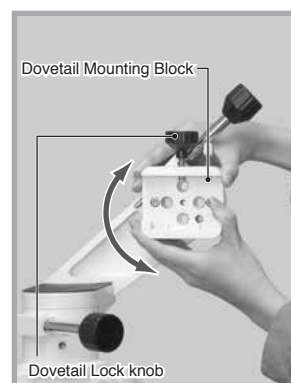
- ⑤ Attach the slow motion control handles onto each of the worm shafts for altitude adjustment and azimuth adjustment on the mount. Orient the metal sleeve so that the dent on the sleeve goes to the flat portion of the worm shaft. Slide the metal sleeve on the slow motion handle over the worm shaft.

※ There are two altitude worm shafts, one on either side of the altitude slow motion unit, and there are another two azimuth worm shafts on the azimuth slow motion unit. Use whichever one you find more convenient.
 ※ The two slow motion handles are the same and you can use whichever for altitude slow motion control or for azimuth slow motion control.

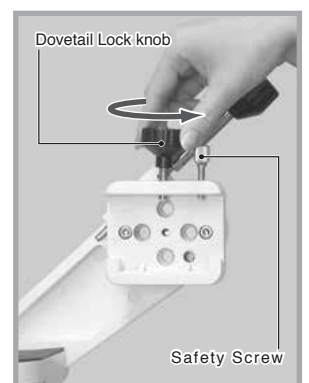


II Preparation for Mounting the Optical Tube

- ① Turn the dovetail mounting block by hand so that the dovetail lock knob is on top.



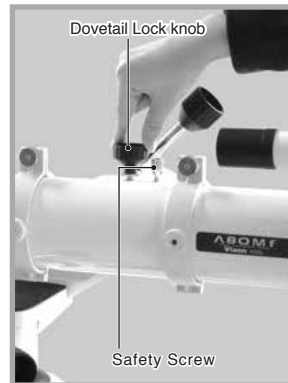
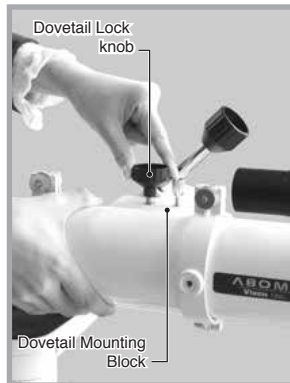
- ② Loosen both the dovetail lock knob and safety screw until the tips of these screws no longer extend into the inner part of the adapter block.



III Mounting the Optical Tube

Attach the dovetail mounted scope into the dovetail mounting block of the PORTA II mount, tighten the dovetail lock knob onto the dovetail tube plate centering notch until snug.

※ Next, tighten the small chrome safety screw onto the adapter until snug.



! WARNING !

Optical tube assemblies are seriously damaged if dropped. Tighten the dovetail lock knob securely. The safety screw should also be screwed in completely.

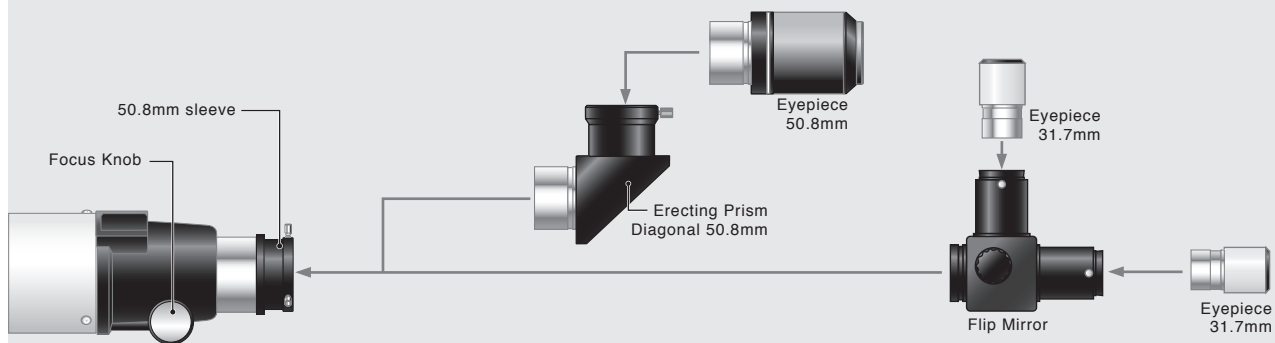
! WARNING !

Make sure that the dovetail tube plate is flat against the dovetail mounting block. Tightening the dovetail lock knob with a gap between these parts may result in the telescope unexpectedly falling off.

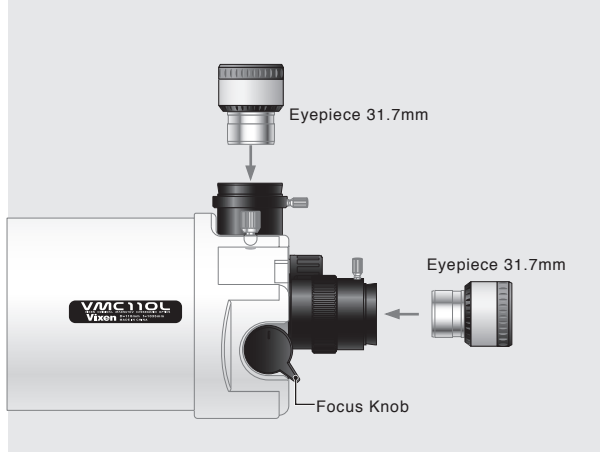
IV Attaching the Eyepiece

(For other PORTA II telescopes, refer to instruction manuals supplied with them.)

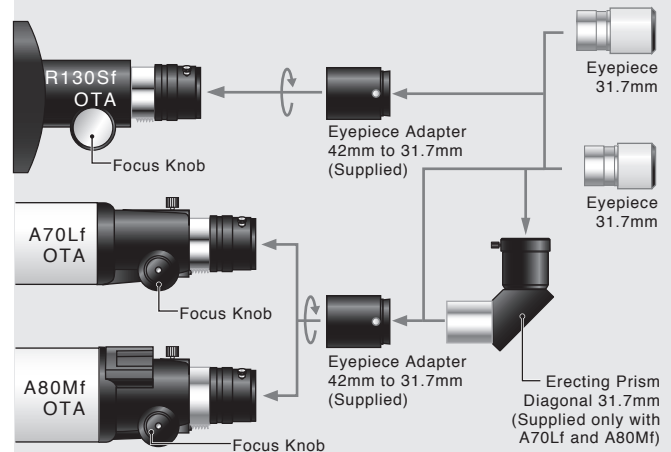
Visual Observation with the ED80Sf or ED100Sf



Visual Observation with the VMC95L or VMC110L



Visual Observation with the A70Lf, A80Mf or R130Sf

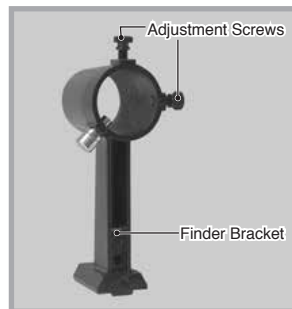


Preparation

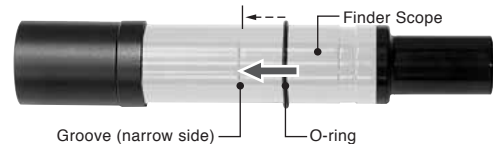
Attaching the Finder Scope to the Telescope

V-1 Attaching the Finder Scope (PORTA II A80Mf and PORTA II R130Sf)

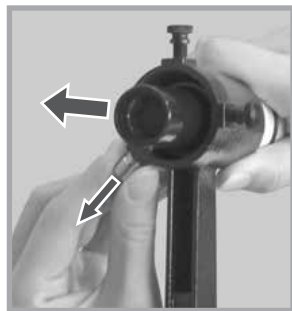
- ① Back out the adjustment screws on the finder bracket to allow passage of the finder scope. (Make sure the adjustment screws do not fall off the bracket.)



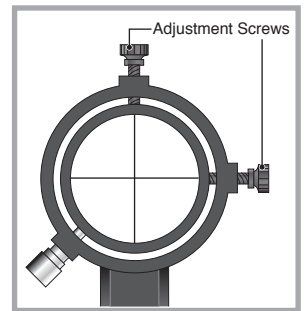
Slide the rubber O-ring onto the eyepiece end of the finder. There are two grooves on the finder tube. Position the O-ring on the narrow groove at the middle of the finder tube.



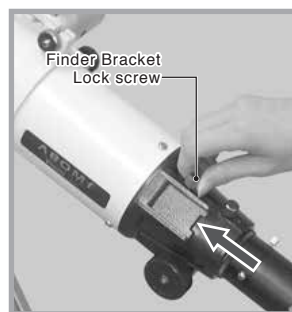
- ② Pull up the fixed stud on the bracket ring and pull it so that the finder tube slides into the bracket ring from its eyepiece end. Release the fixed stud at the position that the wide groove on the finder tube is underneath the stud.



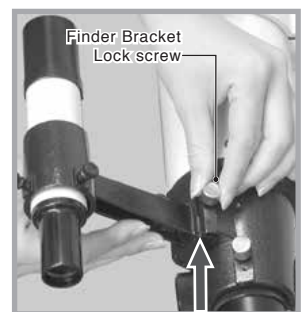
- ③ Tighten the two adjustment screws so that the finder scope is aligned as shown in the figure.



- ④ Loosen the finder bracket lock screw on the telescope.



- ⑤ Attach the finder bracket as shown in the figure, tighten the finder bracket lock screw securely.



V-2 Attaching the Finder Scope (PORTA II A80Mf and PORTA II R130Sf)

- ① Take off the two finder bracket fixing screws on the telescope.



- ② Attach the bracket on the finder scope as shown in the figure, tighten the finder bracket fixing screws securely.

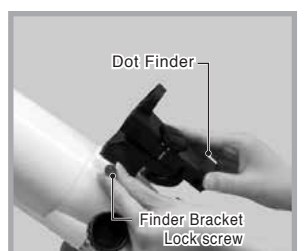


V-3 Attaching the Finder Scope (PORTA II Telescopes with the XY Red Dot Finder)

- ① Loosen the chrome finder bracket lock screw on the telescope.



- ② Attach the bracket on the dot finder as shown in the figure, tighten the finder bracket lock screw securely.



You can easily separate the tripod from the PORTA II Altazimuth mount assembly with the provided lock knob underneath the tripod head. It enables you to use an optional SXG half pillar and other accessories sold separately.

1. An optional SXG half pillar can be used with the PORTA II.
2. With the installation of the SXG half pillar, an optional SX-HAL130 tripod can be used for the PORTA II.
3. An optional SX tabletop tripod can be used with the PORTA II.

*For usage of the SXG half pillar, refer to instruction manuals supplied with the SXG half pillar.

Example: Attaching to the SXG half pillar

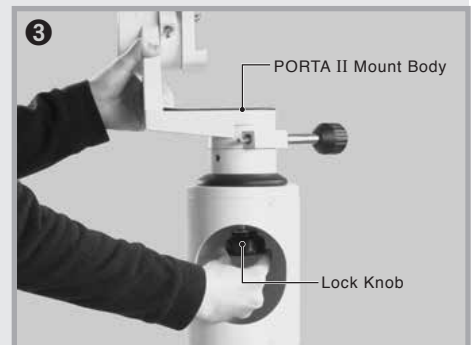
*Refer to the set up chart below as for the installation of other optional tripods available for the PORTA II.

- ① Loosen the lock knob underneath the tripod head of the PORTA II and take the mount body off.

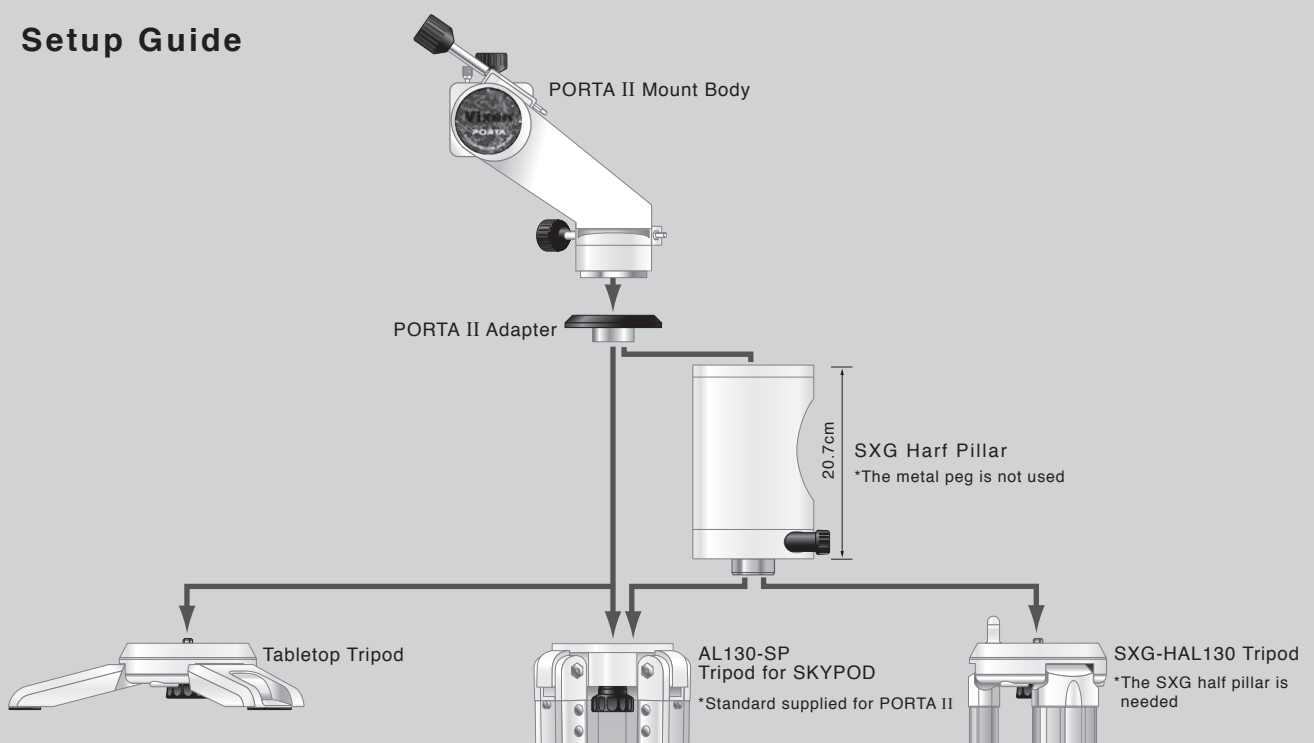
*Make sure to hold the mount body in one hand securely to avoid falling off while you loosen the lock knob in the other hand.

- ② Attach the SXG half pillar onto the tripod head so that the center projection on the bottom of the SXG half pillar fits the sunken tripod head. Tighten the lock knob underneath the tripod head securely.

- ③ Attach the mount head of the PORTA II onto the SXG half pillar and tighten the lock knob as shown in the figure.



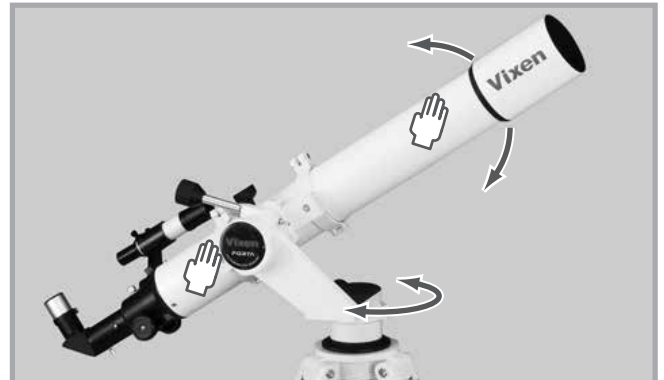
Setup Guide



I Quick Slewing Motion

You can quickly move the telescope toward the desired target by grasping the tube and moving it in altitude or azimuth. Do this to center the target in the finder and then fine-tune the position in the eyepiece by following the steps below.

※ Do not swing the Telescope by pulling or pushing the altitude or azimuth slow motion handles. Doing so may bend the worm shaft or even cause the shaft ends to break off.

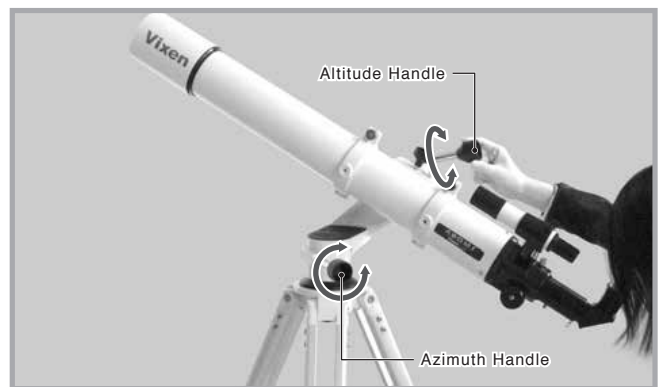


II Fine Motion and Tracking

For fine target positioning, rotate the altitude or azimuth slow motion handles in either direction while looking at the target through the eyepiece.

The PORTA II mount will rotate the telescope smoothly into position.

On an alt-azimuth mount, it is best to put celestial targets at the edge of field and allow the motion of the Earth to drift them across the field of view while observing. This will allow for steadier views and less manual tracking.



Hint

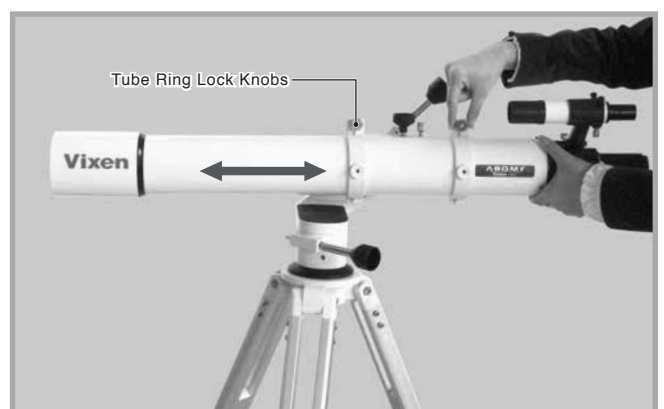
At high power, it is hard to follow celestial target in the field of view of the telescope by pushing / pulling the mount by hand. The altitude and azimuth handles allow smooth slow motion control of the telescope in order to search for and track objects.

III Balancing the Optical Tube

If the optical tube moves because of unbalance, shift it to the center of balance.

With the optical tube in the horizontal position, hold the optical tube and loosen slightly the tube ring lock knobs so the optical tube can slide. Grasping the optical tube, rotate it on the altitude axis. If it feels overweighed on one end, slide the optical tube toward the other end. Repeat until the optical tube is balance.

Tighten the tube ring lock knobs before proceeding.



IV-1 Aligning the Finder Scope (PORTA II A80Mf and PORTA II R130Sf)

- 1 Choose a conspicuous target in the distance and place the target in the center of a field of view of the telescope.

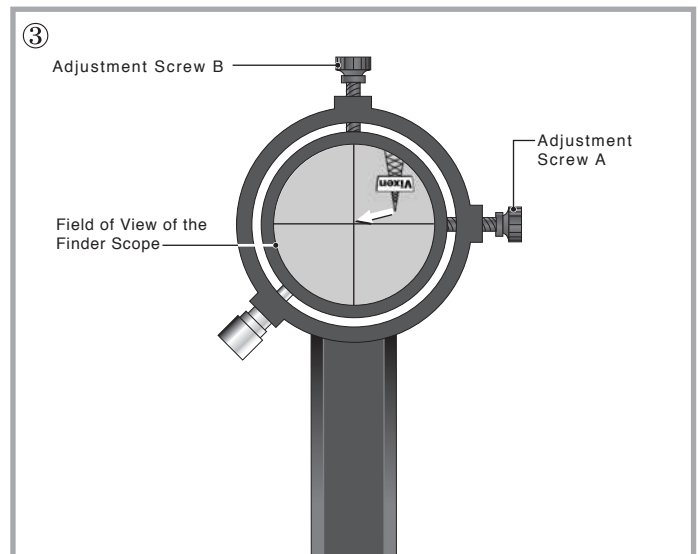
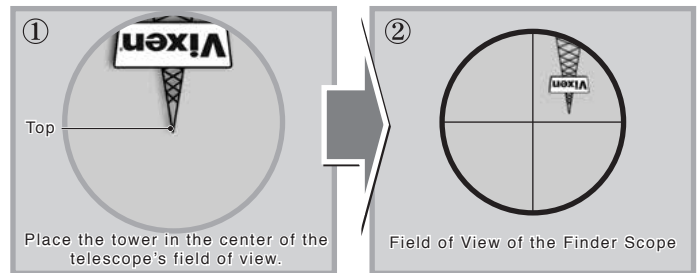
In the illustration, a distant Vixen tower is brought into the center of the field of view of the telescope.

- 2 Next, look through the finder scope. You should probably find the same target somewhere within the finder's field of view.

In the illustration, the tower is seen in the upper right of the finder's field of view. The finder scope has cross-hairs.

- 3 Align the optical axis (field of view) of the finder scope with the optical axis (field of view) of the telescope. Adjust the finder scope by loosening or tightening the adjustment screws A and B until the target is in the same position, in the center of the cross hairs.

In the illustration, the top of the tower is in the center of the cross hairs.



Example : The top of the tower can be moved toward the center of the cross hairs by loosening the adjustment screw A and tightening the adjustment screw B.

IV-2 Aligning the Finder Scope (PORTA II A70Lf)

- 1 Choose a conspicuous target in the distance and place the target in the center of a field of view of the telescope.

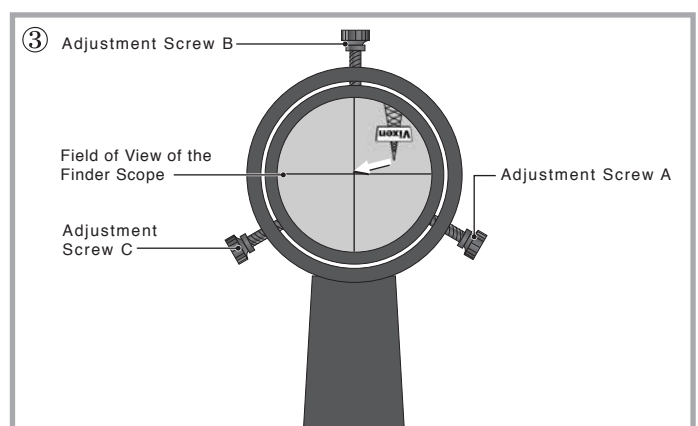
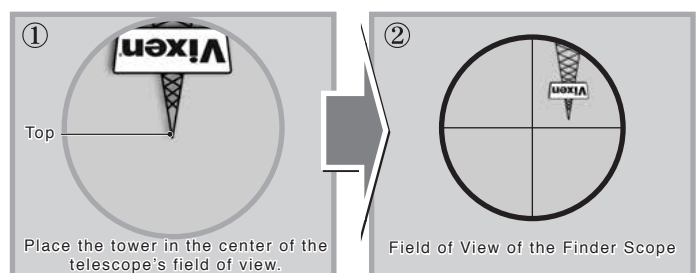
In the illustration, a distant Vixen tower is brought into the center of the field of view of the telescope.

- 2 Next, look through the finder scope. You should probably find the same target somewhere within the finder's field of view.

In the illustration, the tower is seen in the upper right of the finder's field of view. The finder scope has cross-hairs.

- 3 Align the optical axis (field of view) of the finder scope with the optical axis (field of view) of the telescope. Adjust the finder scope by loosening two adjustment screws out of three adjustment screws and tightening the remaining one adjustment screw until the target is in the same position, in the center of the cross hairs.

In the illustration, the top of the tower is in the center of the cross hairs.



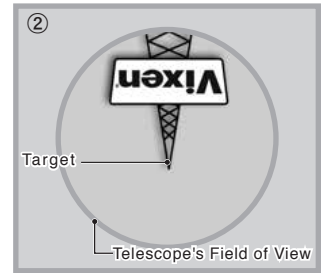
Example : The top of the tower can be moved toward the center of the cross hairs by loosening the adjustment screw A, B and tightening the adjustment screw C.

IV-3 Aligning the Finder Scope (PORTA II Telescopes with the XY Red Dot Finder)

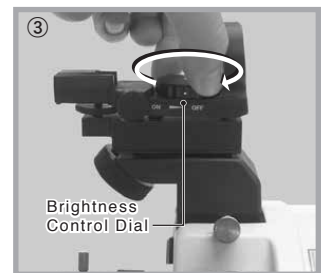
① Loosen the alignment clamp knob on the XY red dot finder and move the upper portion of the dot finder by holding its front end so that dot finder is parallel to the telescope tube roughly. Tighten the alignment clamp knob.



② Insert an eyepiece with low magnification into the eyepiece adapter on the focuser of the telescope. Choose a conspicuous target in the distance and point the telescope for it to get the target in the field of view of the eyepiece. Place the target in the center of the field of view.

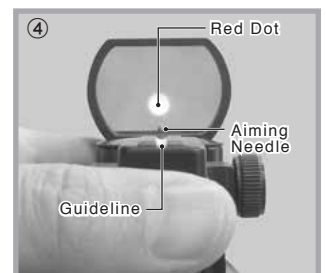


③ Turn on the red dot by turning the brightness control dial. The intensity of the brightness can be varied freely and stop turning the dial at a proper brightness.



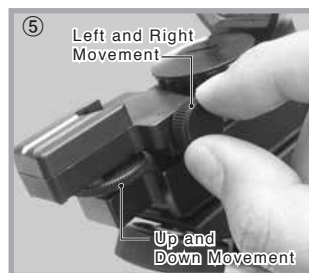
*The brightness control dial turns off when the white dot mark on the dial goes back to directly overhead the white dot mark on the side of the dot finder.

④ Confirm that a red dot is spotted just above the aiming needle on the bottom of the finder's field of view which is aligned with the white guideline as shown in the figure.



*The red dot can be seen clearly with a target in the far-off distance if your eyesight is good enough without spectacles. The red dot may not be seen as a tight point image or blurred if you have weak eyesight.

⑤ Adjust the dot finder by turning the adjustment knobs on the side of the dot finder so that the red dot aims at the same target in the telescope's eyepiece. The adjustment knob on the side of the dot finder moves the red dot left and right, and the knob on the back moves the red dot up and down.



⑥ Turn the brightness control dial until it clicks to switch off the red dot. You should readjust the brightness of the red dot when you use the XY red dot finder in the nights.

*Be careful not to turn the brightness control dial by force as it may be off the alignment by shifting the dot finder body from the bracket.



Hint

Use the XY red dot finder so that its red dot is in the center of the field of view.

The red dot is used for sighting regardless of a position of view as long as it can be seen in the dot finder's field of view. However, sighting from the corner is uncomfortable and it makes you difficult to locate the red dot. It may result in inaccuracy of the dot finder. If you are unable to find the red dot, try to sight from a position close to the white guideline.

Adjustments

I Adjusting the Altitude / Azimuth Slewing Motion

Test the motion smoothness of the PORTA II Mount with a balanced scope by moving the telescope tube by hand in altitude and azimuth (without using the alt-azimuth handles). Depending on the length and weight of the telescope, you may find too much or too little resistance to the motion. This resistance may also change with use. Directions here are to adjust this motion tension to your preference.

- 1 Peel back the rubber cover on the mount base and remove the 4mm (smaller) Allen wrench



- 2 Locate the Allen screws that control the tension of the altitude or azimuth motion in the picture at right. These screws are recessed on the stationary part of each axis assembly.



Adjust tension by rotating the screws and testing the motion by pushing/pulling on the tube.

II Adjusting the Altitude Handle Position

You can change the orientation of the altitude handle relative to the optical tube to suit your observing preference. You may also wish to do this to avoid confusing it with the dovetail lock screw knob.

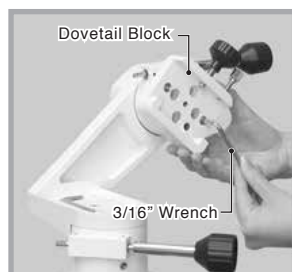
- 1 Put the scope in a horizontal position, grasp it with one hand, back off the safety screw and dovetail lock knob.



- 2 Peel back the rubber cover on the base of the mount and select the 3/16" (larger) Allen wrench.



- 3 Locate the two large Allen head screws holding the dovetail mounting block onto the altitude axis plate. Grasp the dovetail block and back out the screws with the Allen wrench.



- 4 Remove the dovetail block from the mount. Note the outer ring of threaded holes pairs on the altitude axis plate. These will be used to reorient the dovetail block.



- 5 Reorient the altitude axis to place the altitude handle in a desired position as shown in the figure right. Match the dovetail block with an outer pair of threaded holes on the altitude axis plate.



- 6 Attach the dovetail block with the previously removed Allen screws. Put the Allen wrench back to the tool compartment on the mount base.



Adjustments

III Adjusting the Azimuth Handle Position

You can change the orientation of the azimuth handle relative to the optical tube to suite your observing preference. You may wish to do this to avoid obstructing the optical tube.

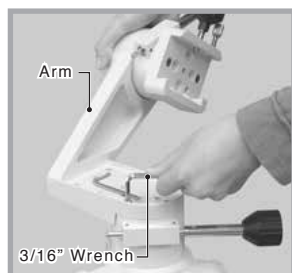
- ① Put the scope in a horizontal position, grasp it with one hand, back off the safety screw and dovetail lock knob to remove the optical tube.



- ② Pull the rubber cover on the base of the mount and select the 3/16" (larger) Allen wrench.



- ③ Locate the four Allen head screws holding the base of the altitude unit on the azimuth axis. Grasp the arm of the altitude unit and back out the screws with the Allen wrench.



- ④ Remove the altitude unit from the azimuth axis plate on the tripod base. Note the outer ring of the threaded hole pairs on the azimuth axis plate. These will be used to reorient the altitude unit.

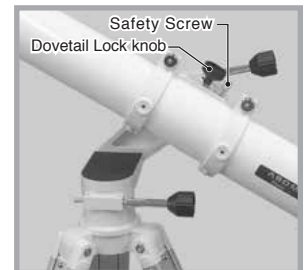


Reorient the azimuth axis to place the azimuth handle in a desired position as shown in the figure right. Match the altitude unit with an outer pair of threaded holes on the azimuth axis plate.

- ⑤ Attach the altitude unit with the previously removed Allen screws.



- ⑥ Put the Allen wrench back to the tool compartment on the mount base. Attach the optical tube.



IV Terrestrial Viewing

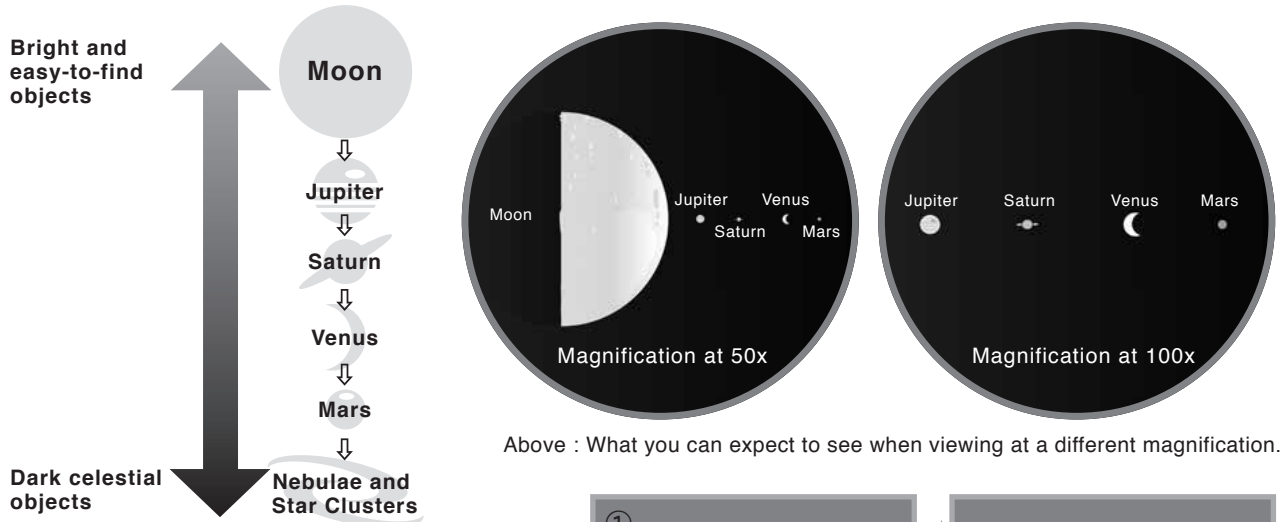
Beginners may have difficulty assembling and operating a telescope and PORTA II mount on the first night of astronomical observation. We recommend following the instructions in this manual in daytime first.

Try observing landscape in order to understand the movements of the PORTA II mount and the field of view of your finder scope and telescope.

Observation

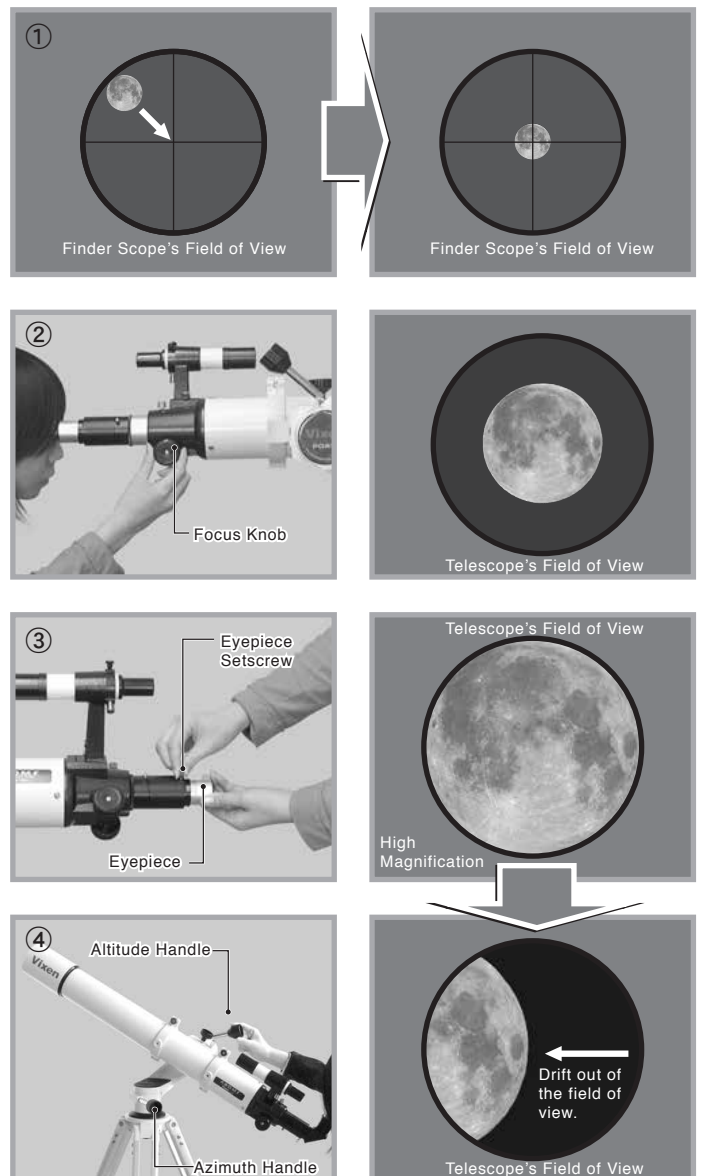
Observing the Moon

With the finder scope aligned and the eyepiece attached, you are ready to use the PORTA II telescope for your celestial observation in the night sky. Let's begin by observing a bright and easy-to-find object, the Moon, and then proceed to finding planets and dark objects easily visible at moderate power.



Above : What you can expect to see when viewing at a different magnification.

- ① Point your PORTA II telescope at the Moon by slewing the telescope tube by hand. Locate the Moon in the finder scope (or the dot finder). Center the Moon in the finder using the slow motion handles.
- ② Look through the telescope with an eyepiece of low magnification and the Moon will be there. Focus the telescope on the Moon by turning the focus knob.
- ③ Try using a different eyepiece to change the magnification.
- ④ The Moon (stars and other celestial objects as well) appears to move out of the field of view while looking through the telescope due to the Earth's rotation. The higher the magnification, the faster the movement. Turn the slow motion handles on the PORTA II mount to bring the Moon into the center of the field of view again.



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