WHAT WILL YOU...  DISCOVER.

WELCOME TO THE WORLD OF EXPLORATION.

By giving others a deeper understanding of the universe, our products serve an important purpose, and we want to help you sustain them.

That is why we offer Explore STAR – our fully transferrable, unlimited lifetime warranty that covers any problem no matter the cause and guarantees an unprecedented level of satisfaction that can be passed on to future owners.

To obtain this impressive coverage, all you have to do is register your Explore Scientific branded telescope within 60 days of purchase. We encourage you to do so today, so your telescope can be protected for a lifetime.

To activate your Explore STAR warranty, simply register the product with Explore Scientific within 60 days of purchase.

To complete your registration, select one of the following options.

• Visit http://explorescientificusa.com/pages/warranty and click on the "Registration" tab.

• Mail in the enclosed Registration Card

• Call our Customer Service Department at 866.252.3811.

CONNECT.

We live in a world of distractions populated by devices that foster detachment. But there are other worlds filled with inspiring landscapes, unimaginable beauty and the primordial matter that unites us. With your Explore Scientific telescope, your family can visit these places together and connect with each other through the cosmos.

DISCOVER.

Whether your interests lie in our lunar neighbor, our planetary brethren or the mysterious residents of deep sky, your Explore Scientific telescope can reveal the secrets you seek. Each night can present new targets, new challenges and new revelations. So turn your scope to the sky and discover what wonders await.

CAPTURE.

For some, preserving the beauty unfolding in their eyepieces is the ultimate goal. If you want to take your explorations beyond observation and into astrophotography, the precision optics of your Explore Scientific telescope can give you the contrast and crispness you need to capture the night sky's treasures in stunning detail.

SHARE.

Watching people's face light up when you show them Saturn's elegant rings or the Moon's chiseled terrain for the first time is a rewarding experience. By taking your Explore Scientific telescope out to a star party, a street corner or any outreach event, you can share your eyepiece and awaken others to the marvels of the sky.

We would like to thank you for selecting an Explore Scientific telescope as your pathway to the stars.

Since 2008, Explore Scientific has been on a mission to make astronomy accessible and provide a truly transformative experience by giving people the tools and guidance they need to explore the skies.

With our high-end optics and well-executed design, our precision optical instruments enhance your observing experience by rising to the highest standards of clarity, contrast and functionality. We also aim to exceed your service expectations by providing our exclusive Explore Star Forever Warranty that guarantees an unprecedented level of satisfaction.

We think of our telescopes as more than products. They are gateways to the universe that will broaden your perspective by revealing the intricate beauty of our nearest neighbors as well as the bounty of celestial wonders that lie well beyond our humble solar system.

The adventures this telescope can send you on are immeasurable, and we encourage you to enjoy it fully, use it often and share with others. All of us at Explore Scientific want you to have the experience you deserve, so please do not hesitate to contact our Customer Service Center with your questions or suggestions through an online chat at www.explorescientificusa.com or by calling (866) 252-3811.

Scott Roberts
President and Founder
Explore Scientific, LLC

Robert Price
Chief Sales Officer and Managing Partner
Explore Scientific, LLC

Table of Contents

Welcome to our AR Doublet Series

Designed to deliver crystal clear imagery full of contrast, the telescopes in our AR Doublet Series will reveal the universe's breathtaking sights with rich detail. Available in three apertures ranging from a highly portable 102 mm to a far-reaching 152mm, these achromatic refractors produce stunning views of countless celestial treasures like the Moon's chiseled craters, Saturn's elegant rings or the churning spiral of the face-on Pinwheel Galaxy. To connect you with the cosmos, the doublet telescopes in this series use a pairing of a crown glass lens and a flint glass lens separated by a cushion of air to minimize chromatic aberrations. To further guarantee high-quality imagery, all optical glass is fully multi-coated. Each model also offers a three-point collimation cell that allows for pinpoint adjustments of the objective lens for precision performance. Your AR Doublet Series telescope offers all of these benefits and more. This set-up manual and the accompanying materials will guide you through a basic assembly process that will have you at the eyepiece and under the stars in no time.

SUN WARNING

DO NOT use this telescope or any accompanying finder scope to look at or near the Sun! Even momentary visual contact with the Sun's light rays can instantly cause irreversible damage to your eye(s). Eye damage can be painless, so there is no warning to the observer that damage has occurred until it is too late.

Take extra care when using the telescope or a finder scope during daylight hours, and do not point either at or near the Sun. Do not look through either when you are moving the instruments during the daytime. Never allow anyone to use the telescope or a finder scope during the daytime without warning them of the hazards of aiming either at or near the Sun. Make sure that they are adequately trained on the use of these instruments before allowing them to start observing. Children should always have informed and trained adult supervision while observing.

PROPER CARE WARNING

Your telescope is a precision optical device and keeping the optics free of dust and dirt is crucial for optimal performance. However, the use of improper cleaning techniques, tools and/or solutions can cause irreparable damage to your telescope. In terms of solutions, use distilled water and/or an optical glass cleaner that can be found at most camera stores. Only use pure cotton swabs/balls or white, unscented, lotion-free tissues for wiping down optics after you have removed as many particles as possible with forced air or a photographic-grade camel hair brush. DO NOT use optical lens cleaning tissues as many contain fiberglass particles that can be abrasive.

UNPACKING and MOVING

Please Note: We recommend that you keep the original shipping box and packing materials if possible, in case your scope should ever need to be returned for service or warranty purposes. When the box is opened for the first time, you will find that all parts are packaged in plastic bags and the telescope's tube is wrapped in tissue. To begin assembly, slowly remove the optical tube. All models will come with their cradle rings attached, which makes for easy removal. Rarely, the cradle could have come open during packing or shipping, so it is important to check the latches and then do a quick, small lift

by the cradle handle to make sure the ring is secure before pulling the instrument all the way out. Although our telescopes are designed with portability in mind, it is important to use proper lifting techniques to prevent back injury and/or strained muscles. Whenever possible, use two people to move or lift the equipment and make use of wheeled devices like carts or dollies for additional aid.

DEW SHIELD

The dew shield is an important part of your telescope because it slows moisture build-up on the objective lens and can reduce image interference caused by ambient light. On each model in this series, the dew shield is pre-attached.

DIAGONAL

Astronomical observation usually requires the telescope to tilt up significantly, which can make straight-thru viewing awkward and uncomfortable. A diagonal solves this comfort problem by using a mirror to direct the light at a 90° angle toward the eyepiece, which is positioned perpendicular to the optical tube assembly (OTA) making the image more accessible. Equipped to fit both 1.25" and 2" eyepieces, your telescope's diagonal houses a precision-polished, two-inch mirror that is 99% reflective to maximize light transmission. To install the diagonal, begin by removing the dust covers from the focuser's drawtube and the diagonal itself. Loosen the screws on the drawtube's tension collar, and slide the barrel of the diagonal into the drawtube. Tighten the three tension screws to secure it firmly. Should one of these tension screws accidentally become loose, the barrel of the diagonal is tapered to prevent it from falling out of the focuser. The 1.25" eyepiece adapter or 2" eyepieces can be secured in the diagonal by tightening the tension screws on the compression ring lock. The 1.25" adapter also has a compression ring to secure eyepieces that are inserted into it.

CRADLE RINGS

Please note: On our 102mm AR Doublet Achromatic Refractor, you will need to install the finder scope before you put on the cradle ring assembly. On all of our other telescope models, the finder scope can be installed after the cradle rings are in position.

To attach any of the AR Doublet models to a mount you will need to use the individual model's included cradle ring set. Engineered to snugly grip its particular telescope, each extruded aluminum cradle assembly includes a hinged ring system, a slotted carry handle and a felt-lined interior that protects the tube's delicate surface. The rings are attached to a dovetail saddle plate to secure your scope to a mount. To attach cradle rings to your OTA, release the locking mechanism on each ring by loosening the metal thumbscrews and then separate the rings. Position your OTA within the rings, close them and retighten the thumbscrews until the tube is secure. If you are only repositioning the tube, you probably will not need to remove the assembly completely. Instead, you can undo the lock on each ring so that the tube is loose enough in the rings to slide back and forth or rotate. Be careful to hold the tube securely so that you do not lose control of it while the cradle rings are loose. Once the tube is in the desired position, be sure to retighten each lock. Finding the right placement of the cradle ring assembly involves finding your individual scope's balance point, which depends largely on the accessories you will be using. Before attempting to find this point, you should make sure the diagonal

and/or any heavy attachments like cameras or large eyepieces are installed. You may need to make adjustments for cone error if you are using a German equatorial mount. Cone error occurs when the polar axis of your mount and the center of your telescope's optical axis are not aiming at the same point in the sky. To check for cone error, you will need to first line your mount up with a fairly fixed point in the sky like Polaris or a stationary terrestrial target that will be far enough away to see well in your telescope. Mount your telescope and see if it is centered on the same target. If it is not, you will need to take the scope off of the mount and slightly tilt the telescope tube away from or toward the saddle plate by threading the adjusting screws in or out. These screws flank a central locking screw on each end of the saddle plate. The process will take some trial and error before the perfect adjustments are found. Please note that when the final adjustments are made, the center locking screw must have enough engagement with the threads of the cradle ring to make sure that the saddle plate stays connected.

Please note: On our 102mm AR Doublet Achromatic Refractor, you will need to install the finder scope before you put on the cradle ring assembly. On all of our other telescope models, the finder scope can be installed after the cradle rings are in position.

Each scope in our AR Doublet Series comes with a non-illuminated straight finder scope: This classic reverse-view finder scope has a simple crosshair that can be centered on your target. The first step in mounting your finder scope to your telescope is to slide it into the finder scope bracket, which has two rings to hold your finder scope in place. Each of these rings has three adjusting screws. If your finder scope is not already installed in the bracket, loosen each of the adjusting screws until you have opened up the full inside diameter of the rings. Slide the finder scope into place and gently tighten all of the adjusting screws until your finder scope is secure. The bracket has a dovetail base that slides easily into the mounting assembly that is already attached to the optical tube assembly (OTA). Once it is installed in the base, secure it by tightening the two large, heavy-duty plastic screws. For information on aligning your finder scope and telescope, please refer to the finder scopes pamphlet.

Welcome to our ED Triplet Essential Series

Designed to deliver crystal clear imagery rich in contrast, the premium telescopes in our ED Triplet Essential Series are the ideal optical instruments to capture the universe's breathtaking sights. Available in three apertures ranging from a grab-and-go 80mm to a versatile 127mm, these apochromatic refractors produce stunning views of countless celestial treasures like the Moon's chiseled craters, Saturn's elegant rings or the churning spiral of the face-on Pinwheel Galaxy. To provide you a true view of the cosmos, the telescopes in this series feature an air-spaced triplet optical design that virtually eliminates chromatic aberrations. In addition, they use a combination of genuine HOYA extra-low dispersion (ED) glass and proprietary EMD enhanced multi-layer coatings on all optical surfaces to generate brilliant high-contrast images with crisp definition. The quality of the optics also allows those seeking to push magnification based on their choices of eyepieces or focal extenders to do so without sacrificing clarity. To further guarantee precision performance, these telescopes include a three-point collimation cell that allows for pinpoint adjustments of the objective lens. Your ED Triplet Essential Series telescope offers all of these benefits and more. This set-up manual and the accompanying materials will guide you through a basic assembly process that will have you at the eyepiece and under the stars in no time.

SUN WARNING

DO NOT use this telescope or any accompanying finder scope to look at or near the Sun! Even momentary visual contact with the Sun's light rays can instantly cause irreversible damage to your eye(s). Eye damage can be painless, so there is no warning to the observer that damage has occurred until it is too late. Take extra care when using the telescope or a finder scope during daylight hours, and do not point either at or near the Sun. Do not look through either when you are moving the instruments during the daytime. Never allow anyone to use the telescope or a finder scope during the daytime without warning them of the hazards of aiming either at or near the Sun. Make sure that they are adequately trained on the use of these instruments before allowing them to start observing. Children should always have informed and trained adult supervision while observing.

PROPER CARE WARNING

Your telescope is a precision optical device and keeping the optics free of dust and dirt is crucial for optimal performance. However, the use of improper cleaning techniques, tools and/or solutions can cause irreparable damage to your telescope. In terms of solutions, use distilled water and/or an optical glass cleaner that can be found at most camera stores. Only use pure cotton swabs/balls or white, unscented, lotion-free tissues for wiping down optics after you have removed as many particles as possible with forced air or a photographic-grade camel hair brush. DO NOT use optical lens cleaning tissues as many contain fiberglass particles that can be abrasive.

UNPACKING and MOVING

Please Note: We recommend that you keep the original shipping box and packing materials if possible, in case your scope should ever need to be returned for service or warranty purposes. When the box is opened for the first time, you will find that all parts

are packaged in plastic bags and the telescope's tube is wrapped in tissue. To begin assembly, slowly remove the optical tube. All models will come with their cradle rings attached, which makes for easy removal. Rarely, the cradle could have come open during packing or shipping, so it is important to check the latches and then do a quick, small lift by the cradle handle to make sure the ring is secure before pulling the instrument all the way out. Although our telescopes are designed with portability in mind, it is important to use proper lifting techniques to prevent back injury and/or strained muscles. Whenever possible, use two people to move or lift the equipment and make use of wheeled devices like carts or dollies for additional aid.

To begin assembly, slowly remove the optical tube from its foam casing. The 102mm, 127mm and 152mm models will all come with their cradle rings attached, which makes for easy removal. Rarely, the cradle could have come open during packing or shipping, so it is important to check the latches and then do a quick, small lift by the cradle handle to make sure the ring is secure before pulling the instrument all the way out. Although our telescopes are designed with portability in mind, it is important to use proper lifting techniques to prevent back injury and/or strained muscles. Whenever possible, use two people to move or lift the equipment and make use of wheeled devices like carts or dollies for additional aid. Due to its necessary size and weight, the 152mm model's case comes with wheels for easier transport.

DEW SHIELD

The dew shield is an important part of your telescope because it slows moisture build-up on the objective lens and can reduce image interference caused by ambient light. We advise using the dew shield when possible to maximize these crucial benefits. For the 80mm, 102mm and 127mm models, the dew shield is an easy-to-operate retractable style that slides smoothly up and down the optical tube assembly with no installation required.

DIAGONAL

Astronomical observation usually requires the telescope to tilt up significantly, which can make straight-thru viewing awkward and uncomfortable. A diagonal solves this comfort problem by using a mirror to direct the light at a 90° angle toward the eyepiece, which is positioned perpendicular to the OTA making the image more accessible. Equipped to fit both 1.25" and 2" eyepieces, your telescope's diagonal houses a precision-polished, two-inch mirror that is 99% reflective to maximize light transmission. To install the diagonal, begin by removing the dust covers from the focuser's drawtube and the diagonal itself. Loosen the screws on the drawtube's tension collar, and slide the barrel of the diagonal into the drawtube. Tighten the three tension screws to secure it firmly. Should one of these tension screws accidentally become loose, the barrel of the diagonal is tapered to prevent it from falling out of the focuser. The 1.25" eyepiece adapter or 2" eyepieces can be secured in the diagonal by tightening the tension screws on the compression ring lock. The 1.25" adapter also has a compression ring to secure eyepieces that are inserted into it. Please note: Your telescope may come with extension tubes for situations in which you need more back focus. Please see the "Focusers" insert for more information on how to install these accessories between the focuser and the diagonal.

CRADLE RINGS

(The following section does not apply to the 80mm model, as it does not include or need a cradle ring. Instead, the 80mm has a vixen dovetail plate attached directly to the OTA.) To attach the 102mm or 127mm model to a mount you will need to use the individual model's included cradle ring set.

Engineered to snugly grip its particular telescope, each extruded aluminum cradle assembly includes a hinged ring system, a slotted carry handle and a felt-lined interior that protects the tube's delicate surface. The rings are attached to a saddle plate to secure your scope to a mount. The cradles for the 102mm and 127 models have vixen dovetail plates. To attach cradle rings to your OTA, release the locking mechanism on each ring. On the 102mm model, the locking mechanism consists of a metal bar capped with oversized thumbscrews. At the point where each half of the ring meets, simply flip the bar over and tighten the thumbscrews. The 127mm model has an easy-to-operate latching lock mechanism. If you are only repositioning the tube, you probably will not need to remove the assembly completely. Instead, you can undo the lock on each ring so that the tube is loose enough in the rings to slide back and forth or rotate. Be careful to hold the tube securely so that you do not lose control of it while the cradle rings are loose. Once the tube is in the desired position, be sure to retighten each lock. Finding the right placement of the cradle ring assembly involves finding your individual scope's balance point, which depends largely on the accessories you will be using.

To begin assembly, slowly remove the optical tube from its foam casing. The 102mm and 127mm models will come with their cradle rings attached, which makes for easy removal. Rarely, the cradle could have come open during packing or shipping, so it is important to check the latches and then do a quick, small lift by the cradle handle to make sure the ring is secure before pulling the instrument all the way out. Although our telescopes are designed with portability in mind, it is important to use proper lifting techniques to prevent back injury and/or strained muscles. Whenever possible, use two people to move or lift the equipment and make use of wheeled devices like carts or dollies for additional aid.

Welcome To Our ED Triplet Carbon Fiber Series

Designed to deliver crystal clear imagery rich in contrast, the premium telescopes in our ED Triplet Carbon Fiber Series are the ideal optical instruments to capture the universe's breathtaking sights. Available in four apertures ranging from a grab-and-go 80mm to a far-reaching 152mm, these apochromatic refractors produce stunning views of countless celestial treasures like the Moon's chiseled craters, Saturn's elegant rings or the churning spiral of the face-on Pinwheel Galaxy. To provide you a true view of the cosmos, the telescopes in this series feature an air-spaced triplet optical design that virtually eliminates chromatic aberrations. In addition, they use a combination of genuine HOYA extra-low dispersion (ED) glass and proprietary EMD enhanced multi-layer coatings on all optical surfaces to generate brilliant high-contrast images with crisp definition. The quality of the optics also allows those seeking to push magnification based on their choices of eyepieces or focal extenders to do so without sacrificing clarity. To further guarantee precision performance, these telescopes include a three-point collimation cell that allows for pinpoint adjustments of the objective lens and a carbon fiber optical tube assembly that eliminates focus change attributed to shrinking or expansion caused by temperature fluctuations. Your ED Triplet Carbon Fiber Series telescope offers all of these benefits and more. This set-up manual and the accompanying materials will guide you through a basic assembly process that will have you at the eyepiece and under the stars in no time.

SUN WARNING

DO NOT use this telescope or any accompanying finder scope to look at or near the Sun! Even momentary visual contact with the Sun's light rays can instantly cause irreversible damage to your eye(s). Eye damage can be painless, so there is no warning to the observer that damage has occurred until it is too late.

Take extra care when using the telescope or a finder scope during daylight hours, and do not point either at or near the Sun. Do not look through either when you are moving the instruments during the daytime. Never allow anyone to use the telescope or a finder scope during the daytime without warning them of the hazards of aiming either at or near the Sun. Make sure that they are adequately trained on the use of these instruments before allowing them to start observing. Children should always have informed and trained adult supervision while observing.

PROPER CARE WARNING

Your telescope is a precision optical device and keeping the optics free of dust and dirt is crucial for optimal performance. However, the use of improper cleaning techniques, tools and/or solutions can cause irreparable damage to your telescope. In terms of solutions, use distilled water and/or pure isopropyl alcohol (99%). Do not eat, drink or smoke while using this substance, wear protective gloves and eyewear, use in a ventilated area and follow proper disposal techniques. Only use pure cotton swabs/balls or white, unscented, lotion-free tissues for wiping down optics after you have removed as many particles as possible with forced air or a photographic-grade camel hair brush. DO NOT use optical lens cleaning tissues as many contain fiberglass particles that can be abrasive.

UNPACKING and MOVING

Please Note: We recommend that you keep the original shipping box and packing materials if possible, in case your scope should ever need to be returned for service or warranty purposes. Each model in this series comes packed in a deluxe case with spring-loaded butterfly latches and handles on both ends. After twisting all four latches open, you will be able to fully remove the lid to reveal the molded interior that includes specific spaces for all included accessories. When the case is opened for the first time, you will find that all parts are packaged in plastic bags and the telescope's tube is wrapped in tissue. To begin assembly, slowly remove the optical tube from its foam casing. The 102mm, 127mm and 152mm models will all come with their cradle rings attached, which makes for easy removal. Rarely, the cradle could have come open during packing or shipping, so it is important to check the latches and then do a quick, small lift by the cradle handle to make sure the ring is secure before pulling the instrument all the way out. Although our telescopes are designed with portability in mind, it is important to use proper lifting techniques to prevent back injury and/or strained muscles. Whenever possible, use two people to
move or lift the equipment and make use of wheeled devices like carts or dollies for additional aid. Due to its necessary size and weight, the 152mm model's case comes with wheels for easier transport.

DEW SHIELD

The dew shield is an important part of your telescope because it slows moisture build-up on the objective lens and can reduce image interference caused by ambient light. We advise using the dew shield when possible to maximize these crucial benefits. For the 80mm, 102mm and 127mm models, the dew shield is an easy-to-operate retractable style that slides smoothly up and down the optical tube assembly with no installation required. On the 152mm model, the dew shield is stationary and must be attached using the included set screws. To do this, remove the optical tube assembly from its case, take off the front dust cover and gently slide off the dew shield, which is in a reverse position during storage. During packaging, a foam padding is placed between the tube and the dew shield. This can now be removed. Flip the dew shield around, reattach it to the front of the tube and secure it by carefully tightening the three set screws. During breakdown, simply reverse the process.

DIAGONAL

Astronomical observation usually requires the telescope to tilt up significantly, which can make straight-thru viewing awkward and uncomfortable. A diagonal solves this comfort problem by using a mirror to direct the light at a 90° angle toward the eyepiece, which is positioned perpendicular to the OTA making the image more accessible. Equipped to fit both 1.25" and 2" eyepieces, your telescope's diagonal houses a precision-polished, two-inch mirror that is 99% reflective to maximize light transmission. To install the diagonal, begin by removing the dust covers from the focuser's drawtube and the diagonal itself. Loosen the screws on the drawtube's tension collar, and slide the barrel of the diagonal into the drawtube. Tighten the three tension screws to secure it firmly. Should one of these tension screws accidentally become loose, the barrel of the diagonal is tapered to prevent it from falling out of the focuser. The 1.25" eyepiece adapter or 2" eyepieces can be secured in the diagonal by tightening the tension screws on the compression ring lock.

CRADLE RINGS

(The following section does not apply to the 80mm model, as it does not include or need a cradle ring. Instead, the 80mm has a vixen dovetail plate attached directly to the OTA.) To attach the 102mm, 127mm or 152mm model to a mount you will need to use the individual model's included cradle ring set.

Engineered to snugly grip its particular telescope, each extruded aluminum cradle assembly includes a hinged ring system, a slotted carry handle and a felt-lined interior that protects the tube's delicate surface. The rings are attached to a saddle plate to secure your scope to a mount. The cradles for the 102mm and 127 models have vixen dovetail plates, while the 152mm model has a Losmandy-style plate. To attach cradle rings to your OTA, release the locking mechanism on each ring. On the 102mm model, the locking mechanism consists of a metal bar capped with oversized thumbscrews. At the point where each half of the ring meets, simply flip the bar over and tighten the thumbscrews. The 127mm and 152mm models have an easy-to-operate latching lock mechanism. If you are only repositioning the tube, you probably will not need to remove the assembly completely. Instead, you can undo the lock on each ring so that the tube is loose enough in the rings to slide back and forth or rotate. Be careful to hold the tube securely so that you do not lose control of it while the cradle rings are loose. Once the tube is in the desired position, be sure to retighten each lock. Finding the right placement of the cradle ring assembly involves finding your individual scope's balance point, which depends largely on the accessories you will be using.

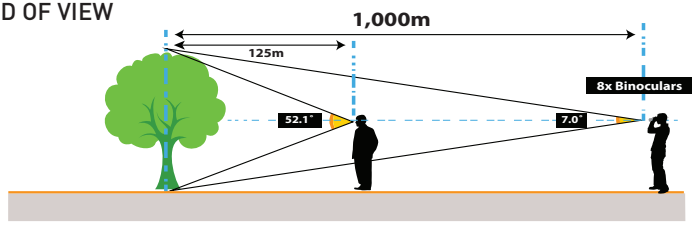
Before attempting to find this point, you should make sure the diagonal and/or any heavy attachments like cameras or large eyepieces are installed. On the models with vixen dovetail saddle plates attached to the cradle rings, you may need to make adjustments for cone error if you are using a German equatorial mount. Cone error occurs when the polar axis of your mount and the center of your telescope's optical axis are not aiming at the same point in the sky. To check for cone error, you will need to first line your mount up with a fairly fixed point in the sky like Polaris or a stationary terrestrial target that will be far enough away to see well in your telescope. Mount your telescope and see if it is centered on the same target. If it is not, you will need to take the scope off of the mount and slightly tilt the telescope tube away from or toward the saddle plate by threading the adjusting screws in or out. These screws flank a central locking screw on each end of the

saddle plate. The process will take some trial and error before the perfect adjustments are found. Please note that when the final adjustments are made, the center locking screw must have enough engagement with the threads of the cradle ring to make sure that the saddle plate stays connected.

Introduction To Our Eyepieces

Your telescope's eyepiece is more than a simple accessory. It sets the magnification and field of view of your optical system and is a critical component in determining how profoundly you connect with the cosmos. Designed to provide wide fields of view for a full immersion experience, Explore Scientific's premium eyepieces ensure stunning detail with high-end optics that allow your telescope to reach its full potential. We offer five series of eyepieces that differ in factors like field of view, available focal lengths, barrel diameter and eye relief. However, they all share characteristics that guarantee superior image quality. For peak performance, each of our precision eyepieces offers lenses made of low-dispersion glass with a high refractive index. In addition, each lens is fully multi-coated with durable enhanced multi-layer deposition (EMD) coatings. The combination of these factors brilliantly captures the celestial wonders you seek with sharp contrast, high resolution and crisp definition. To protect the precision optics, the body of each eyepiece is O-ring sealed and purged with an inert gas (either argon or nitrogen) for a waterproof environment that is impervious to internal fogging and prevents contaminants like fungus and dust from entering. Each also offers foldable soft silicone rubber eyecups to provide the most comfortable viewing experience and a filter thread on the backside that will allow for use of moon or light filters.

FIELD OF VIEW



There are two distinct types of field of view to consider in any eyepiece. The first of these is apparent field of view (AFOV). Expressed in degrees, the AFOV is the perceived angle from your eye to the edges of the field stop of an eyepiece. The larger the AFOV, the more area you will see. With AFOVs ranging from a wide 68° to a hyper-wide 120°, our five lines of eyepieces will open up vast expanses of inky black sky for you to explore. To provide views that are truly stunning, each eyepiece model is designed with the distinct number and configuration of elements (optical lenses) needed to ensure a well corrected field of view is maintained as the angle widens. The benefits of our wide field eyepieces go beyond the amount they reveal. When you have more sky to work with, objects are easier to locate and stay in the field of view longer, which translates to fewer adjustments. This is especially helpful when you are using a non-driven mount. These eyepieces also allow the viewer to use averted vision, which is a technique that aids in observing faint objects. When using averted vision you gaze slightly to the side of your target object rather than directly at it. This puts the image on a part of your eye that is more sensitive to light, which allows you to enjoy fainter objects. The second type of field of view is true field of view (TFOV), which is the actual field of view of the sky or terrestrial scene expressed in degrees and/or fractions of a degree as seen through a telescope/eyepiece combination. To calculate the TFOV, you will divide the apparent field of view by the magnification. For example, if the resulting magnification from your telescope and eyepiece set-up is 50x and your eyepiece has a 100° AFOV, you will divide 100 by 50 to get a TFOV of 2°. TFOVs usually range between .25° to 2 degrees.

MAGNIFICATION

One of the main roles the eyepiece plays is setting the magnification or power of a specific optical set-up. The amount of magnification you will want to use depends largely on your subject. To calculate magnification, divide the focal length of the telescope by the focal length of the chosen eyepiece. The resulting number will be your power. For example, a 20mm eyepiece in a telescope with a 1,000mm focal length will result in 50x power, which will make the object appear 50 times larger. If you change the eyepiece, the power goes up or down accordingly. When choosing magnification, it is important to remember that the lower the power the brighter the image. If you are observing the Moon or a notable double star, a high power eyepiece will work well because the loss of brightness that occurs as magnification amps up is not a huge factor. However, if you are viewing a dim subject like an expansive galaxy or a faint nebula, you will want to use your lowest power because you will need all of the brightness you can get. Overall, the best way to determine what magnification level to use is to try different powers and see how the image changes. Having a nice range of eyepieces available can be the most rewarding way to enjoy all that the night sky has to offer.

EXIT PUPIL

The exit pupil is the diameter of the beam of light coming out of the eyepiece. To calculate exit pupil, divide the focal length of your eyepiece by your telescope's focal ratio. For example, if you use a 20mm eyepiece with an f/5 telescope, the exit pupil would be 4mm.

EYE RELIEF

Eye relief is all about a comfortable viewing experience because it is the distance at which you need to position your eye from the eyepiece's outermost surface to enjoy the full field of view. This characteristic is of special concern to observers who wear glasses to correct a astigmatism, because a long enough eye relief is necessary to allow room for glasses. A full spectrum of eye relief distances is represented across our five eyepiece lines.

OTHER ACCESSORIES:

FOCAL EXTENDERS

Available in 2x, 3x and 5x in a 1.25" barrel and 2x in a 2" barrel, our focal extenders add versatility to your eyepiece line-up by allowing each eyepiece to perform at two powers. For example, if your particular eyepiece/telescope combination results in a 50x power, adding a 2x focal extender will change that to a 100x power. To guarantee superior image quality, our focal extenders use multiple lens elements that are made of high-quality glass and fully multi-coated with EMD coatings to reduce chromatic and spherical aberrations. To use a focal extender, install it in the eyepiece barrel of your telescope/diagonal before the eyepiece and then secure the eyepiece into it.

COMA CORRECTOR

Coma is a common optical aberration that can plague the outskirts of your image. When coma is present, stars in the center of the field will pop like precise points of light, but stars at the edge take on an unnatural comet-like shape. Explore Scientific's Coma Corrector can help you minimize or even eliminate image aberrations caused by this off-axis optical phenomenon even in fast Newtonians. Our 2" coma corrector offers multi-coated lenses, a black-anodized aluminum barrel with spacer markings and a textured rubber grip. Tightly secured by three thumbscrews, this accessory comes with two adapters (.75" and 1") to secure to your T adapter and a protective cap.

FIELD FLATTENER

A curved focal plane is an inherent feature in most telescope designs and is nothing to note for general stargazers. But, for astrophotographers, the consequences of that same curved plane can ruin hours of patient imaging. Designed for refracting telescopes, Explore Scientific's Field Flattener can tackle the edge-of-field aberrations caused by this necessary curvature to ensure your long night at the eyepiece will not be in vain. This accessory offers fully multi-coated optics and slides securely into the 2" eyepiece holder.

FOCAL REDUCER

Explore Scientific's 3" Field Flattener/.7x Focal Reducer is a multi-faceted accessory designed to enhance your astrophotography experiences. As a field flattener, this piece addresses the edge-of-field aberrations caused by curved focal planes to ensure your night at the eyepiece will result in crisp, true images. As a focal reducer, this device will reduce your f-ratio by .7, which results in a wider field of view, brighter images and less exposure time. Recommended for our 127mm and 152mm refracting telescopes, and is designed for f/7.5 to f/8.5 ratios and is best centered on a f/8 optical design, this field flattener/focal reducer boasts fully multi-coated optics and comes with a 2" adapter to accommodate different focuser sizes and two T-thread adapters.

Introduction To Our Finder Scopes

Finding a specific target in the vastness of the night sky can be a daunting and frustrating task when the only tool at your disposal is a telescope. To help you hone in on the celestial wonder you seek, a good finder scope that is properly aligned is a necessity. Our eight-power 50mm finder scopes are designed to be precision optical instruments in their own right. Outfitted with a fully multi-coated doublet main lens and a long eye-relief eyepiece with a precision crosshair or reticle (depending on the model), our finder scopes provide high resolution, high contrast images at low magnification to effortlessly and quickly orient your telescope to a particular object or area of the sky. Although they share a common mission to provide easy guidance, we do offer three distinct models. They are: Non-Illuminated Straight Finder Scope: This classic reverse-view finder scope has a simple crosshair that can be centered on your target. It features a front focus with locking ring and a bright 6° field of view. Illuminated Straight Finder Scope: Explore Scientific's original straight-style, correct-image finder scope has a precision-etched illuminated open circle, crosshair reticle with adjustable deep red LED illumination that makes target acquisition easy. Precise focus of both the main objective lens and the eyepiece allow for the sharpest views of the target being viewed as well as the reticle. The finder scope's correct-image, right-side-up viewing produces a natural view that benefits astronomy and terrestrial observers. Polar Illuminated Right-Angle Finder Scope: In addition to offering a right angle eyepiece for comfortable viewing and a larger 7° field of view, our top model comes with an illuminated reticle that features northern and southern polar reference markings for quick and precise polar alignments with any equatorial mount. Although it has a larger 7° field of view, it shares the same attention to design and features of the Illuminated Straight Finder Scope. These include adjustable brightness for the reticle's deep red illumination, precision focus of both the main objective lens and the eyepiece and correct-image, right-side-up viewing.

SUN WARNING

DO NOT use a telescope or finder scope to look at or near the Sun! Even momentary visual contact with the Sun's light rays can instantly cause irreversible damage to your eye(s). Eye damage can be painless, so there is no warning to the observer that damage has occurred until it is too late. Take extra care when using a telescope or a finder scope during daylight hours, and do not point either at or near the Sun. Do not look through either when you are moving the instruments during the daytime. Never allow anyone to use a telescope or a finder scope during the daytime without warning them of the hazards of aiming either at or near the Sun. Make sure that they are adequately trained on the use of these instruments before allowing them to start observing. Children should always have informed and trained adult supervision while observing.

PROPER CARE WARNING

Your finder scope is a precision optical device and keeping the optics free of dust and dirt is crucial for optimal performance. However, the use of improper cleaning techniques, tools and/or solutions can cause irreparable damage to your scope. In terms of solutions, use distilled water and/or an optical glass cleaner that can be found at most camera stores. Only use pure cotton swabs/balls or white, unscented, lotion-free tissues for wiping down optics after you have removed as many particles as possible with forced air or a photographic-grade camel hair brush. DO NOT use optical lens cleaning tissues

as many contain fiberglass particles that can be abrasive.

FOCUSING YOUR FINDER SCOPE

(Please note: This section does not apply to our Non-Illuminated Straight Finder Scope, which does not have a focus feature.) Our illuminated finder scopes allow for focus adjustments of both the objective lens and the eyepiece.

On the Illuminated Straight Finder Scope, your initial focus adjustments can be made before you mount the finder scope to your telescope. While holding the finder scope in your hand, loosen the focus lock ring on the eyepiece by holding onto it while you turn the eyepiece focus adjuster counterclockwise. Once the adjuster is moving freely, let go of the lock ring and aim the finder scope at a blank wall. Turn the focus adjuster left or right until you see the finder scope crosshairs reach perfect sharpness. Tighten the lock ring down to hold the focus position

Now, loosen the objective lens focus adjuster in the same way. Aim the finder scope at a very distant, stationary object. Turn the objective lens focuser left or right until you see the object and the crosshairs reach perfect sharpness. Tighten the lock ring down to hold the focus position.

Once your finder scope is mounted on your telescope, repeat the process on the Moon or a bright star and make adjustments as necessary.

MOUNTING YOUR FINDER SCOPE

The first step in mounting your finder scope to your telescope is to slide it into the finder scope bracket, which has two rings to hold your finder scope in place. Each of these rings has three adjusting screws.

If your finder scope is not already installed in the bracket, loosen each of the adjusting screws until you have opened up the full inside diameter of the rings. Slide the finder scope into place and gently tighten all of the adjusting screws until your finder scope is secure.

The bracket has a dovetail base that slides easily into the mounting assembly that is already attached to the optical tube assembly (OTA). Once it is installed in the base, secure it by tightening the two large, heavy-duty plastic screws.

Please note: On our 102mm AR Doublet Achromatic Refractor, you will need to install the finder scope before you put on the cradle ring assembly. On all of our other telescope models, the finder scope can be installed after the cradle rings are in position.

ALIGNING YOUR FINDERSCOPE

Once your finder scope is mounted on your telescope, it is time to align the finder scope so that it and the telescope will be centered on the same spot in the sky when it is time to use it. Although the process can be tedious, it is important to follow through to avoid later frustrations that can ruin an observing session.

We recommend doing that first alignment in the daytime using a land-based target. Be careful to do this in an area where you will not accidentally point either your telescope or finder scope at or near the Sun, (see Sun Warning in this manual).

After you have set up your telescope and attached the finder scope, find an easy, stationary target that is at least 200 meters away. We suggest using a streetlight or the top of a telephone pole.

Insert your lowest power eyepiece into your telescope's eyepiece holder and center the chosen target in the telescope's eyepiece. Look through the finder scope's eyepiece and loosen or tighten one or more of the adjusting screws that are located on the finder scope rings until the crosshairs are precisely centered on the same target as the telescope.

Once you have reached the most accurate position, repeat the process with a medium and a high power eyepiece in your telescope if possible. Once night falls, center the Moon or a bright star in your finder scope then check the view in your scope. Make small adjustments as needed.

USING YOUR ILLUMINATOR

(Please note: This section does not apply to our Non-Illuminated Straight Finder Scope.) To turn your illuminator on, simply turn the top dial past the click stop. If you continue to turn it clockwise, the illuminator will get brighter, but we recommend that you use it at the dimmest setting that will still allow you to comfortably see the red-illuminated crosshairs or polar reference markings (depending on which model you are using)..

CHANGING BATTERIES ON YOUR ILLUMINATOR

The batteries that power your finder scope's illuminator should last for several hours of continuous illumination, but we do recommend turning the illuminator off when not in use to preserve battery life.

To change the batteries on your illuminator, unthread the illuminator from the finder scope by grasping the entire unit and twisting it counterclockwise until it is free. Separate the two halves of the illuminator by holding the two ends and twisting counterclockwise. When the two halves are free of each other, carefully separate them so that the batteries and the sleeve that holds them do not pop out uncontrollably.

Replace the old batteries with two new LR41 batteries and reinstall the sleeve, making sure that the negative ends of the batteries are facing the LED illuminator.

Twist the halves back together and switch the illuminator on to make sure the batteries are working. If the illuminator works, rethread it onto the finder scope. If not, check that the polarity position is correct and that the batteries are new and fully charged. If the illuminator still does not come on, clean the battery terminals with a pencil eraser and try again. If the illuminator still does not respond, please contact our Customer Service Department at (866) 252-3811 or online at www.explorescientificusa.com.

Introduction To Our Focusers

It takes more than excellent optics for your telescope to truly perform. If you want to capture the intricacies of our Moon's winding Hadley Rille or the spiraling arms of the Pinwheel Galaxy, you will need to have a superior focuser in your astronomical arsenal. The focuser is one of the most important mechanical components of your telescope because it is the tool you use to find and hold that perfect crisp image. Although there are differences in design, all four of our dual-speed focusers are built to meet high standards of precision and functionality. We want to make sure you see the details you seek without needing to make constant adjustments.

COMMON FEATURES

In addition to a shared mission to provide you the best viewing experience, each of our focusers have some similar elements. These include:

• Fine and Coarse Focusing: On one side of each focuser you will find a stacked set of dials. The largest of the pair controls your coarse focusing and the smaller provides micro-focusing. Both controls are knurled so that you can grip them easily for smooth adjustments even when you are wearing gloves.

• Locking and Tension Screws: Although they are located in different places on each model, locking and tension screws perform vital functions on all of our focusers. To avoid unintended adjustments, the locking screw can be gently tightened to keep the focuser stationary once you have reached your desired focus. The tension screw(s) are used to put pressure on the drawtube to secure it and keep it from sliding when heavier accessories like cameras or large eyepieces are added.

• Tension Collar: At the end of each focuser, you will find a tension collar with three set screws that are used to hold a diagonal or an eyepiece in place.

• Compression Ring Eyepiece Adapter: The purpose of this component is to allow you to still use eyepieces/diagonals that are smaller than the diameter of the drawtube. Our three 2" focusers include a 1.25" adapter, while our Feather Touch 3" focuser includes a 2" adapter. The adapter locks into place in the tension collar by tightening the collar's set screws.

STYLES OF FOCUSERS

Rack and Pinion Focuser

This focuser uses a circular gear (pinion) linked to the focus dials to move the drawtube along a linear rack lined with teeth. As you turn the dial the gear engages with the teeth guiding the drawtube in and out. On this 2" focuser, the locking screw is in the center on the underside of the focuser and the two tension screws that press down to keep the drawtube from slipping are on the top. This focuser is also rotatable, meaning that it can be easily repositioned to change the position of the dials or to meet your specific comfort or viewing needs. To use this feature, slightly loosen the tension screw on top of the visual back adapter on your telescope tube that presses down on the focuser, rotate the focuser and gently retighten the screw.

Crayford-Style Non-Rotatable Focuser

This focuser has a flat plane on the bottom side of the drawtube that rides along a roller assisted by ball bearings to smoothly adjust the focus.
On this 2" focuser, the tension and locking screws are both located on the bottom of the focuser, with the smaller of the two serving as the locking mechanism that holds the focus dials stationary.

Crayford-Style Rotatable Focuser

This focuser has a flat plate installed on the bottom side of the drawtube that rides along a roller assisted by ball bearings to smoothly adjust the focus.
On this 2" focuser, the tension and locking screws are both located on the bottom of the focuser, with the center most of the two serving as the locking mechanism that holds the focus dials stationary. This focuser is also rotatable, meaning that it can be easily repositioned to change the position of the dials or to meet your specific comfort or viewing needs. To use this feature, slightly loosen the tension screw on top of the visual back adapter on your telescope tube that presses down on the focuser, rotate the focuser and gently retighten the screw.

Feather Touch 3" Focuser

This special edition 3" Feather Touch focuser made by Starlight Instruments is designed for use on our 152mm ED Triplet Carbon Fiber Telescope. It is an extremely high-quality rack and pinion focuser. On the Feather Touch, the tension screw is located on the top of the focuser, and the locking screw is on the bottom. This focuser is also rotatable, meaning that it can be easily repositioned to change the position of the dials or to meet your specific comfort or viewing needs. To use this feature, slightly loosen the three tension screws on the visual back adapter on your telescope tube that press down on the focuser. Rotate the focuser and gently retighten the screws.

INSTALLING YOUR FOCUSER

The following is the procedure you should follow to install your focuser if it was not already on the telescope tube when you receive it or if you are changing focusers. One end of the focuser has the tension collar that secures a diagonal or eyepiece to the focuser. The other has a "lipped" end that fits directly into the visual back adapter on your telescope tube. Once the focuser housing is inserted into the visual back adapter, gently tighten down the set screws at the juncture to secure the focuser in place.

ADVANCED TENSION ADJUSTING TECHNIQUE FOR CRAYFORD-STYLE FOCUSERS

Most tension adjustments on our Crayford-style focusers can be easily accomplished by using the tension screw on the bottom of each model. However, if you feel more tension is needed, there are sets of small screws on the top of each device that can be used to adjust the pressure that is coming down on the drawtube from above. To make these adjustments, you will first need to loosen the button head screws (which are the largest in the sets) using a hex wrench. For these screws, which serve as locking screws, you will need a 2mm hex wrench for the Non-Rotatable Crayford-Style and a 2.5mm for the Rotatable Crayford-Style. Once the button heads are loose, you can begin by carefully

tightening the four smaller screws equally using a 2mm hex wrench. It is important to make sure each of the four screws is tightened the same amount to avoid giving the drawtube an awkward and unbalanced tilt. Also be sure to make these adjustments in very small increments. If you make these screws too tight, the drawtube will not glide smoothly. If you make them too loose the drawtube will have difficulty maintaining its position. Once you are done adjusting the smaller screws, retighten the larger locking screws.

EXTENSION TUBES

Some observing situations and accessories require more back focus than your focuser alone may be able to provide. Extension tubes aid in fixing this problem by extending the length of the drawtube. To install extension tubes, unthread the tension collar at the end of the focuser, thread the extension tube right onto the focuser tube and then rethread the tension collar onto the end of the extension tube. Depending on your needs you may want to use more than one extension tube. If that is the case, simply thread one tube onto the other before replacing the tension collar. You can then install your diagonal or eyepiece.

Share the Sky!

Awakening individuals to the marvels of the universe can be one of the most rewarding aspects of owning a telescope.

When you share your eyepiece with others, you can witness their sense of wonder bloom as they take in celestial spectacles like the chiseled lunar terrain, the elegant rings of Saturn or the blue-white stars of the misty Orion Nebula for the first time.

Whether you are in your backyard, on a street corner or at a star party, by using your telescope for outreach you are continuing a tradition started by Galileo more than 400 years ago. Since then, humanity's understanding of the universe has grown at an astounding pace, and much of that discovery can be linked to the desire to explore that is born from looking through a telescope.

Founded in 2000, the Astronomy Outreach network (AOn) was created to encourage and celebrate public outreach efforts by astronomers of all levels. This non-profit organization has tasked itself with forging connections between individual astronomers, astronomy clubs and larger astronomy and space education initiatives. No matter where you are at in your journey to provide outreach, AOn is a great resource that can be accessed at www.astronomyoutreach.net or through Facebook and Twitter.

As Carl Sagan said, "The Earth is a very small stage in a vast cosmic arena." At the eyepiece, the petty differences of humanity dissolve as our collective place in the universe is put in perspective. We are on this "pale blue dot" together, and helping others realize our common fragile bond is vital.

We encourage you to help others access the stars while you are on your own journey of exploration. The mind-expanding experience you can share can truly make a difference by inspiring others to discover more about the planet, the solar system, the galaxy and the universe we all call home.

Visit www.astronomyoutreach.net today!

EXPLORE SCIENTIFIC

www.explorescientificusa.com