

**CORONADO<sup>®</sup>**

A Meade Instruments Company



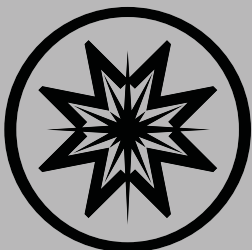
INSTRUCTIONS, MAINTENANCE & SAFETY

# CORONADO<sup>TM</sup>

## DAYTIME

Meade Instruments and Coronado Instruments have night and day covered for the amateur astronomer. When the leader in night time astronomy teams up with the leader in solar observing the amateur astronomer benefits. Whether you are imaging deep sky objects with your Meade telescope and DSI or gazing at our nearest star through a Coronado filter, keep an eye on the Meade/Coronado teams to provide you with the most technologically advanced and innovative product to enhance your enjoyment of Astronomy. No matter where, or what time of day your interest in astronomy calls to you, we will be there with you. Night and Day, we've got you covered.

## NIGHTTIME



# MEADE<sup>®</sup>

# CORONADO

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## ABOUT CORONADO



Coronado™ Instruments Inc. was founded in 1997 by David Lunt and Geraldine Hogan as Coronado Technology Group. Tremendous demand changed the initial concept of producing a few H $\alpha$  telescopes a month for the keen amateur and Coronado grew rapidly into a full-fledged company. David Lunt's 40 plus years experience at the forefront of optical design and innovation translated into patented technology allowing the classical Fabry-Perot etalon to be constructed in a novel way. With black and white business card ads in the leading magazines, sales grew as our reputation for attention to detail, quality, and safety spread. Our first thermally stable H $\alpha$  telescope, the Helios I, is still being used worldwide by amateur and professional astronomers and its offspring, SolarMax™ 70 Telescope, is in production today.

The founders next developed two filters for adapting nighttime telescopes, ASP 90 and AS1 60. Now sold under the name SolarMax 90 and 60. Continuing with their initial mission to make solar observing affordable, the founders released the SolarMax 40 in summer 2001 at the then unheard of price of \$995.00. The SolarMax 40 was followed by the award-winning Personal Solar Telescope that came to the market at \$499.00 and firmly established Coronado's name in the world of leading astronomy equipment manufacturers.

Since 1997 we have grown to become one of the largest telescope manufacturers in North America. We now produce over 5000 Fabry-Perot etalons a year; 5 dedicated H $\alpha$  telescope models; 9 different filter combinations for use on night time scopes; white light binoculars, a series of eyepieces, and custom telescopes. We continue to maintain the founders philosophy for building filters – Safety, Quality, and Performance. You can rest assured that your new instrument has been hand assembled and tested before being sealed in the box. In fact, every telescope and filter is field tested so we are confident you can look forward to a lifetime of H $\alpha$  views. If you have any questions please do not hesitate to contact us.

In December of 2004 the assets of Coronado Technology Group were acquired by Meade Instrument Corporation & became Coronado Instruments Inc.. This joining together of two leaders in the astronomy industry ensures innovation and service to the amateur astronomer for years to come.

## FILTER SAFETY, CARE, AND, CLEANING



**Safety** - It is widely known that there are inherent dangers involved with observing the Sun. Coronado Instruments Inc. has always been, is, and always will be, obsessed with the safety of its products. A proposed new product is not released until it has been fully proven that it can be made completely safe for the user. We provide our safety documentation, performed by an outside laboratory, on our website or via mail per request. Never use a solar viewing device of any kind unless the manufacturer provides relevant safety data. All Coronado instruments are tested and sealed at our facilities as complete, safe, and working units. Do not attempt to disassemble any Coronado product, doing so will void your warranty and could compromise your safety. Before each use make sure your filter does not appear damaged in any way, if you have any doubts please call customer support. Coronado is obsessed with safety and you should be too.

We recommend you establish a safety checklist for each viewing session, ensuring that all adaptors, filters and blocking filters are secure before aligning the system to the sun. Make this safety check part of your observing routine. Never leave a solar telescope unattended.

An additional safety consideration is exposure to the Sun. Always use sunscreen, and wear a hat and long sleeved shirt.

### **Cleaning**

Should your filter get a build up of loose dirt particles on any surface use a static free lens brush to gently "sweep" it clean. Fingerprints and other residue can be cleaned using a high grade optical solution applied to an optical tissue. Using a circular motion work from the outside edge in towards the center. As these are hard coatings you can be firm but do not rub. Finish with an anti-static lens cloth. All of these cleaning items can be purchased through a camera/telescope dealer.

Never use the following items on any section of your filter.

1. Compressed Air
2. Acetone
3. Anything with acidic properties
4. Any fabric not intended to clean optical coatings
5. Household cleaners

If you have questions please contact customer support.

### **Care**

The filters, if used properly, will not degrade with exposure to the Sun's rays. You may leave your filter set up in the Sun, even tracking the Sun, all day without risk. When your filter is not being used it should be stored in a cool, dry location in the foam-lined case it was shipped in and, with the included protective caps securely in place. In locations with excessive humidity placing a silica packet in the box is advised. Provided you do not drop or subject the filter to rough handling, it will work as well 50 years from now as it does today. We use hard coatings throughout the system to ensure uniform performance for years to come. It is safe to carry your filters on airplanes and to pass them through X-Ray machines.

## WHAT WAS THAT? DEFINITION OF TERMS



**Prominences** – H-alpha emissions projecting beyond the limb of the sun, consisting of complex clouds or streamers of ionized hydrogen above or in the Chromosphere.

**Filaments** – Prominences seen against the face of the sun, appearing as long narrow dark streamers or diffuse dark areas.

**Active Region** – Active regions are the result of enhanced magnetic fields and appear darker than the surrounding areas with a roughly circular shape. Active regions show plage, sunspots, and flares.

**Plage** – Patchy H-alpha brightening on the solar disk, usually found in or near active regions, which can last for several days. These are found in areas of nearly vertical emerging or reconnecting magnetic lines.

**Sunspots** – Spots of varying size usually consisting of a dark central region (umbra) and a lighter halo consisting of many short fine fibrils (penumbra).

**Flares** – A sudden eruption of energy in the solar atmosphere lasting minutes to hours, from which radiation and particles are emitted.

**Chromosphere** - An incandescent, transparent layer of gas, primarily hydrogen, several thousand miles in depth, lying above and surrounding the photosphere of the Sun and beneath the transition region of the corona.

### **Solar Facts**

- The Sun is 93 million miles (150 million km) away from Earth and 900,000 miles (1.4 million km) across.
- The Earth is about 8,000 miles (13,000 km) across
- Think of the Sun as a basketball and Earth as pin head and you have the proper proportions.
- It takes a little over 8 minutes for light from the Sun to reach Earth.
- Approximately 1 million earths would fit inside the Sun
- The Sun's core is approximately 15 million degrees Celsius. Its coolest part is around 6,000 degrees Celsius.

Solar radius = 695,990 km = 432,470 mi = 109 Earth radii

Solar mass =  $1.989 \times 10^{30}$  kg =  $4.376 \times 10^{30}$  lb = 333,000 Earth masses

Solar luminosity (energy output of the Sun) =  $3.846 \times 10^{33}$  erg/s

Surface temperature = 5770 K = 10,400 °F

Surface density =  $2.07 \times 10^{-7}$  g/cm<sup>3</sup> =  $1.6 \times 10^{-4}$  Air density

Surface composition = 70% H, 28% He, 2% (C, N, O, ...) by mass

Central temperature = 15,600,000 K = 28,000,000 °F

Central density = 150 g/cm<sup>3</sup> = 8x Gold density

Central composition = 35% H, 63% He, 2% (C, N, O, ...) by mass

## Terms and Definitions

**FOV** – Field of View. This describes, in degrees, the area of sky one can see when looking through the eyepiece.

**OTA** – Optical Tube Assembly. This is the main body of a refractor.

**H-alpha** – A wavelength of light at 656.3nm  
(1nm = 1 billionth of a meter)

**Angstrom** – A unit of measurement for the wavelength of light.  
(1A = 0.1nm)

**Bandpass** – A filter's bandpass tells how wide a region of the light spectrum is transmitted around the primary wavelength. The narrower the bandpass, the more surface detail becomes visible on the Sun. Coronado can further narrow the bandpass of your primary filter by adding a matched filter of the same size to the objective or by placing a smaller secondary filter in the optical train. The term "double stacking" is used to describe this process.

**E.R.F.** – Energy Rejection Filter. Prevents UV and IR light from entering the telescope.

**Etalon** – The heart of a Coronado filter. Composed of optics with tolerances 4 times tighter than those used in the Hubble telescope.

## Troubleshooting

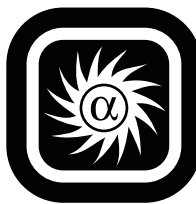
Here is a quick reference guide to answer some of the most commonly asked questions and solve the most common problems for the new Solar observer.

**I can't find the Sun** – One of the hardest things to master is lining up your telescope on the Sun. You can use a technique based on minimizing the shadow on the ground. This method will work by standing in front of and to the side of your set up. You can see the SolarMax casts a shadow onto the lip of the T-Max™, once you get rid of this shadow you should be on the Sun. Also try and use a 25mm to 30mm eyepiece to lower the magnification. However, by far the easiest way of lining up the sun is to use one of our Sol Ranger™ Sun finders. Using a mount with a Meade Autostar, now upgraded for Solar Observing, can be helpful in locating the Sun, especially when used in conjunction with the Sol Ranger.

**I found the Sun but it won't focus.** – Make sure that the drawtube or tubes have been extended. If you still can't achieve focus you may be looking at a ghost image or reflection of the Sun. Move the telescope's FOV around slightly and you will find the actual image. If this doesn't work then you should contact customer service.

**I don't see any detail.** –  $H\alpha$  is very far into the red end of the spectrum and our eyes are not, initially, very sensitive to this. The more you view the more detail you will pick up. The average observer takes around 3 months to become fully accustomed to  $H\alpha$ . Another important factor is the weather, bad seeing conditions will limit the amount of detail you can see.

# SOLARMAX 40MM, 60MM & 90MM FILTER SETS



Congratulations on your purchase of a SolarMax H-Alpha filter set! Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax filter. You can refer to the diagrams below for questions regarding the components of your system. Never point your telescope at the sun until your filter set is fully assembled on the telescope. Please read these instructions in full before setting up your new filter set and contact customer service if you have any questions.

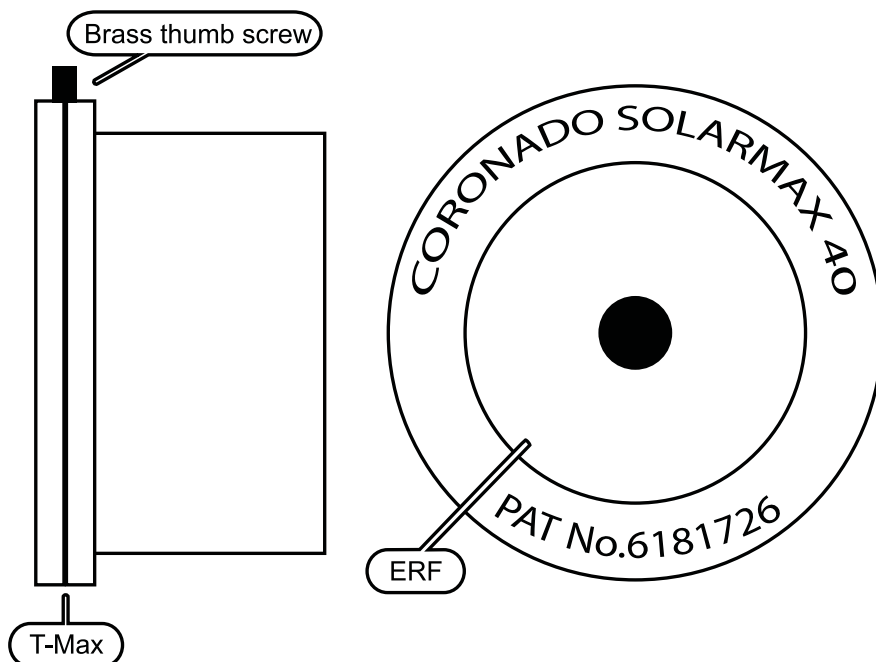
**Adaptor Plates** – With the exception of a few refractors you will need an adaptor plate to use your SolarMax filter. Coronado will only guarantee the performance and safety of our filters when used with a Coronado manufactured adaptor plate. We manufacture both slip over and a thread on models. Please call us for details regarding your telescope.

**Mounting SolarMax** – Never point your telescope at the sun until your filter set is fully assembled on the telescope. Coronado recommends that you have your telescope fully mounted and pointing away from the Sun while attaching the filters. The SolarMax/T-Max is designed to be mounted on the objective lens of your telescope either directly or via an adaptor plate. Make sure that the T-Max is fully threaded into the adaptor plate or telescope objective cell.

**Blocking Filter** – This is an essential component of your H-Alpha set up and must be installed for the system to work.

**BF5, BF10, BF15** – Each of these are housed in a 1.25" right angle diagonal. Slide the silver draw tube into the focuser and tighten the retention system of your telescope. If you have a 2" focuser you will need a reducer to 1.25". Coronado manufactures a Zero Length Adaptor for this purpose that does not add a travel to the focuser, call us for details. The BF15 is also available in a 1.25" straight through configuration for an additional charge.

**BF30** – This is a 2" straight through design of our BF series, designed for use on telescopes with FL of 1500mm to 3000mm. Slide the silver draw tube into the focuser and tighten the retention system of your telescope. Coronado recommends using a 1.25" diagonal and eyepiece for visual work and has provided a Zero Length Adaptor with your BF30. Some two inch accessories may not come to focus and are not recommended.





**T-Max** – As a rule there is one optimal setting of the T-max for each viewing session and it does not require constant adjustment. The T-Max tuner is located directly behind your SolarMax etalon cell. Start with the T-Max in the closed position. While viewing the sun use your thumb to slowly open the T-Max by rotating the brass thumb wheel clockwise. Doing this will cause your etalon to be detuned, shifting the passband towards the blue wing of H-Alpha. When events on the sun move rapidly towards earth they will Doppler shift and de-tuning the etalon is required in order to view these events.

**Double Stacking** – Double stacking requires a second SolarMax and T-Max with the correct adaptor ring. Please contact us with any questions. For the most part randomly selected etalons will not match each other for double stacking. We recommend you send your filter to Coronado for guaranteed results.

**Eyepieces** – The best eyepieces for solar viewing are Coronado's CEMAX™ contrast enhanced series eyepieces. Conventional night time eyepieces can also be used, the fewer elements in the optical system the better the view – try to use 1.25" eyepieces with 2 to 4 elements at the most to reduce spurious light.

**Dark Cloth** – One easy way to reduce incidental light from entering your eye is to use a dark cloth to completely cover your head and the eyepiece. The inside should be black but a reflective surface on the outside is recommended to avoid heat build up.

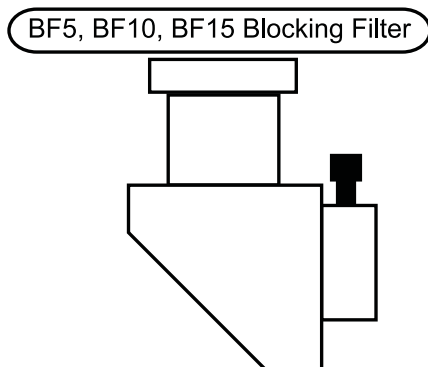
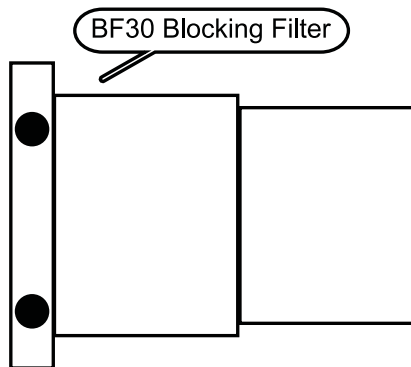
**Location** – One of the benefits of owning a Coronado solar observing set up is the portability of the system. For optimal seeing avoid setting up on heat reflective surfaces such as concrete or tarmac. Grass, water, or low trees are your best surroundings for viewing.

**SolarMax Telescope Upgrade** – Once you own a SolarMax filter and blocking filter you can upgrade to a SolarMax telescope for improved contrast. Contact your dealer or Coronado for details.

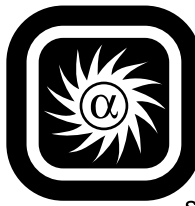
**WARNING!**

**Do not insert your eyepiece into the Blocking Filter until you have the telescope securely mounted and the SolarMax element attached and secured.**

SolarMax Series Filters  
Filter Type – Interference filter with hard non-degradable coatings  
Bandwidth –  $<0.7\text{\AA}$   
Thermal Stability –  $0.005\text{ \AA}/^{\circ}\text{C}$   
Blocking - Full blocking  $>10^{-5}$  from EUV to far IR



# SOLARMAX 40 DEDICATED H-ALPHA TELESCOPE



Congratulations on your purchase! Coronado has shipped your SolarMax telescope fully assembled and ready for use. Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax telescope. You can refer to the diagrams below for questions regarding the components of your system. Please read these instructions in full before setting up your new SolarMax telescope and contact customer service if you have any questions.

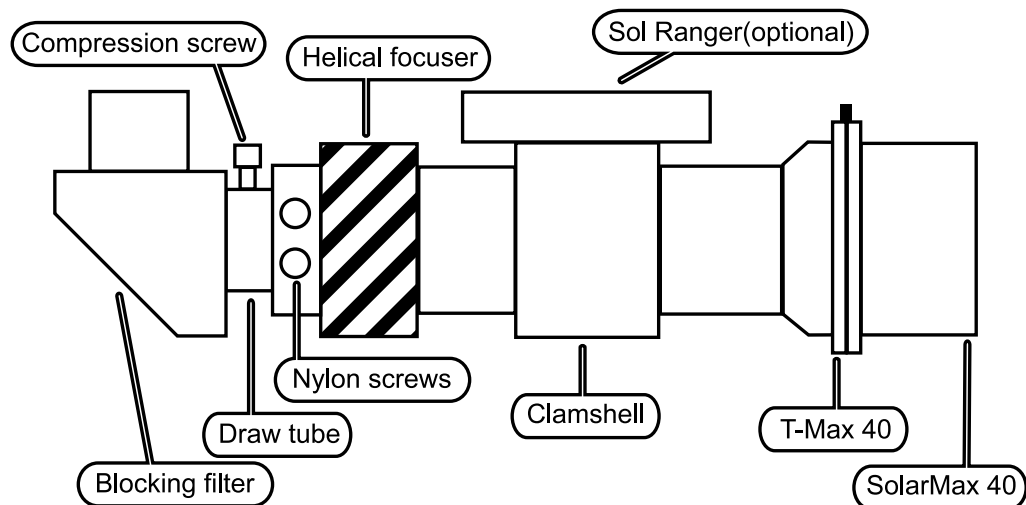
**Mounting** – The clamshell mounting ring your SolarMax telescope has shipped with is compatible with any ¼ 20 thread. Most standard photographic mounts and mounting hardware can be used to provide a safe, stable, and reliable set up. This is also compatible with piggyback mounting systems. Coronado does not manufacture any additional mounting hardware.

**Draw Tube** – The SolarMax series telescope has a helical focuser that rotates around the OTA in order to achieve focus. This focuser also has a drawtube that will need to be adjusted for “rough focus”. To do this locate and loosen the 2 nylon set screws located in between the helical focuser and before the larger silver compression screw, do not adjust the silver compression screw as this is used to secure the blocking filter in place. Once the nylon set screws are loose the drawtube will easily slide in and out of the focuser but cannot be completely removed. Most eyepieces will come to focus when the drawtube is nearly fully extended but some variations in eyepieces may require different positioning of the drawtube. Secure the drawtube in its new position by retightening the nylon set screws. The drawtube should be fully inserted for storage. All adjustable screws are meant to be finger tight – do not over tighten.

## WARNING!

**Do not insert your eyepiece into the Blocking Filter until you have the telescope securely mounted and the SolarMax element attached and secured.**

**Finding the Sun** – Coronado has designed the clamshell to accept our Sol Ranger Sun finder. This finder scope sits on top of the SolarMax telescope and allows a small, harmless, ball of light to be projected on to the opaque glass at its back end. By standing back from the Sol Ranger you can easily place this ball of light in the center of the glass



and the telescope will be aligned with the Sun – Do not put your eye up to the opaque glass. Sol Ranger is an optional accessory on the SolarMax 40 and SolarMax 60 telescopes and can be purchased separately. If you do not have a Sol Ranger you can line up the telescope by minimizing its shadow on the ground; this technique will take some practice. See ‘troubleshooting’ for details.

**Helical Focuser** – Once you have the Sun in the FOV and the draw tube extended insert the eyepiece into the eyepiece retainer and tighten the thumbscrew to secure it. Adjust the helical focuser by holding between the thumb and fore finger and rotating in either direction.

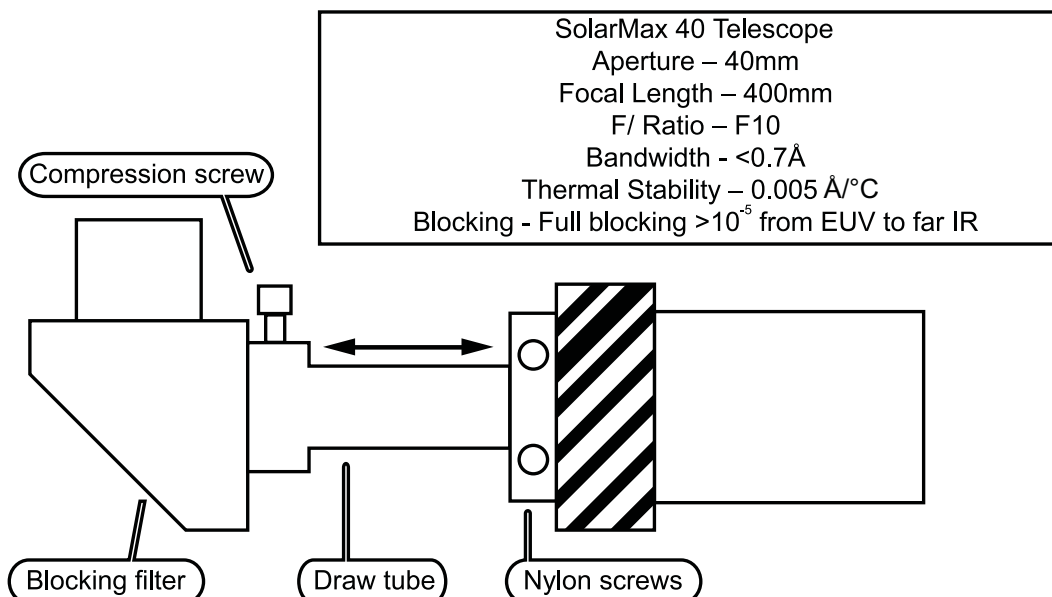
**T-Max** – As a rule there is one optimal setting of the T-max for each viewing session and it does not require constant adjustment. The T-Max tuner is located directly behind the SolarMax etalon cell. Start with the T-Max in the closed position. While viewing the Sun use your thumb to slowly open the T-Max by rotating the brass thumb wheel clockwise. Doing this will cause your etalon to be detuned shifting the passband towards the blue wing of H-Alpha. When events on the sun move rapidly towards earth they will Doppler shift and de-tuning the etalon is required in order to view these events.

**Imaging & Bino-Viewers** – All SolarMax series telescopes will allow for both prime focus and eyepiece projection imaging with standard equipment. For prime focus imaging with the SolarMax 40 Telescope it is recommended that you thread the optical element of the CEMAX 2x Barlow to the draw tube of the blocking filter, being sure to replace the blocking filter into the telescope’s draw tube. Bino-Viewers will also come to focus using a Barlow or optical correcting system. There are many cameras that can be used for imaging-Coronado does not make adaptors.

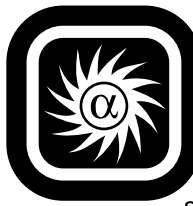
**Double Stacking** - This greatly increases contrast by narrowing the bandpass to  $<0.5\text{\AA}$  and gives a spectacular 3D effect showing increased surface detail. The SolarMax 40 telescope requires the following equipment for double stacking:

1. SolarMax 40/ T-Max
2. AP185 adaptor plate

Connect the second Solar Max / T-Max unit to the first using the AP185. Start with both T-Max in the closed position while looking thru the eyepiece adjust the furthest T-Max to remove ghost images and use the closest T-Max for Doppler shifting. Contact Coronado directly for pricing and to schedule your upgrade



# SOLARMAX 60 DEDICATED H-ALPHA TELESCOPE



Congratulations on your purchase! Coronado has shipped your SolarMax telescope fully assembled and ready for use. Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax telescope. You can refer to the diagrams below for questions regarding the components of your system. Please read these instructions in full before setting up your new SolarMax telescope and contact customer service if you have any questions.

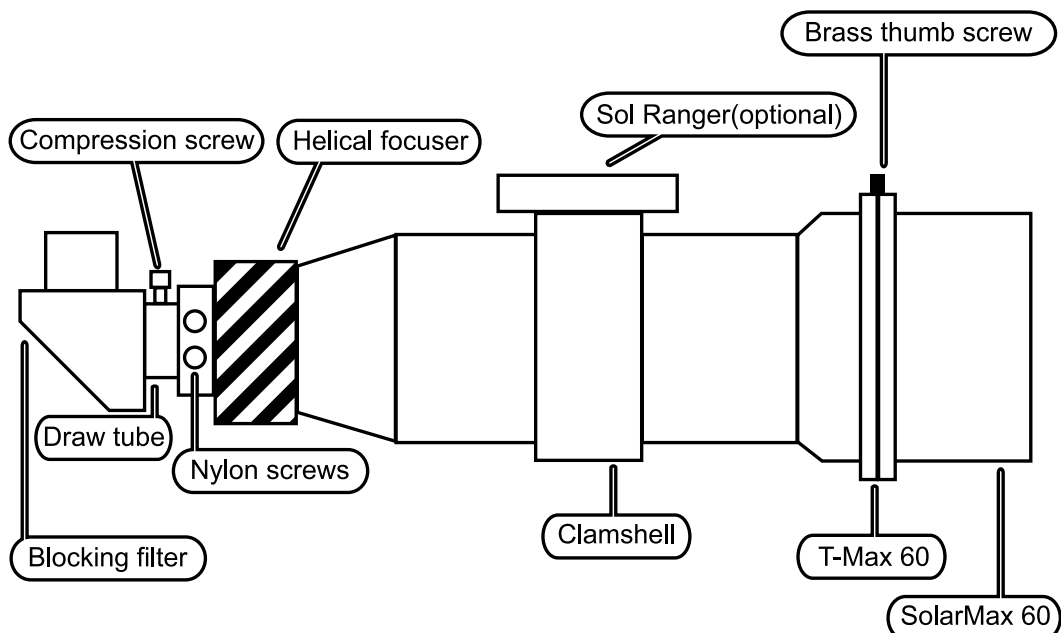
**Mounting** – The clamshell mounting ring your SolarMax telescope has been shipped with is compatible with any  $\frac{1}{4}$  20 thread. Most standard photographic mounts and mounting hardware can be used to provide a safe, stable, and reliable set up. This is also compatible with piggyback mounting systems. Coronado does not manufacture any additional mounting hardware.

**Draw Tube** – The SolarMax series telescope has a helical focuser that rotates around the OTA in order to achieve focus. This focuser also has a drawtube that will need to be adjusted for “rough focus”. To do this locate and loosen the 2 nylon set screws located in-between the helical focuser and before the larger silver compression screw, do not adjust the silver compression screw as this is used to secure the blocking filter in place. Once the nylon set screws are loose the drawtube will easily slide in and out of the focuser but cannot be completely removed. Most eyepieces will come to focus when the drawtube is nearly fully extended but some variations in eyepieces may require different positioning of the drawtube. Secure the drawtube in its new position by retightening the nylon set screws. The drawtube should be fully inserted for storage. All adjustable screws are meant to be finger tight – do not over tighten.

## WARNING!

**Do not insert your eyepiece into the Blocking Filter until you have the telescope securely mounted and the SolarMax element attached and secured.**

**Finding the Sun** – Coronado has designed the clamshell to accept our Sol Ranger Sun finder. This finder scope sits on top of the clamshell and allows a small, harmless, ball of light to be projected on to the opaque glass at its back end. By standing back from the Sol Ranger you can easily place this ball of light in the center of the glass and the telescope should be aligned with the Sun – Do not put your eye up to the opaque glass.



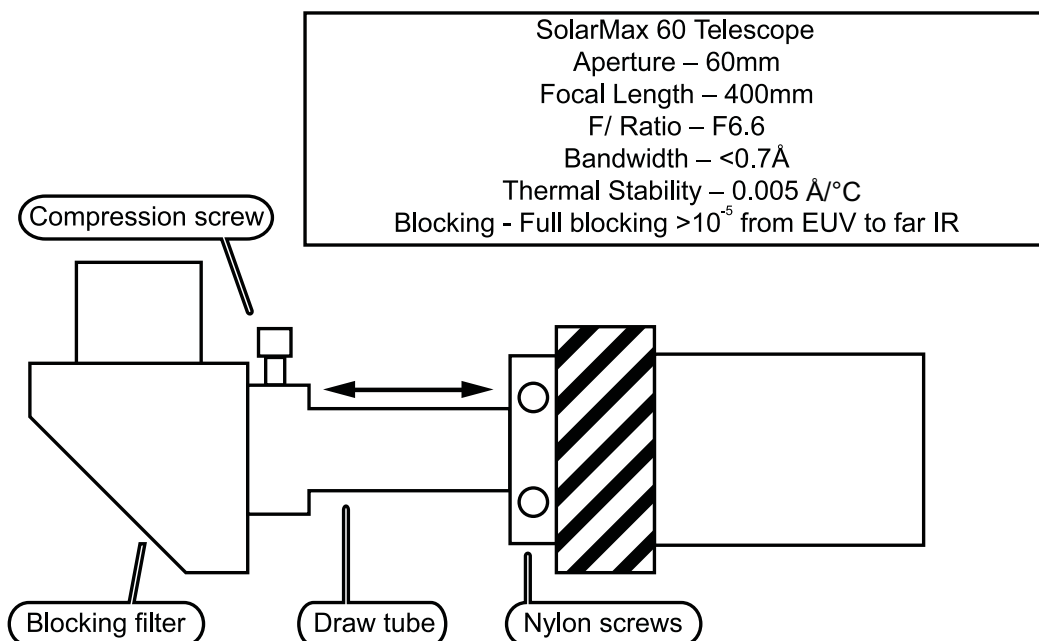
Sol Ranger is an optional accessory on the SolarMax 40 and SolarMax 60 telescopes and can be purchased separately. If you do not have a Sol Ranger you can line up the telescope by minimizing its shadow on the ground. This technique will take some practice. See 'troubleshooting' for details.

**Helical Focuser** – Once you have the Sun in the FOV and the draw tube extended insert the eyepiece into the eyepiece retainer and tighten the thumbscrew to secure it. Adjust the helical focuser by holding between the thumb and fore finger and rotating in either direction.

**T-Max** – As a rule there is one optimal setting of the T-max for each viewing session and it does not require constant adjustment. The T-Max tuner is located directly behind your SolarMax etalon cell. Start with the T-Max in the closed position. While viewing the sun use your thumb to slowly open the T-Max by rotating the brass thumb wheel clockwise. Doing this will cause your etalon to be detuned shifting the passband towards the blue wing of H-Alpha. When events on the sun move rapidly towards earth they will Doppler shift and de-tuning the etalon is required in order to view these events.

**Imaging & Bino-Viewers** – All SolarMax series telescope will allow for both prime focus and eyepiece projection imaging with standard equipment. For prime focus imaging it is recommended that you thread the optical element of the CEMAX 2x Barlow to the draw tube of the blocking filter, being sure to replace the blocking filter into the draw tube once completed. Bino-Viewers will also come to focus using a Barlow or optical correcting system. There are many cameras that can be used for imaging - Coronado does not make adaptors.

**Double Stacking** – The SolarMax 60 telescope can be double stacked by returning the unit to Coronado. An internal module with a second etalon can be placed inside the optical tube assembly or a second external etalon & T-Max tuner can be matched and installed. This will greatly increase contrast by narrowing the bandpass to  $< 0.5 \text{ \AA}$  and increase surface detail. Contact Coronado directly for pricing and to schedule your upgrade.



# SOLARMAX 70 DEDICATED H-ALPHA TELESCOPE



Congratulations on your purchase! Coronado has shipped your SolarMax telescope fully assembled and ready for use. Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax telescope. You can refer to the diagrams below for questions regarding the components of your system. Please read these instructions in full before setting up your new SolarMax telescope and contact customer service if you have any questions.

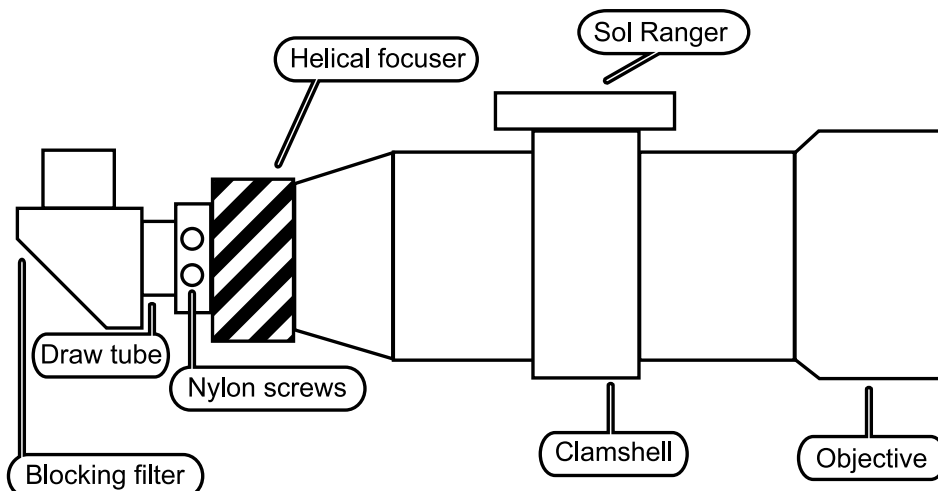
**Mounting** – The clamshell mounting ring your SolarMax telescope has been shipped with is compatible with any  $\frac{1}{4}$  20 thread. Most standard photographic mounts and mounting hardware can be used to provide a safe, stable, and reliable set up. This is also compatible with piggyback mounting systems. Coronado does not manufacture the hardware for this.

**Draw Tube** – The SolarMax series telescope has a helical focuser that rotates around the OTA in order to achieve focus. This focuser also has a drawtube that will need to be adjusted for “rough focus”. To do this locate and loosen the 2 nylon set screws located in-between the helical focuser and before the Blocking Filter. Once the nylon set screws are loose the drawtube will easily slide in and out of the focuser but cannot be completely removed. Most eyepieces will come to focus when the drawtube is nearly fully extended but some variations in eyepieces may require different positioning of the drawtube. Secure the drawtube in its new position by retightening the nylon set screws. The drawtube should be fully inserted for storage. All adjustable screws are meant to be finger tight – do not over tighten.

## WARNING!

**Do not insert your eyepiece into the Blocking filter until you have the telescope securely mounted.**

**Finding the Sun** – Coronado has designed the clamshell to accept our Sol Ranger Sun finder. This finder scope sits on top of the SolarMax and allows a small, harmless, ball of light to be projected on to the opaque glass at its back end. By standing back from the Sol Ranger you can easily place this ball of light in the center of the glass and the telescope should be aligned with the Sun – Do not put your eye up to the opaque glass.



**Helical Focuser** – Once you have the Sun in the FOV and the draw tube extended insert the eyepiece into the eyepiece retainer and tighten the thumbscrew to secure it. Adjust the helical focuser by holding between the thumb and fore finger and rotating in either direction.

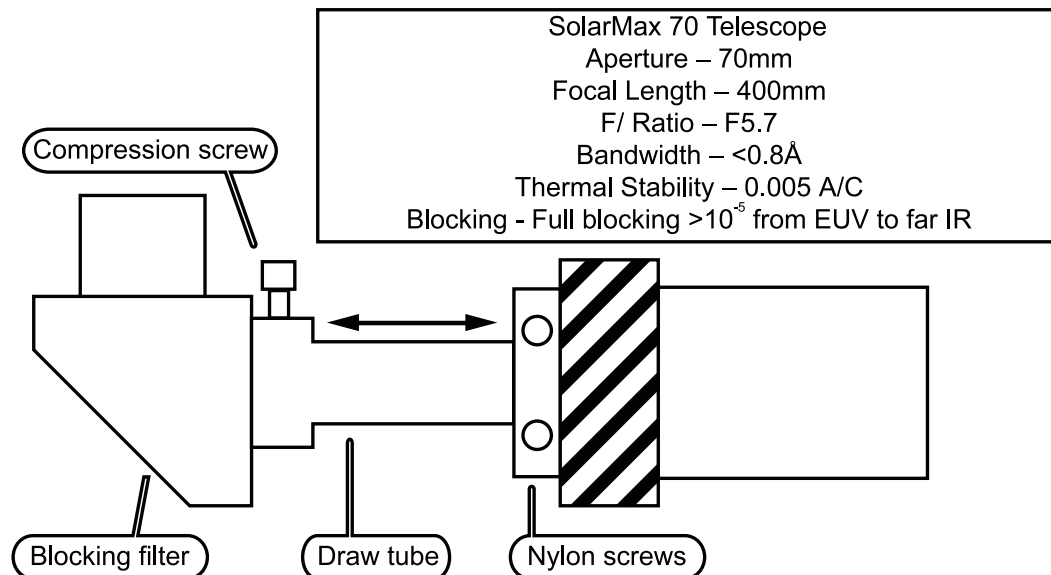
**Imaging & Bino-Viewers** – The SolarMax 70 telescope is unique in that it has a fixed blocking filter and all elements except the eyepiece are in a sealed unit. This will prevent the use of some bino-viewers. Prime focus imaging can still be accomplished by using various Barlows depending on the system. There are many cameras that can be used for imaging - Coronado does not make adaptors.

**Double Stacking** – The SolarMax 70 telescope requires the following parts for double stacking. This will greatly increase contrast by narrowing the bandpass to  $<0.5\text{\AA}$ . Contact Coronado directly for pricing and to schedule your upgrade.

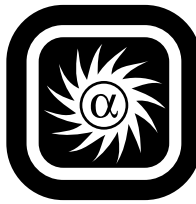
1. SolarMax 70 / T-Max 70

Connect the SolarMax / T-Max unit to the objective cell. Looking thru the SolarMax 70 telescope adjust the T-Max to remove ghost images.

**Safety** - The SolarMax 70 telescope has been designed as a sealed unit. Other than the eyepiece, no element of the telescope should be, or can be, removed. All of the critical filters have been placed inside the unit and out of view. This design is to facilitate multiple user use in a group and school settings. This built in configuration may mean that some cameras and bino-viewers have trouble coming to focus.



# SOLARMAX 90 DEDICATED H-ALPHA TELESCOPE



Congratulations on your purchase! Coronado has shipped your SolarMax telescope fully assembled and ready for use. Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax telescope. You can refer to the diagrams below for questions regarding the components of your system. Please read these instructions in full before setting up your new SolarMax telescope and contact customer service if you have any questions.

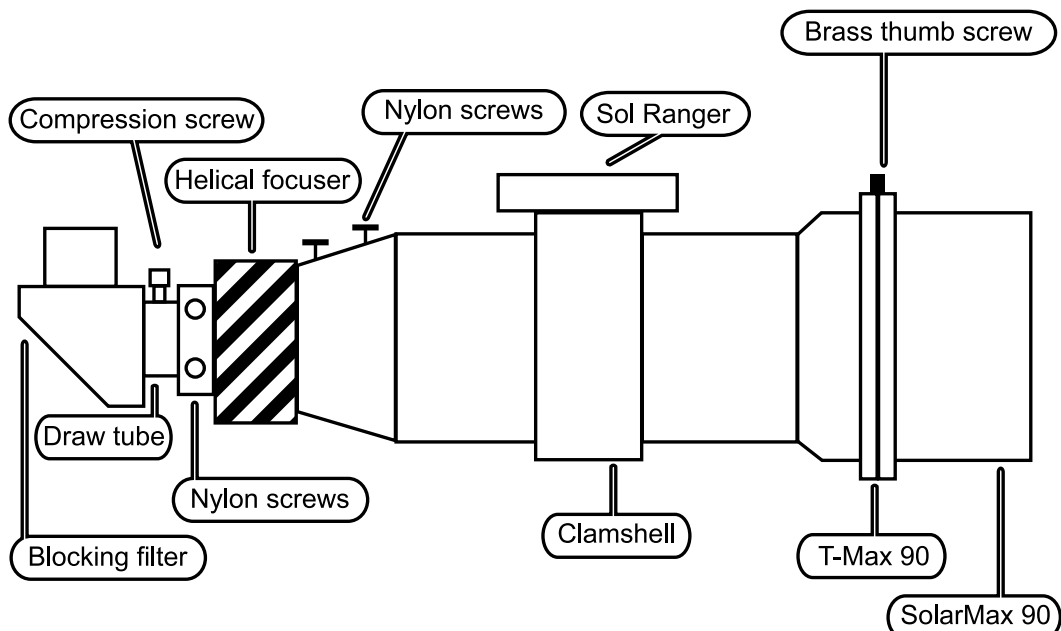
**Mounting** – The clamshell mounting ring your SolarMax telescope has been shipped with is compatible with any  $\frac{1}{4}$  20 thread. Most standard photographic mounts and mounting hardware can be used to provide a safe, stable, and reliable set up. This is also compatible with piggyback mounting systems. Coronado does not manufacture the hardware for this.

**Draw Tubes** – The SolarMax 90 telescope has a helical focuser that rotates around the OTA in order to achieve focus. This focuser also has two drawtubes that will need to be adjusted for “rough focus”. To do this locate and loosen the 2 nylon set screws located in-between the gold colored OTA and the helical focuser, once the screws are loose the draw tube #2 will extend but can not be fully detached. Retighten the set screws before proceeding. To extend drawtube # 1 locate the set screws between the helical focuser and the end of the telescope. Once loosened the drawtube will extend but cannot be removed. Retighten the setscrews before proceeding. Most eyepieces will come to focus when the drawtubes are nearly fully extended but some variations in eyepieces may require different positioning of the drawtube. Bino-viewers will require very little extension of the drawtubes and imaging equipment will vary by make. The drawtubes should be fully inserted for storage. All adjustable screws are meant to be finger tight – do not over tighten.

## WARNING!

**Do not insert your eyepiece into the Blocking Filter until you have the telescope securely mounted and the SolarMax element attached and secured.**

**Finding the Sun** – Coronado has designed the clamshell to accept our Sol Ranger Sun finder. This finder scope sits on top of the clamshell and allows a small, harmless, ball of light to be projected on to the opaque glass at its back end. By standing back from the Sol Ranger you can easily place this ball of light in the center of the glass and the telescope should be aligned with the Sun – Do not put your eye up to the opaque glass.



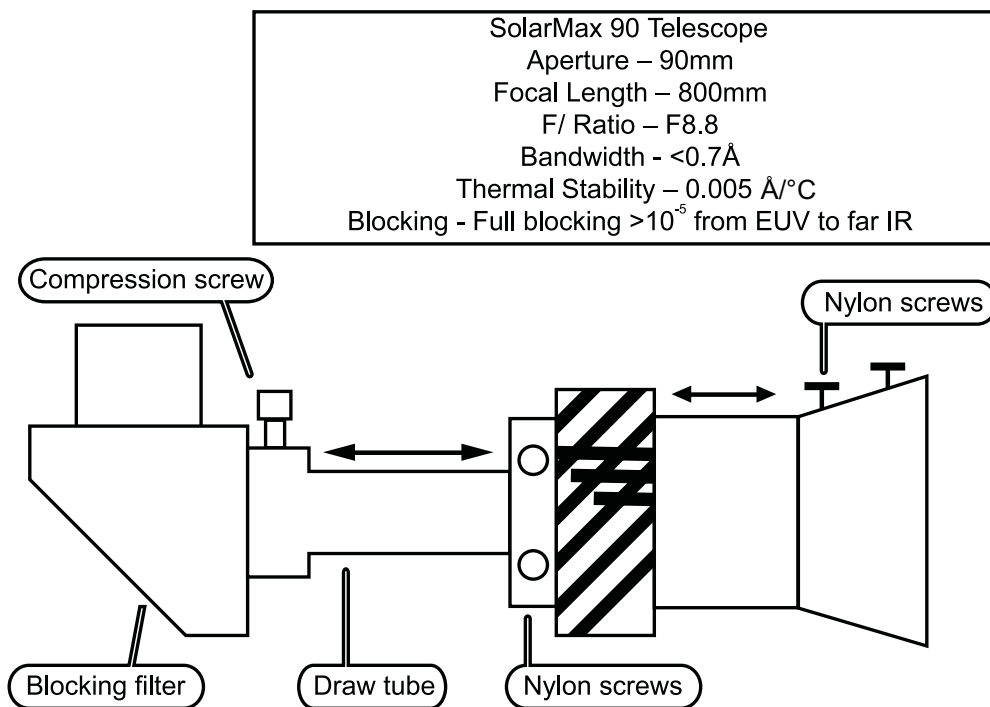


**Helical Focuser** – Once you have the Sun in the FOV and the draw tubes extended insert the eyepiece into the eyepiece retainer and tighten the thumbscrew to secure it. Adjust the helical focuser by holding between the thumb and fore finger and rotating in either direction.

**T-Max** – As a rule there is one optimal setting of the T-max for each viewing session and it does not require constant adjustment. The T-Max tuner is located directly behind your SolarMax etalon cell. Start with the T-Max in the closed position. While viewing the sun use your thumb to slowly open the T-Max by rotating the brass thumb wheel clockwise. Doing this will cause your etalon to be detuned shifting the passband towards the blue wing of H-Alpha. When events on the sun move rapidly towards earth they will Doppler shift and de-tuning the etalon is required in order to view these events.

**Double Stacking** - This greatly increases contrast by narrowing the bandpass to  $<0.5\text{\AA}$  and gives a spectacular 3D effect showing increased surface detail. The SolarMax 90 is double stacked by installing a matched 60mm etalon inside the OTA or attaching a second matched 90mm external etalon & T-Max. Double stacking filters must be matched to the primary etalon with blocking filter. The SolarMax 90 telescope can be ordered this way or later upgraded by Coronado. Contact Coronado for details.

**Blocking Filters** – The SolarMax 90 telescope is available with a BF15 or BF30. The BF15 version is pictured below. The BF30 version will appear to be the same. However the BF30 will be mounted inside the telescope and the diagonal supplied will be without any blocking. The SolarMax 90 telescope with an internal BF30 can be used without the diagonal to mount imaging equipment in a straight through configuration but drawtube #1 will still be 1.25". If you have the BF15 version you MUST use the diagonal. Contact Coronado if you are unsure which version you have.



# SOLARMAX 70 DEDICATED CaK TELESCOPE



Congratulations on your purchase! Coronado has shipped your SolarMax 70 CaK telescope fully assembled and ready for use. Be sure to read the safety and cleaning instructions on page 2 before using your SolarMax telescope. You can refer to the diagrams below for questions regarding the components of your system. Please read these instructions in full before setting up your new SolarMax 70 CaK telescope and contact customer service if you have any questions.

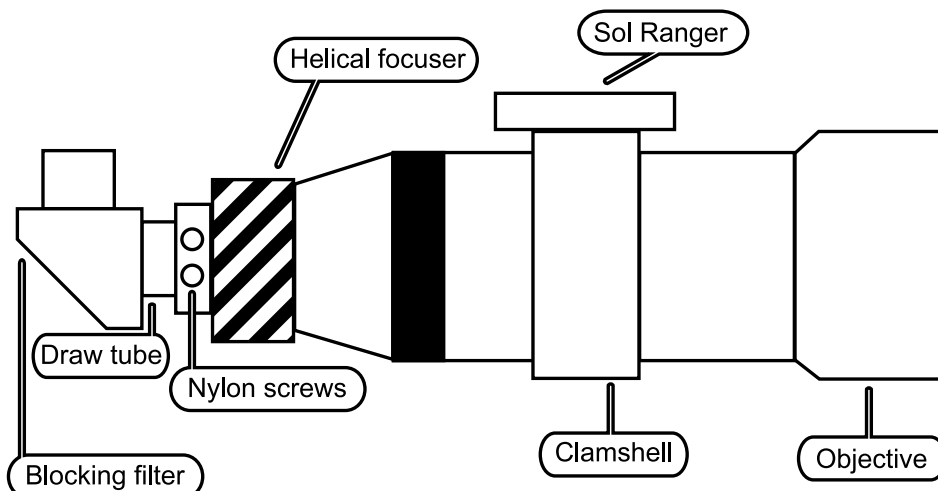
**Mounting** -The clamshell mounting ring your SolarMax telescope has been shipped with is compatible with any  $\frac{1}{4}$  20 thread. Most standard photographic mounts and mounting hardware can be used to provide a safe, stable, and reliable set up. This is also compatible with piggyback mounting systems. Coronado does not manufacture the hardware for this.

**Draw Tube** -The SolarMax series telescope has a helical focuser that rotates around the OTA in order to achieve focus. This focuser also has a drawtube that will need to be adjusted for "rough focus". To do this locate and loosen the 2 nylon set screws located in-between the helical focuser and before the Blocking Filter. Once the nylon set screws are loose the drawtube will easily slide in and out of the focuser but cannot be completely removed. Most eyepieces will come to focus when the drawtube is nearly fully extended but some variations in eyepieces may require different positioning of the drawtube. Secure the drawtube in its new position by retightening the nylon set screws. The drawtube should be fully inserted for storage.

## WARNING!

**Do not insert your eyepiece into the Blocking filter until you have the telescope securely mounted.**

**Finding the Sun** - Coronado has designed the clamshell to accept our Sol Ranger Sun finder. This finder scope sits on top of the SolarMax and allows a small, harmless, ball of light to be projected on to the opaque glass at its back end. By standing back from the Sol Ranger you can easily place this ball of light in the center of the glass and the telescope should be aligned with the Sun. Do not put your eye up to the opaque glass.

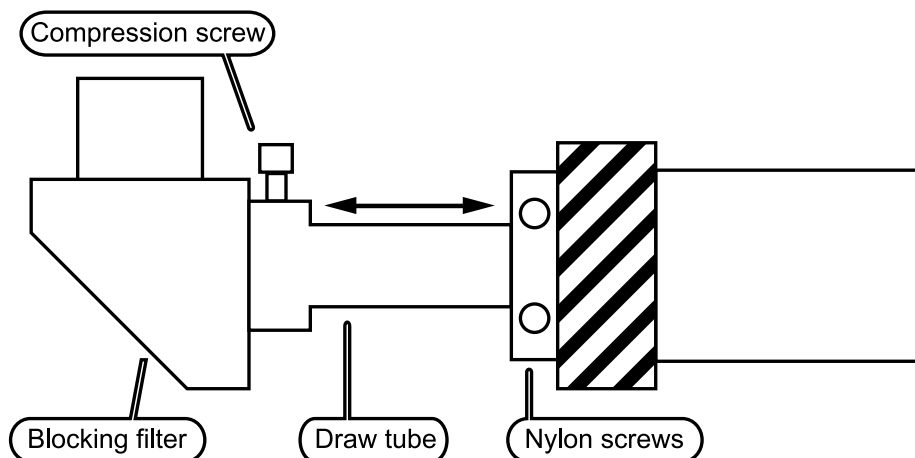


**Helical Focuser** – Once you have the Sun in the FOV and the draw tube extended insert the eyepiece into the eyepiece retainer and tighten the thumbscrew to secure it. Adjust the helical focuser by holding between the thumb and fore finger and rotating in either direction.

**Imaging** - The SolarMax 70 CaK telescope is unique in that the CaK image may not be visible to all users, and the ability to see this wavelength will diminish with the age of the user. Our intention, in designing this instrument, was to create a telescope with imaging as the primary purpose. This telescope has been designed for use with almost any imaging equipment on the market, although we do recommend digital mediums. All users will be able to enjoy the Sun in CaK when used with an appropriate imaging system. The same adaptors used for nighttime imaging will work with the SolarMax 70 CaK.

**Safety** - The SolarMax 70 CaK telescope has been designed as a sealed unit. Other than the eyepiece, no element of the telescope should be, or can be, removed. All of the critical filters have been placed inside the unit and out of view. NEVER attempt to take apart any element of the SolarMax 70 CaK. As constructed, it is a completely safe instrument. Any tampering with internal components could result in compromising eye safety.

SolarMax 70 CaK  
Aperture – 70mm  
Focal Length – 400mm  
F/ Ratio – 5.7  
Bandwidth – Max 2.2Å  
Thermal Stability – 0.005 A/C  
Blocking - Full blocking  $>10^{-5}$  from EUV to far IR



## REPLACEMENT MANUAL AND ACCESSORIES

**Replacement Manual** – Should this manual tear or be damaged you can download and print a free replacement from our website- [www.coronadofilters.com](http://www.coronadofilters.com) Select “Instructions” from the drop down menu. From this page you can download the entire catalog, any individual pages, and extra sheets for recording your observations. There is a nominal fee to have a new instruction manual shipped from Coronado, please call for details.

**Accessories** – As well as making the safest and best performing solar filters and telescopes we offer a select line of accessories to enhance your enjoyment and expand the use of your new system.

**Adaptor plates** - You can use your SolarMax series filter on more than one telescope by purchasing the adaptor from Coronado. We make adaptor plates to fit telescopes up to 16” diameter! Please call us to confirm that your SolarMax series filter set is suited to your telescope.

**CEMAX Eyepieces** – The best eyepieces for H $\alpha$  observing. In fact these are the only eyepieces built specifically to have their peak transmittance at H $\alpha$ . Using optimized coatings to enhance contrast and minimize glare, we have set the standard for the market. Available in 25mm, 18mm, 12mm, and a 2x Barlow. 20mm eye relief, 52 degree FOV. You will see the difference! Call or see our website for package deals.

**Solar Observers Hat** – Made from UV protective material this high quality hat is the one to wear observing the sun or anytime you are outside. Features include Coronado logo on the front and back, extra long bill for protection, rear drape to protect your neck and act as a shade cloth, machine washable, one size fits all. It is important that you take necessary precautions to protect your skin when solar observing. Long sleeves, a hat and good quality sun screen are essential accessories for the smart observer.



# OBSERVATION JOURNAL

Equipment	Location	Conditions	Date/Time	Event	Quadrant	Notes



# OBSERVATION JOURNAL

Equipment	Location	Conditions	Date/Time	Event	Quadrant	Notes

**Coronado Instruments, Inc. Limited Warranty**  
27 Hubble, Irvine, CA 92618  
Phone: 949-451-1450

Thank you for your purchase of a CORONADO product. Upon receiving your instrument, please examine it thoroughly. Notify your supplier immediately should any visible signs of exterior damage to the package be present. This filter was field tested and rigorously evaluated before leaving the factory. It is important that you sign, where indicated, and submit the applicable portion of this warranty form within **30** days of the noted date shipped and/or receipt from a dealer, to the address shown above or via **FAX**. Make sure to keep a copy for your records. Failure to return the warranty form portion within thirty (30) days of **RECEIPT DATE** of filter will render this warranty **VOID**.

**Coronado Instruments, Inc. Limited Warranty**

Coronado warrants the product against defects in materials and workmanship for a period of sixty (60) months from the date of delivery. Once accepted by the Customer and the warranty form returned, the filter will be considered to be in good working order. Any subsequent de-contacting of the Fabry-Perot etalon within the filter system, is not covered by this warranty nor is any other subsequent damage to the blocking filter. Any modification, alteration, disassembly, damage to or tampering with the **PRODUCT** or any of its components will void the warranty, and, **MAY MAKE USE OF THE INSTRUMENT UNSAFE.**

Please review **WARNING** contents below.

RGA Number Required: Prior to the return of any product or part, a Return Goods Authorization (RGA) number must be obtained from Meade by writing or calling (949) 451-1450. Each returned part or product must include a written statement detailing the nature of the claimed defect, as well as the owner's name, address and phone number.

**RETURN OF THE PRODUCT IN ANY OTHER TYPE OF PACKAGING,  
OTHER THAN THE ORIGINAL AS SUPPLIED BY CORONADO TECHNOLOGY GROUP,  
WILL VOID THE WARRANTY.**

The warranty set forth above shall be **IN LIEU** of any other warranty, expressed or implied, including, but not limited to, any implied warranty of **MERCHANTABILITY** or fitness, for a particular purpose.

**WARNING: UNDER NO CIRCUMSTANCES SHOULD THE  
USER ATTEMPT TO DISASSEMBLE OR REMOVE ANY PART OF THE PRODUCT.  
THE FILTER HAS BEEN SEALED AFTER FINAL TESTING AND HAS BEEN  
CONSTRUCTED TO PERMIT SAFE SOLAR VIEWING. ANY ALTERATION,  
DISASSEMBLY, DAMAGE OR TAMPERING TO THE PRODUCT WILL COMPROMISE  
ITS SAFETY, VOID THE WARRANTY AND, MAY RESULT IN PERSONAL INJURY. IF  
THE PRODUCT IS TO BE USED IN CONJUNCTION WITH OTHER OPTICAL  
INSTRUMENTS, IT IS IMPERATIVE THAT ALL OPTICS OF SUCH OTHER  
INSTRUMENTS BE FULLY COVERED TO AVOID ACCIDENTAL VIEWING THROUGH  
THOSE INSTRUMENTS. WE RECOMMEND THAT THE USER EMPLOY A SOLAR  
VIEWING CHECKLIST SO AS TO AVOID ACCIDENTAL MISUSE OF THE PRODUCT,  
WHICH MAY RESULT IN PERSONAL INJURY.**

Date shipped:  Serial number:

Complete this form; make a copy for your records and mail to Coronado.

Serial number:  Date shipped: \_\_\_\_\_  
Please refer to the numbers above in any type of correspondence Date received: \_\_\_\_\_

Purchased from: \_\_\_\_\_

Name (please print): \_\_\_\_\_

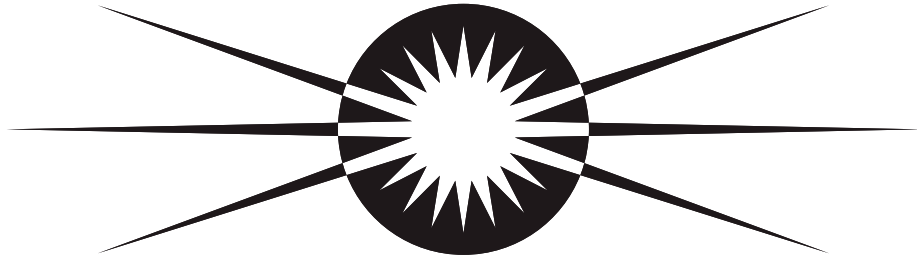
Address: \_\_\_\_\_

How did you learn of this product?: \_\_\_\_\_

Telephone or Email: \_\_\_\_\_

Signature: \_\_\_\_\_

This warranty gives you specific rights. You may have other rights which vary from state to state. Meade/Coronado reserves the right to change product specifications or to discontinue products without notice.



# **CORONADO<sup>®</sup>**

A Meade Instruments Company



**MAKE SURE TO CHECK  
OUT THE P.S.T!  
OUTSTANDING VIEWS,  
LIGHT WEIGHT,  
AND A GREAT VALUE!**

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