# Instruction Manual LS80MT

Lunt Solar 80mm H-alpha  Modular System




## Included contents:

Lunt Blocking Filter (B1200 or B1800)

2” Crayford Focuser or Upgraded 2” Starlight FeatherTouch Focuser

(Also available with Rack and Pinion Focuser)

Mounting Ring Assembly with Red Dot Sun Finder handle

6” Dovetail

Warranty Registration instruction card

Hard case with custom fit foam and keys

**Congratulations and thank you on your purchase of a Lunt Solar Systems 80mmTelescope!**
The LS80MT joins Lunt Solar System's New Modular Telescope line up, allowing you to enjoy the full range of Astronomical Observation with only one telescope. The LS80MT is big enough to impress in any configuration, while remaining easily transportable for use during the day or night. Lunt Solar Systems is known for throughout the world for quality telescopes. At 80mm of aperture features and details such as, prominences, surface granulation, active regions and filaments are never too far away. And with Lunt Solar Systems doppler true tuning pressure system, standard with all of our Modular Telescopes, you can make extra fine adjustments in your tuning to delve into the Sun and bring out the absolute best views!

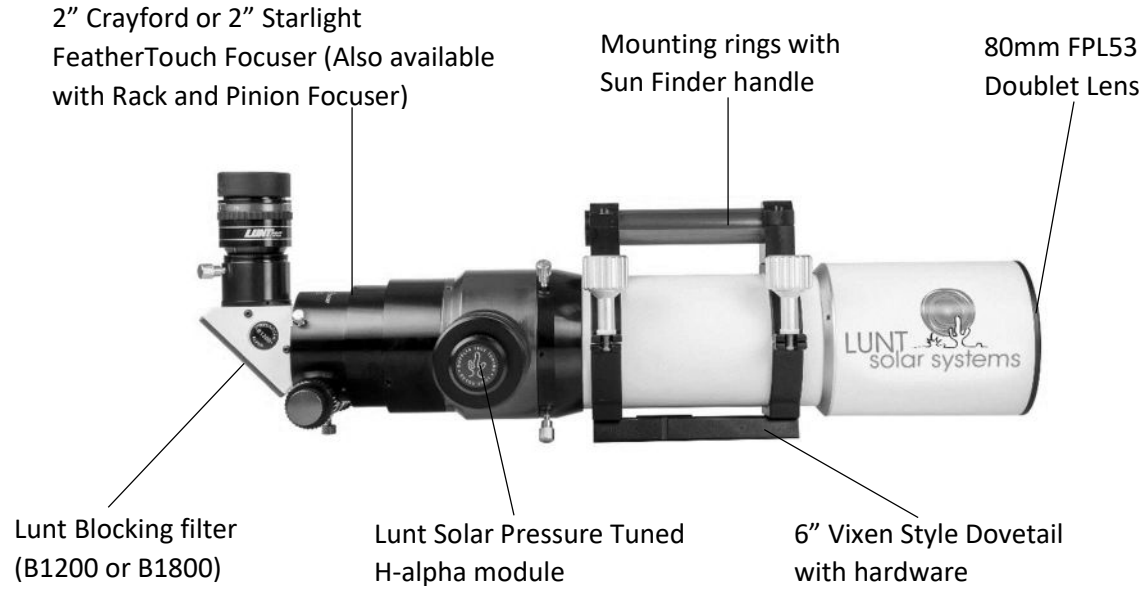
## Okay let's get started...

**Safety First!**

- **Always check any telescope before use. Do not use any telescope or filter that appears to be damaged. Verify that all glass and filters are in place. Contact Lunt Solar with any questions before use.**
- **The Blocking Filter diagonal must ALWAYS be used with the Lunt Telescope or Filter. Lunt Filters and Blocking Filters are NOT interchangeable with products from other manufactures.**

**Please see page 5 of this manual for more on safely observing the sun.**

## Getting Familiar:



So you have your **LS80MT** setup on a mount. Let's take a look!

- Place a ~25mm eyepiece in the focus end so you have the largest field of view to look at.
- Pull the diagonal slide tube out about 50mm.
- Put the focus tube at about 75% of travel.
- Align your scope using the Sun Finder Handle

**Initial adjustments:** Position your mount to where the sun is showing through your Sun Finder handle. Now, look through the eyepiece. You should see a fuzzy red ball. If not, make sure you have removed the dust cap from the front. Additional adjustments may be required to center the sun in your view.

**Focus:** Coarse focus is achieved by moving the diagonal drawtube in and out. Medium focus is achieved using the larger knobs on either side of the focuser assembly. Fine focus is achieved with the 10:1 reduction (smaller Red knob). The fine focus will be most used when imaging. Focus so that the edge of the Sun is as sharp as possible.

**Tuning:** On the side of the LS80MT is a large black cylinder. This cylinder is the tuning system for the LS80MT. The black knob of the Pressure Tuned system has a 4 start thread attaching it to the brass cylinder body. Unscrew the black knob completely. The system is now reset for your altitude. Carefully re-thread the PT knob onto the body and engage the threads about one turn. While looking through the eyepiece gently turn the PT knob onto the cylinder body. There will be little resistance at first, but as the pressure in the cylinder builds the resistance will increase slightly. As you turn the cylinder you should see features come into view through the eyepiece. Continued turning will result in the wavelength shifting thru 656.28nm and detail will begin to disappear. Fine-tune the cylinder for the best performance.

**Re-Focus:** When you feel you have tuned effectively, re-focus the telescope. The finer details should come into view. Try to relax the eye while observing and let the details come to you.

**Change the eyepiece:** When you have a good feel for observing at lower magnifications try to increase the magnifications in small steps. Place an interesting artifact in the center of the field. Replace the ~25mm with a ~12mm eyepiece. Look through the eyepiece and re-focus carefully. The image has likely dimmed slightly due to higher magnification, but the details should be easier to see. You can push the magnification as seeing conditions allow. At any point you can return to the 25mm, re-align the system and try again.




We recommend our Lunt 7-21mm Zoom Eyepiece.

**Keep In Mind:** Seeing conditions can affect the performance of your telescope. Cloud cover, wind, humidity and heat can all play a factor.

The LS80MT is a complete Solar Telescope. Above described are the basic principles of the scope's use as delivered. This refractor-based system uses a 80mm Fully Multi-Coated FPL53 ED Doublet lens for enhanced resolution. The focal length is 560mm providing a ~5.6 mm image through the 12mm or 18mm blocking filter.

Recommended accessories include our Lunt Zoom Eyepiece(7-21mm) and Lunt Solar Hat with protective flap. For expanding the amazing capabilities of this modular system we recommend the DSII-SFPT for Double Stacking in H-alpha mode, 2" Lunt White Light Wedge (pictured below), 12mm or 18mm CaK module and the Backing Plate and Focuser for nighttime mode. For more information on any of these products please check our website www.luntsolarsystems.com or contact our team by phone or email at 877-344-7348 and sales@luntsolarsystems.com.



Pictured: Lunt 12mm CaK Diagonal with Backing Plate and Focuser assembly



Pictured: 2" Lunt White Light Wedge with Backing Plate and Focuser assembly.

## Safety Information

### Safe Viewing

There are inherent dangers when looking at the Sun through any instrument. Lunt Solar Systems has taken your safety very seriously in the design of our systems. With safety being the highest priority, we ask that you read and understand the operation of your telescope or filter system prior to use. NEVER attempt to disassemble the system. Do NOT use your system if it is in some way compromised due to mishandling or damage. Please contact the factory with ANY questions or concerns regarding the safe use of your instrument.

- Never look at the Sun with your naked eye or with a telescope that is not specifically designed to do so. Permanent and irreversible eye damage may result.
- Check that all filters are installed correctly and are free of any surface contamination that may compromise performance and/or potentially damage the surface of the optic when exposed to the Sun. i.e.: fingerprints. Perform a routine safety check before each viewing session.
- Never leave the solar telescope unsupervised while pointed at the Sun. People who are not familiar with the correct operating procedures of the system may inadvertently replace the diagonal or remove the filter itself not being aware of the integrated safety features of each.
- The Lunt Solar filter/telescopes are NOT interchangeable with competitor products.
- Always be aware that you are viewing in direct sunlight. Take necessary precautions to protect yourself from sunburn and heat exposure.

## Handling and Equipment Care

### Handling

A Lunt Solar Systems solar filter or telescope houses many optical elements that are all pre-aligned and fixed at the factory. There are no user serviceable parts inside the scope. The telescope or filter should NEVER be taken apart. This will not only void your warranty leading to costly repairs, it can only serve to further damage the instrument and compromise its safety.

- Most Lunt Solar Systems filters and telescopes house a delicate optical element referred to as an Etalon. These etalons are suspended in the filter housing in an effort to both protect it and isolate it from outside influences, which could de-tune the etalon filter. Extensive research has been done to assure the best performance of what is essentially the "heart" of the system while protecting it from the day-to-day bumps, jarring, and vibrations of normal use.

- The instrument should NEVER be subjected to shock due to being dropped. Mishandling of the filters system will cause the etalon to de-contact (not covered under warranty) and will render the instrument nonfunctional until repaired.

- The instrument should be stored in its original case. As with any precision optical instrument it should be kept in as low a humidity area as possible.

- With proper handling and care the filter should last a lifetime.



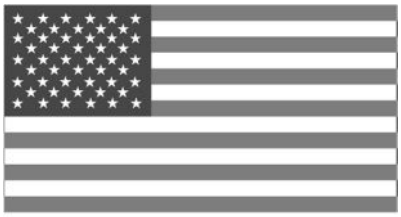
**Equipment Care**

As with most telescopes and optical equipment there can be a buildup of dust and debris on the lens and exterior components after sitting out all day. Here are some guidelines for the care of your new Lunt Solar Systems Telescope:

- Blow off loose dust and dirt using a clean dry air source at low volume. Do NOT use shop compressed air, which contains oil and will further contaminate the instrument.
- Stubborn particulates can be brushed from the surface with a static free lens brush. Use gentle sweeping motions.
- Fingerprints and smudges can be removed using lens tissue or a Kleenex type tissue product. Fold the tissue or cloth to make a "pad", apply a cleaning product to the end of the pad dampening it evenly (do not apply solution to the lens), wipe in circular motion starting at the center and working around the edge and off in one complete motion. Be firm, but do NOT rub. Blow lightly once the lens is clean to help remove residual solution. Residual dust from the cloth can be blown off.
- Do NOT use Acetone or strong degreaser type products, household cleaning agents, paper towels, tissues with added scent or color (plain tissues only), or bleach or acidic products which will damage the anodized surfaces.

If ever in doubt, consult your local dealer or call Lunt Solar Systems at 877-344-7348 with any questions or concerns. We are happy to assist you!

LUNT solar systems



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## Interesting and Helpful Terms

The Sun is active on a daily basis. During solar maximum the Sun will put on awe-inspiring displays that include solar flares, prominences, surface granulation and surface filaments. Here is a brief overview of those terms to help you understand and identify what you are seeing.

- **Prominences**: These look like eruptions from the disk (edge) of the Sun. Prominences can be small spiky looking details, or large cloud like detail with fine feather-like features. They are, in fact, Ionized hydrogen emissions being projected from the limb. Prominences are anchored to the Sun's surface in the mesosphere and extend outwards into the Sun's troposphere.

- **Filaments**: These are string like features on the surface of the Sun. At high resolution they take on a 3D effect due to the cooler aspect of the filament contrasted against the bright, hotter, Sun. They are actually prominences being viewed against the surface.

- **Spicules**: A spicule is a dynamic jet of about 500km diameter on the Sun. It moves upwards at about 20 km/s from the photosphere. Father Angelo Secchi of the Vatican Observatory in Rome discovered them in 1877. The chromosphere is entirely composed of spicules. These features can be seen as "fur" around the edge of the disk.

- **Plage**: This is a bright region in the chromosphere of the Sun, typically found in regions of the chromosphere near sunspots. The plage regions map closely to the faculae in the photosphere below, but the latter have much smaller spatial scales. Accordingly, plage occurs most visibly near a sunspot region. Faculae have a strong influence on the solar constant, and the more readily detectable because chromospheric plage areas traditionally are used to monitor this influence. In this context "active network" consists of plage-like brightening extending away from active regions, as their magnetism appears to diffuse into the quiet Sun but constrained to follow the network boundaries.

- **Solar Flares**: A solar flare is a violent explosion in the Sun's atmosphere. Solar flares take place in the solar corona and chromospheres, heating plasma to tens of millions of Kelvin and accelerating electron, protons, and heavier ions to near the speed of light. They produce electromagnetic radiation across the electromagnetic spectrum at all wavelengths from long-wave radio to the shortest wavelength gamma rays. Most flares occur in active regions around sunspots, where intense magnetic fields emerge from the Sun's surface into the corona. Flares are powered by the sudden (timescales of minutes to tens of minutes) release of magnetic energy stored in the corona.

- **Chromosphere**: The chromosphere is a thin layer of the Sun's atmosphere just above the photosphere, roughly 10,000 kilometers deep (approximating to, if a little less than, the diameter of the Earth). The chromosphere is more visually transparent than the photosphere. The name comes from the fact that it has a reddish color, as the visual spectrum of the chromosphere is dominated by the deep red H-alpha spectral line of hydrogen.

