



# astro-tech AT 72ED II

from Astronomy Technologies

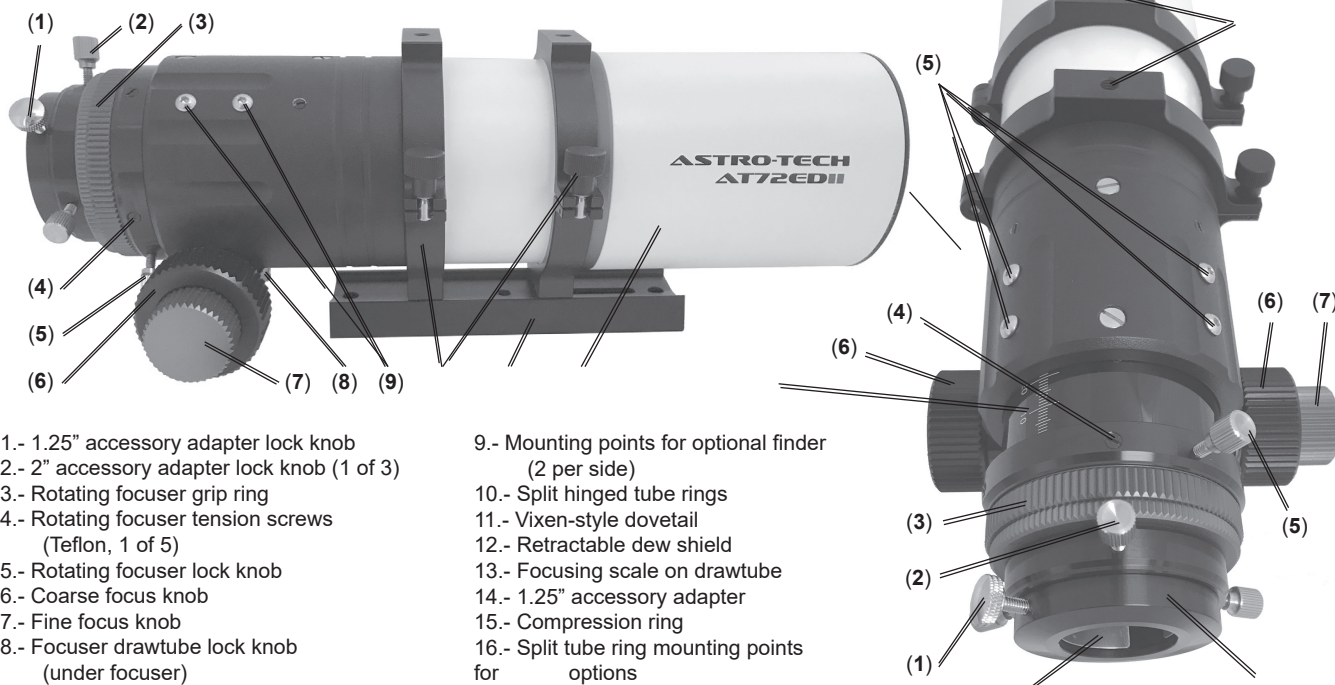
Thank you for choosing this **Astro-Tech AT72ED II** high-quality compact ED doublet refractor.

The images from its f/6 ED (FPL-53 Extra-low Dispersion) air-spaced doublet optics are virtually color-free. We believe you'll find the optical performance of your AT72ED II to be exceptional, particularly in view of its reasonable price.

This instruction sheet will provide you with information on how to get the most out of your new telescope, and how to properly maintain your telescope so it can give you a lifetime of observing enjoyment.

Please familiarize yourself with your telescope's parts and functions before operating it for the first time.

## USER-ADJUSTABLE PARTS OF THE AT72ED II



- 1.- 1.25" accessory adapter lock knob
- 2.- 2" accessory adapter lock knob (1 of 3)
- 3.- Rotating focuser grip ring
- 4.- Rotating focuser tension screws (Teflon, 1 of 5)
- 5.- Rotating focuser lock knob
- 6.- Coarse focus knob
- 7.- Fine focus knob
- 8.- Focuser drawtube lock knob (under focuser)

- 9.- Mounting points for optional finder (2 per side)
- 10.- Split hinged tube rings
- 11.- Vixen-style dovetail
- 12.- Retractable dew shield
- 13.- Focusing scale on drawtube
- 14.- 1.25" accessory adapter
- 15.- Compression ring
- 16.- Split tube ring mounting points for options

## Astro-Tech AT72ED II Apochromatic Refractor Specifications

**Aperture** ..... 72mm (2.83")  
**Focal Length** ..... 432mm  
**Focal Ratio** ..... f/6  
**Objective Type** ..... air-spaced doublet, with one element of FPL-53 ED glass  
**Optical Coatings** ..... fully multicoated  
**Resolving Power (Dawes' Limit)** ..... 1.61 arc seconds  
**Visual Limiting Magnitude** ..... 11.8 maximum  
**Light Grasp (versus the eye)** ..... 106x  
**Lowest Usable Power** ..... ~11x (with 40mm eyepiece)  
**Highest Terrestrial Power** ..... 72x (with 6mm eyepiece)  
**Highest Practical Power** ..... 108x (with 4mm eyepiece)  
**Theoretical Maximum** ..... 144x (with 3mm eyepiece)

**Field Stops** .... 2 glare-reducing baffles in optical tube, plus 15 micro-baffles in the focuser drawtube  
**Focuser** ..... dual-speed 2" rack-and-pinion, with 10:1 reduction ratio fine focus, camera angle adjuster, and 1.25" and 2" compression ring accessory holders  
**Focuser Travel** ..... 3.38" (86mm)  
**Lens Shade** ..... retractable, 88mm o.d.  
**Objective Lens Cover** ..... slip-on metal  
**Tripod Mount** ... dual split rings, 6" Vixen-style dovetail  
**Tube Diameter** ..... 84mm o. d.  
**Tube Length (lens shade retracted)** ..... 12" (305mm)  
**Tube Length (lens shade extended)** ..... 15" (381mm)  
**Weight (w/rings, dovetail, 1.25" adapter)** ... 4.65 lbs. (2.11 kg)

Your **Astro-Tech AT72ED II** refractor is usable for day and night viewing, simply by adding an appropriate star diagonal or image erector and an eyepiece. Any 1.25" or 2" eyepiece can be used, from a 40mm or 41mm focal length for the lowest practical magnification, to a 3mm for high power use.

The AT72ED II has a dual speed 2" rack-and-pinion focuser with camera angle adjuster, a non-marring 2" compression ring accessory adapter for use with 2" star diagonals, 2" eyepieces, or 2" photo accessories. Also supplied is a 1.25" compression ring accessory adapter for use with 1.25" star diagonals, terrestrial image erectors,

and 1.25" eyepieces and photo accessories.

The 432mm focal length of your AT72ED II is ideal for low to medium power wide-angle views of nebulas, open star clusters, large galaxies, and comets. Crisp views of the Moon, planets, binary stars, and globular clusters are also routine at magnifications of 108x to 144x when seeing conditions permit.

To calculate the magnification of your telescope and eyepiece combination, divide the telescope focal length in mm by the eyepiece focal length in mm. For example, an 8mm eyepiece will give you a magnification of 54x (432mm/8mm = 54).

**Astronomical Observing:** The theoretical maximum usable power available from this telescope is 144x, although this requires a 3mm eyepiece that provides a narrow and dim 0.5mm exit pupil. Still higher power is occasionally possible, given excellent seeing conditions. Keep in mind that seeing conditions play an important role in how high a magnification you can use on any given night. Only very good seeing conditions (clear skies and calm air) will support viewing at 144x or higher. Under less than ideal conditions, lower powers in the 72x to 108x range provide more consistently usable and pleasing images.

The widest practical field of view with a 1.25" eyepiece is about 4°, which can be achieved with an 11x (40mm) TeleVue Plössl eyepiece. A 2" wide field eyepiece such as the 40mm Explore Scientific 68° or TeleVue 41mm Panoptic will deliver an immense field of view (6.3° @ 10.8x with the Explore Scientific and 6.45° @ 10.5x with the TeleVue), making the AT72ED II its own best finderscope when used with either of these eyepieces.

The AT72ED II also does an outstanding job as a wide-field astrograph for DSLR and CCD imaging. A mm scale on the focuser drawtube lets you note and quickly return to the best photographic focus, while a chrome lock knob under the focuser lets you lock in that sharp focus.

**Terrestrial Observing:** The AT72ED II works very well for daytime birding, nature studies, sweeping the landscape from the home with a view, etc. It is also a very good f/6 432mm (8.6x) telephoto lens for terrestrial photography. Generally speaking, the maximum usable daytime power with any terrestrial scope is about 1x per mm of aperture (72x with a 6mm eyepiece). Attempts to push the daytime power higher often magnify the heat waves, dust, and "mirage" in our atmosphere to the point where the images become blurry and unusable. A 17x (25mm) to 54x (8mm) eyepiece is usually more satisfying for everyday terrestrial use than a 72x eyepiece.

**Mounting the AT72ED II:** A stable photo tripod or astronomical mount is essential for best viewing. The 4.65 pound AT72ED II is light enough to be used on any good quality camera tripod with a minimum payload capacity of 7 to 8 pounds. The scope's supplied Vixen-style dovetail has a 1/4"-20 thread hole for direct connection to a standard photo tripod head.

**Finder Mounting Points:** There are four mounting holes on the focuser available for installing an optional finder (such as the optional Astro-Tech illuminated multiple reticle finder or the Astro-Tech 8x50mm right angle dark crosshair finder). The mounting hole positions (two per side) are shown on the illustration on the front page. The holes are sealed by hex head bolts when no finder is installed.

**Camera Angle Adjuster (CAA):** The AT72ED II is equipped with a combined camera angle adjuster/2" accessory holder. To rotate the CAA to adjust the camera angle for the best photographic composition, loosen the chrome lock knob at the side of the CAA body (shown in the illustration on the front page). Rotate the CAA to the desired angle and tighten the lock knob to hold it in position.

There are five Teflon rotation tension screws around the rotation mechanism. If the rotation is too stiff or becomes loose due to use or temperature extremes, you can adjust these screws slightly and evenly to tailor the rotation tension to suit your preference. These should rarely need adjustment, however, and should be turned only in small increments. Excessive or uneven tightening of these screws can damage them, a problem not covered by warranty.

A chrome lock knob under the rack-and-pinion focuser body lets you lock the focuser drawtube at a sharp focus for photography.

**Optional Astro-Tech Accessories:** The adjustable-height Astro-Tech Voyager II altazimuth mount has worm gear manual slow motion controls in both altitude and azimuth to make tracking terrestrial and astronomical objects smooth and easy. The Astro-

Tech 1.25" and 2" star diagonals have state-of-the-art 99% reflectivity dielectric coatings to provide the maximum brightness and planetary detail and contrast possible from your AT72ED II. 45° viewing angle image-erecting 1.25" diagonals are available to provide correctly-oriented terrestrial images.

**Caring for Your Scope Optics:** Never store your telescope in a damp or humid environment. Avoid leaving it in a hot environment (exposed to direct sunlight on a windowsill, in a car trunk, etc.) If you must store it in high humidity conditions, put a few packets of desiccant (silica gel or the equivalent, available from most camera stores) in with the telescope to absorb excess moisture. If not properly stored in a humid environment, the telescope may develop mildew that can damage the optics.

If dew has formed on the scope after a night's observing, allow the scope optics to air dry at room temperature before putting the lens cover on the scope and storing it away.

If the front lens surface becomes dusty, smeared, or shows fingerprints or any other surface build-up, you can clean the lens as follows. Gently blow away any surface dust or particles with a clean air blower (a child's ear syringe or a photographer's camel's hair brush with attached blower bulb, for example).

Moisten a soft cloth with a few drops of an optical cleaning solution designed for multicoated camera and binocular lenses. A well-worn cotton handkerchief works well and Canon, Nikon, and Zeiss make suitable lens cleaning fluids. Do not drip cleaning fluid directly on the lens. Use the barely damp (not wet) cloth to gently wipe the lens clean, turning the cloth frequently to always keep a clean portion of the cloth in contact with the lens.

Blot the lens dry with a dry portion of the cleaning cloth or a separate cloth. Use a clean cloth each time cleaning is needed.

Avoid overcleaning your scope. The multicoatings on the lens are quite hard and durable. However, frequent overzealous cleaning can scratch the coatings if all the dust particles (often tiny flecks of windborne rock) are not removed before you start pushing a damp cloth around the lens surface. A few specks of debris on the lens will not be visible in your images, as they are not in the focal plane and don't block enough light to measure, let alone be seen.

Fingerprints should always be cleaned off promptly, however, as they can etch the coatings on your lens if not removed before storing your scope.

As a rule, though, clean your optics only when absolutely necessary. If you take proper care of your scope, cleaning should rarely be needed.

**Caring for Your Scope Finish:** Your AT72ED II is finished in baked-on automotive paint, with portions hard anodized. These very durable surfaces can become smudged with fingerprints during use, but these will not harm the finish. A clean soft cloth slightly dampened with plain water (or a little moisture from your breath and a quick wipe with a clean handkerchief) is generally enough to remove the fingerprints. Avoid harsh chemical cleaners or organic solvents like benzene, alcohol, etc., as these may ruin the finish. They can certainly affect the optical coatings if they accidentally drip or splash on the objective lens.

Never use your AT72ED II terrestrially in the rain or in conditions where it may get wet. Your telescope is not waterproof. If your scope accidentally gets caught in the rain, immediately wipe off all water using a clean and dry soft cloth. If your telescope gets totally soaked in water, or submerged, immediately contact your dealer for service instructions. Do not disassemble or attempt to repair your telescope yourself, as this violates the warranty terms under the limited product warranty, and negates any guarantee.

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