

The AstroTrac, a Precision Astrophoto Rig Small Enough to Fit in a Handbag



All the items needed for automated tracked long exposure wide-field astrophotography are provided by the AstroTrac

By Robert Reeves

Many sky shooters want a means of "hands-free" automatic tracking to image constellations, the Milky Way, and the larger nebulae and galaxies without tying up telescope resources that could be used for visual observing. In the past this need has been served by constructing homemade motorized "barn door" trackers, but achieving precision tracking with these devices is often challenging. The 21st Century answer to the need for precision unguided tracking is to use one of the commercially manufactured trackers from AstroTrac, Kenko, or Takahashi. If properly polar aligned, all three of these units provide quite accurate star tracking.

I have previously used a Takahashi Sky Memo and found that it tracked very well with light-weight cameras, but these devices are no longer available. Today, I use an AstroTrac, which I find to be perfect for unattended wide-field astrophotography. In my opinion, its

high load-carrying capacity coupled with its very compact design and electronic controls give it an edge over other commercial trackers. This unit can be thought of as a barn door tracker on steroids for carrying small telescopes and cameras using moderate telephoto lenses. The device is technically not a barn door tracker, but is instead a tangent arm tracker with an extremely accurate electronically controlled drive screw.

Measuring 17- x 3-inches and 1.5-inches thick, the AstroTrac is small enough to fit into a camera bag or accessory case. Made from aircraft-quality aluminum, the unit is exquisitely machined and is downright beautiful to those who appreciate a finely crafted piece of machinery. The advantage of the tangent arm drive design is that counterweights are not needed and a small telescope or photographic gear can use the unit's entire load capacity. Twelve-volt power is supplied to the tracker drive through either an included cord with 8-cell AA battery pack or a cord

with a cigarette lighter plug.

Although I personally use the AstroTrac TT320, there is a higher-capacity model available now, the AstroTrac TT320X, that has nearly identical size dimensions, operating procedures, and price. The TT320X weighs 2.3 pounds, yet it can carry 33-pounds of equipment. The tracking accuracy of the TT320X is five arcseconds peak-to-peak over a five-minute period. This about the length of most widefield DSLR exposures and shows that as long as the unit is well polar aligned, photographic tracking with moderate telephoto lenses will be flawless.

In use, the AstroTrac unfolds like a pocketknife. The magnetically-attached polar scope mounts to a swingout arm. The arm rotates to click stops every 15 degrees to allow viewing through the illuminated polar scope in case the camera blocks the view. The tangent arm drive flips 90 degrees to the left to drive in the northern hemisphere or 90 degrees to the right for the southern



The AstroTrac is attached to a tripod and the drive screw assembly is rotated to the left for northern hemisphere use

hemisphere. The AstroTrac uses a beefier 3/8-inch tripod mounting hole instead of the photographic standard 1/4-inch hole. A robust swivel ball-head adapter that threads onto a 3/8-inch stud mounts cameras and small telescopes to the AstroTrac. The larger thread sizes provide a high degree of stability.

Setting up the AstroTrac and beginning an astrophoto exposure takes less than five minutes:

- 1.) The tracker is attached to a sturdy tripod (30 seconds elapsed)
- 2.) A ball-head adapter is attached to the tracker (60 seconds elapsed)
- 3.) The camera is attached to the ball-head (90 seconds elapsed)
- 4.) The polar scope is attached to the tracker (2 minutes elapsed)
- 5.) The unit is polar aligned with the polar scope (3 minutes elapsed)

This beautiful image of the southern summer Milky Way in Sagittarius is a 10-minute exposure tracked by an AstroTrac TT320. A Nikon D200 with a Nikon f/3.5 zoom set at 27mm was used at ISO 400. The Celestron-14 in the foreground was illuminated for 30 seconds with a red flashlight. Photo by Adrian New

6.) The camera is aimed, the tracker turned on, and the exposure started (5 minutes elapsed).

The AstroTrac is operated through four illuminated pushbuttons on the tracker body. The left two buttons control the illumination brightness of the pushbuttons and the volume of the beeps confirming they have been pushed. The right two buttons are for starting the drive, which allows just under two hours of continuous sidereal rate tracking, and rewinding the drive screw when it reaches the end of its travel. The unit automatically stops tracking when the limits of the drive screw travel are reached. It takes about 90 seconds to rewind the drive screw from its full travel length. Solar or lunar tracking rates can be selected by holding down either the brightness or volume button as the unit is powered up. A blinking green light softly illuminates the transparent drive screw cover to show the unit is tracking properly.

The only hitch users will encounter is the lack of setting circles when aiming narrow field of view telephoto lenses at invisible deep sky targets. A magnifying right-angle viewfinder is a huge help in viewing through the finder of an upward pointing camera. Navigation by star hopping is required to find invisible targets.

As with any astronomical instrument, a stable mounting is critical. It is recommended that a heavy-duty tripod be used with the AstroTrac. Lightweight portable camera tripods will NOT be sufficient. AstroTrac recommends that an adjustable alt-az gear head be used between the tripod and AstroTrac to aid in polar aligning. I have found this not necessary when using my heavy video tripod as long as care is taken while slewing the tripod head to view Polaris (or the south celestial pole) through the illuminated Losmandy-style polar scope.

I have found the AstroTrac to be a device that puts a heavy dose of fun back into wide-field astrophotography. I heartily recommend it not only to experienced astrophotographers but also beginners who do not own a telescope. The TT320X is precision built, small, lightweight, and easy to use. I have found it to be an astronomical device that fully delivers on its advertising claims. Indeed, in my use, the AstroTrac follows the sky just as well as my considerably larger Losmandy GM-8 telescope mount. Sequentially viewing 12 consecutive 5-minute sky images taken with a "normal" lens on an AstroTrac-driven DSLR reveals no trailing or star movement between frames.

The AstroTrac is now available from Adirondack Video Astronomy at www.astrovid.com.

Check out one of these amazing devices. I think you will also be impressed with the AstroTrac!

Article and Photos by Robert Reeves



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