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A Versatile New TRACKING MOUNT

With the introduction of Sky-Watcher's Star Adventurer system, the growing selection of portable tracking mounts just got bigger and more interesting *Text and photos by Alan Dyer*



THE BOOMING INTEREST in astrophotography has inspired several manufacturers to introduce affordable (\$400 to \$600) tracking systems, perfect for taking amazing images of the Milky Way and constellations with today's digital SLR cameras.

The latest entry, the Star Adventurer from Sky-Watcher, stands out for the many ways it can be configured, as I show in the photos. It can be purchased as a Stand-Alone Bundle, with just the compact mount, ball-head adapter and polar illuminator, for \$360. This is all you need for most wide-angle shots of the sky.

The Photo Bundle adds the equatorial wedge. But for the maximum flexibility, there's the Astro Bundle, which includes the wedge, the mounting assembly (essentially a declination axis) and a counterweight. The full package goes for \$500. This is what I tested in a unit on loan from Sky-Watcher.

Just to be clear, the Star Adventurer does not include a tripod or a ball head. You must supply those, and they have to be solid, medium-weight units, or you'll have no end of issues with trailed stars from mechanical slippage. Consider their weight when planning to pack for flights to exotic sites.

SHOOTING THE SKY

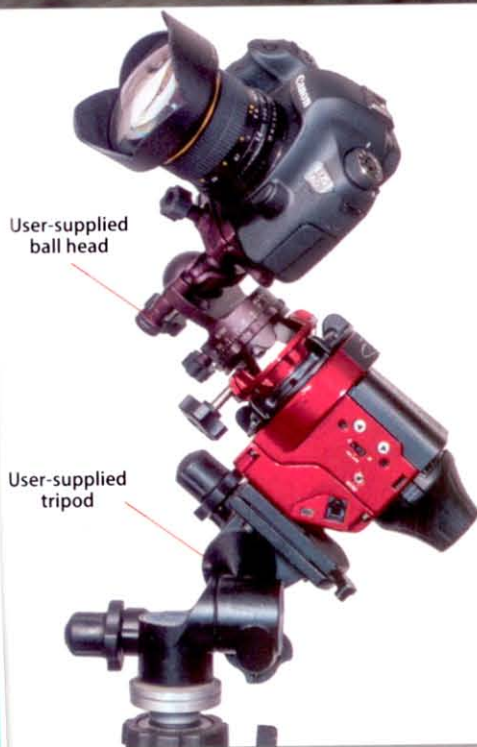
In all its configurations, the Star Adventurer worked very well, indeed. The polar-alignment scope has an accurate reticle for precisely nailing the position of the celestial pole, in both the northern and southern hemispheres. (I was pleased to see that it included the horseshoe pattern of faint stars around sigma Octantis, which I always use to align when Down Under.)

The nicely machined equatorial wedge is solid but easy to finely adjust to aim the polar axis at the pole. My only real complaint about the system is that once you begin attaching camera brackets and plates, you can't use the polar scope and certainly not the add-on illuminator. You must polar-align first, then take

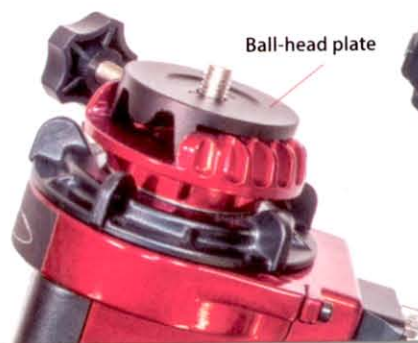
BASIC CONFIGURATION In its simplest Stand-Alone package, the Star Adventurer is bolted to a sturdy tripod and angled up to polar-align it. A single camera is attached with a user-supplied ball head. The head itself weighs 1.5 kilograms.



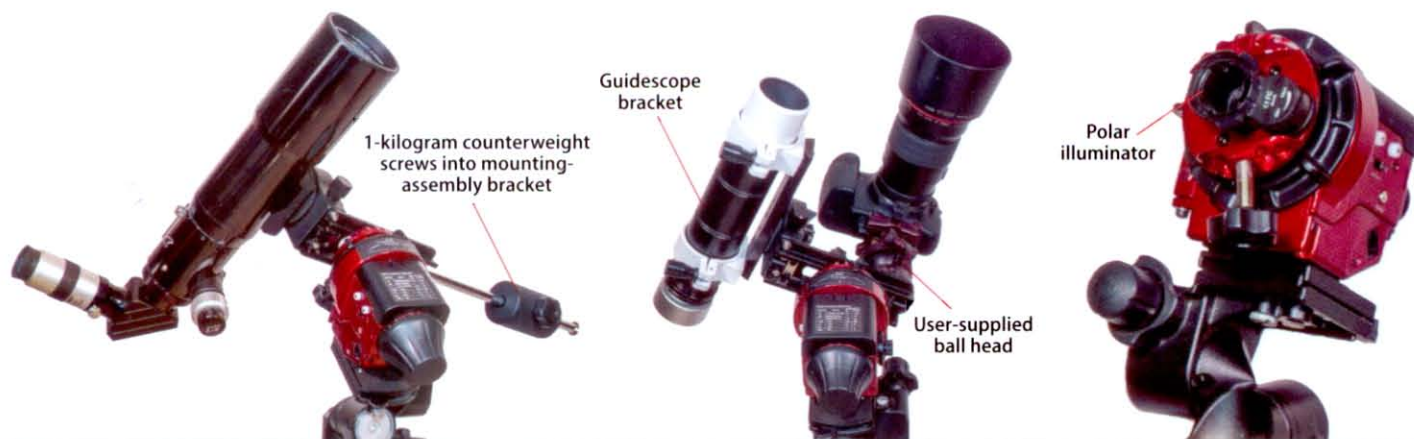
TRACKING THE SKY Great “photo ops” are possible when you can track the sky with a portable mount. Taken with the Star Adventurer at the Mt. Kobau Star Party in July, this image is a stack of five 5-minute exposures for the sky, with the foreground coming from just one of the frames through the magic of Photoshop masking.



BALL-HEAD ADAPTER The basic Star Adventurer package includes this ball-head adapter plate, with a $\frac{1}{8}$ -inch bolt for attaching any sturdy ball head. All fittings use the standard Vixen dovetail system. The ribbed black ring is the clutch for the polar axis; loosen it to make large position adjustments, then tighten it to begin tracking.



ASTRO CONFIGURATION #1 The more costly Astro Bundle includes this mounting-assembly bracket, which allows the user to attach two cameras, one in landscape orientation via a ball head and one in portrait orientation via the declination axis. Two cameras side by side in landscape orientation would collide with each other.



ASTRO CONFIGURATION #2 The Astro Bundle includes a one-kilogram counterweight for balancing a small 60mm (shown here) to 80mm telescope solidly attached at the end of the declination axis. The telescope will need a mounting shoe with a 1/4-20 tripod socket. The full configuration, sans scope, camera and tripod, weighs 3.7 kilograms.

ASTRO CONFIGURATION #3 An alternative is to attach a small guidescope to the declination axis, with a camera on a ball head at the other end. Again, the guidescope would need to be mounted in rings, with a plate that has a 1/4-20 bolt hole. For accurate guiding, everything must be solid—don't cheap out on a flimsy mini ball head.

POLAR ILLUMINATOR The Star Adventurer includes an add-on "bright field" illuminator for the polar scope. The main drawback to the system design is that the illuminator can be used only when no other accessories or plates are attached. This makes it impossible to check polar alignment throughout the night without removing gear.



WITH OPTIONAL WEDGE The Photo Bundle and Astro Bundle come with a sturdy wedge that attaches directly to a tripod via a standard 1/2-inch threaded socket. Fine adjustments in altitude and azimuth made it easy to polar-align, and the unit stayed solidly in position. The wedge has a range of 0 to 70 degrees latitude.

SLOW-MOTION CONTROL The declination axis has a worm gear and a manual slow-motion knob for making fine adjustments to the north-south position. A clutch can be loosened to perform coarse movements. These features, lacking on some competing tracking units, allow the Star Adventurer to be used with a small scope.

CONTROL PANEL The Star Adventurer has a standard ST-4-compatible auto-guider jack, as well as north-south switches, 12x speed buttons and the mini USB external power jack. The SNAP port can connect to a camera to fire its shutter, but only at preset intervals that won't be ideal for many shooting situations.

care not to bump anything when you start clamping on cameras.

The Star Adventurer is powered by four onboard AA batteries. I installed one set of NiMH rechargeables at the start of my testing, and they were still working fine after a dozen nights of use, including one occasion when the unit was accidentally left on overnight. Very impressive.

For shots with wide-angle and normal lenses (35mm to 50mm), the Star Adventurer worked great, requiring no more than accurate polar alignment and being set to the sidereal tracking speed. Shots with a 135mm telephoto lens showed slight trail-

ing on some frames when blown up, typical of what I've seen with other trackers (in this case, you just take lots of shots and toss out the few that are trailed). But shots with a 200mm lens and a 1.4x teleconverter (for a focal length of 280mm) showed enough trailing on every frame to be objectionable.

The solution is that the Star Adventurer can be electrically connected to an auto-guider (via a standard ST-4 port) and a small guidescope can be attached via the mounting-assembly bar. I tested it with a light 50mm Borg guidescope, an Orion StarShoot auto-guider and the free PHD Guiding software.

This combination worked brilliantly, producing pinpoint stars. However, I would recommend using no more than a lightweight 50mm guidescope and shooting with nothing bigger than a light 300mm telephoto lens. Anything more ambitious—and heavy—will demand a full-sized equatorial mount.

Be aware that the Star Adventurer allows guiding only in the right-ascension, or east-west, direction. But with the short exposures typically used, even with telephoto lenses, any north-south drift in declination should be negligible, provided you take care to polar-align accurately.



POWERING THE MOUNT A set of four AA batteries powered many nights of use. The Star Adventurer can also be run by an external five-volt power source (such as might be used to charge a mobile device) via the mini USB jack. The plastic cover for the battery compartment was initially hard to remove without fear of snapping its plastic retaining tab.

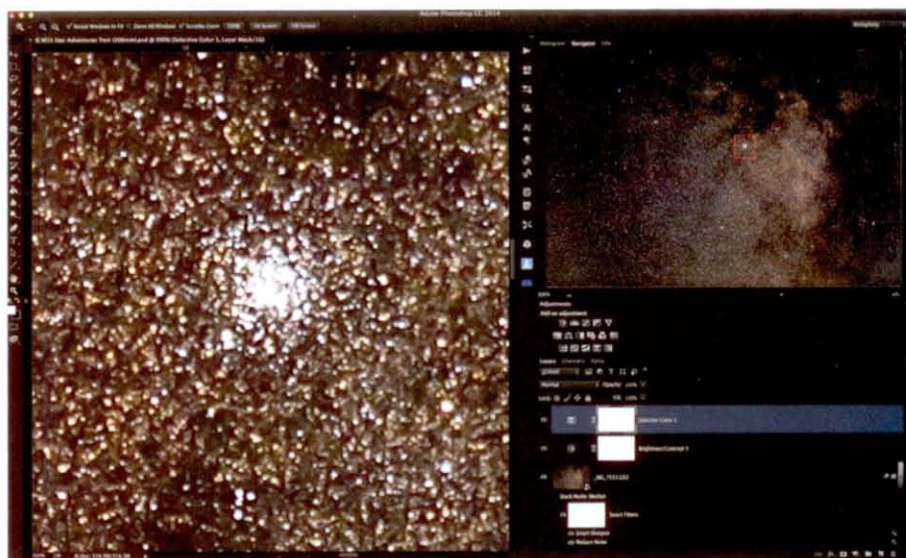


SPEED CONTROL The Star Adventurer can turn at the sidereal, solar or lunar rate, as well as at a 0.5x half speed, good for nightscapes to minimize blurring of the ground in tracked shots. The 2x, 6x and 12x speeds are for panning in time-lapse sequences, though only through a preset arc of 60 degrees.

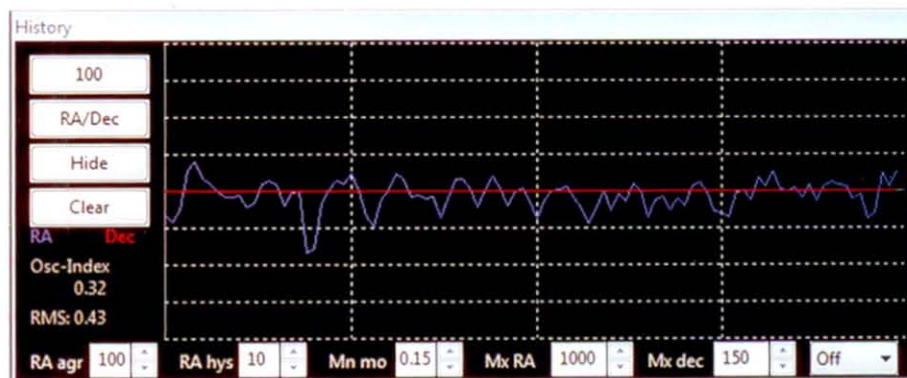
TIME-LAPSE IMAGING

The Star Adventurer also includes time-lapse modes. By mounting the head on a tripod and aiming the polar axis straight up, you can pan horizontally across a scene at various speeds while the camera fires away. The Star Adventurer can even fire the shutter through its SNAP port. (The system can be purchased with adapter cables for various camera models.)

However, experienced time-lapsers might find the Star Adventurer limiting. In its higher-speed modes, it is restricted to one preset panning motion: moving 30 degrees in one direction, coming back 60 degrees,



AUTO-GUIDING TEST For shots using a telephoto lens, the Star Adventurer can be controlled with an auto-guider to minimize trailing from mistracking. A set of stacked 4-minute exposures of the Scutum star cloud taken with a 200mm lens showed perfect star images, even under extreme magnification zooming into the M11 cluster.



AUTO-GUIDING GRAPH A screen grab taken during the M11 tests shows the corrections being applied back and forth in right ascension. While the corrections are large, the stars should still record as pinpoints with the focal lengths likely to be used with the Star Adventurer. Note that the red line for the declination corrections is flat—no declination guiding is possible with the Star Adventurer. As such, the PHD Guiding software used here must be set to “Declination: OFF” to work.

then reversing again for 30 degrees to return to its starting point. I’ve shot hundreds of time-lapses, and I can’t think of any occasion when I would have used such a pattern. Unlike with Sky-Watcher’s AllView mount, you cannot set start and end points for a time-lapse move.

In addition, the Star Adventurer can fire the shutter at only a few factory-set intervals, most of which won’t be applicable. In the high-speed (2x to 12x) modes, intervals are from one to six seconds, too short for most nighttime use. Nor is the Star Adventurer a “shoot-move-shoot” device—its motor turns continuously, even in time-lapse mode.

When tracking the sky at the normal sidereal rate, your only choice is 49- and 99-second exposures through the SNAP port, somewhat useful but too short, in my book, for most tracked Milky Way shots. To control your camera, I suggest using an external intervalometer, not the Star Adventurer.

I don’t consider these shortfalls to be serious. The important points for astronomers are that Sky-Watcher’s Star Adventurer is easy to accurately polar-align, tracks the sky very well, auto-guides great and is compact yet well built and versatile. I recommend it to anyone looking for a portable tracking system. ♦