

Paramount MyT – Part 2 – Rough Polar Alignment & Play

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Not everything worth doing is worth doing well.

-Tom West

One of the things that make a Paramount such a powerful piece of technology is the synergistic capability of all of the elements working together. High quality mechanics, on-board electronics and firmware combined with The SkyX Pro & T-Point software. Each part doing the task that it does best.

Yes, I recognize that a goal of many new owners is to get everything working together as quickly as possible. I also realize that most people who would choose astrophotography as a pursuit are probably over achievers. Nevertheless, there is something to be said for going slow and learning the pieces a bit at a time.

For example, I've known several Paramount owners who, weeks after buying the mount, had not taken a single actual picture. In other words, they were so busy chasing initial perfection that they became trapped in the samsara of T-Point, @Focus, ProTrack, PEC and guider calibration. There are also regular posts from new, as well as experienced, Paramount owners who seem uncertain about what element of the Paramount system does what.

As anthropologist [George Dorsey](#) described, the most natural way to build knowledge is to “play”. Moreover, at least in the stage of “playing” and “exploring”, perfection is not warranted. In the world of astronomy, [perfection](#) is seldom even possible. Rats. While we will go through all of the above software components, we're going to start with the basics and then we're going to stop and smell the roses.

The first step is always alignment.

In order to track objects in the night sky, The Paramount smoothly rotates around its Right Ascension (RA) axis and that axis must be aligned with the same axis upon which the night sky appears to turn. If you are unfamiliar with the Equatorial (Eq) coordinate system and how it compares to the more “every day intuitive” Altitude-Azimuth (AltAz) coordinate system, I would suggest that you watch Forrest Tanaka's [video](#) about mounts.

The simplest of Eq mounts don't have any formal way to “align” the mount with the pole. You simply point them in the general direction of Polaris and call it done. This is usually fine because the telescopes in use on these mounts tend to be wide-field, they are used for visual observing and the mount is not expected to track all night long with a minimum of adjustment. The minimalist Eq mount on this 1958 Swift 838 is a good example:



Imaging, or high magnifications require a bit better Polar alignment than can be achieved by just plunking the mount down. In general, within two minutes of the pole is considered necessary for most imaging purposes.

The next evolution in polar alignment was the Polar Alignment Scope (PAS). The PAS is a calibrated telescope that runs through the axis of the mount. It might be a simple affair with a couple of constellation drawings and marks for Polaris, Sigma Octantis or other stars.

On the other hand, the Polar Alignment scope might be an analog computer that incorporates a level, longitude and local time such as found on the Takahashi EM-200.



Unfortunately, many modern mounts have dropped the PAS as a cost saving measure, leaving the user to align Polaris by looking through an empty hole. All is not lost, though. Many GoTo mounts use their on-board software to help you align the mount. Aligning with software may be more time consuming than a polar alignment telescope but it will often do a better job and also allows you to align in a location where you can't see Polaris. Moreover, aligning with software is less frightening to the younger generation that relies on their telephone to navigate to the mailbox.

Despite being dismissed in recent years, PASes have made a recent resurgence, both in ergonomic forum, such as the Astro-Physics RAPAS and more modern electronic versions such as the QHY PoleMaster. If you feel the need for a PoleMaster, Software Bisque does sell an adaptor for the MyT.

Although other Paramounts can be fitted with a PAS, the MyT is designed to use software alone to refine polar alignment. This is similar to the polar alignment routines mentioned above built into many other GoTo systems. One key difference with the Bisque software alignment routine is that it is designed specifically for imagers using SkyX, a camera and a Paramount. A second difference is that the system leverages the amazing precision of TPoint.

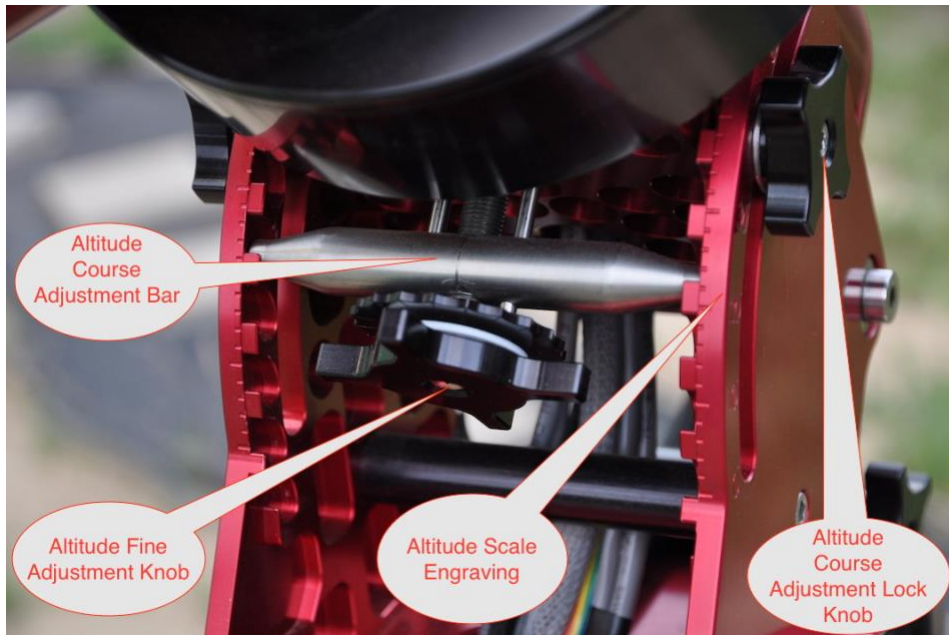
Before you reach the point of running T-Point, however, you should "rough" polar align the mount. I will then challenge you to play with the mount for an evening. Yes, I know that this clashes with the tradition of bragging to everyone on the Bisque WWW site about how many samples are in your T-Point model, but just try it. I think that you will be pleasantly surprised.

Let's get started: Assuming that you placed the mount somewhat close to the correct altitude and azimuth during setup, rough polar alignment is fairly simple. First, connect to the mount and allow it to "home". The Rough polar alignment process is based on the idea that the Paramount has a "home" position to which it reliably slews upon initialization. Furthermore, The SkyX Pro software very closely knows where that "home position" is against the sky for your specific time and location. No synchronization is necessary.

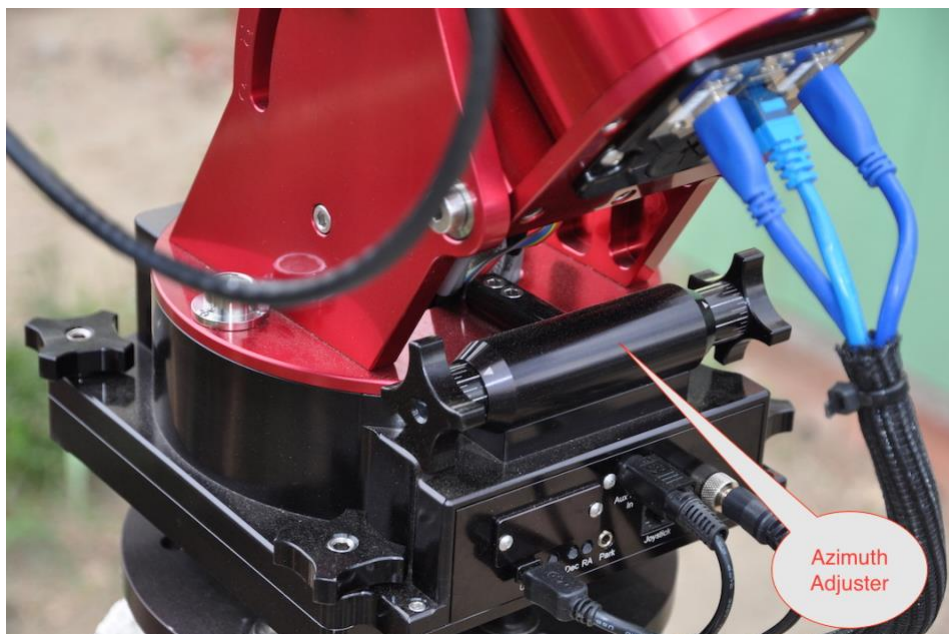
In other words, if the mount were properly Polar aligned, you could home the mount and then slew to a specific target and the target should be centered. Of course, if you're setting up from scratch, the mount will **not** be properly Polar aligned and the target will not be centered. In this case, if you move the mount's Alt-Az adjusters so that the star is centered in the camera (or eyepiece), then you will have roughly polar aligned the mount.

Go ahead and slew the mount to some convenient mid-altitude star and align the OTA on that star. Do not use the hand controller to adjust the mount; you must use

the manual adjusters because your goal is to move the base of the mount so that it is aligned with the celestial pole.



If you have a camera on the telescope and no finder scope, it may be more difficult to get the star centered in the telescope's FOV, but you can probably get it pretty close by sighting along a couple of tube ring bolts, mounting screws or just the body of the telescope. For example, you can center the OTA left & right by looking along the top of the tube, then up & down by looking at the star along the side of the OTA.



You can find the step-by-step instructions for a rough polar alignment in the Paramount Robotic Telescope User Guide (February 2018 edition) starting on page 113. You can also watch Tolga Gumusayak setting up and rough aligning a Paramount [here](#) or watch the process explained by Richard Wright [here](#).

Remember, that if you have a focused & wider field optical system, you can put the camera into a short-exposure “continuous exposure” loop under the “Focus Tools” menu. You can then turn on the cross-hairs in the FITS image viewer to help you center the chosen star. Please note that, because this method relies on a single star for alignment, the pointing will probably become less accurate the further you move the telescope from that part of the sky. Fortunately, Closed Loop Slew (CLS) should still be able to adjust for the error for expedient imaging needs.

Finally, even if the mount drifts, guiding will keep things centered. If you’re too fashionable to guide, you can still get away with some short exposures. Also, short exposures, especially wide-field, will show minimal field rotation. In fact, Richard Wright [evaluated](#) the performance of a single star alignment on a Paramount MyT and it was surprisingly effective. Even without the refinements of PEC & T-Point, the MyT will still outperform most other mounts on the market.

This would be a good time to get more experience with your gear, use CLS and try your hand at guiding in order to take some fun pictures before you become submerged with refinements. Moreover, Image Link & CLS are critical for future steps.

What? You don’t know anything about CLS and are frightened by guiding? Read on!