# Performance Specifications

The Paramount ME outperforms commercial "go to" telescope mounts in the following critical areas.

Critical Area	Paramount ME Specification
All Sky Pointing Accuracy	In *theory*, the Paramount ME can point your telescope to *1/3 of an arcsecond* (which is the limit of the control system's optical encoders). In *practice*, you should expect to achieve repeatable, quantifiable pointing accuracies from 10 to 30 arcseconds RMS by employing TPoint for Windows Telescope Pointing Analysis software. The bottom line is that the Paramount ME with TheSky, TPoint and a robust payload will deliver exceptional pointing accuracy.
AutoHome Technology/Nightly Initialization	When aligned with the celestial pole (a requirement for all German equatorial mounts), the Paramount ME can be restarted (powered off then on) with the identical pointing and tracking from session to session. With AutoHoming, you will not have to "resynchronize" or initialize the mount each session, or after losing power. No other commercial mount offers this capability.
Backlash	The spring-loaded worm-to-gear interface has ***virtually zero backlash in both the right ascension and declination axis***.
Tracking Performance and Periodic Error	The peak-to-peak periodic error for the right ascension gear is seven (7) arcseconds or less, *before periodic error correction* and *without* ProTrack. The typical Paramount ME periodic error after periodic error correction is applied is *one arcsecond peak-to-peak or less.* So, the tracking errors that are the result of the worm rotating are generally less than the errors introduced by atmospheric turbulence (local seeing) and are immeasurable.s

Periodic Error: Amplitude vs. Peak to Peak
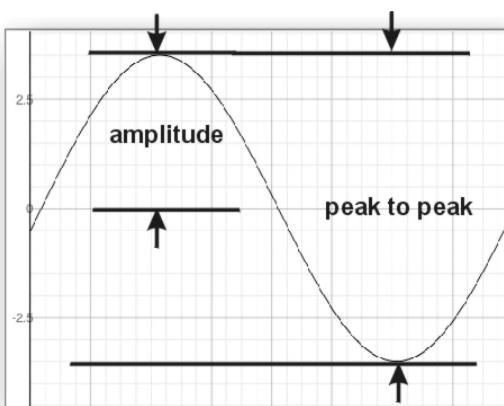
Graph showing amplitude (3.5 arcseconds) versus peak-to-peak (7.0 arcseconds) periodic error.

There are two ways to specify the periodic error: the *amplitude* of the periodic error, or the *peak-to-peak* periodic error. The amplitude of the periodic error curve is measured from zero to the peak of the error. The peak-to-peak error is measured from the high point in the y-axis to the low point. Therefore, the peak-to-peak periodic error equals two times the amplitude.

*The Paramount ME's periodic error is specified as the **peak to peak periodic error**, not the **amplitude** of the periodic error.*

What is AutoHome?

AutoHome™ is an automated initialization process initiated via TheSky (or the hand paddle) that slews both the right ascension and declination axes of the Paramount ME to a mechanically fixed position, called the *Home Position*. The control system performs this step each time the Paramount ME is turned on so that the mount's absolute *position* and *orientation* can be established (to the nearest one-third arcsecond).

AutoHome provides the following benefits:

- Once a mount is aligned with the celestial pole, homed and a reliable time base is used, extremely repeatable and accurate pointing can be achieved using TheSky and TPoint.
- After homing, the mount "knows" its orientation and therefore cannot be slewed into the pier. The right ascension software tracking limits are located approximately 5 degrees "past the meridian" (when the counterweights are above the counterweight shaft).
- The periodic error correction (PEC) function uses this information to calibrate the control system's internal PEC table with the orientation of the worm gear.
- You can quickly recover from power loss to the mount or other communication malfunctions.
- The Home Position can be used to aid initial polar alignment (see Quick Polar Alignment Procedure in the Paramount ME User Guide.)