Steve & Debbie Russell's Telescope Clinic

German Equatorial Mount

If the mount is accurately aligned, it will track the motion of objects through the sky well. It is quickly and easily set up once its operation is understood. *Perfect* polar alignment is very time-consuming and serves little purpose. Do not set up a telescope where the sun can shine into the optical tube; this is dangerous.

Set initially, check occasionally:
While the telescope is *not* on the mount, set the latitude adjustment for your latitude (40° in central Indiana) and lock it. This needs changing only if significantly north or south of 40° north latitude (70 miles along the Earth's surface is roughly one degree).

Verify that the finder scope is oriented to the same target as the main telescope. This is easier if you find some object in the main telescope first and then align the finder to center that same object. Use an object at least a few blocks away that is not moving (i.e., an aviation marker light on a tower or a pole-mounted power transformer, but not a star).

Each time the telescope is used:
Set the declination slow-motion control to the approximate center of its range.

Adjust the leg length to roughly level the base.

Move the telescope in right ascension and declination until the optical tube is at its highest point; lock it.

Rotate the mount to find Polaris, the North Star, in the main telescope. If you do not see it there, seeing it in the finder scope will suffice. Lock the rotation of the mount. The telescope is now roughly "polar aligned".

To aim the telescope, only use R.A. and Dec. motion.

If properly aligned, slow, occasional rotation of the R.A. slow-motion control will keep the desired object centered in the eyepiece. Error in the alignment will require adjustment of declination also.

The R.A. setting circle can be calibrated as follows: Aim the telescope at a known star (away from Polaris) and rotate the circle until it reads the correct heading for that star. This setting will be different each time the telescope is used.

When properly aligned and oriented toward Polaris, the mount will look like this.

Note that
- when aligning, the optical tube is parallel to the right ascension axis of rotation;
- the R.A. axis stays oriented toward Polaris regardless of where the telescope is pointed.