A QUICK POLAR ALIGNMENT GUIDE

Quick Polar Alignment

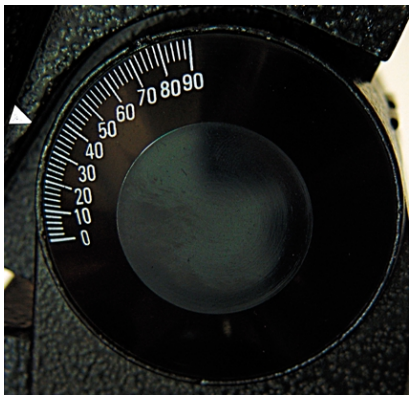
Confused about True South? Don't care about the absolute accuracy of a polar scope?

I'm often asked… how does one polar align a telescope? Unlike our friends north of the equator, southern observers don't have a bright star such as Polaris to guide us when polar aligning our telescope mounts. Using a polar scope is the most accurate method however the faint stars in the constellation Octans (as etched onto many polar scope reticles) can be difficult to see under the obtrusive lighting of many suburban areas.
So, the first thing to do is point your telescope and mount facing south (not north!). A compass will help but remember that a compass does not normally point to true north and over most parts of the world actually points at an angle east or west of geographic north or "true north". The true north and south poles about which Earth rotates are called the celestial poles (True North and South). A compass needle only points in the direction of magnetic north and the angle of difference with the true poles is known as magnetic declination.

I should also point out that when using the magnetic poles with a compass as a guide to finding the celestial poles, this is not a fixed system over time. Due to fluid motion of molten metallic material in the Earth's outer core, the poles of this magnetic field encompassing Earth do shift slightly over time and thus magnetic declination is not constant. So the figures in the table will be slightly different in several years from now.

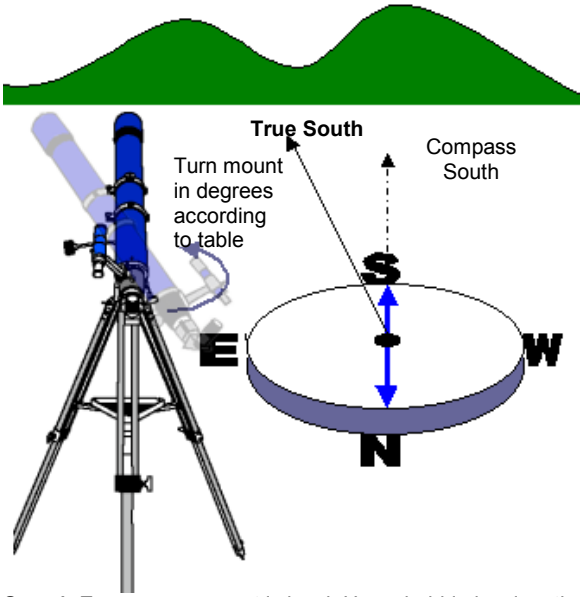
For a very rough polar alignment, you can simply point your equatorial mount to magnetic south and with a RA motor drive running objects will stay in the field of view for several minutes without requiring adjustment. However, a more accurate approach is to align the mount as accurately as possible to the South Celestial Pole (SCP - True South).

Below we've outlined a simple but effective method of obtaining good polar alignment. Though not as accurate as using a polar scope, it will certainly facilitate better tracking for much greater, extended periods of observing and is certainly good enough for basic long exposure photography.



Above: The latitude scale on the base side of your equatorial mount must be adjusted to an elevation above the southern horizon equal to the latitude of your observing site so that polar axis of your mount is parallel with Earth's polar axis. The table at right lists the latitudes for various capital cities as a guide.

Example for Sydney, Brisbane, Melbourne, Darwin and Adelaide



Step 1. Ensure your mount is level. Use a bubble level on the base of the mount head.

Step 2. Position yourself directly behind the telescope facing south and look along the line of sight of the south point of a compass needle extending to the axial shaft of the mount head. Turn the mount or whole tripod so that mount head falls parallel to this line of sight. Now the mount is aligned to magnetic south.

Step 3. Back to your original point behind the telescope, look at the compass you are holding and turn yourself in the direction east or West according to the SCP direction table below. This is the final angle at which the mount head or tripod must turned to be closely aligned to the SCP.

Step 4. Using the latitude scale on the mount head adjust the elevation of the mount in accordance with the latitude for your observing location. (See the table below)

For the most part, you're telescope should now track nicely however if you're really fussy you can refine positioning throughout the night. Once a satisfactory compromise has been achieved you can then mark out the ground / floor position of your tripod legs at that spot to save going through the process each time you set up to observe.

Location	Latitude (SCP elevation)	Longitude	SCP Direction from compass South
Adelaide	34° 56'S	138° 35' E	8° 12' E
Brisbane	27° 28'S	153° 2' E	11° 7' E
Darwin	12° 28'S	130° 51' E	9° 55' E
Melbourne	37° 49'S	144° 58' E	11° 39' E
Perth	31° 57'S	115° 51' E	1° 41' W
Sydney	33° 52'S	151° 12' E	12° 36' E

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