Astro-Physics Daytime Polar Alignment Routine

Adapted from Roland Christen's August 1st, 2017 post on ap-gto@yahoogroups.com

Any of our mounts can be quickly and accurately aligned using the following method. Please follow these instructions and your mount will be very close to polar-aligned. Once you do this alignment you can further refine it via the drift method, but this should get you very close.

Easy-Peasy Polar Alignment

The main question is how to polar align quickly and accurately when Polaris is not visible. Here is my simplest method that can even be done in daytime (which I will use for the upcoming eclipse), and it is quite accurate. You will need a small Carpenter's level or a smart phone level App. I use the Keypad, but you can any program that will park the mount.

1) Send the mount to Park1, wait until it stops slewing, then send it to Park1 again (this double park increases accuracy). Place the level on the counterweight shaft or the Dec axis and level manually by releasing the RA clutches and moving the axis by hand). Tighten the RA axis clutches.

2) Send the mount to Park2 (double park again), loosen the Dec clutches and level the scope tube assembly manually. Then tighten the Dec clutch knobs.

3) Send the mount to Park1 again (and double park) and this time level the tube assembly by turning the altitude knob until the scope is level.

These 3 mechanical adjustments do not require a star or sky object, but your mount is now properly polar aligned in altitude. Remember to leave the clutches tight now because we don't want to lose the alignment. Now all you need to do is to center a star in azimuth, and for that you simply slew the mount to a known (bright) star somewhere in the South, East or West. For daytime alignment, use the Sun, our closest star, with a proper filter over the front lens.

Enter the star (or sun), press GoTo and let the mount slew to the object. If it is too far off in azimuth you may need to bring it up in the finderscope. You can also use a smart phone compass app to get you close. Now adjust the azimuth angle until the star is on or near the center of the finderscope or main scope field. At this point you are basically done with your polar alignment.

If you are planning to observe or image during the evening, you may want to check your overall alignment by slewing to a star near the zenith, due South, due East and due West, and you can tweak the azimuth adjustment accordingly. I like to send the mount first to the zenith, recal on a star there and then send it to a star on the same side towards the South, East or West. The Overhead star is the center of a pivot, and will basically stay on the crosshair as you adjust the azimuth on a star elsewhere. You can always slew back to the overhead star and it will stay in the same place in the eyepiece no matter how far you adjust the azimuth axis.

I hope I have described this simple method clearly. It is really quite easy to do and results in the mount's mechanical axes being in the right place so that no further electronic software twisting of the sky is needed to point accurately. You can do this without a computer, just a simple keypad or smart phone app is all you need.

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