Daylight Polar Alignment Made Easy

By: Spencer R. Rackley IV | May 19, 2017

Aligning an Apogee fork mount using an iPhone running *Sky Safari 5*.
Sean Walker

Let's say you're all set to capture photos of the 2017 solar eclipse with your trusty scope on a Sun-tracking equatorial mount, but clouds thwart your view of the event. Your weather app tells you that conditions are much better several miles from where you're stationed. What to do? You can race down the road with a few minutes to spare, but accurately following the Sun without polar aligning your mount in broad daylight is next to impossible. If only there were a quick way to align your scope.

You're in luck, because there *is* a way to get rough polar alignment that takes about 30 seconds! All you need is your smartphone with a planetarium app installed that automatically aligns with the sky using the phone's internal compass and accelerometer — and a flat surface on your lens cap or an equatorial wedge. Here's how it works.

First, check to make sure the app on your smartphone has an equatorial grid function, and possibly either a crosshair or a Telrad field-of-view circle. The brightness settings on the display should be as high as possible, so you can see it in the daylight. (The planetarium apps *Sky Safari* and *SkEye* include crosshairs).

Attaching your smartphone over the front of your polar finder works just as well. For German equatorial mounts without a polar scope, set the Declination to +90° and attach your smartphone to your telescope or camera's lens cap.

Spencer R. Rackley IV

Next, set up your mount with the polar axis pointed close to North. If you're using a German equatorial mount with your lens or telescope, attach your optic to the mount, set the declination to +90°, and keep the lens cap on. Your telescope or lens cover will act as a surface perpendicular to the mount's polar axis.

Open your planetarium app, and place the phone on the lens cap with its back flat against the cap with some tape or an elastic cord. Because the phone's display is on top, the phone will effectively be pointing downward, toward the South Celestial Pole. With this in mind, adjusting the fine controls on the polar axis of your mount, and the EQ grid will change accordingly. Move until you see the grid align with the South Celestial Pole. Once you have the Pole centered in the Telrad circle or behind the crosshairs, you're polar aligned!

This technique is even easier with wedge-mounted telescopes, such as my Meade LX200 and ETX EC-90, both of which are mounted on adjustable wedge-like devices to match the user's latitude. Simply remove the telescope and use the flat surface of the wedge just like the lens cap described earlier; click here to watch a video demonstration of this technique.Once you've aligned the wedge, install your scope and you're ready for action.

With practice, this whole operation should take around 30 seconds. Using this method, you can be sure that your scope will track the Sun for at least 3 or 4 minutes, making that mad dash well worth the effort.

CATEGORIES
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About Spencer R. Rackley IV

Rackley is an amateur from Charlotte, North Carolina, who goes by the handle "Astronerd."
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4 thoughts on "Daylight Polar Alignment Made Easy"

1. *Grr8063* May 25, 2017 at 5:37 pm
   The article says that Sky Safari 5 has the Telrad field-of-view circle, however, it appears that the Pro or Plus versions of the program is required.

2. *Monica Young* May 26, 2017 at 9:38 am
   Yes, that's correct – I have the regular Sky Safari app (not Pro or Plus), and it does not provide a Telrad circle.

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   1. *Trevor* May 27, 2017 at 10:59 am
      SkEye free on Android has 8deg and 16 deg circles that would do the trick. Going to try this on my Meade LX90 next time I get the wedge out. Only limitation I can see would be the calibration accuracy of the phone used.

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      1. *Spencer R. Rackley IV Post author*May 27, 2017 at 1:40 pm
         Trevor,
         SkEye free is used in the video. There is some concern about magnetic offset to true north that I have heard about. The developers at SkEye say they correct for magnetic declination and have assured me that accuracy is based on "…the location you enter and the world-geomagnetic data built into the Android system."
         Remember that this technique is intended for a fast setup for solar eclipses if you have to move on short notice.