Dennis di Cicco

iOptron's New ZEQ25GT Mount

There's more to this equatorial Go To mount than just a radical new design.

ZEQ25GT

U.S. price: from $799 (as tested: $937, including tripod, polar-alignment scope, carrying case, and tripod bag)

iOptron
6F Gill St., Woburn, MA 01801;
ioptron.com; 866-399-4587

Tipping the scales at only 10½ pounds (4¾ kg) without the counterweight shaft, the ZEQ25GT is compact and very portable. The pivoting counterweight shaft clears the tripod legs when the mount is set for low latitudes all the way to the equator.

ALL PHOTOS BY THE AUTHOR UNLESS OTHERWISE CREDITED

Someone can correct me if I'm wrong, but I can't recall a company ever offering a wider variety of telescope mounts than iOptron currently does. From small and midweight alt-azimuth designs to a range of German equatorials, the company has the biggest selection of Go To mounts available today. Although iOptron's lineup stops short of the massive "observatory" equatorials used by elite astrophotographers, its offerings fully cover the workhorse needs of amateur astronomy. I've spent decades using portable equipment everywhere from my driveway to the Australian Outback, and there's never been an occasion when I wouldn't have been well served by one of the mounts currently available from iOptron.

One of the company's newest Go To equatorials is the ZEQ25GT. It is touted as a "Z balanced" design because it has the telescope and the counterweights at opposite ends of the polar axis. Compared to a traditional German equatorial mount, the ZEQ25GT's center of gravity is closer to the middle of the equatorial head, leading to better inherent stability. As such, the mount's designers could keep the ZEQ25GT's weight low relative to its specified 27-pound (12¼-kg) telescope load capacity. Indeed, without the counterweight shaft attached, the whole equatorial head weighs only 10½ pounds.

The ZEQ25GT proved to be remarkably stable for its small size and light weight, but initially I had to wonder why iOptron's engineers in China undertook such a radical redesign to shave what would have been only a few pounds from a traditional German equatorial of the same load capacity. An answer to this question may have come last November with the unveiling of iOptron's CEM60 at the Arizona Science & Astronomy Expo in Tucson. A variant of the ZEQ25GT's design, the CEM60 also offsets the telescope from the end of the polar axis, keeping the center of gravity near the middle of the mount. It appears that iOptron is making a concentrated effort to increase the load capacity and performance of portable equatorial mounts. It's an admirable accomplishment that helps the majority of amateur astronomers who, like me, frequently set up and break down equipment when they observe.

S&T: SEAN WALKER

Above: **Mentioned in the text, iOptron's CEM60 (seen here at its unveiling last November at the Arizona Science & Astronomy Expo) is another equatorial mount with a "balanced" design.** ***Below:*** **A bubble level and latitude scale aid in setting up the ZEQ25GT quickly in the field. Care is needed when attaching cables to their respective ports because many use identical modular jacks.**

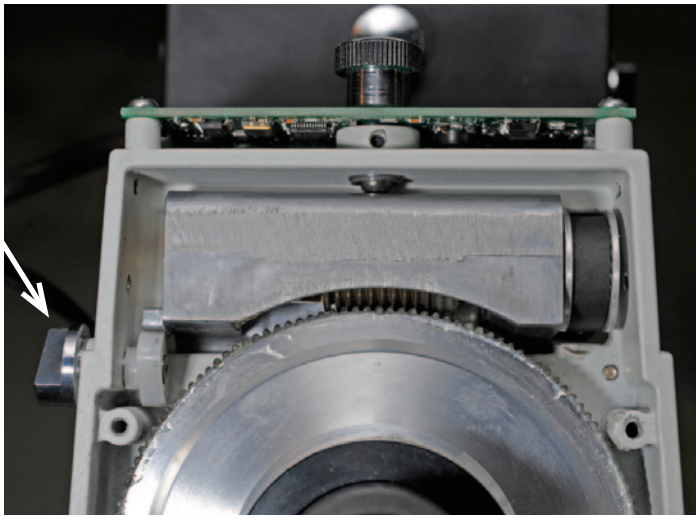
Take one look at the ZEQ25GT's profile from the side and you immediately see where the "Z" in the mount's name comes from. But I also sense a bit of nationalistic pride in the moniker, since Mandarin-speaking Chinese call their country Zhongguo. And speaking of names, one might ponder whether this design is a significant enough departure from the traditional German equatorial mount to be called something entirely new. That's for the astronomical community to decide, but for me the "Z" in the name serves as a nice reminder that this is a Chinese-designed equatorial mount.

WHAT WE LIKE:

- Excellent Go To and tracking performance
- Highly portable with good load capacity for its size and weight
- Quiet operation, especially when slewing

WHAT WE DON'T LIKE:

- Obstructed GPS antenna (see text)
- Limited astronomical information for objects in database



Far left: **To help with balancing the mount, the right ascension and declination drives have gear switches (arrowed) that release the worms from their worm wheels.** ***Near left:*** **The hand control has variable-brightness illumination for the display and buttons. The illumination automatically turns off during periods of inactivity, but returns the moment any button is pressed.**

Notes from the Field

Despite its unusual design, the ZEQ25GT sets up and operates just the same as a conventional German equatorial, and anyone familiar with a traditional equatorial mount will have no problems using this one. Furthermore, the heavily illustrated Quick Start Guide clearly explains the basics as well as features specific to the ZEQ25GT, such as the quick-release "gear switch" that disengages the worm gears from the worm wheels on the right ascension and declinations axes. When the gears are disengaged, the axes swing freely, making it very easy for you to precisely balance the mount on both axes.

The mount is available with an optional hard-sided carrying case and soft-padded tripod bag with shoulder straps.

The mount we borrowed from iOptron for this review came with an optional polar alignment scope. As I've mentioned in previous reviews of iOptron equipment, I'm very impressed with this alignment system for its simplicity and accuracy. The scope's illuminated reticle has two sets of concentric rings graduated into 12 hours. They are for use with Polaris in the Northern Hemisphere and Sigma Octantis in the Southern. Based on the date, time, and location stored in the mount's electronics (more about this in a moment), the hand control graphically displays where you need to position either of these stars on the reticle to achieve accurate polar alignment. There are no calculations necessary on the user's part.

For example, let's say the hand control indicates putting Polaris at the 7^h 30^m mark. You just view through the polar scope and use the fine-motion screws on the mount's azimuth and altitude adjustments to move Polaris in the field of view until it's at the reticle's 7^h 30^m mark and you're done. If you own an Apple mobile device running iOS 6.0 or later, I highly recommend you purchase iOptron's *Polar Scope* app ($1.99 from the iTunes App Store — search for "iOptron"). I find the app visually easier to use for determining the alignment star's correct position on the reticle.

The ZEQ25GT has a built-in GPS receiver for automatically setting the mount's date, time, and geographical coordinates. But there's a caveat. The receiver's antenna is located in the mount's main electronics module, which is attached to the top of the polar-axis housing. As such, it does not have a clear view of the sky when the mount is set up in its initial "home" position with the telescope above the polar axis and pointed toward the celestial pole. In this position, the declination drive blocks the antenna's sky access, which is needed to get a fix from the GPS sat-

ellites. Indeed, I was never able to achieve a GPS fix with the mount in the home position.

The simple solution is to swing the polar axis until the declination drive is far to the east or west side of the mount before powering up the electronics (an easy task thanks to the gear switch mentioned earlier). After a minute or two an audible beep and a message briefly appearing on the hand-control's display will alert you to the mount achieving its GPS fix (assuming there aren't other significant sky obstructions due to trees or buildings). You can then swing the polar axis back to the home position and proceed with the initialization of the Go To pointing using any of several alignment methods involving stars or solar system objects.

Of course, you can dispense with the GPS altogether and manually input the data. Whether you or the GPS enters the data, the electronics retain the information and the correct time when the mount is powered off thanks to a user-replaceable button battery in the hand control. Thus, unless you move to a significantly different location that warrants new geographic coordinates (think tens of miles), the electronics will be immediately ready to use on subsequent nights.

Lasting Impressions

The take-away feeling I got from using the ZEQ25GT for several months last summer, fall, and winter is that it's a very good performer for its compact size and light weight. I spent most of my time using it with a pair of 4-inch refractors, but I also tried it with an 8-inch Schmidt-Cassegrain tube assembly. Although these scopes were all well within the mount's specified weight capacity, I don't think the mount would be a good match for apertures larger than the 8-inch, at least not with the standard tripod supplied with the mount. There is, however, an optional tripod available that has 2-inch-diameter legs, rather than the 1½-inch legs on the standard model.

The ZEQ25GT made a superb platform for camera-only astrophotography. Although Comet ISON's post-perihelion apparition was a bust (page 10), my advanced preparations included testing the mount with a pair of heavy DSLR bodies and a variety of lenses. The whole kit was relatively lightweight and highly portable. And even speedy setup in the field using just the polar-alignment scope was more than adequate for 5- to 10-minute unguided exposures with lenses up to 180-mm focal length.

Having the telescope mounted on the south end of the polar axis didn't cause any unusual problems. As with conventional German equatorial mounts, there are parts of the sky where you have to be careful to avoid having the telescope run into the tripod legs. In general, the ZEQ25GT offered a little more "open" access to the northern part of the sky, whereas a conventional German equatorial gives the nod to the southern part. The only time I really noticed a difference between the two styles of mounts was when I observed around the southern meridian with the ZEQ25GT and Schmidt-Cassegrain, since I found myself shouldering up to the equatorial head and straddling the northern tripod legs.

The ZEQ25GT is lightweight enough to carry around with a telescope attached. The author did most of his testing with a pair of 4-inch refractors, including the Tele Vue NP101 pictured here.

The Go To pointing of the ZEQ25GT was well above average. Most nights I'd use a "one-star alignment" to initialize the pointing after adjusting the mount on the celestial pole with only the polar-alignment scope. With the telescope set in the home position, selecting the one-star alignment automatically sends the scope to the approximate location of a bright star you pick from a list displayed on the hand control. You use the control's push buttons to move the scope until the star is centered in the field of view, press the "enter" key, and your Go To slewing is ready to use. I could send the scope to targets across the entire sky and always have them appear in the field of a low-power eyepiece.

There was one other aspect of the ZEQ25GT that I really liked — the way it sounds when slewing. I find the typical howling motors of most Go To scopes really annoying. But the new iOptron drive was not only far quieter than most Go To scopes, its sound was much more pleasant. It didn't intrude on the serenity of the night sky nearly as much as most other Go To mounts do.

Overall the ZEQ25GT proved to be a very capable equatorial mount. It was an ideal companion for the 4-inch refractors, since I could leave these scopes on the mount and carry the whole setup into the yard in one trip. Polar alignment is fast and the Go To pointing accurate, making spur-of-the-moment observing a breeze. ✦

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*Senior editor **Dennis di Cicco** has been gazing skyward since the dawn of the Space Age.*