iOptron’s Capable Cube

For surprisingly little money, you can get a well-functioning computerized drive on a stainless-steel tripod.

**iOptron Cube “Go To” Alt-azimuth Mount**

**US price:** $243

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The highly portable Cube mount weighs just 8.2 pounds (3.7 kg), including tripod and hand unit, and can carry small telescopes equipped with Vixen-style dovetail shoes.

**Some new products** arise when existing technologies converge in a changing marketplace. The iOptron Cube is one of them. Its melding of motorized Go To pointing and tracking with a standalone alt-azimuth mount is unique in today’s market. But the real eye opener is that the Cube costs less than many non-motorized alt-azimuth mounts, and its price includes the tripod!

The Cube was announced just as I was looking for a portable tracking mount to use with my William Optics 66-mm refractor. It seemed like the ideal match, so I ordered one as soon as they became available last September.

**Getting Cubed**

How much mount does $243 buy? A lot. The basic package (called SmartStar-E Model 8500) includes the Cube Go To mount (available in several accent colors), adjustable tripod, basic hand controller (model 8403 Go To Nova), and AC power adapter. Right out of the box you’re good to Go To — there’s nothing extra to buy. Just affix the Cube to its tripod, plug in the hand unit and power supply, attach your telescope via the Vixen-style dovetail bracket, and start viewing.

I was pleased with the Cube’s solid construction, which is robust cast metal with plastic covers. Partial disassembly revealed a plastic drive train with a large altitude gear. All this sits atop a 38-inch-high tripod with stainless-steel legs and plastic fittings.
The Brains

If you’ve used a Go To telescope before, you know it’s the software that makes it a pleasure or a pain to use. So how does the Cube rate on the pleasure-to-pain continuum? I’d say it’s well up on the pleasure end.

The hand unit’s menus are logically arranged, and it rarely takes more than a couple of button presses to get the Cube to perform most tasks. For example, once you’ve completed your initial alignment (more about this later), you’re only six button presses away from selecting a Messier object.

The Cube does all the basic things I’d expect from a Go To mount, and I often encountered unexpected little refinements. For example, when you instruct the mount to go to the Moon or Sun, the Cube is smart enough to switch its tracking rate from sidereal (the default for stars) to lunar or solar, depending on which object you’ve chosen. Nice.

There are lots of useful features — many more than there’s room to list here. One of my favorites is the “Watch List,” which lets you plan an evening’s observing or put together a sky tour by preselecting objects from the Cube’s database. The watch list then becomes another object category from which you can select your Go To targets. I also like that you can enter a comet’s orbital elements, and the Cube will calculate its position in the sky — a feature I used during the recent apparition of Comet Holmes.

The hand unit’s four-line LCD display provides lots of room for useful data, and the functions of buttons on the minimalist keypad are well chosen. In particular, I really appreciated the dedicated motor-speed button. What a pleasure it is to adjust the mount’s slewing speed without having to drill down through several menu layers to make a change!

So far I’ve mentioned only the pleasure, but what about the pain? Well, there’s a little, but just a little. The model 8403 hand unit boasts a database of more than 5,000 objects, the vast majority of which are stars. The trouble is that, with the exception of the Messier catalog and the Sun, Moon, and planets, you have to select everything else using a unique multidigit number.

And so far there’s no printed cross reference. However, objects with proper names are listed sequentially and alphabetically. So you don’t need to know, for example, that the Saturn Nebula is number 51 in the list of named deep-sky objects — just scroll through the listing to find it between the Ring Nebula and Trifid Nebula. But this doesn’t help with double stars or stars with SAO numbers, so these databases are for the most part useless.

“What We Like:

Very good “Go To” and tracking
Simple to use
Able to carry a wide range of scopes

“What We Don’t Like:

Limited database
Occasional erratic behavior
Barely adequate manual

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“Go To” Fun

Of course, a thoughtful menu arrangement, substantial feature set, and low price don’t mean anything if the mount doesn’t Go To accurately or track well. So, does it? My testing showed that the Cube performs reasonably well on both fronts.

As with all Go To mounts, the Cube has to be synchronized with the sky. You do this initially with either...
a one- or two-star alignment procedure. One-star alignment requires that the mount be level — something that’s easy to confirm thanks to a built-in bubble level. This worked well enough for me to locate Venus in the daytime after using the Moon as my one “star.” You can achieve better Go To pointing accuracy (and not worry about the mount being accurately leveled) if you select two-star alignment, which takes only a little extra time.

As I jumped around the sky, I found that the Go To worked well enough to place most targets within my scope’s 2° low-power field — usually nearer to the center than the edge. And quickly too! The Cube performs its Go To slews at full speed (faster than 5° per second) without needing to “creep up” on the target.

The mount also has a useful “Park” feature. By engaging Park, the Cube orients itself so that it’s pointing due south and the scope is aimed at the zenith. The next time you power up you can skip the alignment procedure and simply begin observing, providing you haven’t moved the scope in the interim.

Tracking accuracy was very good. On one occasion I left the scope aimed at Comet Holmes while I took an observing break. Returning to the dew-soaked scope an hour later, I found the comet still in the center of the field. At times, however, the motors would run in phase, causing a very slight vibration that was noticeable when I observed at high magnifications.

What’s not to like? A couple of things. First, there’s no denying that the Cube is pretty noisy when it’s slewing to a target, but no more so than most low-cost Go To scopes. And like just about every computerized device ever made, the Cube very occasionally acted weird, requiring me to cycle the power off and back on to put things right again.

The Cube worked very well with my little refractor, and the resulting combination makes a great grab-and-go setup. I expect the mount can handle considerably bigger and heavier scopes (iOptron states that the Cube can carry up to 11 pounds and even something as big as an 8-inch Schmidt-Cassegrain), but the lightweight tripod is apt to be the limiting factor.

All things considered, the Cube is an exceptional value.

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**S&T RATINGS**

| Mechanics | ★★★
| Go To accuracy | ★★★
| Overall | ★★★★

★★★★ Sensibly perfect. No meaningful improvements possible.
★★★ Problems noticeable but do not seriously affect performance.
★★ Problems noticeable during normal use — performance compromised.
★ Problems so severe that the equipment is virtually unusable.

Ratings are intended to convey performance compared with equivalent equipment and should not be used to predict the relative performance of instruments having markedly different designs or specifications.

The bottom line: A great value in a versatile and functional Go To mount.

Left: The Cube’s “brains” live inside the supplied (model 8403) hand unit, which includes a database of 5,000 objects. Larger databases and more features are available if you upgrade to either the model 8402 or 8401 controllers. The keypad’s adjustable illumination switches off after two minutes of inactivity. Middle: At the end of your viewing session you can automatically park the telescope (mount facing south with scope pointed at the zenith) before powering down the system. Having done so, you can resume observing later without having to align the mount. Right: The Cube is a solidly built unit that houses its drive within a metal shell. Visible in this photo are the 2.42-inch-diameter altitude gear and worm.

Contributing editor Gary Seronik is an experienced observer and unrepentant gearhead.
This seems like such a good idea, we wonder why someone didn’t think of it sooner. The iOptron Cube is a standalone alt-azimuth mount that will add Go To pointing and sidereal tracking to just about any small telescope with a Vixen-style dovetail connector. It stands only 8 inches (20 cm) tall, comes with a stainless-steel tripod, and is powered by eight internally housed AA batteries. It’s rated for loads up to about 7 pounds (3.2 kg).