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# The 10Micron GM 1000 HPS: Stupidly Easy, Incredibly Accurate

## Or: How I Learned to Stop Worrying and Love My Mount

By Mark Zaslove

Okay, before I begin, let me state two things: One, the 10Micron GM 1000 HPS mount is as good as or better than anything out there. It is truly an upper-echelon mount. Period. It's all svelte Italian precision coupled with bang-for-buck performance. Plus, for the price of admission, you get absolute encoders (more on why that's cool, when financially worthwhile, later).

Two, guided or unguided imaging is about getting good shots, and either way works...if done right. Doing it right involves all the variables coming together: mount; scope; camera; modeling or not; guidescope or not; etc. It's a whole, not a part. There is no right or wrong to guiding or not guiding. But isn't it cool if you can do great imaging with less gear, not more (Image 1)?

### Opening Flashback: The Search

My beloved iOptron iEQ30 (reviewed in this very magazine) was no longer with me, and I was looking for something on the next level. Astro-Physics, Software Bisque, ASA and 10Micron were in the hunt. In fact, I really, really wanted to do a "shoot-out" between the four, but, as with many things in life, it was not to be.

Still, I researched and researched and

researched them. They were all amazing mechanisms capable of giving great stellar performance and making gotos and tracking simply vanish into the background by being exact and eminently repeatable (ya gets what ya pays for). I wouldn't kick any of 'em out of bed. So, how to decide? They each were slightly different in their methods of coming to the same conclusion: great gotos and tracking.

I wanted to try going unguided. I'm a wide-field junkie, and at shorter focal lengths (this rig would have a Borg 90FL at f/4) unguided seemed a slam dunk. So, I was looking at those mounts that could provide that, were built with that possibility, and would be as trouble-free in that department as possible. I wanted to guide, too, but first and foremost in my criteria, was that I wanted to try unguided.

AP had just come out with Astro-Physics Command Center (APCC), which included Astro-Physics Point Mapper (APPM) for modeling and tracking, but the Mach 1 I was looking at didn't have encoders, and couldn't have them added, and, for the price, I wanted encoders to future-proof with (and, they are kinda cool).

Software Bisque had just come out with the Paramount MyT, a lovely wonderfully-priced mount. SB really put the ama-



Image 1 - The Assembled 10Micron GM1000 GoTo Mount

teur-priced robotic mount on the map in the past, along with modeling (*T-Point*) and could do unguided with *Pro-Track*. What's more, the whole *TheSkyX* software suite came with the price of admission. A great buy, but, no encoders (not that they were needed for unguided, or very many other things), and I wanted those encoders.

The ASA DDM60 Pro was built for

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**Image 2 - The Aries Tripod built and tested just for the GM 1000 HPS to ensure great modelling.**



**Image 3 - The outer shipping box, as delivered by UPS.**

unguided from the ground up, all space-age tech and specific software like MLPT (Local Multi-Precision Tracking). But, no matter how many times I read the manuals, I couldn't make heads or tails of it. I'm

limited to one to two nights a month to get out under the stars at my dark site. Fiddling on those nights is poison to me. I want to image, so complicated work flows that I have to parse out under the spangled firmament were a no-go. Yes, theoretically, when I had it under my control, the ASA would be great...but three nights of fiddling meant three months of non-imaging. That was a lot.

So I looked to the 10Micron GM 1000 HPS.

This baby had the absolute encoders built into the price (did I mention no PEC needed with absolute encoders?!), had its own mount-based computer (none of the others had that) as part of the kit, which meant all modeling, polar aligning, ortho aligning, etc., could be done without need of a laptop, if so desired. I always have a laptop for imaging, but what if I didn't want one?! Could use Ethernet/Lan to go from mount to computer (I'm not a fan of serial-to-USB, or even USB-to-USB; USB is not as robust as Ethernet).

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What's more, it was so fast, it could track satellites from horizon to horizon...not that I was ever going to do that, but, you never know when I might be drafted by the NSA to keep tabs on foreign spy "birds."

But the biggest selling point was that the modeling could be automated and was really easy to understand and try. Easy equals more time imaging, less fiddling. So, with the help of Ed Thomas of Deep Space Products, the US distributor of 10Micron stuff, I got my hands on a GM 1000 HPS. By the way Ed's da Man! Way helpful with any questions about anything, and ships quickly.

But let me say again, my choice was subjective: I had certain criteria weighted the way I wanted, not necessarily how others would. I really, really, really wanted through-the-mount cabling, or a USB/power hub built into the saddle, which the other three mounts have, but the 10Micron doesn't. As silly as it sounds, it was almost a deal-breaker, as I hate cables like a teenager hates acne, but, in the end, ease-of-use won out.

But, any of them are superior mounts. We're talking a choice between a Ferrari 488 GTB, a Lamborghini Huracán, a Porsche 911 GT3 RS, or an Aston Martin Vulcan. What's not to like?

### First Act: The Mount Arrives

So, the boxes arrive (I ordered the recommended Aries Tripod [Image 2], which is built/tested just for the GM 1000 HPS to ensure great modelling; you can use others, and



Image 4 - The GM1000 mount head – sleek and well-machined.



**Image 5 - 10Micron's Linux-based computer is purpose designed for unobtrusive control of the GM1000.**

there are adapters, but this is the recommended one, so I went with it) and shipping was the usual cluster firetruck: just look at **Image 3**. Still, the mount cases look bulletproof, and there was not a jar or disruption inside.

I had studied the manual, so I ripped open the boxes and lo-and-behold, beauty met my eye. The mount head was sleek and well-machined, like some exotic European espresso maker (**Image 4**). The Aries tripod was sturdy and military-looking. There's a specific case for the hand controller, cables and weights. It came with its own fitted Allen wrenches. I felt like a sniper in a James Bond movie: crack the cases, start putting it all together. When I set it up, the whole thing had the presence of a stealth mount, capable of going undetected and then perform without a hitch. It was much heavier than my ol' iEQ30, but then, it was supposed to be. It was a monument to steady tracking.

A few additional points: It takes both Vixen- and Losmandy-style rails, has an auto-balance routine, and though it uses 24 volts, there's an automobile/cigarette lighter DC power supply thingie that makes plugging it into 12-volt batteries a snap. There's



**Image 6 - Ready to image with a Borg 90FL and QHY10.**

a Wi-Fi module, if you so desire, and even a polar laser pointer (which is pretty much unnecessary, but cool for those who like that sort of thing).

I popped in the cables, then hooked up the laptop via Ethernet. A pause for a moment to discuss *Model Maker*, created and distributed for free by Per Frejvall. Per is the other "da Man"! *Model Maker* takes all the cool modeling goodness that works inside 10Micron's Linux-based computer that hangs from the side of the mount (**Image 5**) and allows it all to be automated via laptop. With *MaxIM DL* and a full copy of *PinPoint* (Per's working on using other software as well), at a push of a button, the mount goes to a list of points (from 1 to 100), snaps an image, plate solves, then uses that data to model the mount. Again: at the push of a button! Seriously.

What's more, Per is extremely communicative (even when he's off on icebreakers in the Arctic ocean, doing whatever it is he does out there. Although he claims it's scientific research stuff, I think he's a secret agent; though, my imagination can carry me away at times), answered stupid questions I had, and even got on TeamViewer and checked my settings, to make sure

everything was ship shape ... er, mount shape.

So, still inside my place, I set up a 50-point simulated modeling run, hit the button and...the mount zoomed around, so quietly I had to get real close to hear anything, and so quickly it was dangerous to stand too close to. Voila: that's all it took. No figuring, no fiddling, just done. Or, that's the way it ran in simulation. How about under the stars?

### Plot Point One: The First Night

I got it out with the new scope (Borg 90FL with helical focuser and "supposedly" the correct spacers) and a QHY10. I was doing this test run in a driveway in Culver City and not out at my dark site (to shake down any bugs).

Right off the bat, it turns out the spacers on the Borg were wrong, and I couldn't bring the CCD to focus. How did I find this out? I sighted the scope with my eye towards Arcturus and the edge of a giant blob was just sliced at the right of the image field. I brought the giant blob to the center, then tried to focus. Racked ("helicalled?") all the way inwards, getting smaller, but not small enough.

So, first really cool thing the 10Micron mount did, compliments of its absolute encoders: I left it tracking, disconnected the QHY10, removed a big spacer, connected the QHY10 back on and ... OMG! Giant white blob still in view in the exact same spot, even after I rebooted the computer for USB/camera purposes. A couple more times I had to adjust the spacers, each time the blob was still there, in the exact same spot no matter how much I jiggled the scope and mount. Finally, I reached focus, and was ready to model with the reassembled rig (**Image 6**).

In two seconds, I set up a ten-point model for my sky (you just click and go). The very first plate solve ... error, could not solve. I thought, "Oh, boy...here we go." The next one. Solved. And all the rest! Ridiculously easy.



**Image 7 - M8 (the Lagoon Nebula) and M20 (the Trifid Nebula) Region captured as 10-minute unguided subs.**



**Image 8 - The Elephant Trunk Nebula.**



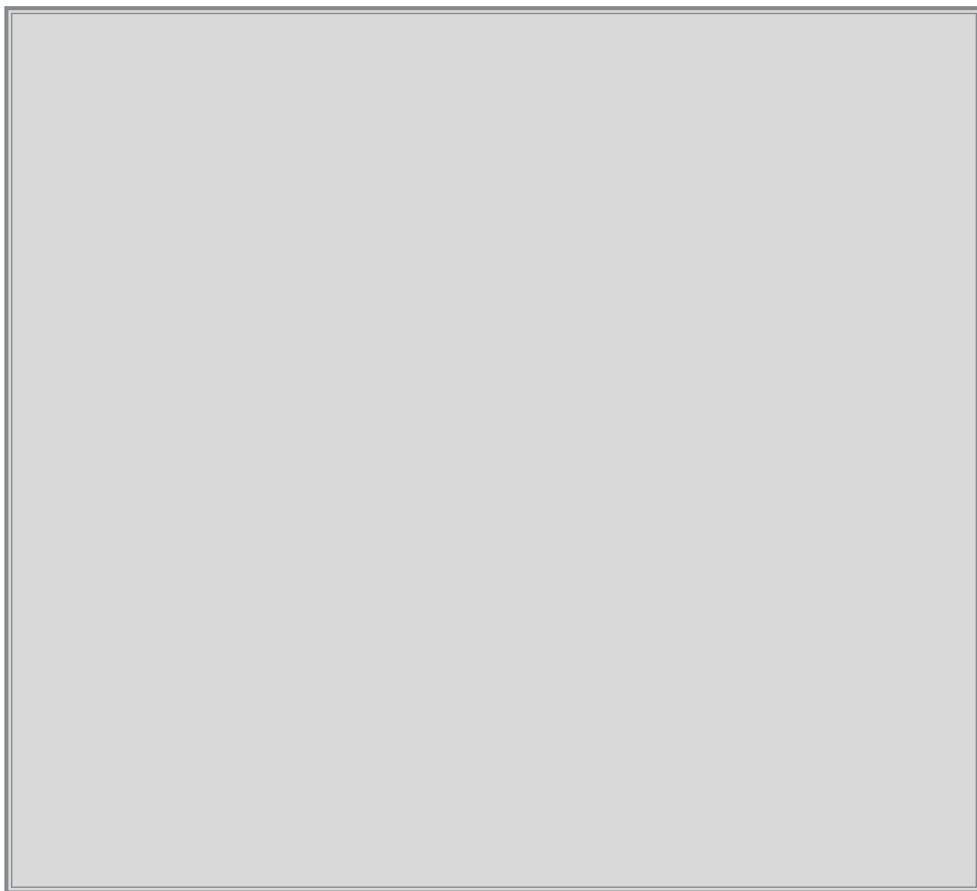
**Image 9 - Veil Nebula Eastern Region.**

I got the polar-align offset per the “align info.” Altitude was 0.56 turns off. Azimuth was 4.7 turns RT. I turned the knobs the wrong way (hey, I’d give my right arm to be ambidextrous), but, this was a test, so I didn’t bother to correct after another quick 10-point run.

So, I cleared the model and did a quick 20 points. Then I did a goto to M81. And there it was, the tiny little nucleus. The galaxy looked oddly centered. I put on MaxIM’s cross-hairs and started laughing out loud. Seriously: the tiny nucleus was smack-dab in the center. Covered by the cross of the cross-hairs. How good is that?

I took six three-minute images (after an initial five-minute test image), just to play with. No flats, no darks or biases. Again: I’d do that at the dark site, when the time came, but why waste time in the light pollution mecca of the world? Wonderfully round stars.

Then I went to M51. Boom! Took some six-minute 20-second images. Just a





**Image 10 - The assembled GM1000 mount and Aries Tripod, ready to accept an imaging scope and camera.**

hint of rotation in stacking (and that's with terrible PA from going the wrong direction). Did the same for M63. Markarian's chain. Took a three-minute of M3. Then, packed up. Test passed in flying colors: microscopically accurate gotos, unguided tracking, idiot-proof to use (with me as the idiot). Now if only next month would hurry up so I could go to the dark site.

## Mid-Point: The First Night at the Dark Site

Okay, here we go. Would the 10Micron be just as easy the second time under dark skies and give me what I wanted: easy, unguided, wonderful images? I zoomed to the Frazier Park area, a song on my lips and my toes a'tappin'. This was the night! After a pre-sunset setup that was easy-peasy, I waited to do my modeling. A bit after sunset, Jupiter and Venus appeared, and I did a goto to Venus, to see where I was: Venus was on the CCD chip. Whoohoo! I then did a seven-point model for to check PA, even before I saw any stars. No sweat. Twiddled the alt/az knobs, did another seven-point model, and got PA even more manageable.

There is a one-star PA routine that I didn't try this night: goes to a star, offsets for the modelled PA, then you move the alt/az knobs to center the star and instant great PA. But, I was too excited to try that, and the PA was pretty good. So then, a 43-point model and all was perfect goto-ness for the rest of the night. Perfectly centered anything.

Quick cutaway to accessories and modeling. I got the GPS. It's not a big deal to add your own latitude and longitude via a phone, but I wanted as much automation as possible, since I'm lazy. Also, great modeling takes into account atmospheric refraction, and such. For that, you need to input temperature and barometric pressure. Again, one can do this by hand, but the 10Micron mounts have a little USB dongle weather station that will do it all for you. Per built in the data gathering from it into his ASCOM driver, and you never have to think about it, as it collects data after each

goto. Pretty nifty and perfect for a lazy potato like me.

Ten-minute unguided subs were the rule of the night (as that's the darks I had ready). M81 and M82, M13 (as a test), M8 and M20 (**Image 7**), a few other tests, like M31. Some weird reducer/CCD tilting, but: "Look Ma, no guiding!" It just works. How cool!

## Plot Point Two: The Second Night at the Dark Site

Okay, second time under the Milky Way, and I wanted to try longer unguiding, and some guiding. Hey, ya got options with this mount: have it your way. I slapped a 50-mm Borg guidescope and a Lodestar guide camera, and instant guiding. Which was the most boring guiding evah! I mean, I had the "aggressiveness" down to 0.2x (I tried it both in *MaxIM DL* and setting the guiding speed on the mount to 0.2x, as well) and I was correcting every five seconds. It barely had to nudge. At all. Boring, but totally a done deal.

I then went back to unguided, taking test subs to see how long I could go before I got central image trailing. After 45 minutes, I gave up. The rest of the night was just boring, boring, boring. There were no problems or hiccups with the mount, and I ended up kicking back and reading under the stars while producing **Image 8** of the Elephant Trunk and **Image 9** of the Veil Nebula Eastern Region.

## Fini

So, what did I come away with from using this mount: It's friggin' awesome! You wanna guide? Do It! You wanna unguide? Do that, too! It's so easy, even a child could do it (or, just someone who acts like a child, which would be me). If you're a drama queen diva, this is not the mount for you. It just tracks the stars with ease, with accuracy, and without hassle. If you want a nice quiet night under the stars just pulling in the photons, 10Micron's GM 1000 HPS GoTo Mount (**Image 10**) should be at the top of your list. ■