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Synta EQ6 Mount by Allister St. Claire [Click to email author](#)



Introduction

Ever since the Synta EQ6 mount was announced earlier this year, there has been great speculation on what the final product would be like. Early positive reports from Joseph O'Neil (Canadian Synta dealer) and Markus Ludes (German Synta dealer) heightened the sense of anticipation. What's so special about the EQ6 mount? Well, a dual-drive EQ mount capable of handling 40 lbs of telescope that sells for \$1000 for one thing. Such a combination of load capacity and low price tag fills a large hole in the amateur astronomy mount market.

What follows is a review in progress. Since so many people are interested in this mount I decided to break from tradition and write/update the article as I use it. I apologize for the initial poor photos - the day after I received the mount I rushed outside to snap some shots. Unfortunately, the sky was completely overcast. I'll retake them once the sun comes back.

As of today (12/07/01) I am aware of (5) Synta dealers for the EQ6 mount. If that changes, someone please let me know and I'll update the article accordingly. If you wish to buy an EQ6 mount here are

sources I'm aware of;

- APM-US (U.S.)
- APM Telescope (Germany)
- O'Neil Photo & Optical Inc. (Canada)
- ITE (U.S.)
- Telehoon (Canada)

Update #1 (12/07/01)

I purchased my Synta EQ6 mount from Markus Ludes of APM Telescopes who is currently selling them for \$1000 + shipping. Shipping from Germany cost roughly \$140 and took 3 weeks to arrive.

The EQ6 mount arrived in two heavy boxes. The first box contained the EQ head, hand controller and external battery case. The second box contained the tripod and counterweights. Both boxes were well packed with the single exception of the external battery case. The battery case is made of fragile plastic and for some reason was packed between the mount head and surrounding foam. As you can imagine, as soon as the mount head shifted it's 36 lbs of weight against that side of the box, the battery case is toast. This is what happened in my case and a replacement box is on it's way. Dealers would be doing us all a favor by finding a different way to pack both the battery case and the hand controller.

Here's what you get when you purchase one of these;

- EQ Head
- Adjustable height stainless steel tripod
- (2) 12 lb counterweights
- Hand Controller
- External Battery Pack
- GP Dovetail Plate
- Spreader assembly with (5) 1.25" eyepiece holes and (2) 2" holes

Weight and Height

Straight out of the box I weighed each piece on my reasonably accurate bathroom scale. Here's the results;



EQ6 Head = 36 lbs

EQ6 Tripod = 18 lbs

Counterweights (2) x 12 lbs

One of the early concerns centered around how heavy this mount would be. As you can see by doing the math, the mount without counterweights comes to 54 lbs. Moving it around wasn't much of a problem as I simply grip the arms of the spreader bar assembly and pull up. Then it's a matter of walking forward while holding the mount in my hands. I'm a reasonably fit person and such a lift and carry doesn't stress me too much. Those who have problems with a 54 lb lift and walk will need to bring it out in pieces and assemble. As I outline below, this isn't a big deal.

The legs are hollow stainless steel with the extensions telescoping into the upper leg assembly. Each leg

has a large knob that tightens/loosens the leg extensions. I measured the minimum and maximum height of the EQ6 (measured at the bottom of the dovetail). Here's at the results and pictures;



Synta EQ6 (left) and Celestron CG5 (right)

Minimum Height = 42"

Maximum Height = 60"

Assembly - what a breeze

If you've ever put together either a CG5 or one of the CG5 clones then you already know how to assemble the EQ6. Assembly is a breeze and takes under 2 minutes to perform. Just like it's little brother, the CG5, the EQ6 head attaches to the base plate of the tripod with a single large threaded screw

which runs up through the bottom of the base plate and into the bottom of the EQ6 head. This screw also holds the leg stabilizer against the legs to keep them from collapsing inwards when you move the mount.



Once the EQ head is attached, you flick a lever on the bottom of the EQ head and the counterweight shaft drops down out of the mount head. That's right, you don't have to detach the counterweight shaft if you are transporting the mount. A nice touch that reduces the number of individual parts you have to keep track of and ferry out to your site. Now you attach your counterweights.

Last step is to attach the hand controller and battery box. That's it - 3 steps and your mount is setup and ready to use.



Electronics and Battery

The external battery pack is designed to hold 8 "D" batteries and sits in the black case pictured above. The black tape in the picture above hides most of the exposed wires. I taped the unit back together after

being smashed in shipping. The case has a loop that allows you to hang it from the mount off the clamp or bolt of your choice. Here's where I start to have issues. The battery pack has two strong flaws; 1) it's made of extremely thin and brittle plastic, 2) the wiring is exposed and it's only a matter of time before a connector is snapped or gets wet and shorts out. It would be nice if Synta would spend the couple extra dollars per mount and redesign this battery box.

The hand controller is a simple unit with 4 directional buttons, a N:S hemisphere selector and a 3 speed selector button (2x, 8x, 16x). I was hoping for 32x slewing as I've been spoiled with this on my Meade 7" LX50.

Mounted and ready to go

As you can see in the first picture of this article, I have my 10" Opticon SCT (presented in a future review) all loaded and ready to go. Unfortunately, clouds and rain are the forecast. In the meantime I've heard rumors of an online manual (none came with the mount) and I'll busy myself reading that and hoping for some light for better pictures. Much more to come.

Update 12/09/01

I arose at an early 5:00 AM and wandered outside to see if the endless clouds had broken. To my delight they had but the temperature had plummeted down into the 20's from the high of 50 the day before. This meant cool down problems with the Opticon before the sun came up. On the other hand, thermal issues don't get in the way of some basic mount testing.

I picked up the entire mount with the telescope and 30lbs of counterweight attached and walked slowly across my backyard to a spot where the trees were not blocking my view of Jupiter to the west. In a distracted sort of way I added up the total weight as I plodded across the yard and came to the grand total of 114 lbs (54lbs + 30lbs counterweights + 30lbs OTA). This isn't as bad as it sounds as the spreader bar assembly is at the proper position to grab with some gloves and bring to waist height. Also, the rear part of the OTA rested gently on my shoulder, stabilizing the whole affair during it's transport.

Setting it down I decided to perform a rough line of sight polar alignment and skip using the polar finder built into the base of the mount. Once completed I came face to face with my 2nd issue with the EQ6 - no bubble level. As mentioned above, my yard is uneven and setting it down in any particular spot usually results in the tripod legs having to be readjusted. Without a bubble level it's difficult to determine when the head is level as one's depth perception is confused by shadows when shining a flashlight on it in the dark. Prior experiences with EQ mounts has led me to the conclusion that as long as the head is not grossly canted, objects will track with a necessary small nudge from the controller every couple of minutes.

However, for those contemplating using this mount for Astro-photography or upgrading it with the GOTO unit, you'll need to devise some method of leveling it in the field. This can be as simple as taking

along a spirit level. Personally I'd like to see Synta (once again) spend a few extra dollars per mount and integrate in a cheap bubble level.

After bringing out my chair, dew shield and Leica zoom, I switched on my telrad and centered Jupiter which was currently traveling through Gemini. Each axis of the telescope is controlled by a single clutch which one tightens or loosens when you wish to move the telescope by hand. Such a system is superior to the CI700 mount (which I've owned) which is controlled by two clutches per axis. Additionally, the EQ6 uses a lever bar to control the clutches which is easier to use than a rounded head when using gloves (which I was this morning).

Once centered in my Leica zoom, I switched on the drives and heard absolutely nothing. I mean not a sound, not a whimper, just plain silence. The power LED was lit on the handcontroller but no sound from the mount, even with my ear pressed against it. I tentatively pushed one of the directional buttons and Jupiter smoothly moved across my FOV. Trying the other 3 buttons resulted in Jupiter moving in it's respective direction around the FOV. Once again, no sound - this is almost unsettling after using my Meade LX50 for the past several months.

The drives are built into the EQ head and appear to be well insulated as I neither hear any sound nor is the image disturbed in any perceptible way when I slew it at 16x. Jupiter tracked reasonably well with a necessary nudge from the handcontroller. The nudges were necessary for 4 reasons

1. I didn't have sufficient counterweights attached for the 30lbs of Opticon OTA riding on it
2. I'd forgotten to set the latitude scale from it's 38 deg default
3. rough polar alignment
4. Not really level

Given these 4 variables I was amazed it was tracking at all. Yet, every couple of minutes while observing Jupiter at 200x I only had to nudge it a little one direction or another. I made a mental note to order additional counterweights and pickup a simple level later today. After that we'll begin to get a sense of the accuracy of the drives for simple visual observing.

That's all for today but more to come.

Update 12/18/01

Nine days of clouds, rain and snow have kept me from using the EQ6 since my last update. The weekend forecast is looking better and I'm hoping for at least 1 clear night before Christmas. Even though I haven't been using it, I've a couple updates that may interest prospective buyers.

Per my prior comments I'm 5 lbs shy of sufficient counterweights to correctly balance my 30lb Opticon OTA. While it may sound illogical that 30lbs of counterweight are insufficient to balance a 30lb OTA, you must remember that the (3) counterweights stack on top of each other on the counterweight shaft.

Consequently, the full 30lbs of counterweights are not located at the end of counterweight shaft while the OTA is on its end.

I checked an online astro store for CG-5 counterweights and found two listed; a 2-lb and a 11-lb. Never having shopped for counterweights I was amazed at the \$49.50 price tag. I mean, this is a melted lead weight, right? A friend suggested I check a local fitness store for a weight plate with a similar sized hole for the counterweight shaft. A week later I visited one and examined 2 different 25-lb plates. The first plate is a universal plate - a large flat plate the size of a small tire with a much larger than needed hole in the center. The second plate is a flat gray circular plate, roughly 1/2 the diameter of the first plate and with a center hole just a bit larger than the counterweight shaft. Almost perfect. Gritting my teeth I glanced at the price tag and heaved a sigh of relief - \$12.50.

Getting the plate home I placed this plate on top of a 11-lb counterweight on the counterweight shaft. While the 11-lb EQ6 counterweight has a tension screw to hold it in place, the weight plate does not. Consequently, the 25-lb counterweight "rides" on top the 11-lb EQ6 counterweight. Seems to work fine and I saved myself a good deal of \$\$.

My second purchase is a simple package of velcro tape. Velcro tape is a wonderful invention with a number of uses for us astronomers. With the EQ6 I placed a strip of velcro tape to the back of the EQ6 hand controller and 1 strip near the top of each of the tripod legs. This way I can "hang" the hand controller on the nearest tripod velcro strip when I'm not using it. Costs a mere \$1.95 and saves me from having to throw it over my shoulder between uses.

So, for a mere \$15.00 I've upgraded my EQ-6 mount in inexpensive but perfectly functional ways.

Update 12/28/01

I ran into my first glitch with the mount this week. While viewing Saturn at 380x the image quivered a bit while tracking. By quiver I mean the image would oscillate almost imperceptibly back and forth. I didn't notice this at lower magnifications and it would only become noticeable at magnifications above 300x.

Wondering if the OTA was misbalanced I released the clutches in both axis in several different positions. The OTA didn't budge or move. Next I tried pushing the OTA by hand with the clutches released and partially engaged - everything moved smoothly. Hmmmmm....., balance isn't the issue.

Recentering Saturn I turned off the motors and the quivers disappeared. Turning the motors back on the mount began to track and the quivers returned. Ahhh, the problem is with the tracking motors - progress!

Pushing the directional buttons at 16x caused the quivers to disappear while the object moved around the fov. Once I stopped slewing the quivers immediately returned. This would indicate some sort of gear problem with the RA motor. Time for professional help.

I quickly emailed Markus Ludes of APM Germany and received a response the next morning. Apparently this is a common issue with drives and results from incorrect tensioning of the gears. There are adjustment screws that change this tension and it's a mere matter of playing with these while viewing an object at high power. I'll update this article with the specific steps once I successfully complete them. Stay tuned.

I've received dozens of emails about the EQ6 mount. There appears to be great interest in this mount and many folks are contemplating such a purchase. I'll continue to update this review with any scrap of information I can think of. Eventually I'll rewrite the whole thing into a better flowing and comprehensive review.

However, as I'm not an astro-photographer I'm unable to comment upon this mounts application for this purpose. If there is an astro-photographer in the studio audience who also owns an EQ6, please step forward and give us your impressions. You can either write a review of your own or I'm happy to include it in the body of this one.

I've also received dozens of emails asking what the heck an Opticon SCT is. This is understandable as to the best of my and the dealers knowledge, it's the only one in the U.S. Opticon is an optics company based in the Netherlands. According to Markus they hand produce a small number of Opticon SCTs each year as a labor of love. There are European dealers and you can place an order for a mere \$6500 and a 2-3 year wait.

I'm told Opticon produces two models; a 10" and a 5" model. The 10" model which I own is a 10" f/15 planetary SCT with a 25% central obstruction. My ota is roughly 6 years old and has a fixed primary mirror with a JMI 2" focuser. Current models use a moving mirror to achieve focus.

I purchased mine used and grabbed it for 3 reasons;

1. I wanted to get a review on Cloudy Nights of such a rare scope. I couldn't bear the thought of the only used Opticon to ever come on the used market disappearing into a collectors hands without some review or comments.
2. Markus commented that it beat the Takahashi SCT on the planets. The Tak SCT has been considered the best SCT made to date
3. I wanted to see what the world's best SCT could do. In all the discussions of the best planetary scope, the SCT never, ever comes up as a discussion contender. Perhaps this will change.

Update 01/27/02

Ok, I've exchanged emails and phone calls with Markus Ludes of APM telescopes over the jitter problem of the EQ-6. The good news is that by following the simple instructions I was able to eliminate 70% of the problem. Additionally, by moving the mount off my driveway onto my grass, the jitters were

reduced even further. The bad news is, the remaining slight jitters at high powers remains something of a mystery - at least for the moment.

I'll snap some photos of the procedure as outlined by Markus later today. For now here is what you need to do to reduce any jitters you find.

1. Each axis of the EQ-6 head has 4 silver allen wrench screws. Locate those 4 screws on the axis you think the jitters is coming from (or all 8).
2. Next located the tiny recessed screw for each axis. The DEC axis screw is 1" above the front of the polar alignment scope. The RA axis is on the rear of EQ-6 head above the silver setting circles.
3. While tracking an object at high power, tighten/loosen each of the tiny recessed screws until the jitters are removed or reduced.
4. Tighten the silver Allen head screws that you loosened.

This procedure will optimize the meshing of the gears. In my case, two of the RA silver screws were extremely tight. Once I loosened these up much of the jitters were eliminated. I played with the tiny set screws across two evenings but did not gain any further benefit. However, I plan to try one more time if the weather remains mild.

Markus reports that all jitters can be eliminated by following the above procedure AND purchasing the upgraded hand controller (\$300 item). This leads me to believe that residual jitters are due to a defect in the hand controller. Perhaps a voltage issue?

I have one last theory to try. Perhaps the above jitters are due to the battery pack which holds the 8 D size batteries. As soon as I purchase an adapter for my 12v battery (a trip to Radio Shack), I'll give this theory a try. Per my comments earlier in the article, I'm underwhelmed by the construction of the battery pack.

Update 02/12/02

The good news is it appears we've licked the jitter problems. A buddy of mine who is an experienced astrophotographer suggested I unbalance the tube slightly against the push of the motors. Up to this point I've painstakingly balanced the OTA in both axis. Taking his advice I unbalance the ota just ever so slightly. Well, the initial results based upon 30 minutes of observing appear extremely promising. For the first time I couldn't detect any mount jitters at high power. I'll test further later this week for a longer period of time. At this point things look real good.

The next piece of good news is I picked up a higher resolution digital camera. I'll snap all new photos on the next mild day.