

# Cloudy Nights Telescope Reviews

## Celestron Advanced Series Mount

by John Crilly [click to email author](#)



The mount reviewed here was lent for that purpose by the folks at [Digitec Optical](#).

### Introduction

The Celestron Advanced Series mount is a German equatorial mount based on the popular Vixen Great Polaris mount. The mount itself is an import from the Far East, and is similar to the many other GP clones with some enhancements. It incorporates a ball bearing in the RA axis, and is supported by a steel-legged tripod far superior to the extruded aluminum units commonly seen in the past. Like most GP clones there is a provision for a polar alignment scope, but one is not included. The GoTo version of this mount does include a routine for polar alignment which makes the polar scope much less necessary. Analog setting circles are installed. The mount is equipped with a Vixen-style saddle which will accept Vixen-compatible dovetail plates. The mount is offered either as a bare mount or bundled with a variety of optical tubes including a 6" F/8 refractor, 5", 8", and 9.25" SCT's (all F/10), and a 10" F/4.7 Newtonian. Maximum payload for this mount used visually is about 30 pounds including accessories (but not including counterweights). Imagers will recommend cutting that in half, to about fifteen pounds. Celestron also offers an Advanced Series 4" F/10 refractor but it's on the lighter CG-4 mount and so is outside the scope of this article.

This review will concentrate on the CG5-GT version, which includes a Nexstar controller and DC servo motors for full GoTo operation. This is the same controller used on the other current Nexstar models from the N8i up, and includes a comprehensive database of over 40,000 objects. The handbox includes a two-line, 16-character liquid crystal display and 19 buttons backlit by LED's through fiber optics. It includes provisions for operation in conjunction with a laptop, PC, or PDA running a variety of available software, including Celestron's NexRemote program (not included). There's an Autoguide input for conventional 4-direction autoguiders such as the ST-4. An accessory GPS module is described to simplify the alignment process, but it requires a port expander module for installation and that module has not yet been released. This module, when available, will also give the user the capability of updating the motor control firmware by download, as is currently implemented on the Nexstar GPS and CGE series mounts. The handbox firmware is not user-updatable. No power source is included with this mount, only a DC cable terminated with a cigarette lighter plug. Celestron offers two gel cell packs as accessories for use with these mounts; one is 7 Amp hours capacity and the other is 17 Amp hours. For assistance in choosing the best size for you, there are some hints at: <http://www.cloudynights.com/howtos2/power.htm>

There's also a CG-5 version which incorporates mechanical slow motion controls rather than motors for manual tracking and slewing.

### Basics

As this mount is an obvious response by Celestron to Meade's LXD55 series, it makes sense to me to begin by discussing some differences and similarities between the two. Both are imported clones of the Vixen GP mount (as are a number of other "bargain" mounts, including the Sky View Pro and all the EQ4/EQ5/CG5 variants except for the HEQ5). The LXD55 mount has been reviewed elsewhere on CN. It filled a large market gap, offering an amazing amount of capability for the money when introduced. It incorporated full goto capability with the well-recognized Autostar controller and was offered with optical tubes weighing up to 30 pounds. Surprisingly (to me), it was capable of good visual performance at that load IF the tripod was beefed up or replaced.

The mounts were shipped with a battery pack using eight "D" cells; users usually immediately switched to a "jump start" battery pack, which required them to purchase or make a cable. Although there were some horror stories, I have owned a number of 'em and all have worked well for me. Because of Autostar's online update capability, new features were added throughout the life cycle of the LXD55 - some major ones (PEC and three star alignment) were added after the line was shut down to be replaced by the LXD75.

As introduced, the LXD55 had no capability to compensate for cone error (optical tube misalignment) so they were shipped with special dovetail plates permitting the owner to perform a precise mechanical alignment of the optical tube with the RA axis. Although Meade never offered a GPS addon for this mount, there are at least two aftermarket units available. The LXD55 has been phased out, and is to be replaced with the LXD75 mount. One major improvement is the switch to a beefier tripod; others include bearings on both shafts.

Apparently learning from Meade's experience with the LXD55 (and using some of the expertise they acquired with the CGE series), Celestron made some improvements over the LXD55 when they introduced the Advanced Series mount. The most obvious (and perhaps the most valuable) improvement is the inclusion of a heavy-duty tripod with tubular steel legs. They also added one steel bearing on the RA shaft. Other functional differences include an autoguide port and a three star alignment procedure, which permits the controller to calculate a cone value to compensate for optical tube misalignment. Unlike the CGE, the Advanced Series doesn't store this value, but instead recalculates it for each alignment. This had advantages if one switches optical tubes frequently.

The Advanced Series mount is shipped with a DC cigarette lighter cable (as is the CGE), permitting the user to connect to a jump start pack. A GPS addon accessory is offered, but requires a port expander to connect to the mount - this adaptor is not yet available from Celestron as of this writing. Because of the architecture of the Nexstar controller, firmware upgrades to the controller itself cannot be done by the user, so any new features will require handbox exchanges. The motor control firmware could be updated, but it will require the port expander mentioned above (and not yet available). Generally, fit and finish on this mount seem superior to those of the LXD55 mounts I've seen.



### Unpacking the Mount

The mount comes in two boxes. One contains the tripod, counterweights and shaft, and other accessories. The tripod box is packed like other imported Celestron and Tasco products, with an outer box containing an assortment of smaller boxes, some of which are merely spacers. The one I received contained two counterweights but I'm not sure that all are so equipped, as this box had been opened and repacked. I suspect the manual normally comes in this box as well, as I didn't find one anywhere. It wasn't an issue, as Celestron has made the manual available on their website.



The other box contains the mount with motors installed, the handbox and its holder, and various cables. The mount box is much nicer, with die-cut foam to cradle and protect those components. It is the same sort of box and packaging as is used for the Celestron-produced CGE series mounts. The mount box was sealed and showed no signs of having been opened. I was pleased to see this, as I wanted to evaluate a mount which had not been preselected for review and all the critical components are in this box.



Unpacking all the components revealed a consistently high level of apparent finish quality. Castings & paint appeared smooth and unblemished. The polar scope cover fits better than on other similar mounts; I think it might actually stay in place (though, sadly, there's no polar scope supplied). The tripod is a vast improvement over those I've seen on other clones. It features heavy 2" diameter steel legs, apparently chromium-plated, and a nicely cast aluminum spreader (even the Nexstar GPS models come with a plastic spreader). The only

thing I wasn't impressed with is the small, cheap-looking power switch. Since there are no internal batteries, this probably won't get any use anyway; I'll just leave it in the "on" position.



### Assembly and Power Up

Assembly was straightforward, with everything fitting together just as it should. I noticed the azimuth adjustment dog (North) on the tripod head is removable and can be placed either between two legs or above one leg. Most similar mounts have this in a fixed position over one leg. This is the most stable orientation since the counterweights are heavy and distant from the balance point. At some latitudes the counterweight shaft can interfere with that leg, so with this mount the peg can be moved to prevent that. This one arrived with the peg in the "between the legs" position and I left it there. I recommend that, unless there is a problem with leg clearance, it be used in the other position - especially if the mount is going to be used with heavy loads. At latitudes above 35 degrees there's no reason to leave it in the supplied position. Easy-to-grip plastic shells on the handbolts made it simple to firmly lock the legs and mount into position. Grabbing the assembly and shaking it gave me some confidence that this mount can handle the optical tubes with which Celestron offers it.



Powering the unit up in the dining room permitted me to verify that there were no gross functional problems. I recommend doing this with any new mount for several reasons. One important reason is that if it appears to be operating improperly it's much easier to determine whether it's just operator confusion or an actual problem if you can clearly see what it's doing. Another advantage of this procedure is that it's easier to get familiar with operation of the mount under these conditions. I began by placing the mount in "polar home" position, relying on the arrows glued to the mount casing. I immediately noticed that the arrows on the DEC axis are, in my opinion, 180 degrees off. In polar home position (or in any subsequent position if begun this way) the smaller, backup dovetail locking bolt is angled downwards. It's more secure if angled upwards, so I reversed the DEC axis and ignored the arrows from then on. Other mounts of this series I've seen have all had the arrows the same (wrong) way. I used the supplied DC cable to connect one of my 7 Amp-hour gel-cell packs.



As instructed by the handbox display, I pressed "Enter" to begin alignment. It asked the usual time/date/location questions, then selected its first alignment star. I accepted the selection and watched the mount slew to its best guess as to where that star was. This permits a "reality check"; one can observe that the mount is pointed generally toward the star's current position. I pressed "enter", then "align", to let it think it was correctly aimed. It then selected a second star on the same side of the meridian and I repeated the procedure. Unlike any other goto GEM I've used (including the Celestron CGE), it then selected a third star on the other side of the meridian, which I accepted and told the mount was centered. This forces the operator to do what on the CGE is referred to a "cone alignment", which is absolutely necessary for good performance in a German EQ mount unless the optical axis is carefully aligned with the RA axis. After a fairly long pause to calculate the cone value, the handbox reported "alignment successful".

So far, so good. At this point I'd say everything is working correctly. The motor noise is similar to a Meade LXD55 or LX200. It's louder than any other Celestron I've used, but does fall within the "normal" range for computerized mounts. The leg-mounted handbox holder is extra nice - much better than what is supplied with the more expensive LX200GPS and CGE models. It's even better when compared with the LXD55, which doesn't include one at all.

Although I rarely use a laptop or PDA in the field, I did want to ensure decent connectivity. For this, I placed the mount in the observatory (with the tripod straddling the pier!) and tried controlling it with a Compaq laptop, a Dell desktop, a Palm M130, and an HP Pocket PC. Software used included Starry Night Pro, Deepsky 2002, Digital Sky Voice, Palm Planetarium, and Pocket Sky. All worked fine with no tricky setup required.



### First light

Clouds coming in and a full Moon but I wanted to make some quick checks. I put the TV Genesis SDF on top and prepared to do a quickie test of a couple of new EP's and see how the mount behaved. I began early, with no stars visible, so I just did an auto align and accepted the alignment star positions, figuring I could tune the alignment up later. I ran into something I had previously seen only on the CGE - if the cone alignment isn't right, replacing alignment stars doesn't work properly. Once I had stars to use, it only offered me two alignment stars to replace and I couldn't redo the third star which the ASC uses for cone. It worked, but objects were not in the center of a 40mm EP; not very good. Simply powering down and realigning would have fixed it, but for what I was doing at the time it was good enough. My fault; next time I'll align it properly. Tonight it was getting cold and the clouds were coming in.

First impressions: it isn't terribly loud outside, but certainly not in the same class as the Nexstar GPS models. Handbox display was very easy to read and it didn't take long to get used to Celestron's control scheme again. The mount feels very solid with the small APO. I needed one 11 pound counterweight at the center of the weight shaft to balance it. Settledown time after a firm tap on the OPTICAL TUBE was within a couple of seconds; much better than an LXD55 on its stock tripod.



Later sessions (with a properly done three star alignment) using a longer and heavier Orion 120mm F/8.3 refractor resulted in very acceptable accuracy. I wouldn't count on hitting a webcam chip every time, but at 100X I could count on objects being near the center of the FOV. It turned out to be an extremely handy portable setup. I found that I could place the mount and tripod assembled into one side of a padded Orion scope bag 48" long. With the counterweights, tripod spreader, and other accessories on the other side the mount was an easy one-trip-from-the-car setup. I've read comments here and there about the supplied DC cable being inadequate due to the small conductors within. I used that cable exclusively for all tests and observing sessions and never experienced any strange behavior that could be power-related. Running the numbers quickly, I found that the cable could be expected to drop only a few tenths of a volt under maximum speed slewing conditions. The supplied voltage should never be permitted to get sufficiently low for that sort of drop to matter. Some tips on choosing a battery pack for telescope use may be found here: <http://www.cloudynights.com/howtos2/power.htm>





I have read about “random slews” on these. I found on that particular date and time and at my location that if I did a goto to the Moon and then another to Arcturus it would consistently take off in the wrong direction and head for a mount collision. Pressing an arrow key would stop it, and pressing “enter” again would result in it moving correctly to Arcturus. I didn’t find any other combinations that would cause this behavior. This behavior is consistent with a firmware bug; I’m sure Celestron will find it and correct it. I believe it’ll require a handbox swap to get the fix into the field, though.

I ran the mount every chance I got for a number of weeks, both in the observatory and in the field. I never found it necessary to use the “polar align” routine for visual use; bore-sighting Polaris through the hole where a polar scope should be gave me good goto performance and satisfactory tracking, even in extended Solar observing sessions. I never had an opportunity to try deepsky imaging so I wasn’t able to evaluate tracking to the precision required for that, nor was I able to experiment with guiding. I smell a shootout coming up, though - I expect to have this mount, an LXD55, and a Sphynx set up side by side soon and will directly compare tracking, PE, and guiding among the three.

## Conclusion

From the above comment about having the mount for future tests, you can safely conclude that I ended up buying the mount. I didn’t intend to - I’m not a huge GEM user in general - but this one packs a lot of bang for the buck and gives me a lot of capability in the field for very little effort. It did a nice job in the observatory also, when I was checking connectivity with the PC and PDA’s - so long as I remembered not to walk into the counterweights. Did I mention I’m a forkmount kind of guy?.

Things I liked	Things I didn't like so much
The Tripod	No Polar Alignment Scope included
Fit & Finish	Noiser slewing the Celestron's higher-end scopes
Functionality	Incorrect (in my firm opinion) placement of ploar home position arrows
Integrated Appearance	
Mount is offered without Optical tube	

All in all, as I stated earlier, it’s a lot of bang for the buck. Meade’s LXD75 is gonna have a tough act to follow.

## Disclaimers

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