MEADE'S LXD75 GERMAN EQ MOUNT
by John Crilly

Introduction

Meade's LXD75 is their current medium-duty German equatorial telescope mount. It replaces the LXD55 model and is intended to compete with the Celestron CG5-GT and the Orion Sky View Pro.

Like all of those, it is an imported unit derived from Vixen's Great Polaris mount with a payload capacity for visual use of approximately 30 pounds. It accommodates a variety of optical tubes through the use of a Vixen-style saddle plate. The LXD75 mount is supplied with dual axis motors and either a dual axis manual controller (EC models) or Meade's popular Autostar controller (AT models). An LXD75EC can be converted to Autostar operation by simply replacing the EC controller with a #497 Autostar. Meade supplies a new steel tripod with this model. The mount's motors and controllers operate from 12 Volts DC and it is supplied with a battery pack for 8 D cells.

BATTERY HOLDER

It is equipped with an illuminated polar alignment telescope. The cap for this polar finderscope is retained by the illuminator, pictured here.

Optical tube options include 5” and 6” achromatic refractors, a 6” Newtonian reflector, an 8” Schmidt- Cassegrain, and 6”, 8”, and 10” Schmidt- Newtonians. Currently, Meade is supplying their Lunar Planetary Imager and the Autostar Suite software with the AT models. Although the mount provides no conventional autoguide port, the LPI and Autostar together do permit autoguiding of this mount. Of course, an external laptop or PC is required.

The Autostar controller provides GoTo and tracking operation, with a database of over 30,000 objects in its user- updatable 1MB Flash memory. Slew rates from sidereal to 4.5 degrees/second are user-

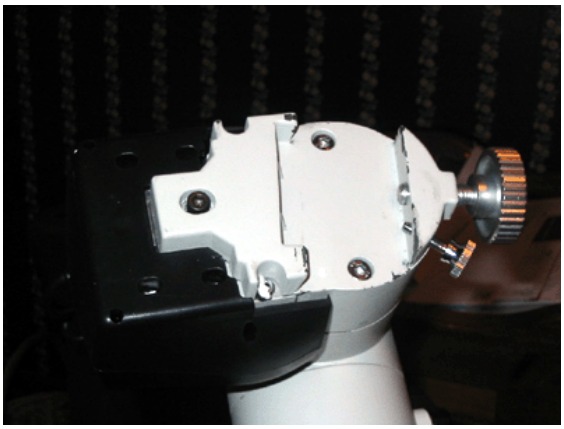
selectable. Meade specifies the pointing accuracy as being within 15 arcminutes. This will suffice to place objects within the center half of the field of view of a 52 degree Plossl at 100X. Meade has issued a long series of user-installable firmware updates for this controller, both to improve operation and to add new features such as PEC and cone correction (three star alignment).

Description

Opening the shipping box reveals a well-packed unit with a fairly high degree of fit and finish. Castings on the mount and tripod are cream in color, while the tripod legs are bright steel and the motors and controller are black. Once assembled, I found the mount to be more attractive than the gray LXD55 units. Meade has again failed to provide a holder for the handbox, but as always Velcro proved to be the answer to that.

What it does

This is an equatorial mount; that is, it is designed so that once the RA axis is pointed toward a celestial pole a celestial object can be tracked by operating a single constant-speed motor. This provides accurate tracking plus it avoids field rotation, both of which are advantageous for imaging. Switching between optical tubes is a matter of loosening the saddleplate bolts, lifting the dovetail from the saddle, and inserting the other telescope's dovetail into the saddle.



SADDLE

SADDLE PLATE BOLTS

With the Autostar controller option (AT models), after a simple two or three star alignment procedure the mount can be commanded to automatically slew to any of the 30,000 plus objects in the unit's database.

What a user should know

As with any equatorial mount, the user should be somewhat familiar with the celestial coordinate system. This means that the user's vocabulary should include right ascension, declination, sidereal motion, celestial pole, and such concepts. The user manual, like most such manuals, doesn't make much of an attempt to educate the user in these topics, so it's up to the user to bring that knowledge. The mount can be used by someone with little or no knowledge of these concepts, but the confusion and frustration level of such a user is sure to be higher than those of someone who has done his or her homework.

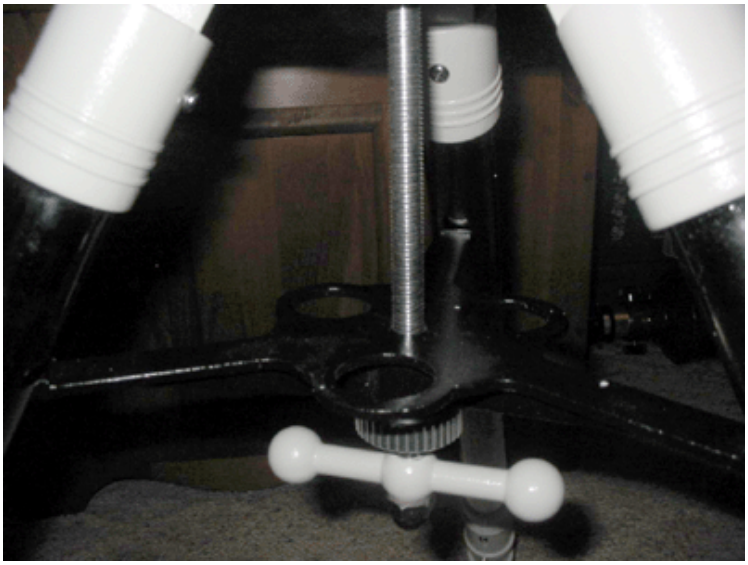
Setting it up

Setup is straightforward. The tripod is shipped with the spreader and mounting bolt packed separately, so assembling the tripod is the first step. The spreader is installed onto the mounting bolt and the bolt suspended from the tripod head's center by the supplied C clip. This step is poorly covered in the manual, and a number of new users found the procedure confusing.

This is the proper order for the parts on the spreader bolt. The "C" clip shown goes above the tripod head, all other parts below it.

The latest revision of the manual is available on Meade's website and does address this assembly. The mount can then be installed. Like the LXD55, the tripod head has the azimuth adjusting dog permanently fixed so one leg is always oriented toward the celestial pole.

Loosening the azimuth adjustment bolts on the mount to provide a gap for this dog, the mount is lowered onto the tripod head. Then the mounting bolt is extended upward into the bottom of the mount and tightened to hold the mount securely. Next, the spreader is pulled tightly against the tripod legs with the supplied handnut on the mounting bolt.



Next, the counterweight shaft is attached to the mount and the appropriate number of counterweights installed. Be certain to install the counterweight retaining screw at the end of the shaft after this is done.

COUNTERWEIGHT RETAINER

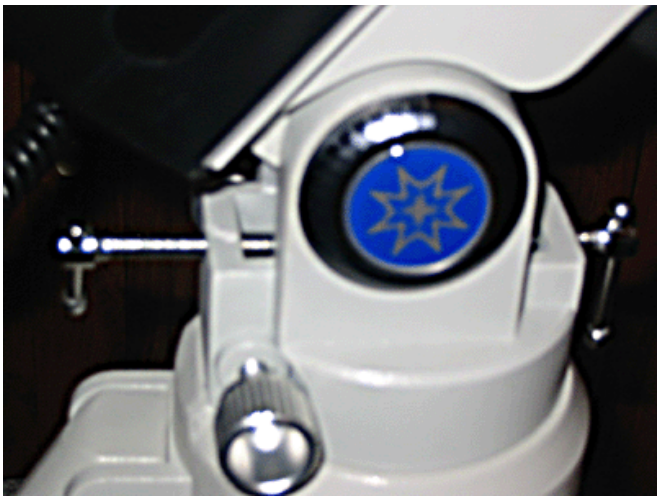
Then the optical tube's dovetail is inserted into the saddle. Except for assembling the tripod and tightening the spreader, all these procedures are precisely the same as for the LXD55 model. There are several additional steps which may be performed for best performance, but I have found that they aren't necessary for visual use. The user is referred to the manual for these procedures, including alignment of the polar alignment telescope to the RA axis and alignment of the dovetail for orthogonality. Finally, the power source, DEC motor cable, and either the EC controller or the #497 Autostar is plugged into the control panel on the RA drive assembly.

Using the mount

First, the optical tube must be balanced in both axes.

DEC axis balance RA axis balance

Next, the RA axis must be pointed at or near the Celestial Pole. There are several ways to achieve this; I'll describe the quick system I have used which suffices for visual use. Imaging will require a more complex setup to achieve the higher accuracy required. Even without aligning the polar alignment scope to the RA axis it can be used for a quick polar setup. I have found that in the Northern Hemisphere simply adjusting the azimuth and elevation bolts



AZIMUTH AND ELEVATION ADJUSTMENT BOLTS

to place Polaris near the center of the polar alignment scope will permit accurate GoTo operation and tracking sufficient for extended viewing of a given object at reasonable magnifications. Polaris is fairly close to (within about half a degree of) the North Celestial Pole. At this point, the mount should be ready for manual operation with the EC controller. The telescope may be aimed by either slewing with the dual axis motors or by releasing the clutches and moving the telescope by hand.

DEC clutch lever

RA clutch lever

Once an object is found, tightening the clutches will enable tracking, keeping the object in view as it appears to move across the sky.

To use the Autostar, some additional steps are required. Date/time/location/time zone information must be entered. The drives must be trained (usually only once) and the Autostar must be aligned using a two or three star alignment procedure. This is begun by placing the mount into the Polar Home position.

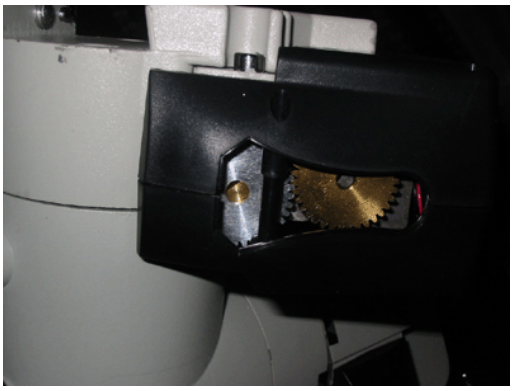
POLAR HOME POSITION

I should mention that the mount is supplied with arrow stickers on both axes to indicate the polar home position. I feel that it's best to rotate the DEC axis 180 degrees away from the position shown by the arrows. It makes no operational difference, but the saddle retaining bolts are oriented such that they will hold more securely this way. In the photos above,the picture on the right shows the arrows aligned. The picture on

the left shows my preferred home position. Next, the alignment procedure begins, in which the user centers the alignment stars after the mount moves to where it thinks they are. After star alignment, an optional Polar Alignment procedure becomes available to refine the polar alignment of the mount. Once alignment is achieved, the Autostar controller permits objects to be selected from any of a large variety of internal catalogs. It also has built- in “tours”, which select items which are above the horizon from lists which have been previously installed. Several of these are supplied in the standard firmware and many more are available online from a variety of sources.

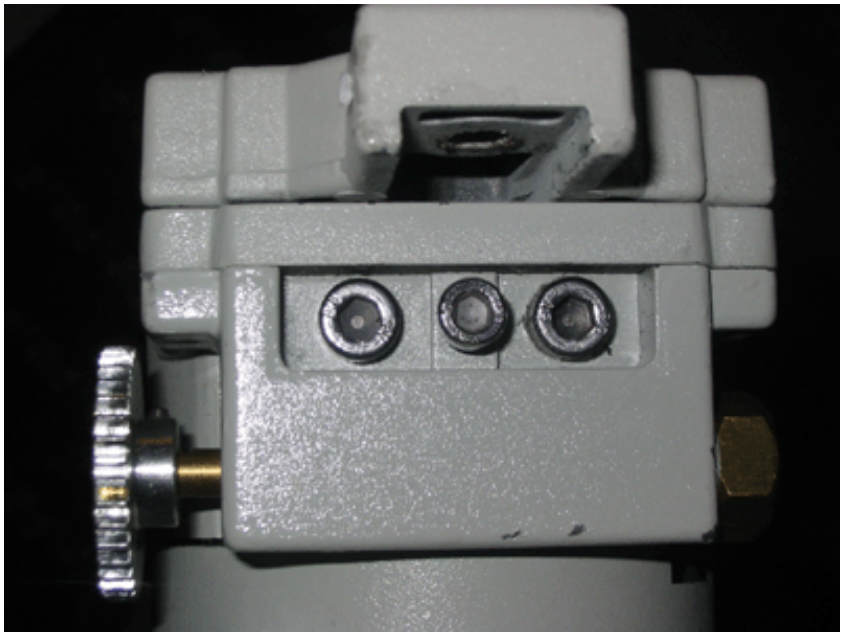
So - how well does it work? My LXD75 is the AT version, which includes the Autostar controller. To verify that all was well I first assembled the mount indoors. This is the best way to initially check out any automatic telescope mount, as it permits the user to see what it is doing and diagnose any problems in a comfortable, well- illuminated environment. I checked the gear engagement and setscrew tightness on the transfer gears in both axes and observed no problems. There are inspection hatches in both drive assemblies:

RA inspection hatch



DEC inspection hatch

I did notice some minor slop in the DEC axis and adjusted the worm/worm gear engagement on the DEC axis (a simple procedure) to eliminate that.



DEC WORM ADJUST

That's the only adjustment this unit required. I then powered it up and entered date/time/location/time zone information. I lied to it about the time, choosing an evening hour at which I knew where many objects would be in the sky. This permitted me to do a reality check - if the mount pointed to where I knew an object should be I'd know it's probably working correctly. I aimed the RA axis at about where Polaris always is, and began a three star alignment. When it slewed to the alignment stars, I could see that it was about correct. Accepting it's guesses as to their positions, I was then able to slew to a variety of object around the sky and observed that the directions to which it pointed consistently made sense. With the confidence gained from this, I was ready to take it out into the dark.

I used the mount at our Club's observing site several times, and used it at Astrofest for our dual Solar viewing setup (Ha and white light).

DUAL SOLAR SETUP AT ASTROFEST

ORION 120MM F/8 REFRACTOR

I used the mount with the 8" Schmidt- Newtonian optical tube, a 120mm F/8 refractor, and with a 6" F/8 refractor plus a piggybacked 80mm F/11 refractor. The SNT and the larger refractor are substantial loads for such a mount, and both had previously been shown to cause instability with the LXD55's extruded aluminum tripod. The LXD75 had no problems with these setups. The dual- refractor rig is a Solar observing setup, so it normally remains pointed at one object for extended time periods. Tracking was very good; the Sun was always there when we returned to

the telescope. The SN-8 was used for miscellaneous deep sky observations and the GoTo accuracy after a good drive training and careful three star alignment was fine; objects were nearly always within the field of view at 100X. Settledown time with either setup was a few seconds. The motors are noisy, as are those on all of the automated Vixen clones. There's a Quiet Slew option in the #497 handbox for those who are concerned about this. That option reduces the maximum slew speed one notch and it does make a difference but it's never silent while slewing. Tracking, on the other hand, is silent.

WHAT I LIKED:

Fit and finish on this unit were quite good. I found the cream and black color scheme to be very attractive; similar to that of the Vixen Sphinx:

SPHINX LXD75

. The new tripod is great. The polar alignment scope illuminator is very nice, as is the fact that the polar alignment scope is included. The Autostar is one of my favorite controllers, and the LPI is a fine accessory for it. The motion in both axes is more free than in any other Vixen clones I've used, which makes balancing the system much easier.

WHAT I DIDN'T LIKE AS MUCH:

The clamp bolts on the tripod legs are small and difficult to tighten with cold fingers.

A quieter drive system would be nice. I wish Meade would offer this mount bare, with no optical tube. A handbox holder would be a good addition. The “North” peg on the tripod head can’t be moved, which can cause problems at some latitudes. The castings are still made of what appears to be very soft aluminum alloy.

Comparison with LXD55

Obvious questions arise regarding comparisons between this mount and the previous LXD55. They are more similar than different - but here are the contrasts I noticed. The steel tripod is a vast improvement due to stronger legs and the addition of a leg spreader. The polar scope illuminator now has a dimmer and a real power switch - and the cap has a retainer! The mount has ball bearings in both axes and is distinctly smoother and more free in its action. Both saddle plate retaining bolts are larger. The current Autostar firmware provides PEC and a three star alignment procedure to correct for cone error, though of course an existing LXD55’s controller can easily be updated to that revision. Functionally, the LXD75 is very similar to the LXD55; the only operational improvements I observed were increased tripod stability and smoother axis motions. I should comment that I have owned several LXD55’s, and have always experienced good performance with those after minor adjustments and/or setscrew replacement.

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Further reading suggestions:

The following articles on Cloudy Nights may be helpful to someone considering this mount, or to someone learning how to use it

CG5-GT review - http://www.cloudynights.com/lab/mounts/asm.pdf

LXD55 review - http://www.cloudynights.com/lab/mounts/asm.pdf

LXD55/75 setup guide - http://www.cloudynights.com/mounts2/lxd55-check.htm

Choosing an alternate power source - http://www.cloudynights.com/howtos2/power.htm

Finally, PLEASE READ THE MANUAL!