Losmandy Gemini (G-11 version)

Introduction

With most manufacturers offering a "goto" mount, Losmandy teamed up with René Görlich, who already had an after market goto product. While it is possible to use the existing stepper motors as per the COAA Win-CTC product, this is very slow but adequate if you only want to view objects in a small area of sky. Most of us are casual observers and like to slew quickly to objects several degrees apart. The Gemini uses servo motors with integral shaft encoders in a similar manner to the famous Meade LX200 series. The Gemini slewing speed is quoted at 6 degrees per second when used on a G-11 mount, which is fast enough for most purposes... especially when you have to rotate a dome or watch for CCD camera cables becoming tangled.

The Gemini does not include a power supply, one is offered by Losmandy that appears to be a fairly standard 13.8 Volt 3 Amp "CB" style of power supply, these units are widely available at low cost. There is an advantage in using an 18 Volt supply to give increased torque from the motors (the specification is for a 12 to 18 Volt supply). Already having an 18 Volt 10 Amp power supply, I fitted a 4 Amp fuse to the output and used this.

The Gemini I ordered arrived within a week but was faulty - a replacement took more than a month to arrive. This is not acceptable quality control and not what is expected on such an expensive unit. Fortunately the replacement works perfectly. Another annoyance is a complete lack of instructions with the unit, while it is easy to download the manual and fitting instructions from the Losmandy site, someone without Internet access wouldn't be able to do this.

It would seem that Gemini units currently supplied (October 2004) include Level 3 software as standard, a few years ago they came with Level 1 software - upgrades were quite costly.

Installation

Installation of the Gemini motors and gearboxes is very straightforward. Three extra Allen keys are supplied, the only additional tools required are a pair of pliers to tighten four threaded spacers. Full details are available on the Losmandy web site. Initial alignment involves setting date, time, latitude, longitude (degrees and minutes) and time zone. Here in the UK the time zone is zero and time is in GMT/UTC. The time and location is used to determine if an object is visible as well as calculating positions. These settings are retained in non volatile memory, there is a battery backed real time clock with an accuracy similar to most laptops and PCs. Mine drifts less than one second per day, which is very good. While Losmandy digital setting circle "shaft encoders" can be used, they are not necessary.

First use

When starting from scratch, the mount must be placed in a "counter weight down, OTA (optical tube assembly) pointing towards the pole" position, this allows the Gemini processor to know where the "crash" limits are when slewing. The RA and DEC clutch knobs need to be tightened to the point where it's very hard to move the mount by hand. There is an optional clutch knob set from Losmandy (at more than $100) that makes adjusting the clutches much easier. Turn on the Gemini and choose "cold start" from the opening menu. Assuming the mount has been correctly polar aligned (it needs to be fairly close to the pole), you choose a bright star and slew the mount to it with the hand controller RA/DEC buttons. Select "initial alignment" and pick the star you are pointing to from the choice of alignment stars in the menu on the hand controller, finally press the right hand RA button - the whole process is much easier than it sounds. For maximum accuracy in alignment of the mount, it is important to use an illuminated reticle eyepiece and not to rotate a diagonal if one is used. The rest of the alignment is fully covered in the manuals and works as described.

Picking four or five stars on the same side of the mount, then one or two on the other will suffice for a first try. These alignments are very critical, it is important not to teach the mount bad locations as it will introduce errors in it's pointing model. In excess of 200 alignments can be done on each side of the mount (OTA to east or west). The most common cause of bad alignment is likely to be either clutch slip or not aligning on the correct star (do you know the difference between Castor and Pollux?)

The first few alignment stars were within a quarter of a degree - based on being on the inner ring of my Telrad, which is half a degree in diameter. Subsequent "goto" commands placed every object within the field of view of a 26mm eyepiece on my 10" f6.3 OTA, in many cases within the field of a 9mm eyepiece. The Gemini seems to cope well with modeling mirror slop and "mount to optical tube" alignment errors, mount sag etc. There is no need to re-synchronise Gemini when viewing objects in either half of the sky, some mounts need intervention when changing from the eastern half of the sky to the western. Gemini copes very well with this and rotates the optical tube through 180 degrees as it slews through the meridian.

The hand controller is easy to use, after a couple of sessions it is intuitive and makes showing visitors deep sky objects very quick and simple. The way the mount does a "meridian flip" and points to the other half of the sky is fascinating to watch. There are no problems with motor to control box cable tangles, although cables to a CCD camera may need careful routing.

The Gemini can be switched off without making any special provisions. Note that time and geographic location are retained on power down. If necessary, the optical tube can moved to a convenient position before turning off the power by "manual" slewing with the hand controller, there is a user definable "park" facility in the Level 3 upgrade. On powering up the mount again, there are 3 choices of startup mode. These are "warm restart", "warm start" and "cold start".

- Warm restart is used if the mount and optical tube haven't been moved since the telescope was last used. The Gemini calculates the position the telescope is now pointing to and will slew to any selected object upon command.
- Warm start is used where the mount hasn't been moved to a new location but the tube may have been moved manually, this mode retains the sky model and needs a single initial alignment star to be set. Note the optical tube needs to be in the "counter weight down, OTA pointing towards the pole" position when performing a warm start.
- Cold start is used if the mount has been moved or the optical tube swapped, this needs the full alignment to be done from scratch.

Having left the mount "parked" for several days, I powering it up using the "warm restart" option (which means the mount should remember where it was left). Selecting Jupiter from the menu slewed the telescope to the planet and placed it within the field of a 12mm eyepiece (133 magnification), which is quite impressive. Finding Venus in daylight is also quite easy.

Update

I quickly ordered a Level 3 upgrade and installed it without difficulty. Alignment is lost when upgrading from Level 1 to 3, however it only takes a few minutes to re-align the mount so it wasn't too much of an issue. The upgrade brings some very useful additions, one of the most useful is the ability to save the mount calibration (sky model), so if the software had a problem it is possible to re-load the data. Other features of Level 3 are a user defined object list that can be saved to Gemini from the Gemini Control Program (Windows PC software), auto park to a user defined position directly from the menu button, polar align assist and several other useful features. Setting the mounts time and location on power up is very easy with the aid of a GPS, my Garmin GPS III works well with Gemini (set the GPS for NMEA output).

The internal lithium battery doesn't last forever, while it's easy to change there is no low battery warning... One day you just expect to use the mount and it states "Cold Start" on the opening menu! I must try and remember to swap the battery every year.