

# Meade's LX200

## Introduction

Any of the modern astronomy magazines will have adverts for, images taken with or articles written by people using the famous Meade LX200 series of telescopes, it is probably the most advanced amateur telescope available 'off the shelf' and has features only dreamt of a few years ago.

The LX200 SCT series range in size from 8 inches to 16 inches, and are available in either f10 or f6.3 focal ranges, the one reviewed here is their 10 inch f10 model.

The main advantage of the LX200 series is the built in computer control, which claims to be accurate enough to place virtually any object onto the CCD chip of any commercially available CCD camera, together with a built in library exceeding 12,000 objects available to 'click and go'. Certainly the slewing speed is impressive, using dc servo motors fed with a series of pulses, however the very accurate polar alignment needed (when using the equatorial wedge) to achieve the claimed accuracy isn't available using the compass, bubble level and latitude scale of the Meade mount (see fig. 3). Given that most LX200's seem to be used with an equatorial wedge, it's surprising that more attention wasn't paid to level and latitude setting. In any event it can usually be ignored as two star alignment is available most of the time, except for solar work and daytime observation of planets etc.

It's nice to have a system that can be pointed to a couple of stars, adjusted, a CCD camera fitted and focused, then choose any one of thousands of objects and just acquire them without further user intervention, your very own automatic 'robotic' telescope. This is possible even with the alt-azimuth mode, using the Meade series of CCD cameras and their motorised focus assembly! However the maximum exposure is limited by field rotation when used like this and most users seem to prefer the wedge option.



One point worthy of note is the high precision pointing (HPP) that Meade are so fond of quoting, a careful read of the user manual gives their game away as to how this works and it's nothing special! If you wish to find a faint object using HPP, you are taken to align on three stars near the object, these are typically magnitude 3 or brighter, finally the scope moves onto the faint object. Using fairly crude digital circles I can achieve the same result in less time and with less of a song and dance about it.

Most mounts seem to have a real mess of trying to implement periodic error correction

(PEC). This is where you can record your tracking corrections and replay them over and over again. Periodic errors are mainly due to imperfections in the worm wheel on the RA drive of the mount. Meade have introduced permanently programmed PEC, a great idea as other mounts (the Losmandy G-11, for instance) lose the PEC settings when you slew the mount!

Many of the advantages and disadvantages of the LX200 are common to any fork mounted SCT, these are:



### Advantages

1. in the 8 inch sizes fairly portable and easy to set up, less so for 10 inch and 12 inch models.
2. probably better value for money than a similar computer controlled telescope.
3. closed optical system and excellent optics for minimal tube currents and reduced tarnishing of mirrors.
4. solid coupling for photographic accessories and off-axis guider. The wide range of focus adjustment allows accessories to be easily fitted, examples include Barlow lenses, flip mirrors and off-axis guiders (the flip mirrors are especially good with a CCD camera). It is generally easier to keep 'north up' with a CCD camera when using a fork mount compared to a German equatorial.
5. ability to mount without the 'Super Wedge' and have auto locate for thousands of objects at any location in the world (fig 4).
6. wide range of accessories, many of the Celestron accessories also fit Meade.
7. compatible with Meade CCD cameras for auto focus, auto tracking and auto mosaic images.



### Disadvantages

1. even though it represents good value for what it offers, the cost including equatorial wedge, dew shield, corrector plate heater etc. is far higher than a basic Newtonian telescope of equal or better optical performance.
2. for the 10 inch and 12 inch models the optical tube assembly is very heavy (10 inch OTA & fork, around 60 pounds), it can be quite difficult to locate the fixing bolts in the dark

(see fig. 2), a few people have dropped the tube assembly either due to fatigue or missing the bolt fixing, these tube assemblies are generally written off by such an accident! Care is needed when placing the tube and fork assembly down after removing it from the tripod/wedge, it is safer to leave the top bolt in place but this means finding a suitable perch for the telescope in order to remove the bolt for transport, see fig 6.

3. the focus mechanism moves the main mirror, it doesn't have a turns counter and actually moves the image slightly sideways as the focus is adjusted, this could cause problems with a CCD camera, other SCT users tell me this is a common occurrence and there is little that can be done. The Celestron 'Ultima' series has a multi-turn counter that makes CCD focus adjustment relatively easy, I can still remember setting '1410' when using one with my Starlight Express camera.

4. there was mechanical play in both ra and dec (should be possible to tighten this).

5. due to the design of the fork mount, there is a problem with mounting cameras and trying to swing the instrument either overhead (when not fitted with the wedge) or through the polar regions with the wedge.

6. it is possible to damage the gears by hand moving the telescope without slackening the clutches, the same may be true for jamming the instrument against the fork mount with a camera and trying to continue slewing. Neither of these problems occur with a German equatorial mount.

7. In common with many fork mounted telescopes, there is no polar alignment telescope. Accurate polar alignment is only possible by the drift method, this can take an hour or more. By comparison, Vixen and Losmandy german equatorial mounts can be fitted with very accurate polar alignment scopes in their polar axis.

Having mentioned that I was including a Meade LX200 review in this months pages, my friend Steve Banbury sent this by e-mail:

*One comment I have heard from 2 owners is that units are not equally well aligned. My friend who dropped his reassembled it himself after Meade basically told him it was scrap. He says he regularly achieves auto pointing to any selected star close enough to be within the field of view of a 9 mm eyepiece. His father's can not achieve this--and his wasn't dropped! Another comment on the LX200. Subsequent to my friend dropping his, I have seen a number of threads on sci.astro.amateur from other people seeking an after market spring device that facilitates single individual mounting of the scope in an alt-az configuration. Apparently numerous other people have experienced "close calls"*

Special thanks to David Clegg for demonstrating his Meade 10 inch f10 LX200.

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