Meade LXD55 200 mm Schmidt Newtonian Review

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Figure 1. The Meade LXD55 200 mm SN: overall it's a pretty good looking telescope .

Introduction

After using an 80 mm Tal Newtonian for a year I decided to look for a high quality Newtonian reflector in the 150 to 200 mm range. It turns out that the choices are quite limited, e.g. Tal, Parks Optical, and Orion Optics in the UK. After I decided on a 150 mm Tal, the Canadian distributor closed down. The Parks Optical and Orion Optics products are considerably more money and somewhat difficult to obtain in Canada. However, a used Meade 200 mm Schmidt Newtonian (SN) optical tube assembly came up for sale. These telescopes seemed to have a good reputation and are relatively inexpensive. Consequently, I sent a money order and the scope arrived a few days later.

The SN design differs from a Newtonian in that instead of a parabolic mirror, a spherical mirror is used in conjunction with a Schmidt corrector plate. One advantage of this design is that the spherical mirror is much easier to manufacture. In addition, off-axis coma and astigmatism are smaller than in a pure Newtonian with the same focal length and aperture.

The Meade LXD55 series of Schmidt Newtonian telescopes are assembled in the United States using USA-made optics and Chinese-made mechanical components (Figure 2). They are available in 150 mm f/5, 200 mm f/4, and 250 mm f/4 configurations with a somewhat expensive optional high-transmission coating for the optics. Oddly, they seem to be only available coupled to a Chinese-made German-equatorial mount. As a result, some people buy the combination just to get the mount and promptly resell the optical tube. There is a great deal of commentary on-line regarding the mount.

This article will focus on the optical tube assembly (OTA). Although the scope reviewed here was purchased used, this particular example was less than a year old and looked well-cared for. Thus, I am assuming it's a representative sample. A label on the tube (see Figure 2) gives some of the specifications. This model had the option UHTC coating as indicated by the label shown in Figure 3.

Figure 2. The label on the tube has much to say.

Figure 3. The presence of the optional coatings is easily verified by an "UHTC" label.

Optical Tube

The tube is 1 mm thick steel without any seam or flat spots. The white paint is well done and is very smooth. The "Meade LXD55" lettering is painted on. On the inside, the tube is flat black with a slightly mottled finish. The tube's end bezels are cast (probably from aluminum) and have a slightly crinkled finish. A well-made metal cover is supplied to protect the corrector plate when not in use. Overall, the fit and finish of the OTA are

very good.

Tube Rings

The tube mounting rings are cast aluminum, felt-lined, and hinged on one side. As shown in Figure 4, the large captive thumb screws are nicely made and look good. Each ring has a tapped metric screw hole top and bottom, which allows for mounting a guide scope etc.

Figure 4. The tube's mounting hardware is rather nice.

Primary Mirror

Shown in Figure 5 is the primary mirror in its cell. A metal ring with three tabs holds the primary mirror in place. Because these tabs produce diffraction spikes some owners have trimmed them off. Although the back of the mirror is covered, the tube is open, which should improve cooling. Primary collimation is via three large thumb screws (see Figure 6) that are spring loaded. Three smaller thumb screws lock the collimation in place. As a collimation aid, the mirror has a dark centre ring of about 1 cm diameter.

Figure 5. The primary mirror is held in place by this rather unusual ring design.

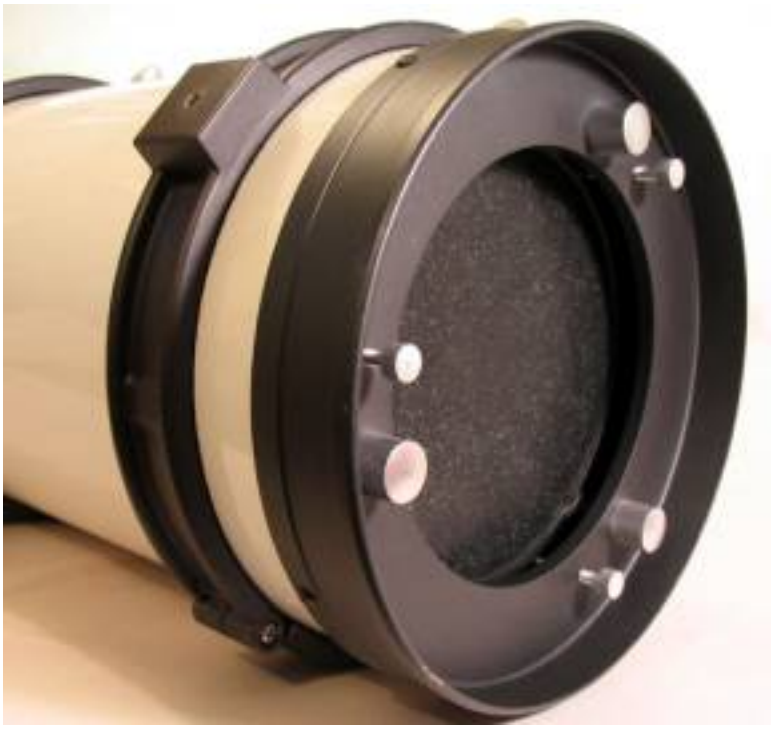

Figure 6. Rear view of the scope showing the three collimation screws and corresponding locks.

Secondary Mirror

The secondary mirror and support (Figure 7) are huge! With an apparent diameter of 79 mm, it is a 39% obstruction. This is much larger than that of a typical Newtonian (about 25%) and will reduce spatial resolution. I suspect that this mirror size was chosen so that a 35 mm film negative would be fully exposed without vignetting: an anarchism in an era of smaller CCD sensors. It would nice if this scope was available with a smaller secondary.

Although the large secondary limits spatial resolution, it does provide some useful benefits. The long focus tube reduces stray light, which helps image contrast. Because the focal point is well outside of the optical tube, obtaining focus with a CCD camera should not be a problem. In addition, there is plenty of room for accessories such as filters.

Figure 7. Visible here is the very large secondary mirror and its collimation screws. Note that part of the aperture is blocked by a misshapen paper gasket.

Finder Scope

Included is Meade's standard 6X30 finder scope (Figure 8). Inside it is black and there is no stop. Focus is set by rotating the objective and locking it with a rotating ring. Although small, it is of reasonable quality and does the job. Similarly, the finder's mount is simple and effective.

Figure 8. The finder scope is small but functional.

Focuser

The focuser is a two-inch design with a generous 80 mm of travel. It's body is made from thin plastic but its tube is aluminum. When racked all the way in a good section of the primary mirror is blocked by the focuser tube. The grease used on the rack is typical Chinese in that it is very much like glue.

Figure 9. The rack-and-pinion focuser has tonnes of travel.

Also included are the accessories shown in Figures 10 and 11. These are an extension tube, a T-ring, a 2 inch and a 1.25 inch adaptor . All of these thread into the focuser. A frustrating oversight by Meade is that the thread on the focuser is slightly non-standard thread (I think 54 mm). Thus, many existing accessories, such as those made for Schmidt-cassegrain visual backs, won't fit. (Note that photographic adaptors made for Takahashi telescopes may fit but this needs to be verified.). The focuser also has a lock, which is handy for photography.

Figure 10. An extension tube and T-ring are included. The extension tube is painted flat black on the inside.

Figure 11. Separate 2” and 1.25” eyepiece holders are included. However, both of these screw on, which will be a problem for frequent switching between 2” and 1.25” eyepieces..

In Use

The following comments are made after a few uses: a I will try to follow up after much more use.

Collimating this scope is different from a standard Newtonian. The scope is fussy about the alignment of the secondary mirror because the optical axis must coincide with the geometric axis of the corrector plate. The primary mirror is spherical which means its alignment isn’t as critical as in a fast Newtonian. As expected, adjusting the primary mirror’s screws while observing didn’t make a huge difference. However, I found that simply carrying the scope outside would upset the secondary’s collimation and this did degrade image quality. A laser collimator is required when owning this scope!

The screws for collimating the primary mirror worked very well. However, the secondary mirror assembly can rotate within the corrector plate and is mildly tricky to sort out. When looking down the focuser the reflection of the secondary is normally offset towards the rear of the tube: a small rotation of the secondary results in this offset being tilted with respect to the tube’s long axis. Getting it realigned takes a few minutes: working with very small changes in rotation, e.g., 2 degrees, seemed to be the best approach. A laser collimator made this job easier.

An important consideration is the mass of this scope. At 10 kg it is heavy and is close to the limit of my Losmandy GM8. I wouldn’t want it to be any heavier or larger. I suspect the larger 250 mm model may be too big to easily lug around and would require a GM11 mount or equivalent.

Cool-down seemed to be faster than a closed-tube STC. However, it may be necessary to add a small fan and some vent holes to speed things along. There is a thin plastic

plate covering the rear of the primary mirror that could either be removed or used to mount a fan.

Unfortunately, as the scope cooled, the focuser became sticky. Along with being too course it was difficult to obtain focus easily. Those of us who observe in cold climates will have to replace the focuser's glue-like grease with something sensible. Meade (and other resellers) should instruct their Chinese suppliers to stop using this gunk. The focuser is rather course and has too much image shift to be used at high powers. As a work around, I ordered a helical focuser from Borg. There are also third-party replacement focusers available.

Assessing optics is always a difficult business (in spite of what many "experts" may claim). The three mirror clips introduce diffraction spikes. Given it's very short focal length and large central obstruction, it isn't well suited for planetary observing. What it does excel at is low-power views of large sections of sky. In this case, worrying about small defects in optical quality is pointless.

Having stated that using an f/4 telescope for high-resolution planetary photography is a bit silly, Figure 12 shows a couple of planetary photographs. The very short focal length and fussy collimation make it a challenge. However, some amateurs have used these scopes to capture very good images of Jupiter and Saturn.

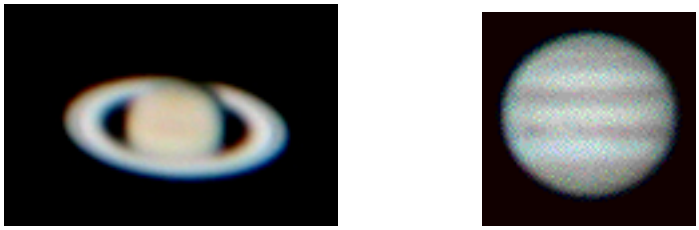

Figure 12. These were taken with a Canon A70 digital camera, Televue barlow, and a 13 mm eyepiece. For a 200 mm scope, they could be better.

Conclusions

In the end is it a good scope? For the price you will be hard pressed to do better. However, the optics may need to be tweaked and the purchase of a helical (or other) focuser may be necessary. In addition it's heavy and may possibly be too heavy for your mount. I don't think it would be a good scope for a beginner; for them a simple refractor is likely best. Those who are moving up from a small reflector may wish to consider this scope.

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