



Meade LS-8" ACF

U.S. price: \$1,999

Meade Instruments

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Meade's LightSwitch telescopes have taken Go To performance to the next level with a fully automated initialization procedure that requires no input from the user. Excellent image quality and built-in audio and video content make the scopes excellent choices for those entering the hobby of astronomy, as well as anyone doing public outreach.

ALL PHOTOS BY THE AUTHOR.

Meade's 8-inch LightSwitch Scope

When it comes to “smart” telescopes, this one is at the head of the class.

FOR YEARS I’VE QUIPPED to friends that I’m collecting material for three books I’ll never write. One is the history of astrophotography, another the history of this magazine, and the third a history of Schmidt-Cassegrain telescopes, which would surely cover the development of computerized scopes. Go To technology is so ubiquitous today, having trickled down to even a few toy-like “department-store” telescopes, it’s easy to forget that only a generation ago computer-controlled instruments were an expensive novelty in the high-end amateur market.

One major turning point in the evolution of Go To telescopes came in early 1999 when Meade introduced the \$750 ETX-90/EC Maksutov-Cassegrain with an AutoStar controller. It slashed the cost of Go To technology to about a quarter of what it had been, and it enticed *S&T*’s then editor, Leif Robinson, to predict that the concept of low-cost Go To telescopes “will grow the hobby on a scale heretofore unimagined.” In the nearly 40 years I’ve known Leif, it’s one of the few times his perceptive insight missed the mark.

Many reasons are floated as to why cheap Go To telescopes didn’t swell the ranks of amateur astronomy, and I have my own thoughts, but one common suggestion is that many beginners just couldn’t get them to work. If you’re an amateur active in clubs or public outreach, chances are you’ve met beginners in this predicament. With rare exceptions, their problem was getting the Go To scopes initialized on specific alignment stars. Even armed with helpful charts and prompting from the telescopes themselves, many beginners couldn’t distinguish Arcturus from Antares, especially in an urban sky, let alone identify alignment stars such as Alderamin.

Exhibiting an attitude that no problem is too big to tackle, Meade responded by creating the LightSwitch (LS for short) line of telescopes, which automatically align themselves on the correct stars. In doing so, the company has reached the biggest milestone yet along the road to Go To nirvana.

LightSwitch technology works remarkably well, as I’ll explain in a moment, but it’s not the only feature of LS

scopes. The optics and the built-in multimedia material are just as noteworthy, and they are the features you’ll be spending most of your night with after the few minutes that it takes for LightSwitch technology to automatically align the scope.

Out of the Box

The LightSwitch concept couldn’t be simpler — set the telescope down, flip the power on, and after a few minutes of electronically induced self-awareness, the scope is ready to point to any object in the night sky with the press of a



The AutoStar III’s illuminated hand control provides one-button access to many frequently used functions and internal catalogs of celestial objects.



LightSwitch telescopes are available with either Meade's traditional Schmidt-Cassegrain optics or the newer and somewhat more costly advanced coma-free design, which offers improved image quality at the edge of the field of view.

button or two. A built-in GPS receiver, electronic compass and level indicator, and CCD camera (for identifying alignment stars) are at the heart of the automatic alignment routine, along with some unimaginable amount of computer code.

My out-of-the-box experience with LightSwitch was early last September with an 8-inch ACF model that we borrowed from Meade for this review. The scope's Quick-start Guide lists 14 steps before you flip the power switch, but this is merely proof that no detail is too small to be omitted. The steps cover setting up the tripod, installing eight C batteries, putting the eyepiece in its holder, and removing dust covers on the scope and CCD camera — about five minutes of work for a brand-new scope.

It was 10 p.m. when I carried the scope to a park across the street from our *S&T* offices. A few lingering clouds floated past as I leveled the tripod by eye in a playing field where trees blocked the view of nearby streetlights. Nevertheless, Cambridge's light-polluted skies were living up to their reputation. The Summer Triangle, Arcturus, and a few other bright stars were the only ones visible to the naked eye — a potent reminder why beginners often become lost in an urban sky.

I flicked on the power and stepped back as the scope sprang to life. Messages displayed on the AutoStar III hand control, as well as verbal announcements (in English) from the scope's built-in speaker, kept me informed as the alignment progressed. In brief, the GPS determines the time and location; the level indicator measures any tip of the tripod; the compass (along with location information) pinpoints true north; and the scope begins looking for bright alignment stars.

Once the scope slews to the expected location of a candidate star, the CCD camera snaps a picture (exposure determined automatically), identifies the correct star, makes a fine adjustment to center the star in the camera's field, and takes a confirming picture. If you have an optional video monitor connected to the scope (I didn't the first night), you can see the camera's images as the process unfolds. The routine repeats for a second alignment star, after which you're ready to observe.

Despite the lousy sky conditions that evening, LS worked perfectly. Given that a little extra time was needed because the GPS was making a "cold start" at a new location, the alignment process took less than 15 minutes. On subsequent nights at my suburban home about 20 miles away, a typical alignment took about 10 minutes.

What if clouds, trees, or buildings hide an alignment star? LS will simply look for another, and doggedly so. One evening a swath of cotton-ball clouds swept across the sky as I started the alignment process. After recording an initial alignment star on the second try, searches for a second star failed. Many times the candidate star was totally hidden or recorded in the first image but obscured for the confirmation shot. After about 15 failed attempts the scope stopped looking — I think it exhausted its list of potential alignment stars currently in the sky — and I switched off the power. Later, with the clouds gone, I turned the power back on, starting the alignment anew, and had success in about 5 minutes.

If you power up at or before sunset, you'll hear a message that the sky is too bright for automatic alignment. But as little as 20 minutes after sunset the system will automatically (and successfully) begin its search for stars. Those with knowledge of the sky can do a manual alignment anytime stars can be identified in the eyepiece. Also, once aligned, the scope can be "parked" for instant

startup at a later time if it hasn't been moved.

Large gears in the mount gave impressive Go To performance. Without failure, the scope always put requested objects in the 0.62° field of the supplied 26-mm eyepiece.

WHAT WE LIKE:

Reliable, automatic alignment and Go To performance

Excellent image quality

Versatile multimedia content

WHAT WE DON'T LIKE:

No optional heavy-duty tripod

The manual says that you should “try to stay away from large metal objects like a car or a metal fence,” that may affect the scope’s electronic compass, disrupting the alignment process. I had no problems setting up 10 feet from parked cars, but metal lurks in unsuspecting places. At one of my test locations, the scope’s alignment procedure was erratic, missing target stars by more than 20° of azimuth. I’ll spare you the tedious details, but I traced the problem to a dense grid of steel rebar in the cement slab beneath the scope — something I confirmed by probing the area with an electronic compass in a handheld GPS receiver, which was equally flummoxed by the steel rebar.

ACF Optics

All LS telescopes use the same mount and currently the line includes 6- and 8-inch $f/10$ scopes with either Meade’s traditional Schmidt-Cassegrain optics or the newer advanced coma-free (ACF) design, which we tested. Stars appear identical at the center of the field in both optical designs, but the ACF models show an improvement at the edge of the field. This is most apparent in wide-field eyepieces, and I particularly liked the view of pinpoint stars across the $3/4^\circ$ field of the 8-inch ACF fitted with a Tele Vue 24-mm Panoptic eyepiece. With its 27-mm-diameter field stop, this eyepiece offers the largest true field of view possible with a 1 $1/4$ -inch eyepiece.

The 6- and 8-inch LS models are supplied with the same tripod, which can vary the eyepiece height from 44 to 63 inches (112 to 160 cm) above the ground and is suitable for most seated or standing observers. The 9-pound (4-kg) tripod is light enough that even with it attached to the 30-pound 8-inch scope, the whole assembly can be easily carried around by one person. While the tripod

is adequate for the larger scope, the setup’s 5-second vibration-damping time is a bit long, and observers who work with high magnifications will certainly benefit from acquiring a set of anti-vibration pads to place under the tripod legs. Perhaps sometime in the future Meade will make a heavier-duty tripod available as an option.

Talking Telescopes

Although LightSwitch’s automatic alignment is a profound achievement, in the long run the scope’s built-in multimedia material may be just as memorable. It’s also one of the reasons that most people will want to purchase Meade’s optional \$99, battery-powered monitor. Here’s a quick overview of the multimedia, and keep in mind that you can toggle the audio and/or video on and off with a single button press as well as set it to be off by default.

There are two “levels” of multimedia that accompany celestial objects selected from the scope’s internal database. If you think of the booming voiceover and splashy graphics that are the hallmarks of movie trailers for Hollywood blockbusters, then you have an accurate mental image of the first level. I found it a bit over the top, especially when I was observing alone, so I usually squelched

Left: In an obvious move to emphasize LightSwitch’s simplicity, the scope’s power switch (the only user “input” required for the setup procedure) is prominently positioned on the mount.

Right: Most observers will opt to use an external 12-volt DC power source, since the scope’s internal power (supplied by eight alkaline C batteries) is good for only three to five hours of operation. Nevertheless, keeping batteries in the scope is a good idea, since they instantly take over if there’s an interruption of the external power, thus avoiding the need to redo the scope’s sky alignment.





Above: As described in the text, audio can be played on the built-in speaker, but an optional monitor, such as this \$99 model from Meade, is needed to view video. All multimedia material, as well as the monitor, can be toggled on and off with a single button press, or set to be off by default when the scope is powered up. The monitor is also handy for showing more of the menu tree than the hand control, thus aiding menu navigation.

Below: Large drive gears provide excellent Go To performance. The motors are also very quiet, in part because the mount's maximum slew speed is a rather leisurely 4° per second.



the theatrics with a press of the Media button. This material would, however, be great for public outreach, since it's all but guaranteed to draw a crowd around the scope (and that would be a good reason to have a large video monitor at public gatherings).

The next level includes audio commentary delivered by Sandy Wood, the serene voice of radio's *StarDate*. The spoken material is a delightful mix of astronomical data, mythology, and popular knowledge. The more I listened to these audio clips, the more I liked them. Despite a day job writing about astronomical objects, I don't walk around with all those facts and figures stored in my head. To view deep-sky objects while hearing about their size, distance, and historical background adds a new dimension to observing. And, pressing the Media key stopped the audio for those times when I wanted to contemplate the view in silence before the audio ended on its own.

There are custom audio descriptions for several hundred celestial objects, including all the popular deep-sky sights, and generic descriptions based on object category for the rest of the scope's database. To my ear the material is very good, though I did raise an eyebrow upon hearing that English astronomer Edmond Halley was a "famous comet hunter" during the description of the globular cluster M13 (which Halley discovered in 1714).

Meade's promotional material for the LS line mentions that you can use the scope's alignment camera for astrophotography. The infinity-focused, color CCD camera covers a roughly 8°-by-12° field of view, and there are rudimentary functions for taking, processing, and saving pictures (on a user-supplied SD memory card), but the night-sky results fall short of stunning. My shots of the crescent Moon in a twilight sky were, however, similar to what I could capture with my aging cell-phone camera. Nevertheless, it's fun to play with the scope's camera.

I've only touched on the features of these LS scopes. Anyone experienced with Meade's earlier AutoStar controllers will find that all the familiar functions are still included with the new AutoStar III. Furthermore, you can customize most functions, including the way the scope starts and how and when the audio and video play. And you don't have to worry about messing up any settings — there's a simple command to restore everything to the factory defaults.

Only time will tell how Meade's achievement of packing "serious" aperture, excellent optics, and foolproof Go To performance in a competitively priced telescope will impact the amateur astronomy hobby. But there's no question that LightSwitch technology works beautifully, and that by itself is a really big deal. ♦

Writing books on historical topics is just one item in a long list of things senior editor Dennis di Cicco will probably never get around to doing.