SKY & TELESCOPE

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S&T Test Report

By Dennis di Cicco

Achieving Stellar Performance

Described in detail in the accompanying text, this view of the well-known galaxy M51 is an excellent example of the resolution and focus stability of the Officina Stellare RiDK 300 astrograph. The author never adjusted the scope's focus during the 15 hours of observing time (spread across two nights) during which he made exposures for the image. The author's colleague, Sean Walker, processed all the astronomical images with this review.

ALL PHOTOS BY THE AUTHOR

Two pieces of premium gear deliver first-class astrophotos from your backyard or from half a world away.

Officina Stellare RiDK 300

U.S. price: $14,695. As tested with the Rotofocuser, $19,454.
officinastellare.com

Software Bisque Paramount ME II

U.S. price: $15,000.
bisque.com

EVERYONE KNOWS the old saying "you get what you pay for." Although it's often the lament uttered for the disappointing performance of bargain-priced products, it's based on the general understanding that truly exceptional-quality stuff isn't cheap. That's the case for two pieces of newly introduced equipment that I've been testing since late last year. Officina Stellare's RiDK 300 astrograph and Software Bisque's Paramount ME II are priced at the upper end of the spectrum in their respective categories. As such, I wasn't just hoping that they'd perform well; I *expected* them to perform well. And perform they did. The scope and mount are truly first-class, and together they enabled me to take some of the finest deep-sky photographs I've ever made from my suburban-Boston backyard observatory.

It would be impossible in the space here to list all the features this equipment has to offer. Furthermore, you'll find extensive specifications and claims of performance on the manufacturers' respective websites, and none of my tests and experiences contradicts any of that material. So rather than a point-by-point review, what follows is some overall information and highlights of my tests. Let's start with the telescope.

Officina Stellare's RiDK 300

The concept of an astrograph based on a two-mirror Dall-Kirkham Cassegrain with an added multi-lens corrector near the focal plane is relatively new. I outlined some of the design's history in a review of the

WHAT WE LIKE:

- Extraordinary image quality
- Excellent focus stability
- Robust mechanical construction holds collimation extremely well

WHAT WE DON'T LIKE:

- Built-in dew heaters and cooling fans require an optional controller

Left: **With their red-and-black motif, the RiDK 300 astrograph and Paramount ME II make a handsome couple, especially when fitted with the similarly hued SBIG STT-8300 CCD camera. The scope is shown here with its black-cloth shroud covering the truss assembly.** ***Right:*** **The scope is relatively compact, measuring only 45 inches (114 cm) from the front of the tube to the focal plane, which extends 9½ inches out from the scope's back plate.**

PlaneWave 12.5-inch CDK telescope (*S&T:* Nov. 2010, p. 36). As a commercial product, the "corrected" Dall-Kirkham made a cameo appearance when Celestron introduced a 20-inch version in the mid-2000s. Soon afterwards, PlaneWave Instruments was founded by several former Celestron employees, and the company began manufacturing its CDK telescopes. Those scopes helped make the design a household name among today's elite astrophotographers.

In their book *Telescopes, Eyepieces, and Astrographs* (Willmann-Bell, 2012), Gregory Smith, Roger Ceragioli, and Richard Berry heap lots of praise on the concept of a corrected Dall-Kirkham, calling it a "viable alternative to the Ritchey[-Chrétien]" design that has dominated the world of high-end amateur astrophotography for several decades. Now the Italian firm Officina Stellare has introduced a line of high-performance, corrected Dall-Kirkham astrographs created by the company's chief optical designer, Massimo Riccardi. Hence the "Ri" attached to the Dall-Kirkham's "DK" in the scope's name.

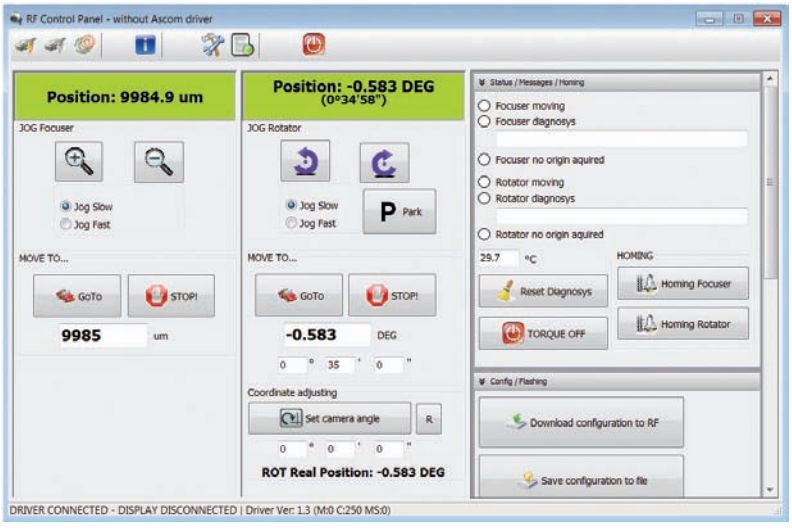
People who visited Officina Stellare's display at the 2013 Northeast Astronomy Forum in New York or the 2013 Advanced Imaging Conference in California had a chance to see the telescope I borrowed for my tests. They know it's a strikingly handsome instrument; even better looking in person than it appears in photographs. This is not surprising given that it's from the same country that gave us the Ferrari, Lamborghini, and Sophia Loren. None of this beauty, however, comes at the expense of mechanical performance.

The optional Officina Stellare Rotofocuser ($3,850) proved to be exceptionally precise. Its rotation and focus positions are accurately set from highly repeatable homing positions.

Left: **If the optics ever need collimation, a pattern of centered rings printed on the surface of the secondary mirror will help.** ***Right:*** **The astrograph's front end is very rigid and, as explained in the text, it held optical collimation exceptionally well. Although the scope has a clear aperture of 305 mm and an f/7.9 focal ratio (as indicated by the printing seen here), its name was recently streamlined to RiDK 300 so it would conform with other instruments in the company's expanding line of astrographs.**

From the moment of "first light," I realized that mechanically this scope is special. Although Officina Stellare offers several options for shipping its telescopes, including custom wooden crates, my scope traveled from Italy to New York, then to California, and finally back to Massachusetts in a rather unremarkable cardboard box surrounded by only 2 inches of polyethylene foam. Add to that the rough handling that equipment typically endures when displayed at trade shows, and you can understand why I was expecting the scope to be out of collimation when I finished setting it up in my observatory. It wasn't, and this fact astounded me.

As nights of testing stretched into weeks and then months, another of the scope's mechanical attributes emerged — it has remarkably stable focus over a wide range of ambient temperatures. The image of M51 on page 38 is a perfect example. I obtained the color data for that shot last March 24/25. The scope was focused at the end of astronomical twilight and remained untouched for the next 8 hours as I made 45 back-to-back 10-minute exposures (15 each through red, green, and blue filters). The unfiltered (luminance) data for the image is a set of 37 back-to-back 10-minute exposures made on April 20/21 during a 7-hour stretch when the focus also remained untouched. On both nights the temperature dropped more than 13°F (7°C) during the exposures.



Software for remote control of the Rotofocuser is straightforward and easy to learn just by looking at its user interface.

I was equally impressed with the mechanical quality of the optional Rotofocuser supplied with the scope. It can be operated at the telescope with a small, dedicated control box, or remotely with software (including an ASCOM-compliant version) running on a host computer. Because of the way I configured my remote setup, each night I had to "home" the Rotofocuser to its zero point and then return it to the focus position, which can be specified in 0.1-micron increments. The precision and repeatability of the system is amazing. Combined with the scope's focus stability, it took only a few minutes to manually achieve excellent focus each time I began an observing session. And most nights I never refocused the system.

Finally, there's the RiDK 300's image quality — perhaps the most important aspect of any astrograph. As fate would have it, my night of first light with the scope had unusually good atmospheric seeing, and a couple of 10-minute test exposures (ones that I didn't make dark or flat calibration frames for) had stars only about 1½″ (arcseconds) in diameter. This is extraordinary and

something that I rarely achieve from my backyard with large-aperture telescopes.

The image quality was so good that I decided to modify my testing plans. Originally I was going to use a CCD camera with a big KAF-16803 chip, covering a 0.88°-square field of view. But this CCD's 9-micron pixels yielded a scale of 0.77″ per pixel, which is on the borderline of undersampling the scope's small star images. Instead, I did much of my testing with a camera having a smaller KAF-8300 CCD and 5.4-micron pixels that yielded a scale of 0.46″ per pixel.

Eastern Massachusetts spends much of its winter sitting under the jet stream, which rarely allows seeing much better than about 3″. As such, it was unusual for me to image at the RiDK 300's maximum resolution, but on those occasional good nights I captured some of the finest images of nebulae and galaxies that I've ever managed from my backyard. The scope would obviously be a superb performer at a site with consistently good seeing.

Software Bisque's Paramount ME II

This is going to sound weird, but I wrote a detailed review of the Paramount ME II months before it was introduced in early 2013. Rather than being clairvoyant, I was actually writing about the company's Paramount MX (*S&T:* July 2012, p. 64). The ME II is a bigger, stronger, more robust version of the MX with a rated load capacity of 240 pounds (109 kg). Everything I said about the MX, with the obvious exceptions about its smaller physical stature, applies to the ME II. This is especially true of the ME II's pointing and tracking accuracy, and its extraordinary integration with Software Bisque's flagship *TheSkyX* program. Rather than repeat that material here, we've put a reprint of the earlier review on our website at **skypub.com/MX** (as this link is not publicly available, you'll need to manually enter it into your web browser).

Compared to the MX, there was nothing new I had to learn to set up and operate the ME II. Once everything was bolted in place and the RiDK 300 mounted on the ME II, it took only a few hours running routines in *TheSkyX* and its included *TPoint* software to achieve excellent polar alignment and all-sky pointing accuracy that was better than 13″. Furthermore, the tracking was good enough to make the unguided 10-minute first-light exposures with the RiDK 300 mentioned earlier.

Nevertheless, after that initial night setting up the ME II, the way I tested the mount was entirely different than how I handled the MX review. That's because I ran the ME II 100% remotely, although most of the time I was only a few hundred feet away working on a computer from the comfort of my home. But I also did a few tests connecting to the ME II with my office computer here in Cambridge, Massachusetts, and once, just for fun, with a netbook computer while relaxing at a hotel in Izmir, Turkey.

Software Bisque wrote the book on operating telescope mounts remotely. The Paramount MX and ME II aren't just German equatorial mounts that had remote control added as an afterthought. They were designed from the ground up to be controlled remotely. And in my opinion, this is one of their greatest strengths.

In a nutshell, here's how I ran the system. A colleague loaned me a relatively modest laptop computer with a solid-state hard drive (SSD), which I loaded with *TheSkyX* and additional software for controlling my CCD cameras and the Rotofocuser. At the telescope, I routed power and USB 2.0 connections for the cameras and focuser through cables and connectors built into the Paramount, so only

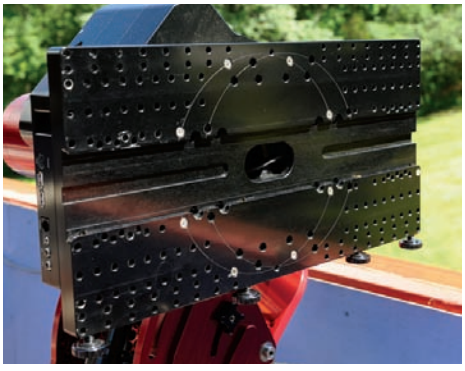
WHAT WE LIKE:

- High load capacity
- Exceptional pointing and tracking accuracy
- Superb software integration for remote operation

WHAT WE DON'T LIKE:

- It would be nice to have more than two built-in USB ports on the saddle plate

At first glance, the Paramount ME II appears to be a twin of the smaller Paramount MX, but there are differences related to the ME II's far greater load capacity. Operation of the two mounts, however, is identical, and anyone familiar with using the MX will instantly know how to run the ME II.



Called the Versa-Plate, the ME II's equipment-mounting plate tested by the author includes a multitude of bolt holes as well as a Losmandy-style dovetail slot, making it very easy to attach just about anything to the mount.

one short USB cable ran between the mount and laptop. The computer also had a wired connection to my home network, which provided its link to the internet. The laptop remained on 24/7, and thanks in part to its SSD, the system worked flawlessly through our unusually cold New England winter.

I used an internet-controlled AC outlet to power the Paramount on and off, and a little bit of Rube Goldberg engineering let me open and close my observatory roof remotely. Lastly, I installed a low-light video camera in the observatory so that I could visually check on how things were running without me being physically present. I accessed the laptop controlling everything in the observatory from anyplace that had an internet connection. All that my "local" computer needed was conventional remote-desktop software that's designed to run one computer from another one when both are connected to the internet.

Everything worked beautifully, and to say that I was impressed with all of this is an understatement, especially given that this was my first experience doing all of my observing remotely. On dozens of nights spread across my months of testing, only once did I venture into the observatory to resolve a problem, and that was because a microswitch froze shut, preventing me from remotely closing the roof. This, by the way, is a potent reminder that any unattended facility needs failsafe backup on critical systems that affect the safety of expensive equipment.

Never once did I need to personally interact with the telescope or mount to resolve a problem. But that's not to say that everything worked perfectly. On a handful of occasions I had to reboot the remote computer, most likely due to conflicts between my software and stuff previously loaded on the machine by other users (and there was a lot of it!). Once or twice I also had to cycle power to the Paramount ME II to get it taking to the laptop again, but this too was likely because of issues with the computer. Thanks to an extremely accurate homing system built into the ME II, the mount always linked up perfectly with the sky overhead — the system never got lost.

I've tested a lot of equipment over the years, but I can't recall ever having a better experience than I had with the RiDK 300 and Paramount ME II. And given the sophistication of this setup, that says a lot. It truly is exceptional stuff. ✦

Sky & Telescope *has published 55,638 pages since senior editor* ***Dennis di Cicco*** *joined the staff in 1974.*

As with the image of M51 on page 38, the author set the focus of the RiDK 300 at the end of twilight and never tweaked it afterward on both nights when he made exposures for this view of the grand spiral galaxy M81 in Ursa Major. The 69 ten-minute LRGB exposures required more than 12 hours of observing time.