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The MallinCam Junior Pro

The Video Revolution Cometh

By “Uncle” Rod Mollise

You hear a lot about the “video revolution” in amateur astronomy lately. And in some places, like the Chiefland Astronomy Village, you see it happening. The last time I set up on the CAV’s Billy Dodd Memorial Observing field, every single one of the 10 observers present was using a MallinCam.

Amateur astronomers are going deeper into the Universe than ever with sensitive long-exposure video cameras. It’s been said a camera like the MallinCam can triple the aperture of your scope, but that is actually an understatement. A 24-inch telescope might show the Horsehead Nebula under good conditions, for example, but the Horse will never look as sharply defined as it does in my MallinCam-equipped C8. Nor will the big scope show the color visible on my monitor.

So why isn’t everybody using a deep-sky video camera? Well, some people would still rather do things the old-fashioned way, with eye and eyepiece. Including me, till I decided I wanted to see details, not just smudges, in the years of observing left to me. I wanted to go beyond the NGC to the fiercely dim little PGC galaxies and other sprites that make up the sky’s background.

But mostly what has kept deep-sky video from taking our avocation by storm has been cost. The top-of-the-line



Image 1 - Shown is the MallinCam Junior Pro with the included wireless exposure control and optional four-button remote.

MallinCam Xtreme requires an investment of \$1500 for a basic setup. That has been too much for some amateurs, especially those who haven’t been able to see video in action. Yes, watching the live broadcasts on Night Sikes Network on the web can give you an idea of what a MallinCam can do, but many folks are understandably hesitant to part with

close to two thousand dollars without knowing exactly what a camera will deliver with their scope and their skies.

There are some less expensive cameras, like the original MallinCam Junior, but they are limited in their capabilities due to their 5-second exposure maximums. My experience is that even a very sensitive camera

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Image 2 - Rear control panel of the MallinCam Junior Pro.

needs to be able to expose for at least 10-15 seconds if you are to go beyond the brightest objects.

The only other alternative for the cost-conscious astrovideographer has been off-the-shelf (non-astronomy) cameras like the Samsung SCB-2000. While it can expose for up to 10 seconds, its very small 1/3-inch chip and higher noise make it no more effective than the original Junior, which has a 1/2-inch CCD and has been optimized for astronomy. The Samsung and similar cameras can give you a taste of video astronomy for \$100, but just a taste.

And there things remained till early this past summer when I heard from MallinCam distributor Jack Huerkamp that Rock Mallin was preparing to release a new camera. As soon as I heard the specs of the MallinCam Junior Pro, I began to think it could be a game-changer. The MallinCam Junior Pro is at heart a MallinCam Xtreme, just stripped

down a little so it can sell for \$599. I knew that if the Junior Pro could at least come within spitting distance of the Xtreme, it would make a lot of y'all who've been waffling make up your minds to try video.

When I pulled Junior out of his box when he arrived on the front porch of Chaos Manor South, I was frankly amazed. The new camera not only looked a lot like an Xtreme, it felt like one too. The solidity, the build quality, was there. The beauty wasn't just skin deep, either. The Junior Pro's CCD chip, a 1/2-inch Sony ICX418AKL, is the same one used in the more expensive camera.

That said, I was well aware of the TANSTAAFL factor: "There Ain't No Such Thing As A Free Lunch." Some compromises had to be made to keep the Junior Pro's price down. The main difference between the Junior and the Xtreme is cooling. Unlike the Xtreme, the Junior Pro's CCD is not cooled. That means more thermal noise. I wasn't overly worried about that, however. My old Stellacam 2 deep-sky camera wasn't cooled, either, and despite me running it with the gain almost wide open to make up for its 10-second exposure limit, I got some good shots with it.

The Junior Pro's exposure system has also been simplified. Junior's exposure length is, like the Xtreme's, virtually unlimited (99-hours), but how you set up those exposures is different. The Xtreme allows you to set and execute long exposures with either a laptop computer or with MallinCam's wireless shutter controller. The Junior Pro does not feature computer control of long exposures, so

you are required to use the wireless. The good news is that the wireless controller for the Junior Pro is included in the purchase price (**Image 1**).

Control of the camera's other functions is the same for both the Xtreme and the Junior Pro. You can use the buttons on the cam's rear panel (**Image 2**) to access a settings screen (**Image 3**) on your video monitor (not computer). If you don't like small buttons or don't like touching the camera when it's mounted on the scope, you can purchase a wired 4-button remote.

Or, you can set things like gain and short exposures (2.1 seconds or less) using a program running on a PC. The Junior Pro's control software is free and can be downloaded from Jack Huerkamp's website (<http://waningmoonii.com>). In order to use a computer with Junior, however, you will have to purchase an optional serial cable. Unlike with the Xtreme, the cable is not included in the Junior Pro package.

What does come with Junior? In addition to the camera, there's a screw-on 1.25-inch nosepiece (threaded for filters), the wireless remote hand control, a wireless receiver that plugs into the camera, a video/power cable, and a small AC power supply. The instructions for the camera are on printed pages and can also be downloaded from Jack's website.

How are the instructions? They are sufficient, and, supplemented by the advice you can get from Jack, Rock, and plenty of experienced users on the MallinCam Yahoo group, will be enough to get most video novices started. However, I'd very much like to see a simplified, comprehensive manual aimed at beginners included in the box.

Any other nits your old Unk picked? I wish a 12vdc power cable were included (one is available as an option). In most cases, running the MallinCams off battery results in cleaner looking video than can be achieved with the stock AC power supplies. The cameras, and especially the Junior Pro, don't draw much current and work well with the ubiquitous jump-start battery packs.

I was impressed by Junior's build quality,

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Image 3 - On-screen settings shown on video monitor.



Image 4 - For the purposes of this article, Uncle Rod tested the MallinCam Junior Pro with his Celestron Edge 800 SCT and VX German equatorial mount.

yeah, but the only true test of astro-gear is under the stars. That turned out to be a problem down here on the Gulf Coast during the summer of 2013. It was the wettest, cloudiest summer I can remember since 1994. It took till late September before I got an evening good enough to give the Junior Pro a fair evaluation.

When I finally got that clear night, Junior and I headed to my club's dark site in the suburbs-country transition zone. The Milky Way is usually visible, but this site is hardly perfect due to a substantial light dome to the east. My telescope? A video camera will work fine with a modern (tracking) alt-azimuth mounted scope, but my current favorite video rig is my Celestron Edge 800 SCT and VX German equatorial mount (Image 4). That combination is light, the go-to is extremely accurate, and the telescope provides a good image scale for the MallinCams' small chips when equipped with an $f/3.3$ reducer.

I'd control the Junior Pro with a laptop computer just like I do the Xtreme, since I much prefer that to mashing tiny buttons on the camera. But I still had to figure out the wireless shutter controller – I don't use one with the Xtreme. After a little fumbling around with it, I gave up and read the “quick

start” instructions Jack put in the box, and soon had Junior cranking out 15-second exposures.

What happened when I sent the C8 to

M13? At first, not much. A layer of clouds had covered the Great Globular. But when they finally blew away, I was also blown away. I'm not sure what I'd expected, but what I

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Image 5 - M13, the Great Globular Cluster in Hercules.



Image 6 - M15 globular cluster in Pegasus.



Image 7 - NGC 7331, the Deerlick Galaxy.



Image 8 - Stephan's Quintet.



Image 9 - NGC 6888, the Crescent Nebula.



Image 10 - M27, the Dumbbell Nebula.



Image 11 - M22 globular cluster in Sagittarius.



Image 12 - M28 globular cluster in Sagittarius.



Image 13 - M16, the Eagle Nebula



Image 14 - Stephan's Quintet.



Image 15 - NGC 6888, the Crescent Nebula.



Image 16 - M27, the Dumbbell Nebula.

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got was a beautiful image of M13 (**Image 5**). If I hadn't known I was using the Junior Pro, I'd have sworn it was a MallinCam Xtreme shot. There was a great big ball of stars staring back at me from my monitor in full-color glory.

I was impressed, but M13 is a bright Messier, one of the brightest globs in the sky. Just about any camera can do a good job with something like that. How about a less good globular cluster? Like M15. Away we went. Again, I was flabbergasted at how similar the image was to what I am used to with the Xtreme. M15 (**Image 6**) with its tiny stars and intense core looked dadgum spectacular. It was still a Messier, though. How about something even harder? Like nearby NGC 7331, the Deerlick Galaxy?

Once more, I was taken by how close what I was seeing was to what I get with the top MallinCam on a similar night. The galaxy's golden hue was obvious. So were the little NGC galaxies scattered across the field, the "deer" at the deer lick. When the

seeing and transparency cooperated, I could even see traces of NGC 7331's subdued spiral arm with 15-seconds of exposure (**Image 7**).

By the way, the images here are just simple single-frame screen grabs. Other than a little adjustment of their curves, I haven't done much processing. And rest assured the live video looks much better and shows more detail. It's a testament to the quality of the Junior Pro's images that these stills look as good as they do.

How about Junior's lack of cooling? Did that make a difference? Some difference, yeah, but not a huge amount in my opinion. There are, naturally, more warm pixels than with the cooled cam, and the backgrounds don't look as smooth. Still, for me, video is about going deep and seeing lots of detail, not getting pretty pictures. There was most assuredly plenty of detail visible in all objects bright and dim.

"Hokay, Unk, but what about ampli-

fier glow?" Because of the heat generated by their on-chip amplifiers, most CCD sensors will show some glow in one of the corners of the frame. The longer the exposure, especially with an uncooled camera, the more prominent this brightening will be. There was some visible in 20-second exposures with the Junior, but I am happy to report it was minor.

After the Deerlick, we were off to an even more challenging target, the nearby and legendary galaxy cluster, Stephan's Quintet (**Image 8**). It was easily visible, though not showing much detail. That was mainly because the approximately 800 mm of focal length of the C8 and reducer combination was just not enough to show details in such small targets. I could see the cluster, though, and that put to bed any worries I had about the Junior Pro being able to tackle the faint stuff. If I needed any more reassurance in that regard, NGC 6888, the Crescent Nebula in Cygnus provided it. The Crescent's notoriously dim loop showed up easily (**Image 9**).

By the time I'd done the Crescent and the Dumbbell (**Image 10**), another mess of clouds was on the way. I had just enough time to do a quick run through the showpieces of the south, though. They all fell before Junior and all looked good. In fact, M22 (**Image 11**), M28 (**Image 12**), M16 (**Image 13**), M17 (**Image 14**), and M8 (**Image 15**) looked marvelous. See also **Image 16** of M57, the Ring Nebula.

At no time did I feel overly handicapped by using the Junior Pro instead of the Xtreme. I just enjoyed the pretty pictures as they appeared on my monitor one after another.

I had some other tests planned – longer exposures and filters – but the fricking-fraking clouds prevented that. Even so, I have no hesitation in giving this camera a big thumbs-up. It's not just a relatively inexpensive way to get into video; it is more than capable of doing real work. If you've been sitting on the video fence, muchachos, it's time to hop off and give Jack a call. You want the Junior Pro. **ATI**

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