

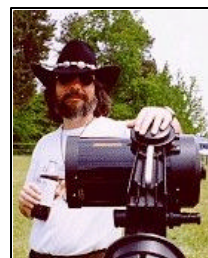
Inside this Issue:

- 1 How I Learned to Stop Worrying and Love Binoviewers!
- 2 Lucy Looks Skyward!
- 3 The EyeOpener!
- 4 MX7C Conversion!
- 5 Confessions of an Astromart Junkie!
- 6 Lunar Software!
- 7 Space Place!
- 8 My Back Pages!

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Rod Mollise's

Skywatch



Great, Huge SUPERSIZED Issue!

How I learned to Stop Worrying and Love Binoviewers

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I don't make any secret of how much I love astro-gear. Anything—telescopes, eyepieces, charts, computer programs, packs of lens tissue. I don't care. But there was one piece of amateur astronomy equipment that I just hadn't been able to stomach: binoviewers.

If you spend any time at star parties, you've seen binoviewers. They are those binocular viewing attachments you'll often find mounted in the focusers of big dobbs or monster SCTs. In theory, it's a good idea. We normally view our world through

two eyes. Only when it's time to look through a telescope do we squint one closed and look at the universe through a single peeper. This is uncomfortable, and, since our brain is used to getting the input from two eyes, we lose detail. A binoviewer is the supposed cure. It's a device that uses prisms to take the light coming from your lenses and mirrors, split it, and direct the image into two eyepieces. Put one of these on your scope and you can view the wonders of the heavens through two eyes as nature intended.

Too bad this idea didn't seem to work well—at least not for me. Many were the times I'd been offered the chance to use a binoviewer, given it a try, and come away shaking my head at the idea anybody could like one of these things. Didn't seem to matter which brand I tried, either, including expensive TeleVues and AP branded units. I just couldn't seem to get one to work for me. I'd look strain, adjust the interocular distance (you can adjust the separation between a binoviewer's eyepieces just as you can with a pair of binoculars), focus, squint,



strain some more and always wind up with two separate images. I couldn't get my eyes and brain to merge the pictures into one. And based on the comments of other folks who've used binoviewers, this problem, while not common, ain't exactly unheard of, either. After a while, I learned just to take a quick look through a BV when offered, mutter something like, "cool!" or "nice!" and head back to my single-eyepiece scope as soon as politely possible.

And there things stood for quite a while. I didn't bother binoviewers, and they didn't bother me. Until one day when I got an email from the good folks at Denkmeier Optical. Seems as how they'd heard some comments about my problems with binoviewing, and wanted me to give one of their "Deep Sky Binoviewers" a try. I was a little hesitant. Like I said, I like gear, and being able to give new stuff a try is one of my favorite pastimes. But I really wasn't sure I wanted to bother with something I *knew* I wouldn't like. But, in the end, I just couldn't resist. I told Russ at Denkmeier to send one on, but not to be disappointed if I hated the Denkmeier as much as I did the rest of the pack. Russ was unphased, and pretty much told me that he guaranteed I'd like his baby. Yeah. Right.

Before I knew it, there was a sizable box sitting on the dining room table. Opening this parcel revealed a well-packed black-plastic carrying case containing the Standard Denkmeier Binoviewer (\$599.00), the StarSweeper focal reducer for SCTs (\$149.00), and all necessary tubes and adapters to allow use of the binoviewer in 1.25" or 2" focusers (you'll need a 2" setup for your SCT in order to use the StarSweeper). I was immediately impressed by the quality of the Denkmeier's construction. It seemed even more solid than the (more expensive) TeleVue, which has formerly been something of a benchmark in the world of BVs. I was further

impressed by the design of the unit. In order to attach the focus tube to the binoviewer, TeleVue uses a system of fussy adapter rings. These can be a real hassle if you have to remove them, as Pat Rochford and I discovered one evening when we unscrewed the adapters from his TV, got 'em back on wrong, and basically ruined 'em to the tune of 60 bucks (we threaded one ring into the wrong part and couldn't remove it). In contrast, 1.25" and 2" focus tubes thread right onto the body of the Denkmeier binoviewer, with no adapters required. There's plenty of room in the carrying case for binoviewer, StarSweeper, focus tubes and more. This foam-padded case appears to be designed to hold a pistol (the eagle embossed on the case cover makes its sporting goods heritage clear), but it's a nice touch and works great.

Was there anything I didn't like right off the bat? The friction fit eyepiece tubes. Rather than locks of some kind to hold your eyepieces in place, the Standard Denkmeier uses friction fit tubes that hold both eyepieces in place with the aid of O rings. I like my eyepieces to be secure and tight, so I wasn't overly happy with this arrangement. It did seem to work OK, however. The eyepieces didn't fall out and I was able to slide both in and out of the tubes for differential focus and they stayed put. But it still seemed a less than ideal situation. This is actually a non-issue now, as Russ informed me shortly after I received the eval unit that all future Standard and Premium Denkmeier BVs would indeed include locking, self-centering eyepiece holders.

Looked nice. Yeah. But I doubted that I'd be able to use this thing, so, so what? A glance out one of Chaos Manor South's kitchen revealed that the coming evening would be clear, something that's been rare this Winter, though, so I decided to give the blasted thing a try. I grabbed the binoviewer, set the C11 up in the

backyard, and got Saturn in the field of view. I inserted the Denkmeier into my 2" diagonal and popped in two eyepieces (the only identical oculars I could find were two 25mm Kellners of dubious heritage). OK, let's get this over with. I put my eyes to the eyepieces, focused and... Yep. *Two Saturns*. I could feel a headache comin' on already. I adjusted the interocular spacing a bit (the Denkmeier "folds" in the middle like a pair of binoculars), focused the big SCT a little and. ALL OF A SUDDEN I WAS SEEING ONE, BEAUTIFUL IMAGE!

I could hardly believe it! After about 5 minutes of use, I even found that I couldn't *force* myself into seeing two separate images. What a revelation. Why was it so easy with the Denkmeier when I'd had such a hard time with other binoviewers? Maybe because I was able to relax and use the BV on my own scope, a comfortable SCT rather than a ladder-equipped dobsonian. But I don't think that's the whole story. I didn't have any trouble when I tried the Denkmeier in Pat Rochford's big Dobsonian either. Talking to the folks at Denkmeier, they stated that they take special pains in the design and alignment of their units to preclude problems with image merging. I guess I'll have to believe 'em, since their binoviewer worked so well for me!

But beyond being able to merge images, what did I think? While the Denkmeier is billed as the "Deep Sky Binoviewer," it was doing one heck of a job on Saturn. I'm not sure I could see *more* with the two cheap Kellners than I could when I switched in my single 22mm Panoptic. But I could easily see as much and without as much effort. And there was the added bonus of the binoviewer's pseudo 3-D effect. When using this or any binoviewer, there's not nearly enough separation between your eyes when viewing a distant object like a planet to produce a real 3-D effect. But

your brain doesn't believe this. It's seeing through two eyes, so there *must* be depth. The way my brain perceived things, Saturn was in the midground, Titan was in the background, and a couple of the other little moons were in the foreground. Completely false, but wonderful nevertheless.

One drawback to binoviewers for SCTs in the past has been the need to use them at f/10. BVs require way too much backfocus to allow you to use them with a standard f/6.3 reducer/corrector. But there's a way around this now. Denkmeier offers a 2" barrel reducer that screws right on to the end of the binoviewer's 2" focus tube and brings the focal ratio down to about f/5. I didn't do a drift check to see what the field size was, but looking at M42 and M37, "f/5" seemed fairly close. At any rate, the StarSweeper reducer produced nice, sharp stars at the field edge with my humble 25mm kellners, and the effect of being able to nicely frame the Orion Nebula while viewing through two eyes was awesome.

How were deep sky objects in general? Slightly dimmer than they were in a single eyepiece setup, but noticeably more detailed and better-looking. More details, more contrast. This was especially noticeably in M37, which tends to be rather subdued in my light pollution. A bit dimmer, yes, but "snappier." The "central" red star really stood out. And this with a pair of junk-box kellners!

Verdict? The Denkmeier Standard Binoviwer was a winner. At f/10 and f/5 it was producing astonishingly good images for me, the binoviewer hater, with astonishingly cheap eyepieces.

But I wanted to see how this thing would do under better skies (Chaos Manor South's skies are about as pink as they get). I also wanted to try it with some better quality eyepieces. To this end, I enlisted

the help of my buddy, Pat Rochford. Pat, as mentioned earlier, is a Binoviewer user and is set up with a full range of eyepiece focal lengths. When the bubbas at Denkmeier heard that I was takin' their baby over to Pat's to try under his fairly dark skies and in his 24" dob, they sent along another piece of gear, the "OCS". The OCS (Optical Corrector System) is a special lens set designed to allow dobsonians to come to focus with a binoviewer. Normally, to use a BV on a dob, you have to place a barlow type device in the light path to move the focus point. This, of course, means you lose any hope of wide fields. The OCS allows the binoviewer to focus while keeping the scope at very close to its native focal length. The unit we tried was Denkmeier's new 2" (\$299.00).

Arriving at Pat's I noticed that, while the Weather Gods were withholding their wrath for a moment, seeing wasn't good, and some fog/haze was moving it. Not a moment to spare, then. I set up the Nexstar and went to Saturn. Just great, even at the fairly high magnifications produced by a pair of 11mm TV plossls at f/10. Despite the not-perfect seeing, the view was impressive—one of the best looks at old Saturn I've had in a long time. Screwed-on the StarSweeper and did some deep sky looking, too. Naturally everything was considerably more impressive than it had been from my light-polluted environs. We did notice some vignetting and field-edge deterioration when we went to 32mm plossls, but this is about what I'd expect with eyepieces of this focal length with any SCT reducer. And at f/5, you don't really need 32s to produce wide fields.

Conditions were now obviously deteriorating further, so we tore down the NS11 quickly and wheeled out the bigdob. Pat normally uses a TV Paracorr to reduce the coma in this f/4 telescope, but this had to be removed in order to use the

binoviewer and OCS. We were very curious to see what the effect would be on field-edge quality in this fast scope. After a little fumbling around to get the OCS adjusted to the point where the scope would come to focus (the OCS barrel is adjustable to accommodate various setups—shorten or lengthen it via fine threads to suit your scope).

We got the dob focused and on M42 and took a look. Amazing! Despite bloated stars due to the seeing, the 24 presented us with some amazing views. The nebulosity was everywhere, and the 3D effect was just mindblowing. The nebula was great in my 11, but 24 inches of aperture is not to be sneezed at, obviously (I still prefer SCTs, of course!). Couple that with a two-eye view and...well, you get the picture. We also noted that the OCS must be doing something to correct coma, as field-edge stars looked quite good. We had originally intended to try the OCS with both the Denkmeier and Pat's Televue binoviewer, but the TV was, as was mentioned earlier, out of service due to our accident with the adapter rings and tubes.

Am I really a convert to binoviewers? Yes. Will I buy one of my own? That is a little harder. Despite the very reasonable price of the Denkmeier, you're talking about a considerable investment, especially when you figure in the cost of at least three sets of identical eyepieces. And the StarSweeper in my case. In my opinion, an SCT user would be crazy not to take advantage of the ability to use a binoviewer at f/5. To buy or not to buy? Yes, always a hard question when allocating those scarce astro-dollars. But I've already decided that for me the answer is "yes." I'll eventually grumble and scrape together the bucks for a Denkmeier. There's something about viewing with two eyes that captures my imagination now that I've seen just how good it can be.

Lucy Looks Skyward

The Continuing Adventures of an SCT...

Dave Moore

Dear all, Saturday night was one of the most interesting and productive observing sessions I've ever had with Lucy, my LX-90. Productive in that though judicious target selection, I was able to observe over 35 different objects over the course of 5 hours, and interesting...well, I'll let you all read on and find out...I've decided to go for a more narrative approach this time...

Saturday daytime was clear (and cold) so after dropping off my fiancée to her parents house (it is too cold this time of year for her to come out observing), I went up to Creech Grange in the Purbecks with the LX-90 to do some observing. I had five layers of clothing on - I realised (and found out) that I would need them all - the temperature was well below freezing and by the time my session ended, there was a layer of ice on just about everything...

Arriving just past 7.00pm, there was not a soul at the lookout point at Creech Grange so I set the scope up and started to let it cool down. But after a couple of moments, I realised that I could take this opportunity to look at a few more Carbon stars. I recently got a hold of Craig Nance's list of Carbon stars, and so I started looking at them. I only had the co-ordinates for five of them with me, so I spent some time looking at these. Carbon stars are one of my favourite types of objects, yet no one else seems to observe them! So over the next half hour or so, I spent some quality time out amongst the cooler denizens of the starry Universe.

VX Andromedae (Andromeda): Bright and obvious at 67x, this is a strong orange star. There are other bright stars around the edge of the FoV, when this star is centred - indeed the impression I get is of a jaw-shaped asterism of stars, with this star located in the jaws, just about to be eaten!

SY Eridani (Eridanus): An obvious deep-orange star with a slight red tinge at 67x. Forms a shallow triangle with two nearby stars. Set in an attractive field at this magnification, with a splash of faint stars visible in the FoV.

RT Orionis (Orion): A deep orange star at 67x. Slightly deeper than nearby Alpha Orionis. Obvious at this magnification but less so at 160x.

BL Orionis (Orion): A bright orange star at 67x. Not the deepest orange colour but still very nice.

RV Monocerotis (Monoceros): An orange star set in a sparse area of stars. Not the brightest star itself but very prominent at 67x. It was now 8.00pm. Cetus was past the meridian, and I wanted to have a look at a few galaxies I hadn't yet looked at (there are plenty more in Cetus, but it's getting to the point where I'll just have to keep them for next autumn).

NGC 596 (Cetus): This galaxy forms an equilateral triangle with two stars, and the whole triangle fits very comfortably in the FoV at 67x. Faintly visible with direct vision as a roundish smudge with a stellar core. 160x reveals the galaxy to be elongated, and the core is very small but very bright.

NGC 908 (Cetus): Faint but large, and elongated at 67x. No real core-brightening is detected, even if I use averted vision. Not visible at 160x. A triangle of faint stars lies nearby.

NGC 1052 (Cetus): Visible easily at 67x - round with a bright stellar core. At 160x it is elongated and has a long bright

core. It forms a triangle with two stars of roughly the same brightness.

I additionally tried to look for NGC247 but it was rapidly sinking into the west and I didn't see it. Just after that, I decided to have another go at finding the galaxy NGC 891. This has been always impossible for me (even though the south hemisphere of the sky at Creech is a dark sea horizon, the sky isn't great (ZLM: 5.6-5.8 most nights), and there always seems to be an inversion layer developing). But I finally nailed this beastie this night - thought it was almost overhead at the time, which helped.

NGC 891 (Andromeda): Very faint and needs averted vision to see properly at 67x. Located within a curving chain of stars branching off from a bright star, this galaxy appears as a faint, cigar-shaped haze with no obvious detail or core-brightening. One of the stars in the chain almost lies directly over the centre of the galaxy, giving the (correct) impression of the galaxy hanging behind the stars. It is elongated perpendicularly to the chain of stars. Not visible at 160x. Very difficult overall.

It was about 8.30pm. Another car pulled in to the car park, ruining what little dark adaptation I had. It pulled up 50 yards away and two people got out and started talking, and opening the boot and making hammering and clinking noises. After five minutes, it dawned on me - they were putting up a tent. IN THIS WEATHER? I thought to myself, but yes, there were putting up a tent. Nutters, I thought to myself, and carried on observing, resolving to go and introduce myself when they had finally put it up.

Now I was onto the "Vanity" part of the evening. I have an obsession with finding objects that hug the horizon - since April I have already logged objects in Lupus, Microscopium, the Tail of Scorpius, Piscis Austrinus and Sculptor, not

that easy from 50 degrees N. Tonight's targets were in Caelum and Columba.

Herschel 3718 (Caelum): A vanity object, and one that would have been impossible to find without the GOTO). Just so I can say that I have seen an object in Caelum from the latitude of the UK (50 degrees N). At 67x, a wide, very slightly uneven pair of white stars. Quite faint, and there is another star nearby, almost giving the impression of a triple system.

8.45pm Oops. Columba is just rising. Got to wait for a while. Whizzed by 15 minutes on a couple of galaxies in Eridanus, which was transiting.

NGC 1395 (Eridanus): At 67x a roundish, patch with a slightly brighter centre set between two stars. Visible with direct vision but better with averted vision. At 160x, it appears more elongated with a hint of a long, thin core visible with averted vision.

NGC 1637 (Eridanus): Very faint and just visible with direct vision as an irregular smudge at 67x, this galaxy is located adjacent to a line of three stars.

At about 9.00pm, the nutters beat me to it. Before I had a chance to introduce myself they popped over, said hello (turns out they were from nearby Poole and were just camping out for the hell of it), offered me a beer (I had to decline (driving), which was just as well considering what happened later in the evening), and asked if they could look through the scope. This is one of the best bits about having a telescope. Letting other people look through it and watching their reactions.

So I got out the planet-buster (the Radian) which had been safe, warm and snug in the eyepiece toolbox until now, and let rip on Jupiter and Saturn. They were most impressed. But their jaws dropped even further when the scope slewed to M42 then M31 and M37. Just seeing/hearing their reactions makes the whole

astronomy thing worthwhile). After 20 minutes we parted, them getting back to their tent to cook something, and me having their email addresses promising them to let them know of the next Wessex Astronomical Society star party.

So, it's now just before 9.30pm. Aha. Fornax is transiting and Canis Major is getting high up. Sirius sparkling intensely. Time for a little whizz around the Large Dog and the Furnace. Two open clusters and a double star in the former and two galaxies and a double star in the latter fell underneath the relentless march of Lucy.

NGC 1097 (Fornax): A quite large, cigar-shaped galaxy easily visible at 67x despite its low elevation. No core brightening detected at this magnification. With averted vision, some slight core-brightening is detected at 160x. Sits within an attractive pattern of stars - three stars forming a triangle pointing away from the galaxy to one side, and another star at the other side.

NGC 1398 (Fornax)A smallish galaxy, obvious at 67x as a alightly elongated blur. Lies within a line of faint stars. At 160x, a fuzzy bright core is visible with averted vision.

Herschel 3596 (Fornax): At 67x a faint close pair of even-brightness white stars. Well split at 160x.

17 Canis Majoris (Canis Major): A quadruple star! Four blue-white stars of slightly varying brightnesses, arranged in a slightly unequal kite-shape. All visible and split well at 67x.

NGC 2345 (Canis Major): Location: Creech Grange, Wareham, Dorset ZLM: 5.6 Bortle: 7/10 A loose zig-zag collection of about a dozen stars, which although visible at 67x, fills the FoV at 160x. There

is one bright star at one end. Not very impressive.

NGC 2354 (Canis Major): Hardly prominent above the background stars at 67x, this loose cluster appears to consist mainly of eight bright stars and many fainter stars scatted in an elongated pattern across most of the FoV.

It was past ten oclock. Another car pulled in to the viewpoint. Trying to look away from the headlights as they swept over me and the scope, I noticed the tell-tale stripe on the side of the car - it was the Dorset Constabulary on patrol. They pulled up at the campers, asked them a few questions (I gather that's it not exactly permitted to camp at the viewpoint but they didn't seem to be too bothered) and exchanged chit-chat with them before popping over to see me. They (a male and female officer) were very courteous and friendly, and just like any other time I've met policemen/women when observing, itching to look through the telescope. So Lucy went off again, on a grand tour of the heavens. Jupiter, Saturn, M42 and M37 produced the expected results, and they parted sated, and me knowing I was a bit safer for them knowing that people used the site at night to observe.

10.20pm. Columba was up far enough. I whizzed into this for 10 minutes, observing a couple of doubles:

Herschel 3735 (Columba): This and Herschel 3825 are more vanity objects, this time in Columba the Dove, which does not get very high above the horizon, although at the time of transit, both Alpha Columbae and Delta Columbae were visible above the inversion layer. Tightish at 67x, 160x shows this double to be an even pair of white stars.

Herschel 3825 (Columba): At 160x a wide, uneven pair of faintish white stars.

It was now about 10.30pm. Aha. Leo and the Big Dipper is now up.

The realm of the galaxies awaits. I spent the next hour pottering about finding some galaxies, and found a gem. I've decided to call NGC 3184 the "Stealth Bomber Galaxy" due to the asterism of stars in the FoV at 67x. There was some light-glow in this part of the sky, and a couple of targets I looked for but could not find.

NGC 2681 (Ursa Major): At 67x, only noticeable as a small fuzzy star-like object lying close to a curious asterism of stars. Four stars form an elongated diamond/kite, and then another star forms the tail of a kite. All five stars are not that bright. 160x does not offer any improvement.

NGC 2768 (Ursa Major): At 67x an elongated patch with some slight core-brightening visible with direct vision but obvious with averted vision. Forms a small triangle with two nearby stars.

NGC 2841 (Ursa Major): A fuzzy path, elongated like a rugby and with a obvious bright and large core at 67x, this galaxy lies just off a line of four faint stars. It is elongated at an angle to this line of stars.

NGC 2903 (Leo) This galaxy appears as a large squat oval but not that bright, at 67x. No core brightening is detected, surprisingly for a galaxy of this size. There is a faint star nearby.

NGC 3245 (Leo Minor): A small round and quite faint patch of light with a pinpoint bright core at 67x. Lies next to a bent line of four stars which give an impression of an elongated dipper.

NGC 3344 (Leo Minor): A small oval smudge, lying next to a star and forming a right-angled triangle with this and another nearby star. At 67x, although visible with direct vision, averted vision is needed to bring out the full form. No real core-brightening detected.

NGC 3079 (Ursa Major): A long thin galaxy, which needs averted vision at 67x to appreciate properly (although visible with direct vision at this magnification as well). What is unique about this galaxy is the setting. In the same FoV are four stars arranged like a cross, but this galaxy forms the first star and fourth arm of the cross. A very interesting and intriguing sight.

NGC 3184 (Ursa Major): A very round, faint patch of light, with no core-brightening detected at 67x. Visible at this magnification with direct vision but averted vision is better. Another Ursa Major galaxy with an interesting field - nearby is an asterism of five stars forming a shallow "V" or Delta-Wing pattern, which appears to be "flying away" from this galaxy. There is only one star between the asterism and the galaxy.

NGC 3310 (Ursa Major): Obvious with direct vision at 67x as a small fuzzy circular patch of faint light. A bright star is also in the same FoV at this magnification.

NGC 2775 (Cancer) A small faint patch of light in a barren FoV at 67x. Needs averted vision to see clearly. No core brightening detected.

NGC 2683 (Lynx): A long thin galaxy, very obvious at 67x, located in the same FoV at this magnification as an attractive triangle of stars and lying next to a fainter star. No core-brightening is detected at either this magnification or 160x.

By now (11.40pm) a thick layer of frost had coated everything bar the optical surfaces. The 30-inch home-made foam dew shield was struggling to cope, so I gave up all further attempts at faint-fuzzy finding and spent the rest of the session (a further hour or so) looking at open clusters and suchlike in Puppis and Monoceros.

IC 418 (Lepus): Stellar at 67x, only at 160x and 250x does this

Planetary Nebula show a disk, albeit tiny. It appears as a very bright grey disk with no colour variation or density variation detected.

NGC 2232 (Monoceros): Appears as a very loose and sparse cluster which fills the FoV at 67x. Gives the impression of a scattering of stars surrounding a central starless void. There are several bright stars and clumps, and one large clump, containing about 10 stars and one very bright star, 10 Monocerotis, which is the true cluster.

Beta Monocerotis (Monoceros): Glorious! Three white gems set close together in the sky. Tight at 67x, but well split at 160x, these three stars form a line. Two of the stars are closer together. All three stars are pure white and of almost even brightness, which contributes to the spectacle.

NGC 2343 (Monoceros): At 67x, I see this cluster as a small squat wedge-shaped conglomeration of perhaps a dozen stars, which seems to trail a few other stars behind it as it "flies through the sky". The stars in the wedge are fainter than the stragglers. About 20 stars in total over the FoV at 67x.

NGC 2506 (Monoceros): At 67x a small blur of stars with a few resolved foreground stars scattered across the face of the cluster. 160x reveals more stars, several dozen at all, arranged in several clumpings.

NGC 2421 (Puppis): A nice sight at 67x. Several dozen faint stars form a fairly small wedge/triangle-shaped cluster, and two nearby bright stars of even brightness point to it.

NGC 2423 (Puppis) This is a quite faint open cluster, which at 67x appears as two clumpings of many faint stars, with a line of brighter stars leading to one of the clumps. Both clumps and the line appear in the same FoV and are all aligned. The many faint stars serve to give

this cluster
an attractive look.

Melotte 71 (Puppis): Lots of faint stars arranged in a circular concentration at 67x, lying next to a triangle of brighter, but still quite faint, stars. Better at 160x when more stars can be made out.

NGC 2539 (Puppis): Very faint and needs averted vision to see properly at 67x. Located within a curving chain of stars branching off from a bright star, this lies near to a bright star, and appears at 67x as dozens of faint stars clumped together. Quite loose and no real increase in density near the core, this is still a very nice cluster, with an apparent 'stardust' effect, like M37.

By 12.30am, it was getting ridiculously cold and the seeing was horrible (fog was forming at the inversion layer) so manfully I put everything away, said goodnight to the campers (who had retreated into their tent) and drove home, arriving back in Bournemouth at 1.00am.

What a night!

The EyeOpener

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Thinkin' back to the days of my misspent youth, I remember how hard we struggled to save up the bucks for an 8 inch Celestron or Criterion SCT. In this current affluent age (remind yourself it still is, relatively speakin', anyway), though, it seems like everybody and their grandma has a big, honkin' CAT—a 10, 11, 12, 14 or even 16

inch monster. Generally speakin', except for aperture, the big SCTs are pretty much identical to their 8 inch sisters. With one important difference: the rear port.

Every SCT user is familiar with the rear port, the slightly-sub 2 inch threaded hole on the rear cell of the scope where you attach diagonals, visual backs, cameras and everything else. This hole matches the size of the 8 inch scopes' baffle tube (the tube the main mirror slides up and down on). All SCT accessories, with a few exceptions, are designed to screw onto this rear port or to fit into some other adapter that screws onto this port. End of story. For sub-ten-inch telescopes, anyway.

But, now, take a look at a bigger than 8 SCT. One thing you'll notice is the larger baffle tube. More like 3" in diameter. This provides a good support for the bigger and heavier primary mirrors of the larger telescopes, and since it's bigger in diameter, Meade and Celestron both make the rear port it opens onto bigger, too: 3 inches rather than 2. This isn't immediately obvious, though, as, to provide backward compatibility with accessories designed for the smaller scopes, Meade and Celestron both screw a rear port reducer onto this big hole. This reducer provides a rear opening of the standard 2 inch size. You can, however, unscrew this reducer anytime you want and use the 3 inch port. Or you could if there were anything to use on it. Until lately, about the only accessory to use the larger opening has been Lumicon's Giant Cassegrain Easy Guider, an off-axis photo-guider. That's changed now, though, with the release of a couple of other accessories designed to use the big port.

One of these is the EyeOpener. It's a simple concept. It's an adapter that screws onto the big rear opening of 10 inch and larger SCTs,

and which allows you to insert 2 inch accessories like 2 inch diagonals directly into the rear of the telescope. Why bother? Why not just use one of the 2" visual back/adapters that attaches to the "normal" 8 inch scope size rear port? A couple of reasons. For one thing, very long focal length, wide-field eyepieces may exhibit some vignetting when used with one of the two inch backs designed for the small rear port. The 2 inch visual backs thread over the small rear opening and accommodate 2" diagonals and other accessories, but the hole at the scope end is about 1.5 inches in diameter rather than 2 inches. The EyeOpener provides a full-size 2 inch opening—your diagonal is not butting up against a 1.5 inch port as it always is with the all 2 inch visual backs.

Another reason to consider the EyeOpener is that it provides a very sturdy and secure home for your 2 inch diagonal when you're using heavy accessories like big honkin' Panoptics and Naglers or binoviewers.

The EyeOpener (\$99.95) comes in two flavors: one for Celestron scopes, and one for the Meades. Don't ask me why, but the two companies use slightly different threads for the big ports on their scopes (the small ports are identical on the two brands). What did I think of the EO when I finally got my hands on one? I was immediately impressed by this accessory. It's beautifully machined and finished and threads onto the scope as smooth as silk. It's equipped with three nylon set-screws, and while some of the folk down here in the Swamp prefer compression rings when it comes to holding heavy accessories, the set-screws on the EyeOpener have done the job very well for me. I've never had any concerns as to whether the diagonal will be held in place securely even with a binoviewer or 31 Nagler or 35 Panoptic in place.

Other benefits? I don't tend to use really long focal length eyepieces, so I can't comment on the EyeOpener's ability to reduce vignetting. But, in addition to the benefit of providing a safe home for my heavy diagonals and eyepieces, the Eyeopener has allowed me to dispense with one piece of gear--it's nice not to have to keep track of the 2" visual back I used to use. Plus, let's face it, the thing just looks COOL.

Drawbacks? About the only one I know of is that you will, naturally, not be able to use a standard Meade or Celestron reducer/corrector with the Eyeopener, as these must thread directly onto the small port. One solution is an adapter that JMI sells. A better one, however, may be the Denkmeier StarSweeper reducer mentioned in the binoviewer review in this issue. I believe this should work as well with a diagonal and a single eyepiece as it does with a binoviewer. This would be the perfect setup for use with the EyeOpener, as the StarSweeper will thread right on to the end of your diagonal like a filter. I'll try to test this configuration while I still have the eval binoviewer here, and will let y'all know my results.

The best recommendation for the EyeOpener? Since I received mine, I've used it just about every time I've set up the scope. The Intes 2" VB sits alone in a case, unloved and unused. At its fairly modest asking price, I'd say the EyeOpener belongs in the arsenal of every big-CAT using amateur. We've all spent more than this on a so-so Plossl.

Starlight Xpress MX7C to MX716 Conversion

Luis Esteves

Shortly after I bought my MX7C I read that the hardware in the MX5C and MX516 were the same and all that needed to be substituted was the CCD chip. I contacted Terry Platt of Starlight Xpress and asked if this was the same for the MX7C line of cameras. Happily this was the case and I put in an order for a Sony **ICX249AL** CCD chip directly to Starlight Xpress.

Now why bother with a mono chip? Why the heck did I buy a color camera in the 1st place? Well, the convenience of 1 shot color is still a huge plus for me but the possibility of having a mono chip capable of taking more sensitive higher resolution luminance images to combine with color data was intriguing. Not having to buy another camera to be able to do this was what sold me though.

If you're not squeamish about this sort of surgery, the swap is not hard to do and a fairly painless calibration is all you need to do to be up and running. However, I'll insert the standard disclaimer here: This sort of thing **voids your warranty**. If you're not comfortable or don't know what you're doing, try and arrange for the camera to be sent back to [Starlight Xpress](#) or a local distributor and they will most likely do this for you. I have no affiliation with Starlight Xpress nor is the information in this article endorsed by them in any way. Its something I did myself and wanted to document in case others out there were interested in doing the same. The calibration instructions described here are adapted from a document provided by Michael Hattey of Starlight Xpress.

First lets take a look at opening the camera. **Figure 1** is confusing but there is method to the madness. The view is obviously of the rear of the camera. The 2 screws circled in green only hold the tripod adapter in place. The screws circled in white attach the back plate to 2 long bolts

that run the length of the camera

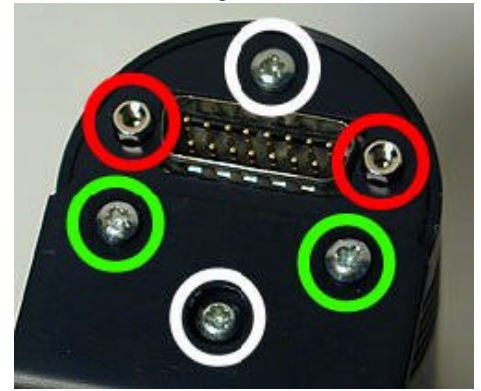


Figure 1

that hold the optical window housing in place. These must be removed. (Be careful not to over tighten these when you put the camera back together!) The hexagonal nuts circled in red hold the back plate of the camera to the 15-pin plug that is soldered to the circuit board. These must be also be removed.

Once the back plate and the camera housing have been removed you will notice a long brass bolt on each side of the camera. These bolts hold the front part of the camera in place - the metal housing for the CCD to which the optical window is attached. Be careful when removing these as the whole front of the camera will come off and the CCD enclosure is made airtight with thermal heat sink grease.

If you are going to do this it is be a good idea to get some computer silicone heat sink paste (a.k.a. thermal grease) at Radio Shack or on-line. The grease under the chip on my camera was completely dry and I had to clean it and reapply some. Remember though that a little goes a long way with this stuff!

While you're at Radio Shack pick up an anti-static bracelet. CCD chips (like most electronics) can be easily destroyed by a static discharge and it is always good practice to keep yourself grounded.

Figure 2 is a close up of the chip. The easiest way to remove it is with

a thin flat-head screwdriver like in the image or prying it up with an x



Figure 2

acto blade. Alternatively, places like Radio Shack have specific tools for inserting and removing chips from sockets without damaging the pins. The trick is to gently lift one end and then the other off of the cold finger until the chip comes loose. It is very easy to bend the pins if you aren't careful.

Note the notch on the left side of the chip. This is **not** pin 1. (It is in fact close to pin 10) It is there, I assume, for leverage to make removing the chip from a socket easier. Pin 1 on these chips is marked by a circular indentation on the underside of the CCD. Since the notch is easily visible I used it to mark the orientation of the chip in the socket. This is **very** important to take note of. If the CCD chip is incorrectly inserted you could destroy the CCD and possibly the camera. That said though, the Sony CCD chips are very similar and pin 1 (or 10) should be easy to identify. I used a drop of liquid paper to mark the position of pin 10 on the cold finger for future reference.

In **Figure 3** you see the cold finger with the CCD removed and dried grease I had to replace. The grease around the edge of the camera was thick but holding out so I left it. It is there to make the enclosure airtight and prevent moisture condensing and then freezing on the CCD chip as it cools down. This was a major problem I had with my CB245.

Installation of the new chip is easy - correctly orient the CCD in the socket, check that all the pins are entering the sockets correctly and press down gently and evenly putting pressure over the pins on each side. It should just slide in.

Under the CCD is the cold finger and under that is the TEC or Thermoelectric Cooling Device.

Once the new chip is installed

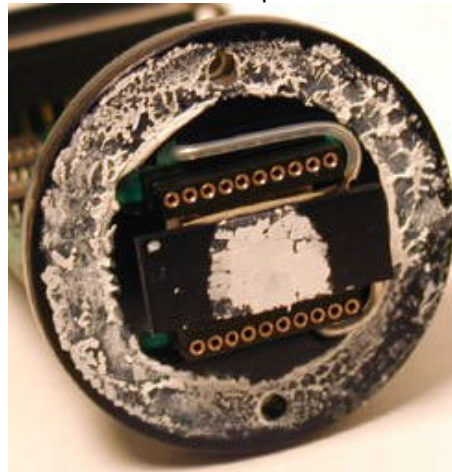


Figure 3

replace the CCD housing and secure it with the long brass bolts. Do yourself a favor and make sure that the glass is very clean both on the housing and on the CCD window before closing it. Any dust specs on these surfaces will show up as circles or doughnuts

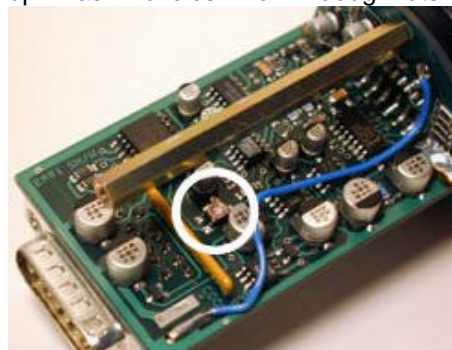


Figure 4

(depending on your telescope) when you try to image forcing you to take flat field frames.

Don't close the rest of the camera

yet, as we now have to calibrate it for the new chip. For calibration we will run a few tests with the camera open and running so adjustments can be made to 2 variable resistors located on opposite sides of the printed circuit board. VR1 is located close to the center of the PCB and is pictured in **Figure 4**.

First of all fire up the camera and take a test image through a pinhole or with a camera lens attached. Hopefully you'll get a normal image and we can move on to dark frame adjustment. If there is a problem, power off the camera and double check the obvious. If the problem persists try reinstalling the color chip and taking an image with that.

For the dark frame test we need to let the camera cool down for about 5 minutes. Then, cover the camera so no light can make it to the CCD chip (Remember how sensitive these chips are to light! I actually put my camera in a black cloth bag as well as covering the CCD.) and take a 1 second exposure and look at the histogram of the dark frame you just took.

The histogram of a properly calibrated camera should look a lot like **Figure 5**. (Note: I used the MX716 version of the software - Starlight Xpress Star_MX7 v2.0e (04/06/2002)) There should no more than 1 or 2 entries in the VAL field and the values should range from between 006 and 016.

If the values are greater than 16, use a small flat-head screwdriver to turn VR1 a few degrees anti-clockwise. Then take another 1 second dark frame and examine the histogram values to see if further adjustment is needed.

If the values are lower than 6 use a small flat-head screwdriver to turn VR1 a few degrees clockwise and repeat the dark frame histogram process until the values are correct.

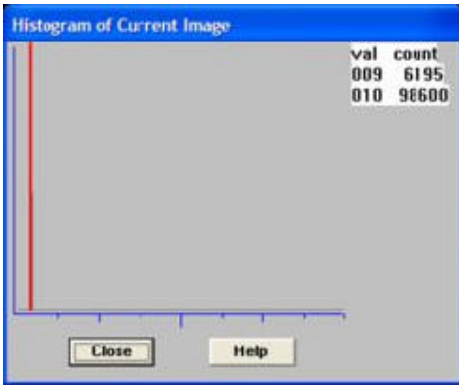


Figure 5

After this process is complete it is a good idea to take a 5minute dark frame to make sure the darks are free of hot spots bright streaks. There will probably be a brighter area in the upper left area of the frame. This is caused by the output amplifier and should be quite faint. If you have the chance it would be a good idea to compare your dark to the dark frame of a calibrated camera of the same type.



Figure 6

For the calibration of VR2 we are going to need a light with a narrow a beam as possible to simulate a star. There are 2 methods for doing this - one easy way is to shine a light or a laser at a spherical Christmas tree ornament to at a ball bearing and to focus the CCD and camera lens or telescope at the reflected beam.

The method I used was to tape a high power eyepiece to a flashlight as seen in **Figure 6** The eyepiece

will focus (or narrow) the beam of light to a finer point. I used a University Optics 12.5mm Orthoscopic. I found the beam to be too bright even with the flashlight on the lowest setting so I added a variable polarizing moon filter to dim the light even more.

VR2 is located on the opposite side of the PCB towards the edge and front of the camera as seen in **Figure 7**. This variable resistor controls the ABG (Anti-Blooming Gate) bias on the CCD chip. Anti-blooming prevents streaking and bloating of bright stars but slightly and affects linearity. The ABG gate can be effectively turned off by turning the VR about 20 degrees anti-clockwise.

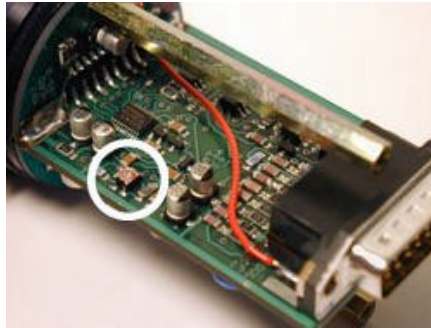


Figure 7

To calibrate VR2 we need to focus the camera on a light source (as previously described) in a dark room and take a 1 second integration. My camera's ABG bias was set too low and my image of the light source looked a an oval due to "bleeding" caused by anti-blooming being almost set to the off position.



Figure 8

To calibrate the camera, take a 1 second picture of your light source. If the resulting image looks like **Figure 8** and/or if there is a bright streak in the image then the ABG gate is set too low. Turn VR2 a few degrees clockwise and take another integration.

If the image is gray or grainy then the ABG is set too high. Turn VR2 a few degrees anti-clockwise and take another integration to test the result. If you overshoot too much in the clockwise direction the camera sensitivity will be decreased by too much anti-blooming. If you overshoot anti-clockwise sensitivity will be higher but stars will be bloated and oval and streaks will appear so proper calibration is critical. This is the hardest and most painstaking part of the calibration to get right.

My suggestion is to turn VR2 anti-clockwise until you get a bloated star image like mine and then take 1 second integrations turning VR2 clockwise 2 or 3 degrees at a time until the blooming just disappears. For the final step in calibrating the camera point it at a white target and take an integration that results in a mostly saturated image. Here I printed 4 colored boxes and a thin crosshair for reference. The resulting histogram should have a major peak at a VAL of 255. If the peak does not reach a VAL of 255 or if the image or looks gray or grainy then VR2 is set too far clockwise and you must go back and adjust it.

And that is it! You now have a MX7 with either the color or the mono chip installed, all calibrated and ready to go! Happy imaging and if you have any questions about this article or need any help; please feel free to contact me at turtle@astroturtle.com.

Clear skies!
Luis Esteves
<http://www.astroturtle.com>

Confessions of an Astromart Junkie

Stu Forster

6 AM, alarm buzzes, turn on the computer, let the dogs out. Cool!! Windows has booted. Double click on the AOL icon (yes, I still use a dial up service). Great, got right through. Hit favorites and there it is Astromart. What's for sale? What don't I have two of? Ooh! A 10mm Radian, more Losmandy counterweights, some filters. Nah! Price is too high, shipping is too much, but that O-III filter I don't need is the right price. Well lets e-mail and see if it's still available. Shucks! Sold. Well gotta hit the shower and get to work.

Home from work. Let the dogs out. Turn on the computer (no, I don't leave it on all day long). AOL again. Go directly to Astromart. Do not pass go, do not collect \$200. Be right back, gotta check for new bargains. Shucks, no new listings. This sad scene repeats itself several times per day.

What is Astromart? For many years I saw ads in Sky and telescope for the Starry Messenger. This along with the classifieds in Sky and Telescope were the primary sources of used astronomical equipment. The Internet changed all that. A big problem with the Starry Messenger was that most of the bargains were gone by the time you got it from your mailbox. Astromart changed all that. It is a non-profit on line site run by Herb York of Anacortes Telescope & Wild Bird. At the current time he personally reviews

all ads to make sure some of the prior unscrupulous posters are kept off the site.

Why buy used? Most amateur astronomers take excellent care of their equipment and you can find eyepieces, mounts and optical tube assemblies for up to 50% or more discounts. In the past 6 months I have purchased scopes, eyepieces, a mount, an electric focuser, filters and adapters all in good condition at significant savings. Another reason to buy used, is that if you don't like a particular product, you can usually sell it for what you paid. Basically try it and sell it if you don't like it. So, if you're looking for some used equipment and don't need it yesterday give Astromart a try.

How do I access it? <<http://www.astromart.com>>. Click on **classifieds** and log in. The first time you log on, you will have to give some personal information. The site will store your password and then you can click on **View Ads**. From there, you can browse the ads and expand the ones you're interested in. But be careful. It's addictive and you'll be amazed at how much equipment you didn't know you were missing.

Lunar Software in Review

Chuck Taylor

For almost two decades, lunar observing has been the forgotten step-child of astronomy. New atlases and guide books for DSOs have come out nearly every year, while the Rukl Atlas of the Moon is no longer even printed (and there is no sign of the new Rukl or any other new atlas). In the same manner, there has been a ton of software written for telescope design, DSO planning, planetarium programs, and almost anything else not related to the moon. But in the last couple of years, interest has swung back to

lunar observing. And with that has come three new software packages for lunar observers. Last year I began working with these three lunar software packages: Lunar Phase Pro (LPP), Virtual Moon Atlas (VMA), and Lunar Map Pro (LMP). This review will attempt to list the strengths and weaknesses of each along with a comparison. However I tested the programs whenever I had free time. And since RITI's program requires you to have the original cd present, I wasn't always able to work with it. Therefore, most of this review will focus on the first two with comments about the third where appropriate. LMP will be reviewed in-depth in a later article.

INSTALLATION & REMOVAL

All three programs installed without any major problems. My testing was assisted by two lunar novices who helped me by installing, using and then removing LPP and VLA on their own systems. The only difficulty reported was when one of the testers had a brief problem finding his longitude and latitude for LPP and VLA. (LMP does not require this input since it does not correct for libration --- LPP allows you to enter multiple sites, all corrected for their own libration). VLA is downloaded from the website, and full installation requires manually running seven self-extracting zip files. LPP and LMP install automatically from a CD.

Both testers also removed the programs from their computers at the end of the testing. Both LPP & VMA did a fairly good job of uninstalling. Both programs left the directory structure intact, but it was easily removed. Norton reported LPP had cleaned up all registry entries, while VLA left only one behind. I removed and reinstalled LMP on my own machine, and found it did not leave as clean an uninstall as the other two. However, Norton was again able to remove the remaining registry entries.

SERVICE / SUPPORT

LPP and VMA are supported by their authors. With LPP there is a Yahoo support group as well. While I was not able to measure response times for all three packages, I did notice that a bug was recently reported to Gary Nugent (LPP author) on the Yahoo group. A fix was released that same day. The individual who had reported the bug commented that Gary had fixed it in 2 hours and 49 minutes from initial report to the time the new download was available! YMMV :) Gary also solicits feedback to determine what features to add next. The LPP group is at <http://groups.yahoo.com/group/LunarPhasePro>

Patrick Chevalley, the author of the software half of VMA is also the creator of Cartes du Ciel, an excellent star-charting program. He has a good track record of listening to the desires of end-users and incorporating new features. He has done this with CdC and now with VMA.

LMP is a relative newcomer and does not have a proven track record in this area. I have written to them several times, and usually received a response. However the responses were reasons why they couldn't incorporate a given feature (libration). They did not respond to a request that they remove the ridiculous copy protection scheme. However I understand that since I wrote, they have allowed some to purchase an additional key that allows them to use the program on one machine without having the original install CD present.

SYSTEM REQUIREMENTS

VMA does not list hardware requirements, simply stating it requires Windows 95, 98, Me, NT, 2000 or XP. To fully run does require OpenGL.

LPP also does not list hardware requirements but also requires OpenGL for the best map image. Gary's recommends "Win 98/ME/NT/200/XP300 MHz, 96Mb RAM, 23 Mb free disk space. It runs

under Win95 but it is not guaranteed or supported (Microsoft no longer supports this version of Windows)"

LMP states they require "300 MHz, 96MB RAM recommended, Windows 98 and later, 160 MB (minimum 85 MB) of free disk space."

I tested the programs on a Compaq Presario laptop with a 1.4 GHz P4 and ATI Mobility Radeon 7500 graphics running XP. The second system is an older Celeron 733 running Windows ME. My two helpers had briefly installed LPP and VMA on a similar Compaq laptop, and a desktop system running a 2.0GHz P4 and Windows 2000. I looked primarily at the two laptops for performance comparisons, as it seems these programs would be most helpful on a system that can be taken to the telescope. In both cases LPP was significantly faster than the other two programs. Pan and zooming the lunar map was quick and responsive. VMA would have a 23 second delay before it began the first pan or zoom. Subsequent zooms or pans in the same direction were much quicker. But if you tried to pan in a different direction (up-down instead of right-left), there was again a delay of several seconds. If you went back to the first direction, there was again a delay. In going to configuration or other screens, there was a delay with VMA. I am used to windows snapping open with the laptop but this did not happen with VMA. However both programs were faster than LMP. LMP's slowness is confusing when you realize it is not correcting for libration but simply posting a map on a sphere and portraying it at neutral libration.

All three programs require OpenGL to operate best. Bitmaps are available for systems not having this capacity. LPP allows the user to switch between the 3D view and a flat Mercator projection bitmap. The Mercator projection does not have

North/South Pole views or libration correction and libration animation.

LUNAR PHASE PRO

Do you remember when you were a kid and wanted one of those fancy Swiss Army Knives? There in one red package you could have a saw, scissors, tweezers, toothpick, bottle opener, file, slotted and philips screwdriver and even a knife blade! Well LPP doesn't have the fat red case, but it does take the same approach to Lunar software.

The opening screen shows the moon with current phase and the correct libration, with a marker for the point on the lunar limb that currently is at maximum libration. This view can be set for flipped or inverted views, depending on what you use to observe the moon. Around that are listed the time and dates for the four different quarters (new, half, full, half), percentage of the moon currently illuminated, age, current distance, RA & DEC, Alt & Az, angular diameter, time and date of apogee and perigee, time of today's moonrise, moonset and transit, sunrise, sunset and sun-transit time, twilight start and ending time (civil, nautical and astronomical) and colongitude. Additionally, a table of libration data adds North-South libration, East-West libration, degree of maximum libration, position angle for that libration and the moon's current position angle. But even more amazing is that all of this data is clear and available at a glance, due to the clear layout employed.

A dropdown menu accesses features to find lunar eclipses within a specified timeframe, display a calendar with phase for each day, lunar features database, Equinox & Solstice dates, Internet links, basic lunar data and other features which will be described below.

As I mentioned, the opening screen tells the current libration, both graphically and in table form. Both LPP and VMA correct their maps for the current libration. LMP does not, which means that when you are

observing near the lunar limb, LPP and VMA will show you what is actually visible, and LMP will not. This is a major difference and one of LMP's biggest problems.

But while both LPP and VMA indicate the correct libration, LPP takes it several steps farther. Clicking on the Moon Explorer button brings up a large image of the moon with current libration. But if you click on the start arrow, the phase and libration shifts to the first of the month. From there, it plays like a movie, with the terminator moving across the surface and the moon shifting to show the proper libration at each point. A clock at top shows the date and time for each frame in the animation. At this point in the review process I ceased to be a lunar observer, and became a kid with a new toy. This has to be the

coolest feature in any of the three programs! There in front of you sits the moon, rocking back and forth with the small libration changes caused by the observer's movement as the earth rotates. And overall is the much larger movement of a month's worth of libration changes, played out before you. It is fun to just sit and watch favorite craters move up into view and back towards the limb. Even more centrally located craters like Tycho, Plato or the larger Mare Crisium move in and out, changing in apparent shape as they go. I confess I played with this for a long time before moving on to checking out the other features!

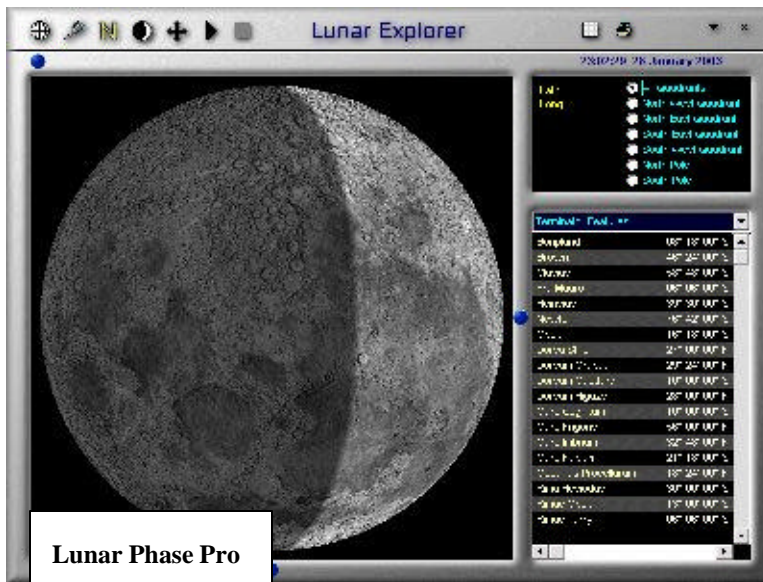
Along with the libration movie and the libration data on the initial screen, there is a clear graph showing the direction and amount of libration for each day of the month. This can be presented for a geocentric position or your actual

geographical location. Again, the small loops caused by the earth rotating the observer from horizon to horizon are superimposed on the larger monthly libration movements. Those wanting to observe features in the libration zones can quickly print out the libration results for the full month.

This brings up what I see as an underlying philosophical difference

are only prominent for a few hours, when the terminator has passed them but not gone much farther. Looking up a crater that was where the terminator would be for best viewing of this cluster of craters, I checked LPP and found the date and time (my own local time) of sunrise for that crater. This was then included in the LFM article, as well as in my own observing session plans. In the same manner, if you wanted to observe or photograph Rupes Recta at sunrise, a quick check would tell you when sunrise will occur. I am presently printing out the sunrise and sunset data for all the listed features each month. It only takes a couple of pages but is very helpful!

The accompanying visibility charts also help with planning by showing how high above the horizon the moon will be at those



in the three packages. LMP basically presents what is present in a printed atlas, but at a smaller scale. There is no correction for libration. VMA takes this much farther, presenting the actual libration for the current moment. LPP does this as well, but also gives you additional tools and data for planning your observing sessions. All three give you a map, but LPP helps you plan out your observing sessions for the month.

This is illustrated by the second major feature I discovered (and the one that is rapidly becoming my favorite). Instead of simply listing lunar features, LPP presents them with the date and time for sunrise and sunset at each of those features. Printing this out is a big help for planning. For example, in writing this month's LFM (on Tycho) I wanted to point out a swirl of craters that are near Tycho. They

particular times of sunrise or sunset on the features I want to observe. Also listed are the moonrise, moonset and transit times for each day of the month in question.

Once you go out to the scope, the Lunar Explorer Screen will come into play. This presents a map of the moon, corrected for libration. LPP and VMA have about the same level of detail. LMP has a slightly higher detail map, but it is much slower when panning or zooming. LPP is definitely faster than VMA and much faster than LMP.

The map and the ability to identify features works both directions. That is, you can click on a feature on the map, and LPP will give you the name and information about that feature. Or, you can go through a list of features and click on a name. The corresponding feature will then be highlighted on the map. Lists are

broken down into 19 categories, including craters, maria, spacecraft landing sites, domes and rima. An additional category lists all of those items which are currently on the terminator.

Easily accessed buttons scroll the display to center the section you want to observe. A slider at the top will change the zoom so you can zoom in on a detail, or drop back to have the full moon in the display. Shortcut buttons will zoom to the 4 lunar quadrants and a North or South Pole view.

An additional feature is the map of the moon's far side. LPP is the only one of the three to include this interesting (and fun!) ability. All of the features work on the far side so you can zoom in, pan, identify features etc.

The map can also be flipped or inverted to show the view as it will appear in your scope. LPP and VLA both have this feature.

VIRTUAL MOON ATLAS

Virtual Moon Atlas is the latest product by Patrick Chevalley, the creator of Cartes du Ciel. It appears to use the same map scale as LPP. It does not include the many session planning tools of LPP but has some unique features of its own. Chief among these is the library of photographs. These can be called up for different lunar items you may be interested in. Many of these are Lunar Orbiter & Apollo photos, and all of the photographs are of high quality. Orbiter and Apollo photos have the disadvantage of being taken from a different angle than you are observing from --- features show their actual shape rather than the foreshortened view you have through the telescope. But their unsurpassed clarity and detail easily make up for this. There is also the ability to add your own photographs and link them to the program.

VMA supplies more information on lunar features than does LPP. The description can be helpful,

Mapping Feature	LPP	VMA
Lunar mapping	Yes	Yes
Flip/Invert the map	Yes	Yes
Information on Lunar features	Yes	Yes
List features on the terminator	Yes	Yes
Go from list to map	Yes	Yes
Go from map to list	Yes	Yes
Measure distances	No	Yes
Print maps	Yes	Yes
Show current phase	Yes	Yes
Indicate point of maximum libration	Yes	Yes
Geological map	Yes	Yes
Feature database	Yes	Yes
Show far side of the moon	Yes	No
Take advantage of higher screen resolutions (above 800x600)	No	Yes

especially for those who are unfamiliar with the item in question. The descriptions have apparently been translated from their original French, which occasionally gives unintended results. For example, Tycho is described as, "Furnace of the most important radiating system," rather than being the center of the largest system of rays. But overall, the translations are clear and concise. The information also supplies the page number for Rukl, Hatfield, Westfall and Viscardy. Additionally, clicking on the "Neighbors" button will give a list of lunar features that are neighbors with the item you are studying.

Unlike LPP, the link between the lunar feature database and the map is only one way. That is, you can click on any feature on the map and it will be identified. But you cannot go to a list, select a crater or other feature and click to have it highlighted on the map. The only

exception is features that are currently on the terminator. Features near the terminator can be selected from a list and they will become highlighted on the map.

There is also a geologic map, dividing the surface into several different geologic categories. Unfortunately this is at a very rough scale and only of limited usefulness. It would be nice to see all three programs add higher resolution geologic maps in the future.

One additional feature is the ability to measure distances. Using the "Tools" section of the map you can mark points with the cursor and get the real distance between them. As with LPP, you can flip or invert the image to match the view at your telescope. This is especially helpful to those who have a hard time going from a "correct" map to a flipped or inverted view at the telescope. The map view can be zoomed and panned.

FEATURE COMPARISON

It is hard to make a table in text files, so for the feature comparison I have listed the feature and then yes/no for LPP, followed by yes/no for VMA. Features are broken down into mapping and planning functions.

As you can see, both programs do a good job of mapping the moon. LPP simply adds more tools for planning your observing sessions.

EDITOR'S CHOICE

As you may have noticed by now, I am impressed by both LPP and VMA, and less so by LMP. I am awarding an editor's choice to both programs but for different reasons. VMA earns an award as it is very good mapping software at an outstanding price (free). Patrick Chevalley has developed both VMA

and CdC as freeware to encourage amateur astronomers around the world. His vision and generosity are to be commended. And, even though it costs nothing, it is good software! I would encourage anyone

companies employed copy protection schemes. They are all inconvenient, and manufacturers slowly realized that people were simply not buying programs that required them to lug around their

Bear in mind that this is a simpler version and does not have all of the planning features of Lunar Phase Pro. I think you will find the additional features in LPP to be worth the \$40 expense.

who has a computer to download VMA and start there.

LPP is also an outstanding value. LPP goes beyond the mapping abilities of the other two and adds a great lineup of tools to plan your observing sessions (lunar feature sunrise/sunset times, visibility charts, libration charts), as well as the cool libration movie. The cost is only \$40. You can also download a simpler version (Lunar Phase) as shareware (\$30 registration and any registered LP user can later upgrade to LPP for \$15). As helpful as VMA is, I think that most will find it worth the expense to purchase LPP and gain the planning tools.

Planning Feature	LPP	VMA
Monthly libration movie	Yes	No
Calendar with phase for each day	Yes	No
Visibility chart (showing moon's height above the horizon)	Yes	No
Lunar Eclipse finder	Yes	No
Graphs of monthly libration changes	Yes	No
List of sunrise and sunset times for Lunar features	Yes	No
Table of Lunar rising, setting and transit times	Yes	No
List libration by degrees and position angle	Yes	No
Internet links	Yes	Yes
List of sunrise, sunset and sun-transit times	Yes	No

original disks. They were buying the competitors' programs instead. RITI supplies a lengthy explanation that it is not because they don't trust their customers but rather they must "protect their investment." It is time to realize this is true for *all* software makers. And obviously they do not trust their customers because their customers are the only people they are selling this software to! Costing more than twice as much as LPP, not correcting for libration, being the slowest of the three programs, and having a very inconvenient copy protection scheme put LMP in last place in this review. Still, others will not hesitate to spend the extra and will have all three programs installed.

LMP is the only nonwinner. But let me add that it is not bad software. Many will prefer it even with the higher price (\$89.95). The map resolution is higher than either LPP or VMA. But it is the slowest of the three programs. Even more critical, the view is not corrected for libration. Yes, I know --- If you contact RITI they will explain that the terminator has been corrected for libration to make sure it is in the right place. But when I observe on the Lunar limb, I want to know what can and can't be seen. If I go to a map, I want it to match the view I have at that particular libration angle. If it doesn't, I am ahead to stick with paper charts and maps. And, my own personal pet peeve is stupid copy-protection schemes. In the 1980's, many software

If money is very tight, I would definitely start with VMA. You can also download the simpler shareware version of Lunar Phase.

VMA is presented as freeware and is available at http://www.astrosurf.com/avl/UK_ind ex.html

A description of LPP with screenshots can be seen at <http://www.nightskyobserver.com/Lu narPhaseCD/> You can also order the installation CD at that site. LP is presented as shareware with a \$30 registration. It is available at <http://www.nightskyobserver.com/Lu narPhase/> LPP is the full version.

LMP is available from RITI and can be ordered at <http://www.riti.com/prodserv lunarm appro.htm>

Clear Skies and enjoy the Moon!
Chuck Taylor Moderator: Lunar- Observing List



Seven Strangers?

Dr. Tony Phillips

At the dawn of the space age some 40 years ago, we always knew who was orbiting Earth or flying to the Moon. Neil Armstrong, Yuri Gagarin, John Glenn. They were household names-- everywhere.

Lately it's different. Space flight has become more routine. Another flight of the shuttle. Another visit to the space

station. Who's onboard this time? Unless you're a NASA employee or a serious space enthusiast, you might not know. Dave Brown, Rick Husband, Laurel Clark, Kalpana Chawla, Michael Anderson, William McCool, and Ilan Ramon.

Now we know. Those are the names of the seven astronauts who were tragically lost on Saturday, Feb. 1st, when the space shuttle Columbia (STS-107) broke apart over Texas.

Before the accident, perhaps, they were strangers to you. But if that's so, why did you have a knot in your gut when you heard the news? What were those tears all about? Why do you feel so deep-down sad for seven strangers?

Astronauts have an unaccountable hold on us. They are explorers. Curious, humorous, serious, daring, careful. Where they go, they go in peace. Every kid wants to be one. Astronauts are the essence of humanity.

They are not strangers. They are us.

While still in orbit Dave Brown asked, jokingly, "do we really have to come back?"

No. But we wish you had.

Please see the NASA Home Page (<http://www.nasa.gov>) for more information on the Columbia investigation.



This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

My Back Pages

"Crimson flames tied through my ears
 Rollin' high and mighty traps
 Pounced with fire on flaming roads
 Using ideas as my maps
 "We'll meet on edges, soon," said I
 Proud 'neath heated brow.
 Ah, but I was so much older then,
 I'm younger than that now."



Time for the Boom-Booms! For all y'all benighted Yankees and others, I mean the PARADES! Mardi Gras parades, that is. You know, drink a ll day, eat junk food, holler, wander around downtown and yell at the dudes riding on the passing floats to "throw me somethin', mister" (if you're a female you may use different tactics). It's amazing the value we begin to place on plastic beads and moonpies in our slightly altered states of mind. So, yer ol' Uncle was standin' on the corner waitin' for the next parade to come by on this just passed Fat Tuesday. That Rebel Yell SHORE was good! Lookin' sideways at my combination fan and parade schedule, I noted that the "Krewe of Fools." was up next. "Hmmm...haven't heard of that one before. But there are a lot of new parading mystic societies these days. BUT ONLY ONE FLOAT?" And man, how ratty can you get? A flatbed trailer being towed by a 1964 Mercury Monterey! And only two maskers? And," OH MY GOD, IT'S THEM!" .<CLONK> Went the hermetically sealed mayo jar (kept on Funk and Wagnal's porch for a fortnight). Tossed by Butt-Head in lieu of beads and which contained the very, very, very latest—heh-heh--

Rumours

Whatever happened to the lawsuit between Meade and Celestron that we were all so worried about a while back? Well, on 2 March, the following appeared on Celestron's web site:

IN HONORED MEMORY



Torrance, CA — March 03, 2003

On February 28, 2003, the U.S. District Court of the Central District of California entered its Order granting Celestron’s Motion for Summary Judgment that Celestron’s NexStar GPS 8 and 11 products, NexStar 5, 5i, 8 and 8i Products, NexStar GT 4, 60, 80, and 114 products do not literally infringe Meade Instrument’s U.S. Patent No. 6,304,376 related to Meade’s ETX/Autostar telescope technology.

In the Order, the District Court also Denied Meade’s motion for summary judgment of infringement that Celestron’s products listed above infringe on Meade’s U.S. Patent No. 6,304,376 related to Meade’s ETX/Autostar telescope technology.

Celestron, based in Torrance, CA, is a leading manufacturer and marketer of computerized and non-computerized telescopes as well as binoculars and sport optics products. Celestron products are sold and distributed both domestically and internationally.

Chances are Meade’s lawyer’s haven’t played their last card, but if the Fat Girl ain’t sung yet, she’s warmin’ up. Which in the opinion of the Anonymous One is a good thing. With this foolishness over, maybe both companies can get back to building scopes.

Is Lumicon back?! I’d have thought the famous astrophotography shop and scope/accessory dealer was gone for good after they declared bankruptcy a little while ago. But a visit to www.lumicon.com shows a big COMING SOON banner. A bit of digging has revealed that the Lumicon domain is now owned by Parks Optical/Scope City, the long-time California scope maker and dealer. So, it appears that Lumicon may be back (and selling filters and OAGs) as a “wholly owned subsidiary” of Parks.

AstroPhysics to make eyepieces? I hear that Roland and Company have entered an agreement with Valery and Company (Aries) to produce a line of high-toned planetary eyepieces.

Where’s my 14 inch LX200 GPS? That’s what a lot of folks wanna know; especially those who preordered these new big dogs of the CAT world. Apparently, putting one together was not quite as simple as the Meade boys had imagined, and steps are having to be taken to beef up fork and drive system from that used on the smaller scopes. Right now I’m hearing “sometime in March”...but that appears to be rapidly

slipping to “midyear.” On the question of whether or not the OTA will be removable from the forks, the last I have is “NOT”.

Fat Tuesday is over an’ my head *hurts*. So I hope you won’t mind if I call it quits here for now. Actually, I don’t care whether you do or not! The Anonymous One is goin’ to bed! ☺

--The Anonymous Astronomer



The doors of Chaos Manor South are *always* open to visiting astronomers! Here’s Tom Clark, Dob Guru and editor of Amateur Astronomy Magazine posing with Miss Dorothy in the front parlor of our beloved manse!