



NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC

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Looking Ahead

Remember, you are always welcome to attend meetings of Council, held on the first Tuesday of every month at 7:30pm in the G.S.O.

January: Lee Johnson with an *In Transit* talk on spring constellations

February: Simon Lily of the DSO, Canadian Project Scientist for the Next Generation Space Telescope

March: Dr. Robert Smith of the U of Alberta speaking on Hubble's history & impact on astronomy

April: Martin Connors of Athabasca University: "Auroras"

May: Ray Villard, Director of Public Relations, Space Telescope Science Institute

Next Issue Deadline

Material for the March Nova should be submitted by Monday, March 5, 2001. Please send submissions to:

Gordon Farrell
(gfarrell@home.com)

or Bob Parry
(robpar@ballard.com)

Review: The ETX-125 with Autostar

by Dan Collier

Surprise! Vancouver Centre won an ETX telescope at the 2000 General Assembly. It's a computerized 127-mm (5") f/15 Maksutov-Cassegrain with an 8x25 finder, a 26-mm Plossl eyepiece giving 73 power, and the Autostar hand controller featuring "go-to," thousands of objects, and RS-232 capability. In testing this scope, we found the ETX's reputation for dubious reliability to be well founded.



The "Mak" has both reflecting and refracting elements and as such it falls in the family of *catadioptric* telescopes. Someone made up this interesting word by combining the Greek adjectives *dioptric* and *catoptric*. Unfortunately, *catadioptric* translates as "something broken that you look through." That would be uncomfortably close to the truth in the case of the ETX. Anyway, a Mak combines a concave *primary* mirror with a lens called a *corrector*, and a small con-

vex mirror, or *secondary*. There is also a diagonal mirror that can be flipped away to allow the light to reach an axial accessory such as a camera or a prism erector. Because

the light path is folded back on itself, the Mak is short-tubed *comme un Cassegrain*. A powerful f/15 telescope occupies a body stubby enough for an f/3 refractor.

By adding his characteristic bowl-shaped corrector lens (a.k.a. *me-*

niscus), Mr. Maksutov devised a compact, well-corrected telescope without the Cassegrain's difficult aspheric optics. The only exotic component of the Mak is the corrector. A heavy, perfectly homogeneous piece of glass is required, and a lot of material has to be gouged away to produce its meniscus form. The corrector of a small Mak might be a centimetre thick at the centre and measure more than 2 cm "between perpendiculars," as a

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Knowledge

by Marc Verschueren

How much does an amateur astronomer really need to know about astronomy? I do have to think about this question very often while I write one of my articles. There is, of course, no real answer to this. It is a strictly personal question. I do feel that what I think I understand quite well I should share with my fellow members. That is one of the essential workings of the club. I hope that others do this in areas where my knowledge or experience is lacking. But what level do we have to reach? This is the same problem that exists in organizing a speakers program for the association. What should the level be? Our local program here in Vancouver has, in general, found a remarkable balance.

All this is, of course, related to the question of why people get interested in astronomy and take up observing the stars as a hobby. One certainly does not need a deep scientific interest in the subject to do this. One can compare this to many other cultural interests people can have. It is perfectly possible for me to be interested in music and to spend whole evenings listening to records without me knowing a single note from another. To enjoy music that way, I not need to be able to read music or to be capable of playing an instrument to perfection.

I must only be able to listen. A tone-deaf person would be denied this pleasure. If I have a small telescope I can look at the stars without being an expert in cosmology. But you must be interested in the sky out there and be able to see something.

But it is clear that immediately some technical knowledge is necessary. You can't just point your telescope to the sky and just look at whatever you happen to find in your eyepiece. You want to know what you are looking at. Or you want to know how to find an object, using a chart, etc., etc. Immediately, technical astronomical knowledge appears to be required and we all have a good solid base of this. And it is not hard to see how we will keep building on this base. As we progress, the subject becomes more and more fascinating in many different directions. I always admire those people who become masters in photographic imaging, something I have personally never attempted, but I feel I am really missing something. You always want to know a little bit more. This is not intellectual greed or some disease that sneaks up on us. It is an essential part of being an observer.

An amateur observer will always be tempted by a little bit more knowledge that will feed his curios-

ity. There are many ways to keep going in this direction. One does not have to be an expert in CCD imaging to make astronomy fascinating. The history of astronomy by itself is a guide that can occupy a lifetime and give meaning to observing. When one sees the moons of Jupiter, one can hardly not think of Galileo. When one sees a planet move from one day to another in its orbit, it is easy to have a connection with our good old friend in astronomy, Kepler. I can never forget when I look at the starry sky that at one time people thought of the stars as attached to a sphere slowly rotating around the earth. It certainly makes a majestic difference to have the awareness of real space instead.

Amateur astronomy does require some knowledge and every amateur astronomer has it. It is one of the major functions of our association to help with this knowledge, and that includes the beauty of electronic photographic images, speculations about the history of the universe and advice on how to handle a telescope and find an astronomical object in the sky. This latter down-to-earth knowledge is sometimes a little bit neglected in our enthusiasm for more exotic subjects. This is a new year; a time to think about change. ★



President's Message

Fellow Adventurers,

What is it about the stars that makes us want to look? I have pondered over that question for many years and I don't believe I'm any closer to the answer now than I was when I first noticed the skies above. It could be the lure of the unexplained and unexplored, or maybe the simple joy of just seeing something new. I know that one of the attractions for me is the sharing of new discoveries.

As we start this new millennium together I would like to take a moment to remember some of the purposes of this Society and what they mean to me. The first purpose, as defined in our Constitution, is to "stimulate interest in and to promote and increase knowledge of astronomy and related subjects." This is an ideal that is quite near what I hope to accomplish during my term as President of the Vancouver Centre. I would like to increase the public awareness of Vancouver Centre and, most importantly, increase our contact with them. Over the last few years, the Centre has participated in a number of "outreach" programs on various fronts; we have spoken to schools, Boy Scouts and Guides and the general public at every opportunity. We would like to increase this kind of contact with the public and so would appreciate any input from the membership.

We should "work in conjunction with the Society and other Centres of the Society to further the progress of astronomy in Canada." To me, this means our participation in supporting the Dark Sky Association and in lobbying of our Members of Parliament to support the Canadian Astronomers' Long Range Plan are the types of projects to be involved in. As with the purpose above, this

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2000 Vancouver Centre Officers

President Craig Breckenridge cbrecken@home.com	437-3103
Vice-President Sean Reddick smrgeog@yahoo.com	946-1137
Secretary/Webmaster Bill Ronald ronaldb@home.com	733-7036
Treasurer Marc Verschuere marcv@telus.net	986-1485
Librarian William Fearon	939-3154
National Representative Bob Parry robpar@ballard.com	215-8844
Membership Dan Collier	732-6046
Chair, CARO Committee Eric Fuller eriful@ballard.com	540-2373
Director of Telescopes Phil Morris	734-8708
Public Relations Angela Squires esquire@vcn.bc.ca	734-9726
Speakers Barry Shanko barry.mail@intouch.bc.ca	271-0615
Merchandising Doug Montgomery moondoug@funcow.com	596-7058
Nova Editor Gordon Farrell gfarrell@home.com	734-0326
Councillors Pomponia Martinez Duncan Munro Marcellus Redmond Norman Song	215-8844 826-9523 533-1830 299-7924
Trustees Sally Baker Lee Johnson	324-3309 941-5364
Trustee, CARO Tony Overton	463-2358

Web Site

<http://pacific-space-center.bc.ca/rasc.html>
or <http://www.rasc.ca> and follow the link to **Vancouver**.

RASC
1100 Chestnut Street
Vancouver, B.C.
V6J 3J9
(604) 738-2855

About RASC

The Vancouver Centre, RASC meets at 7:30 PM, in the auditorium of the H.R. MacMillan Space Centre at 1100 Chestnut St., Vancouver, on the second Tuesday of every month. Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$49.00 per year (\$25.00 for persons under 21 years of age) and can be obtained by writing to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd numbered months. Opinions expressed herein are not necessarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor, mailed to the address below, or uploaded to SpaceBase™ at 473-9358, 59.

Advertising

Nova encourages free use of its classified ads for members with items for sale or swap. Notify the Editor if you wish your ad to run in more than one issue.

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RASC Vancouver Centre.

A New CCD for CARO

by Dan Collier

Lately I have been building one of the “Cookbook” CCD cameras described in the book by Berry, Kanto and Munger with financial assistance from another RASC member. It has a Texas Instruments 245 CCD with 755 by 242 pixels (usually binned in 1-by-3 mode), a parallel port interface, and a Peltier cooler with 40°C capability and water-cooled heat exchanger. Some of the camera’s parts are distributed by University Optics. I had to go to local jobbers like Intek, RP and Active for the balance. As of now, I have stockpiled almost all the parts I need to finish the camera.

Like all engineers, I feel compelled to improve the design! I was influenced by amateur astronomers all over the world who have built Cookbook CCDs and have published their experiences on the Internet. Here are the areas where I am deviating from the standard design:

Cold finger. The “cold finger” is the thermal link between the Peltier cooler and the CCD. U-O supplied an aluminum casting for this critical part that didn’t conform to the dimensions in the book, and it looked too porous to work well. The professionals prefer copper for this application, so I machined a new finger from a hunk of copper donated by Rene van den Elzen. Copper is a better heat conductor than aluminum or brass but is not nearly as easy to work with. It was okay on the milling machine, but on the lathe it galled badly and threw off razor-sharp, wiry lengths of swarf, one of which painfully slashed my thumb. Another curled straight into the business end of the old hair dryer I was using to keep the work cool, and ZAP — instant burnout. Although I tried every combination of

speed, tool angle and feed rate, the lathe just couldn’t put a good finish on the vital surfaces. In the end, I ground them smooth with carbo and alumina against a piece of plate glass. (Here’s a tip: I found it difficult to grind the upper surface—the one that will touch the CCD—against the glass and keep it flat. Then it occurred to me that a ceramic 2732 EPROM is the same size as the CCD, and could be used as a tool. I bent up its legs, sprinkled on a little grit and water on its underside, and lightly ground it on the face-up surface of the cold finger.) Making the copper finger took a lot of effort, but the CCD will run a couple of degrees cooler with it.

Reduced heat flow. To reduce heat piping, all the wires in the CCD chamber will be 32 AWG magnet wire instead of wire-wrap wire. Although the cooler performance gain will be small, the finer wire is not much harder to work with. A liner will be fitted to reduce thermal ingress from the chamber walls.

Temperature indicator. An AD590 thermal sensor will be mounted on the cold finger, and a remote digital readout will indicate the CCD’s temperature in Celsius. I designed and prototyped the readout myself to save money.

Q7 mounting. The CCD’s emitter-follower transistor (Q7) will be mounted inside the chamber. Apparently this reduces temperature drift in the readout process.

Power supply. An open-frame power supply will be provided for the Peltier cooler instead of the crude unregulated design described in the book. The rest of the power supply will be built as specified but with extra surge protection and EMI filter devices.

Umbilical. Connectors will be

installed on the camera head so that the interface box can be separated from it. A single connector will carry all the power supply voltages to ward off the eventuality of cross-connected banana plugs. Banana sockets will be provided for checkout purposes, however.

The advent of the holidays and my other Centre responsibilities has slowed progress. I was relieved of some pressure when Eric Fuller (another Cookbook builder) refurbished the original CARO camera that was built by Victor Amey, but I intend to bear down and finish mine as soon as possible. However, the lack of a suitable power supply enclosure is holding me back. I do not want to build it out of plywood because it could conceivably catch on fire if the fan stalled. Metal is safer. It has occurred to a number of builders that the power supply components can go in the metal enclosures that come with obsolete computer hardware. A guy in South Africa (or was it Australia?) used an old SCSI expansion case that had its own fan and AC connectors.

If you have a surplus metal box that is smaller than a computer but larger than a shoebox, please call me! ★

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yachtsman would say. In classic Maks, as this one seems to be, the secondary mirror is just an aluminized spot on the inside of the corrector.

Did Someone Say... MakTelescope?

How did Maks get their good reputation? Maybe it's because their spherical surfaces are more consistently brought to perfection than paraboloids. More likely it's just a rub-off effect from the excellent Questar and Zeiss telescopes. Two more possible reasons are that the Mak will develop adequate magnification for planetary work without the long, shaky tube, and will deliver an acceptable image with almost any eyepiece.

So the Mak legend could be apocryphal. Maks *are* okay, but they have their limits. Unlike the Newtonian reflector, it is not possible to design a useful Mak with a secondary obstruction less than one-third the aperture. According to the specs, the ETX-125's secondary blocks 39.4 mm of the available 127 mm. Before we dismiss this claim for the shabby prevarication that it is, let's observe that it already amounts to a 31% obstruction. The diffraction induced by this large obstruction will be obvious to an experienced observer. When you count the tapering baffle tube that surrounds the secondary, the true blockage is closer to 40%. Meade goes on to claim that the secondary obstructs a fraction of area of just 9.6%, or 31% squared, to reassure the doubtful buyer. What actually counts is the percentage of *diameter*, not area. In my opinion, the ETX-125 should be outperformed by a less costly six-inch f/8 Newtonian with a secondary mirror sized to 20% of aperture.

Even so, the ETX's Maksutov optics are its strongest suit. This scope delivers reasonably sharp, contrasty images free of spurious colour when used with its 26-mm "LP" eyepiece (the ETX apparently does not merit one of Meade's premium 4000 series eyepieces). With my Celestron

Barlow inserted to yield 146x, stars expanded into clean Airy disks surrounded by two bright, contrast-robbing diffraction rings, just as I would expect for a big-blockage Mak. Nevertheless, I was able to make out very small lunar craters like Linne and Aldrin when the seeing permitted.

A more stringent exercise is the "star test." One observes a bright star at high magnification while adjusting the focuser back and forth a little on each side of best focus. This expands the star into a dark-centred system of Fresnel diffraction rings that reveal a lot about the telescope's optics. If the optics are good, the Fresnel system will expand almost identically on either side of best focus. This was true of the ETX. However, the rings were slightly pinched in one sector, indicating a collimation problem.

Here's a tip: you don't have to spend \$200 on a laser tool to check your collimation! It was possible to see what was wrong using a simple device consisting of an eyepiece-sized plug with a peephole drilled in it. The idea of the peephole is to position your eye on the optical axis as you look up toward the secondary mirror. In it you should see the perfectly centred reflections of the primary mirror and corrector. The obvious place to put the device is in the eyepiece holder, but there's this flip mirror to think about. When I put the peephole in the accessory port and retracted the flip mirror, the reflections were correctly centred in the secondary. However, with the peephole in the eyepiece holder and the flip mirror in its active position, things looked out of kilter. Ergo, a misaligned flip mirror. Many ETX owners have reported this fault. The mirror is held short of the required 45 degrees by a poorly installed spring in the flipper mechanism.

But VWs Get Better Fuel Mileage

Commercial scopes have worse electronics than Volkswagens. This one is no exception. Electronic scopes are a big, BIG peeve of mine.

Finicky about power. My well-regulated 1/2-amp power supply wouldn't run the ETX. A 2200-microfarad capacitor across the terminals didn't help. However, the scope ran very well on Bob Parry's gelled lead-acid battery. A lead-acid will run the telescope longer than a set of AA cells, and it can run other accessories too. The economic break-even point is about fifty hours of use.

Shutdown problems. The simple "EC" handbox refused to work properly on a set of depleted AA cells totalling 10 volts. The old AAs did get the fancier Autostar up and running, but after a few minutes it would issue a "motor fail" message and shut down. With fresh AAs it still shut down, though not as frequently. Shutdowns also occurred with my regulated 5-amp, 12-volt AC power supply. Some say their Autostars work better if the supply voltage is reduced to 10. Nope—ours still failed (the motors did run more quietly, but slower). Others claim that firmware revisions older than 2.0i have more problems. Ours had 2.0g. The user can obtain up-to-date firmware from Meade and "flash" it into the Autostar if he or she has an Internet connection, three megabytes of disk space, and a special RS-232 cable.

Telephone connectors. Ughh! These critters are bad enough on telephones! In the dark, on a cold mountaintop, in the hands of a frustrated astronomer, they're an unmitigated disaster.

No manual capability. You have to have a working handbox to use this scope. It's not unusual for handboxes to go out of production, so don't be too surprised if someone steals yours at the 2006 Kobau star party. The simple EC handbox can generate a sidereal motion but you have to polar-align the scope to make use of it. Only the Autostar handbox can track the sky in alt-az mode. Moreover, only the Autostar has an RS-232 port so you can't play with

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Upcoming Events

(some dates are approximate and may be subject to change)

March 25, before sunset - dawn:

Messier Marathon at Aldergrove Lake (contact Doug Montgomery after the meeting for details)

April 28, noon - midnight:

Astronomy Day at the GSO

May 6, 8 at 7:30pm:

Ray Villard, Public Relations Director of the Space Telescope Science Institute

May 12 or 26:

Artificial Star Party at the GSO

June 1 or 2, 1/2 hour before sunset:

Spring Sidewalk Astronomy at English Bay (foot of Denman St.); meet at the bathhouse

June 3, 10am-5pm:

Fraser River Festival at Deas Island Regional Park

July 20-21:

Manning Park Star Party #1

August 18-26:

Mt. Kobau Star Party

September 14-15:

Manning Park Star Party #2

October 5 or 6, 1/2 hour before sunset:

Autumn Sidewalk Astronomy at English Bay (foot of Denman St.); meet at the bathhouse

A note about the Ray Villard talk. Mr. Villard's talk at the regular May 8th meeting will be free to members, but members may have to reserve a seat. An additional talk may be scheduled for May 6th. This talk would be open to the public and tickets would be available for purchase. Further details will be available at meetings leading up to the talk and in the next Nova. ★

Poetry Corner

A Cancelled Visit from the Sun by Gordon Farrell

'Twas the morning of Christmas and all through the house
not a creature was stirring but the cat's new toy mouse.
The bedside alarm was set early with care
in the hope a Yule spectacle would be visible out there.

When the appointed hour came the alarm rang with a clatter
and I leapt up to see if the sun might just shatter
the clouds that had been overhead for some days
obscuring completely the sun's brilliant rays.

I ran to the window, was there in a flash
opened the curtains and threw up the sash
when what to my wondering eyes should appear
but a sky the very antithesis of clear.

Of cumulus, stratus and nimbus, the gloom
shed precious little sunlight in my room.
It seemed quite apparent to me that the day
would bring little else but a sky coloured grey.

So alas, my first and last chance slipped away
for a partial eclipse on this merry day
but for those who look skyward I hope there will be
clear skies on Christmas 2383.

Astronomer's Angst by Dan Collier

Twinkle, twinkle, Mag 4 star
Can't see you without L P R
Warm tonight 'cuz of CO₂
At least my scope ain't got no dew.

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is a matter of educating the public, and the active participation of the membership is very valuable in this aspect.

The Centre is charged to “acquire and maintain equipment, libraries, an astronomical observatory and other property necessary for the pursuit of its objectives.” The Vancouver Centre has an active loaner program for members and we have quite a good library. We anticipate both of these programs to grow in the years to come. We maintain an observatory at Aldergrove Lake as well as our CARO Project, which I would like to see start observing on a regular basis by this summer. We do anticipate active participation by the membership in these ventures.

The final purpose listed in our Constitution is “to promote interest in amateur telescope making.” While this is not an area that has been discussed yet by the executive, I would like to see an active group organized to help guide those of the membership who are interested through the process of building their own telescopes. I have built a barn-door mount for my camera and my 10” scope is going through the design and material fabrication stages of my second Dobsonian mount. Neither of these projects are too difficult for any member to undertake.

All of the purposes above have one principle in common—that of education. By teaching and sharing our knowledge, we can only make this an enjoyable experience.

“The chief thing is to see that interest is excited” – H.C. Trumbell; Teaching and Teachers, 1884 ★

– Craig Breckenridge

ASTROCOMPUTING

SpaceBase™ (473-9358). Affiliated since 1992 with RASC Vancouver, our link to RASC Net, RASC Members only chat area. Future data distribution hub for CARO Project. Features include latest HST images, current world space news and astronomy programs. Provides a file uploading facility for submitting articles and imagery to Nova.

LIBRARY

The centre has a large library of books, magazines and old Nova's for your enjoyment at the GSO. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

RASCVC on the Internet

<http://members.home.net/rascvc/index.html>

H.R. MACMILLAN SPACE CENTRE

The Pacific Space Centre Society is a non-profit organization which operates the H.R. MacMillan Space Centre and Gordon M. Southam Observatory. Annual Membership (\$30 Individual, \$65 Family) includes a newsletter, Discounts on Space Camps, special programs and lectures, Vancouver Museum Discounts, and free admission to the Space Centre. Admission to the Space Centre includes: Astronomy shows, Motion Simulator rides, multimedia shows in GroundStation Canada, and access to the Cosmic Courtyard Exhibit Gallery. For Membership information, call Mahi Jordao at 738-7827, local 237 for information. You can also reach them on the Internet at <http://www.hmacmillanspacecentre.com/>

MEMBERSHIP HAS ITS PRIVILEGES!

New members, did you know? The Vancouver Centre has 6 telescopes available for loan free of charge! We have telescopes ranging from 3" to 10" diameter. For more information call Phil Morris, Director of Telescopes at 734-8708, or see him in the lobby of the GSO after the members meeting. The loaner period is for one month only. All telescopes are to be picked up and returned after the members meeting. No telescope will be allowed to circulate outside of these meetings!

Your greatest opportunity as a member of the R.A.S.C. is to take advantage of the company of other enthusiasts to increase your knowledge, enjoyment and skill in astronomy.

The best thing you can do to gain the most from your membership is to get active! Take in the club meetings; engage other members with questions; come out to observing sessions (also known as “star parties”), and, by all means, volunteer to take part in our many public events.

Observing takes place at the Dale McNabb Observatory in the Aldergrove Lake Park, located in Langley, on 8th Avenue, just east of 272nd Street. We are there most clear nights. Contact Mike Penndelton at 888-1505 or Howard Morgan at 856-9186.

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PC control unless you put down another \$150 U.S. for one (cable not included). By the way, David Lane has assured me that his ECU planetarium software will control the ETX using the LX-200 protocol.

Display bug. When you do try to use the RS-232 port, you will stub your toe on an irritating bug. When I plugged the Autostar into my PC's serial port, the Autostar display faded out. Luckily I could see the display just well enough to call up the utility menu and adjust the contrast—but the next time I powered up the scope, the Autostar reverted to blankness and stayed blank until I had punched enough keys from memory to get to a certain point in the start-up procedure. Bush.

Good look-and-feel. At last, something positive! The Autostar handbox is quite easy to use once you've played with it for half an hour or so. The packaging is neat, the ergonomics are on the mark, and I enjoyed playing with it. My only criticism is that the "Mode" key is adjacent to the "Up" slew key. If you accidentally press Mode while centring an alignment star, the alignment procedure aborts. A hang-up hook would be nice.

Nightmare on Chestnut Street

The mechanical parts of this scope are a big problem. And this is no mere lemon. Comments from the various user groups assure me that my experiences are hardly exceptional. Would Meade knowingly donate a lemon to the RASC? I hardly think so. I'm going on the assumption that it was set aside from early production before the full proportions of this horror story were realized.

Plastic parts. Although the telescope's tube and part of its base are metal, the rest is pure plastic. We're talking a massive shortfall in strength and durability here. Be very careful with it and don't force anything.

Finderscope. The finderscope

itself is okay, if a little small. However, the finder's mount is a soft plastic part with squishy nylon alignment screws. It was hard to align the finder with these, and impossible to keep it aligned for any length of time.

Slipping locks. The lock on the polar axis consists of a heavy toggle-headed bolt that squeezes the drive gear against the axis. This thing takes getting used to. It feels more like a bench vise than a telescope clutch, and boy, you have to reef it down *tight* or you'll lose the go-to accuracy. I'm afraid someone is going to over tighten it and break something. The declination lock feels even worse—and remember, almost everything in this area is plastic. When the declination lock is tightened, the tube floats uncertainly as if something is loose inside.

Poor focusing. The focuser's tiny 1/8" shaft looks inadequate. Its worst moment is during the unpacking stage when you have to remove the foam blocks from between the tube and drive base. In use, the focuser has two serious problems. The first is an unbelievable amount of "mirror flop", of the order of half a Moon diameter. Secondly, turning the focuser shakes the image exactly when it has to be steady. Options like flexy extender knobs and electric focus motors are just Band-Aids.

Motor noise. The motors are noisier than one would expect of an expensive instrument. Ours is so loud that the Meade service rep in California pronounced it healthy just by listening to it over the phone. An old model train enthusiast like me knows just how poorly these little motors work at low speeds. In this case they're urged onwards with pulsed current and optical feedback, though by the sound of them they're probably stalled most of the time. Some ETX users have complained that the vibrating motors blur the view.

Five Quirks for Muster Meade

Sun warning. A patronizing

"don't point this telescope at the Sun" message scrolls across the Autostar display every time power is switched on (you can cut it off by pressing "5"). If you absolutely insist on observing the Sun, you won't find it on the solar system menu. The Autostar knows perfectly well where the Sun is but you have to enter its coordinates manually from an almanac. A pity, since this scope would work very well with a piece of Baader solar film over the big end.

Setting the clock. The Autostar's clock has to be set every time power is switched on. It is not essential to set the clock to carry out a two-star alignment, but you will have to find the alignment stars yourself. You also have to set it for solar-system go-to's.

Polar axis motion. The polar axis has stops to prevent endless rotation. You must follow the set-up procedure carefully to avoid colliding with the stops. In alt-az mode the scope sometimes slews the long way around to avoid the stops. This process chews up time. If you bump the mount or experience a shutdown, and have to repeat the alignment process, more time is lost. Admittedly, these characteristics—and the nuisance shutdowns—are not unique to Meade products.

The Moon. The Autostar computes moonrise and moonset times, which is nice, but it gets them wrong by hours.

Autostar library depth. All the binaries in the library seem to be easy ones. The challenging ones have been left out. Hmmmmmmm.

Lead On, MakDuff

Meade engineers would probably say, "Those aren't bugs, they're *features!*" The Autostar is a powerful toy, to be sure. It can compute the true coordinates of the Moon to within minutes of arc, including the parallax for Vancouver. That's pretty good for a handbox. However, I am not going to apologize for what might be taken as

picky criticisms. I am a (small) man who has written “go-to” control software for telescopes. Meade is a giant corporation.

Quirkiness is one thing; durability is another. The ETX loudly blew a motor a week after we received it and it had to be shipped back to California. Let’s not beat around the bush—the ETX scopes have been a terrible experience for Meade. Many other users have reported the same faults as I have, and more. The smaller ETX-90 series has a better record,

especially the manual models, but the ETX-125 seems to have pushed the cost-cutting paradigm too far.

In summary, I don’t think Vancouver Centre should put the ETX-125 in the general loaner program. It would be more suitable for events like Astronomy Day where it can be more closely supervised.

This just in: the ETX has been acid-tested at a GSO public night! Bob Parry made an adapter to mount the ETX on his Meade LX-series tripod so we could try it out in alt-az

mode. The Autostar didn’t track objects very well, but I admit that we haven’t “trained” the motors since the scope came back from Meade. After a while I mounted the ETX on a studio-grade camera tripod with a tilt head. With the head tipped 41° and the EC handbox in sidereal mode, the ETX followed Jupiter perfectly for long periods at 120x. The woozy declination clutch wasn’t a problem, at least for now. ★

Wiring the Autostar Serial Port

by Dan Collier

Here is how I wired the Autostar’s RS-232 jack to my PC’s serial port. Note that the Autostar accepts the narrower plug used only on handset curly cords. Most curly cords seem to be too short, so get a nice long one or else have someone crimp a handset-type plug onto a generous length of uncurled phone cord.

First, get a fresh curly cord and plug it into the Autostar. Hold the Autostar with the keys facing you and the curly cord coming out the bottom. Unplug your cord from it, hold up the plug without rotating it, and examine the wire colours through the plastic. If the wires colours are black, red, green and yellow from left to right, leave that end of the cord intact and cut the plug off the other end. (If the colours are backwards, try swapping the cord end for end. If the *other* end fails the colour test, read the colours in the table below in reverse order.)

Solder the wires to a standard female 9-pin plug according to the table below. [Use the numbers in square brackets if the serial port jack on your PC is the older 25-pin type. This can be identified by its male pins. Do not confuse it with the parallel port, which has 25 sockets.]

Wire**	PC plug	Function
black	pin 3 [2*]	data from PC to ETX
red	pin 2 [3*]	data from ETX to PC
green	—	do not connect
yellow	pin 5 [7*]	ground

* Numbers in square brackets apply to 25-pin plugs only.

** Order of colours may depend on the curly cord used. See above.



The plug that you will attach to the end of your curly cord has to be female. Before plugging the cable into your PC, check it with a voltmeter as follows (the 9-pin plug is assumed):

- (1) Plug the cable into the Autostar, plug the Autostar into the scope, and power up the scope.
- (2) Pick up the PC end of the cord and insert the voltmeter’s negative probe into the hole marked “5”.
- (3) Read the voltage in holes 2 and 3. Hole 2 should have about 10 volts in it, while 3 should be close to zero.

The exact voltage on hole 2 is not important, but if you see something much different than 10 volts you’ve either wired the plug wrong or burned out the Autostar. [For 25-pin plugs, put the negative probe in hole 7; hole 3 should have about 10 volts in it.]

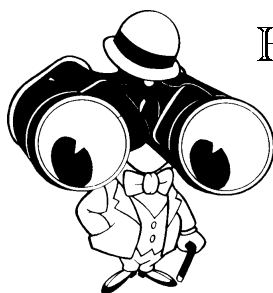
WARNING! RS-232 ports can be destroyed by careless handling. Avoid plugging and unplugging the RS-232 cable if the scope and/or computer are powered on! The MAX-232 chip in the Autostar is quite vulnerable to this, especially if the telescope is operating from an AC adapter. It is much safer to plug and unplug the cables with everything powered off.

★

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