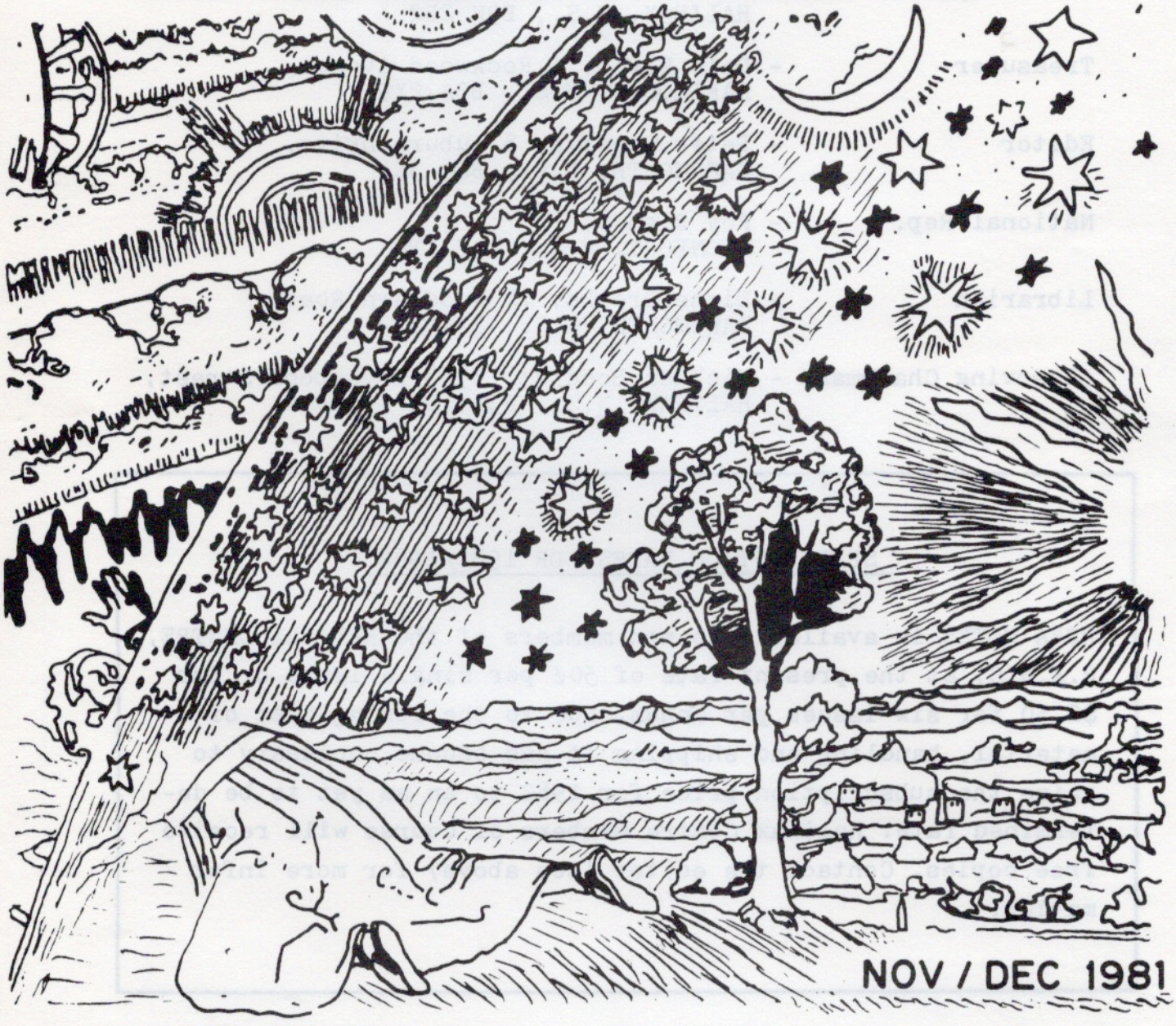
NOVA NOTES



NOV / DEC 1981

ASTRONOMY

R. A. S. C.
HALIFAX CENTRE

1981 HALIFAX CENTRE EXECUTIVE:

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SUBSCRIPTION RATES FOR 1981/1982

NOVA NOTES is available to non members of the HALIFAX CENTRE, R.A.S.C. at the present rate of 50¢ per single issue or for $2.50 for six issues per annum. Due to the rising cost of material, handling and shipping it has become necessary to raise the subscription price for 1982 to an as yet to be determined rate. Halifax Centre members of course will receive free copies. Contact the editor (see above) for more information.

NOTICE OF MEETING

Date: Friday, 20 November, 8:00 PM

Place: Nova Scotia Museum; Meeting to be held in lower auditorium/theatre. Access from parking lot and side door.

Speaker: Dr. Murray Cunningham, Halifax Centre Executive (Secretary).

Topic: Ancient and Modern Astronomy in China

Dr. Murray Cunningham has recently returned from a trip to mainland China and will be sharing his experiences with us, especially as related to ancient and modern astronomy.

NOTICE OF MEETING

Date: Friday, 18 December, 8:00 PM

Place: Nova Scotia Museum; Meeting to be held in lower auditorium/theatre. Access from parking lot and side door.

Speaker: Mr. Wilf Morley, Bridgewater, Nova Scotia

Topic: High School Astronomy Projects

Mr. Morley will be discussing various aspects of teaching astronomy in high schools and the projects that he has carried out at his school.

2nd. Speaker Dr. Roy Bishop, Halifax Centre Executive (National Representative).

SECRETARY'S REPORT 16 October, 1981

Minutes of the October meeting of the Halifax Centre, R.A.S.C.

The president, Peter Edwards opened the meeting by calling for nominations for the offices of this centre for the coming year. A nominating committee had been hard at work and in fact there were two names presented for every office except two. This is what we call democracy and by next month we will have chosen our new slate of officers.

The speaker for the meeting was a physicist, amateur astronomer and until recently a member of the Ottawa Centre. He was David Chapman of the Defence Research Establishment, Atlantic. Actually his line of research at the moment is on underwater explorations but this talk was very much above ground. His subject was Prehistoric Stone Monuments of Astronomical Significance in Great Britain. Unlike the talk that I gave to this Centre about a Year and a half ago, David Chapman actually went to these monuments and photographed them and even had a lady stand up to them for size. David did present lucidly though, the major and minor stand-offs of the moon and how one could readily observe perturbation of the moon's orbit using the standing stones at Calnish. He didn't buy all the claims of Tom or even of Hoyle. It was a refreshing talk and he brought many beautifully illustrated books on the subject.

Murray Cunningham

ELECTION OF OFFICERS:

The election of Centre Officers will take place at Nov. meeting. Your ballot which you should have received several days ago must be returned by the time specified. Late ballots will not be counted. Please note that you must be paid up for the 1982 Membership year to vote. You may include your cheque in the outer envelope when returning the ballot.

THE PRESIDENT'S CORNER

This year has given new relevance to the phrase "Blood, Sweat and Tears." I feel every member (and former member) of this year's executive can relate to this phrase more than ever. I shall not articulate on the matter, only to express special graditude to Dr. David Tindall for holding everything intact throughout the spring and summer months.

When my term began last January, I had hoped to start a centre's observing project; something we could all contribute to and culminate the project as the centre's display at the G.A. So much for the well layed plans of men and mice.

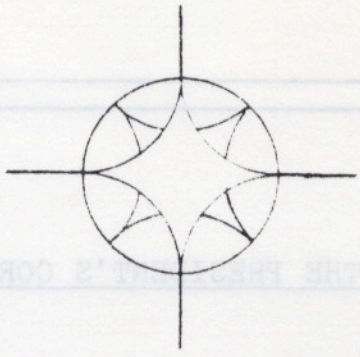
Nova Notes took on a new look this year...and then so did our banker; we'll now have to do some budget cutting in the Editor's Office.

There were many accomplishments this year and one important accomplishment I see evident, particularly at all the observing sessions, was a closer comradery. This is easily achieved in a small centre, but as the centre grows, this is lost. Here in Halifax, you have managed to rejuvenate this spirit and to me, this is a promise of a bright and prosperous future for our centre.

It has been a privilege to serve this centre this year and I thank you for having given me this opportunity.

Peter J. Edwards
President, Halifax Centre
R.A.S.C.

BURKE GAFFNEY AWARD
FOR 1982



The Burke-Gaffney Award was established several years ago to promote the development of the writing skills of non-professional members of the Centre. The Award also acknowledges the contribution of the Centre's first Honourary President to the formation of the group and to his long and tireless efforts to educate the public in the mysteries of atronomy. This years contributions for the Award must reach the President, Editor or the third person of the Judging Committee by 19 March 1982.

RULES

1. Topics. Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well informed amateurs and may be of current or historical interest.

2. Presentation. Articles should be 1000-1500 words, written in proper grammatical form and presented type-written and double spaced. Diagrams should be complete and ready for drafting and photographs should, if possible, be submitted with the original negatives.

3. Eligibility. Any member of the Halifax Centre in good standing may submit articles with the exception of those with graduate degrees (any field of study).

4. Judging. Articles will be judged on scientific accuracy, originality and with a strong emphasis on the overall literary merit. Papers must demonstrate that the author(s) has read widely and has contributed some original thought to the discussion. Judging will be carried out by the President, Editor of Nova Notes and a third person appointed by the Halifax Executive.

5. Prize. The Award will be given once annually. The winning contribution then becomes the Centre's official entry in the Simon Newcomb Award which is nationally competed for. The winner of the Burke-Gaffney Award will have the choice of several prizes including:

Ottwell's Astronomical Calendar (1982);year's subscription to Griffith Observer; or a suitable book of astronomical interest.

6. Submission of Entries. Entries will be received anytime until 19 March 1982. You may direct queries concerning the rules to the President.

7. Previous Awards. The Burke-Gaffney Award has been won on two occasions by Bill Calnen (1979 and 1980) and most recently by Dianne Brooks (1981). Winners are eligible to go on to enter the Simon Newcomb Award at the annual General Assembly.

»«

DOUBLE THE FUN WITH THE SUN

Living in Nova Scotia we are blessed with beautiful scenery, lots of unpolluted, fresh air and a way of life that is the envy of many more urban canadians. One thing that we do not have is an abundance of good "astronomical seeing". Consider the many times you were prevented from observing a meteor shower, the planets or some deep sky object and you will readily agree with me that the weather, especially in the metro area, leaves a lot to be desired by amateur astronomers. The amount of time that an observer can spend at a telescope is therefore rather limited. There is an excellent solution to this problem, however limited the benefits may be. Join me in daytime observing of the sun.

To get more telescope time I purchased a "Solar - Skreen" for my C-90 and found that it opened a whole new world to me. For one thing, I no longer get cold when out observing, the telescope therefore does not dew up while observing and of course the urge to go to bed because I have to go to work in the morning is also gone. When observing the sun I find that it is done in a very relaxed manner.

To set up for viewing the sun can be done at a very modest cost, about the price of an eye piece. Before going any further I would like to bring your attention to an article by B. Ralph Chou in the R.A.S.C. JOURNAL for February 1981 and again in SKY & TELESCOPE for August 1981. This particular article is an excellent in depth study of various safe and not so safe materials used in making solar filters. As always we are reminded not to look at the sun without a filter and when using one to be sure that it is a safe filter and not damaged. The article will help you to find the proper filter material and if you still have questions then check with someone in the Halifax Centre who has been using one for a while. Now to observing the sun.

With the proper solar filter correctly installed and the telesope aimed at the sun you should be able to distinguish sun spots of various sizes. Sun spots not only vary in size, they also will shift location over hours and days as differential rotation of the sun takes place. The more commonly known "sun spot cycle" will also affect the number of sun spots visible on the face of the solar disc at any particular time. When using low to medium magnification (best) it is also possible to observe solar granulation near sun spots, especially if they are located toward the edge of the solar disc. Find out more about sun spots by reading some of the fine books available through our centre library.

Peter Steffin

THIS MONTH'S CONSTELLATION

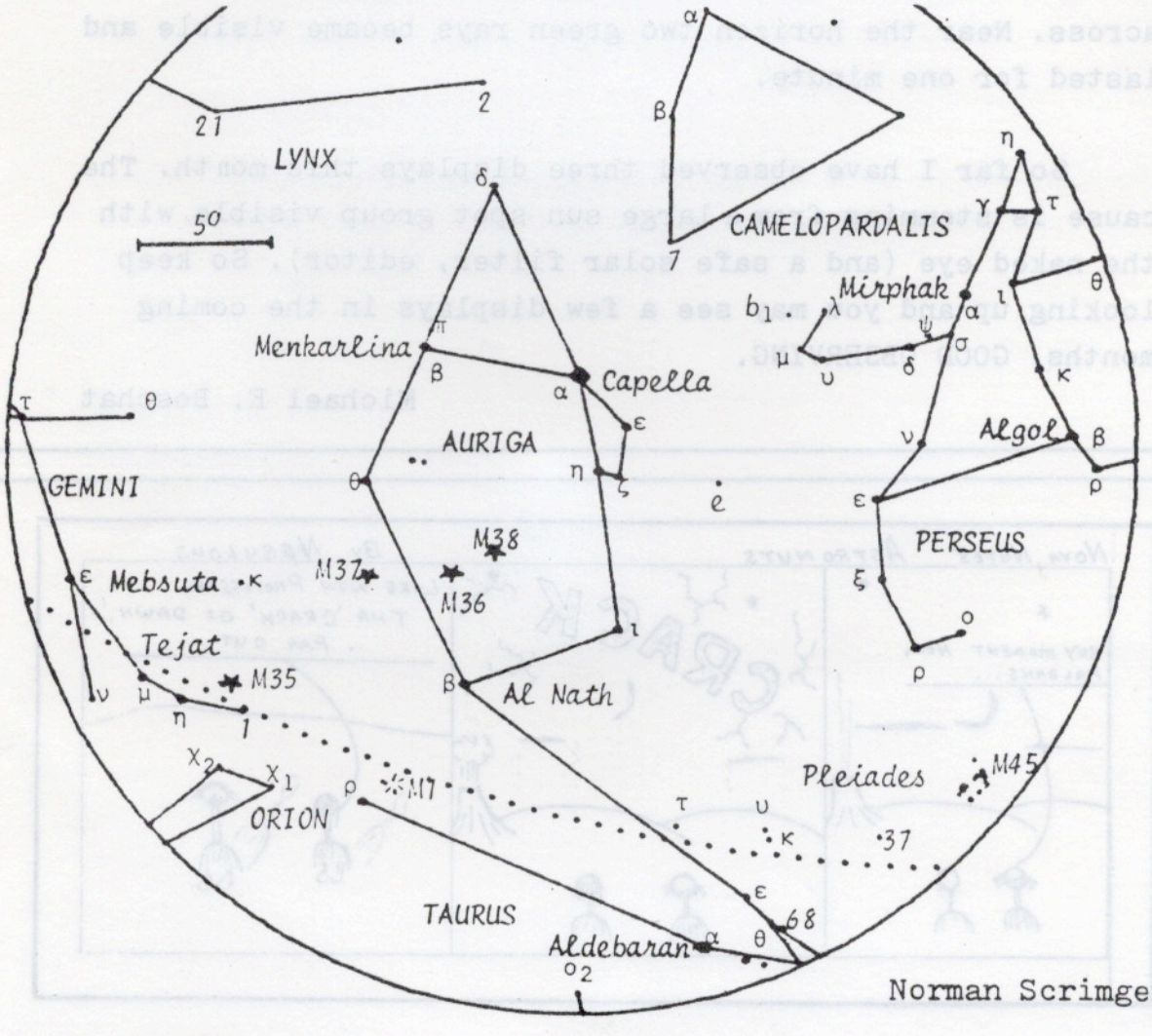
AURIGA: The Charioteer

This month's constellation, Auriga, which heralds the coming of winter, is prominent high in the eastern sky after sunset.

The constellation represents Erechthonius, the lame son of Vulcan and Minerva. His mother kept Erechthonius' existence a secret from the other Olympians. Erechthonius's lameness required that he find some easy method of transportation and so he invented the four-horse chariot which was quite suitable for his regal position as one of the early kings of Athens. For this invention, Jupiter rewarded him by giving him a position in the sky.

The figure depicted by the stars is that of a seated man. The chariot is not generally outlined in modern drawings. The diagram below shows a pentagon with a rather large triangle added to the north of Capella and Menkarlina. The apex of this triangle is the head of the chariot driver. Below and to the west of Capella is a small kite-shaped extension to Auriga. Capella and the nearest joined star represent a goat that is supported by the driver's forearm. The other two stars completing the extension are the Haedi, or Kids of the goat. These two kids are resting on the knee of the charioteer. The driver's feet are the two bottom stars of the constellation, and his right hand, the star θ, holds the horses' reins.

The brightest star in Auriga, Capella, passes almost directly overhead for an observer in the Maritimes at about 1 am on December 1st. A line drawn from the top of the bowl stars of the Big Dipper will pass just to the south of Capella, and can help to locate Auriga. Of the three open clusters in Auriga, M37 is the finest.



Norman Scrimger

AURORAE REPORT

October - Aurorae Month! (Aurorae Alert!!!)

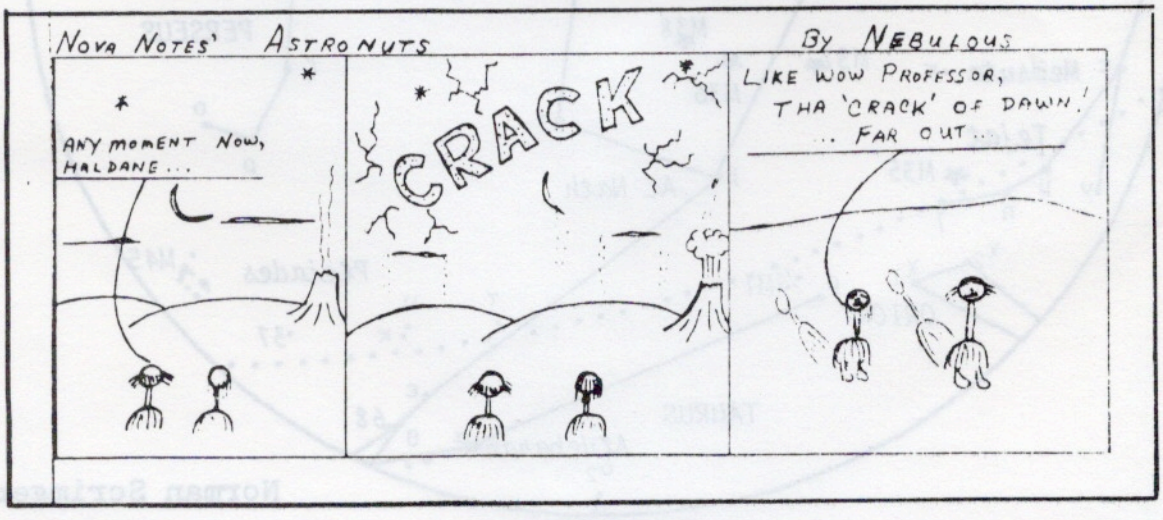
October 13/14, between 0300 and 0330 UT. Very red rays from horizon to zenith observed. One bright emerald green ray observed at 0320 UT, lasted one minute. The reddest ray was about 35 degrees across. One in Ursa Major was 20 degrees across. Most of the rays pulsated somewhat irregularly.

October 14/15, between 0000 and 0030 UT. Only one red patch was seen in Ursa Major, nothing after that.

October 20/21, between 0225 and 0335 UT. Red rays were observed in Ursa Major, Ursa Minor, between Lyra and Draco and in the NNE. These rays also pulsated. They extended from the horizon to the zenith and a few rays were 15 degrees across. Near the horizon two green rays became visible and lasted for one minute.

So far I have observed three displays this month. The cause is stemming from a large sun spot group visible with the naked eye (and a safe solar filter, editor). So keep looking up and you may see a few displays in the coming months. GOOD OBSERVING.

Michael E. Boschat



ALIGNMENT OF THE POLAR AXIS OF A TELESCOPE

The practicle problem of setting an equatorially mounted telescope with its polar axis parallel with the rotational axis of the Earth is a common concern for amateur astronomers and professionals. Various schemes have been described in journals and magazines but in my opinion are neither fast enough nor easy to execute. The following method is useful for those who have a permanent mounting for their telescope and who leave it in position between observing sessions. Reasonable accuracy can be achieved in one to two hours and if your interest is photography with minimal need for tracking corrections, then another hour or two might be necessary. This method is routinely used at the Burke-Gaffney Observatory and I believe it originated with J.D. Fernie of the U of T and having been rooted out by Walter Zukauskas several years ago.

Alignment is carried out in two steps: 1) corrections for altitude; and 2) corrections for azimuth.

Altitude correction:

1) Choose a high powered eyepiece with cross-hairs and align the cross-hairs with the North-South/East-West directions by trailing an equatorial star back and forth across the cross-hairs.
2) Select a star with a dec of apx. 45^{o} and an hour angle 6 hours east or west.
3) Set the star precisely on the cross-hairs and let the telescope track for several minutes until the star noticeable drifts off the cross hairs.
4) If the drift is to the south, the axis of the telescope is too low and must be raised slightly or if it drifts north, the axis must be lowered. These relations assume a star East of the meridian and the relations are reversed if the star is 6 hours West.
5) Repeat step 4 until you are satisfied that the telescope is tracking accurately enough for your requirements.
6) Should you want to determine the accuracy of this alignment use the formula:

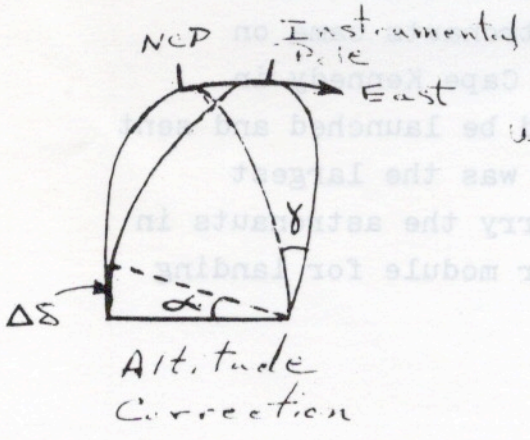
$$\Delta h = \left[\frac{229}{\cos \delta}\right] \times \frac{\Delta \delta}{\Delta t}$$

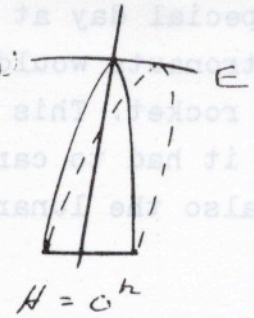
In this formula Δh is the correction in minutes of arc required to align the telescope exactly. δ is the declination of the star, $\Delta\delta$ is the drift north or south in minutes of arc and Δt is the time to drift $\Delta\delta$.

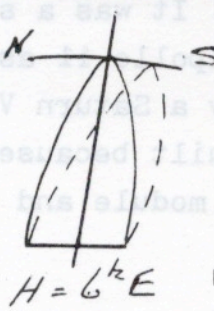
Azimuth correction:

The procedure is exactly the same as above except that you must choose a star on the celestial equator and near the meridian, ie. O hour angle. If the drift is Southwest of the cross-hairs, then the axis lies NE-SW of the true pole and it is necessary to move the telescope axis to the West and to repeat the process. Again the above formula gives the correction required.

The theory is relatively simple and you should be able to see what the procedure is designed to accomplish by refering to a globe and considering the possible combination of errors. The diagrams below will be of help in this exercise but if you want the details of the theory, give me a call and I'll send a copy along.







R.C.Brooks

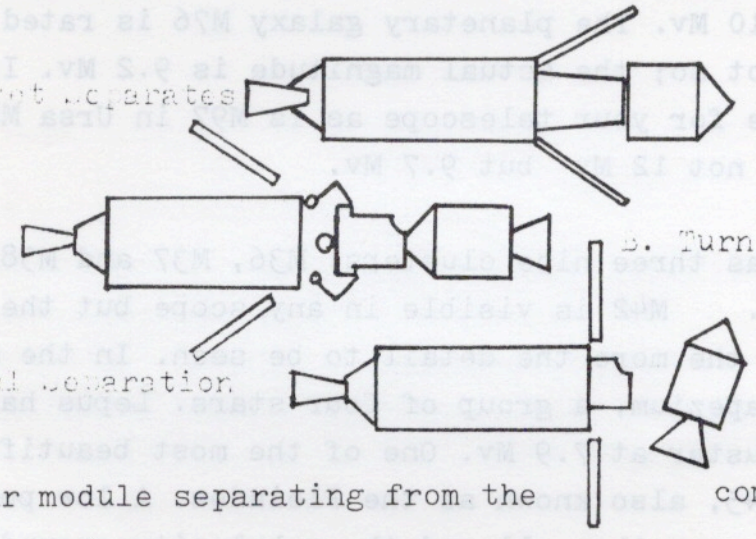
Exploration of the Moon

The moon is the earth's only natural satelite and it is the nearest object to us. It has always been interesting to man. Some people worshipped the moon as a god, others used it as a calendar and still others wondered at its mysteries and looked at it with primitive telescopes to solve these mysteries. Today we know much more about the moon because of the space program and especially the Apollo moon flights. The U.S.S.R. was the first country to crash land a space probe on the moon in 1959. The U.S.A. then quickly developed the Apollo program which led to the landing of men on the moon on 20 July, 1969.

The Apollo moon project took many years to complete. The first Apollo flight to the moon took about four days to get there and three days to return to the earth. This difference in time is caused by the earth's gravity. Many of the early Apollo flights did not go to the moon. They practiced linking together in space. Later Apollo flights then went around the moon to photograph it and to select landing sites for future landings. Much knowledge is required to put a man on the moon and the Apollo astronauts had to do it right the first time. After the photographs were taken, the scientists on earth selected a landing site.

After that it took many months to prepare a moon lander and to train the astronauts to operate it. They even trained a set of back-up astronauts for emergencies. Then finally everything was ready for the big event, to land a man on the moon. The big day to launch the astronauts came on 16 July, 1969. It was a special day at Cape Kennedy in Florida. The Apollo 11 astronauts would be launched and sent to the moon by a Saturn V rocket. This was the largest rocket ever built because it had to carry the astronauts in their command module and also the lunar module for landing on the moon.

A million people in Florida and many millions more watched on television all over the world as the rocket took off from the launch pad. The astronauts were very busy as they headed for the moon. The earth's gravity was trying to hold them back but they were moving very fast and soon entered the moon's gravity. When they got to the moon the command module and the lunar module separated. While the command module stayed in orbit, the lunar module landed on the moon. This was 20 July, 1969 and the first time that a manned space ship had landed on the moon. Astronaut Armstrong was the first man on the moon and he was joined by astronaut Aldrin soon after.



The lunar module separating from the command module.

On the moon the astronauts set up some scientific equipment and collected some moon rocks. The astronauts also explored a small area around their landing site. It was very easy for them to get around in the lighter gravity of the moon. The next morning they got ready to come back home. They launched from the moon, docked with the command module and astronaut Collins for the trip home. The Apollo 11 astronauts splashed down in the Pacific Ocean. Many more astronauts have landed on the moon since then. Just like the first landing, each one is "a small step for man and a giant leap for mankind."

Michael Steffin,
age 10 years.

OBJECTS OF THE WINTER SKY

How many of you do any observing in the winter? This is the best time to observe. If you dress warmly you can stay out till 2 AM or as we say 0600 UT. So listed below are some objects worth looking at through your telescope.

The first object is good old M31 in Andromeda. Some amateurs (not here) have traced it out to 5 degrees long. What is your estimate? In Triangulum is M33, the other galaxy. It is somewhat fainter because its light is spread out on account of its angular diameter. M74 is a faint galaxy in Pices and rated at 10 Mv. The planetary galaxy M76 is rated as 12 Mv but this is not so; the actual magnitude is 9.2 Mv. It is a good challenge for your telescope as is M97 in Ursa Major which once again is not 12 Mv but 9.7 Mv.

Auriga has three nice clusters; M36, M37 and M38. Orion is well known. M42 is visible in any scope but the larger the telescope the more the detail to be seen. In the midst of it lay the Trapezium, a group of four stars. Lepus has M79, a globular cluster at 7.9 Mv. One of the most beautiful open clusters is M45, also known as the Pleiades. A low power is recommended to see them all and the nebulosity around Merope is faintly visible in a 10 cm telescope. M1 or the Crab Nebula is visible with a 6 cm telescope and is 11 Mv. M35 in Gemini is worth looking at as is M41 in Canis Major; note the red star near its center.

Some doubles are; Alpha Geminorium, Gamma Andromeda, Gamma Arietis, Eta Orionis and Beta Orionis. A few variables are; Alpha Cassiopeia, Alpha Orionis, Omicron Ceti and Beta Persei.

This is a small list so check the 'HANDBOOK' for others and observe. Don't forget to check the Milky Way for novae and other areas for comets. Good Observing.

Michael E. Boschat

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