saw it for the last time the next night, very low and dim. Twice more I saw 1957 Beta, once from the street beside the GAO building and one morning, again from the fire-escape landing.

So I say, no matter where you live, and even if you don't own field glasses, it takes only resourcefulness to observe any of the visual objects which come along. After all Tycho Brahe didn't own a telescope and it is amazing how starlight can make its way through the city lights.

Jewell Boling

* * * * * *

SAM FEILD BECOMES STAR DUST'S PHOTOGRAPHY EDITOR

STAR DUST is very fortunate that Sam Feild has agreed to take on this job. We can now look forward to a STAR DUST with pictures of astronomical events. With each issue of STAR DUST we hope to have it better looking and more interesting. This comes within the range of possibility because of the work which Sam will do. If we also had a LAY-OUT EDITOR we could promise much more. We are still hoping someone will volunteer to do this job for NCA.

* * * * * *

NEW MEMBERS

Charles E. Ashmore, 7507 Hopkins, College Park,Md.
Raymond W. Barlow, 749 Sudley Road, P.O. Box 30,Manassas,Va. 715
*David F. Bassett, 5223 Farrington Rd., Washington 16,D.C. OL 4-3642
Henry W. Bassett, 5223 Farrington Road, Wash.16, D. C. OL 4-3642
*Bill Dalness, 424 Cedar Hill Road, Falls Church, Va. JE 3-3238
*Albert George DiCanzio, 2851 So. Buchanan St., Arlington, Va. KI 8-4628
Mrs. Loraine K. Dickerson,Apt. 205, 3222 Wisconsin Ave., Washington 16, D. C. WO 6-4572
Irving S. Friedman, 5512 Brite Drive, Bethesda,Md. OL 2-7103
Mr. and Mrs. Paul Griffith, Jr., 5504 Lambeth Rd., Bethesda 14, Md. OL 4-6904
*Ronnie Goldwyn, 5742 - 26th St., N. W. Wash. 15,D.C. EM 3-2295
Anthony Hass, 3334 Volta Pl., N.W. Washington 7,D.C. HU 3-4694
W. Bert Johnson, 714 N. Abingdon St., Arlington 3,Va. JA 7-8865
*Steve Johnson, 714 N. Abingdon St., Arlington 3, Va. JA 7-8865
*Kevin Miller, 765 Rollins Drive, Alexandria, Va. SO 5-3798
Theodore T. Noble, 2104 - 32nd Place, S. E., Wash. 20 LU 2-6721
*Mickey Oksner, 814 Patton Drive, Silver Sprind,Md. JU 9-1026
*Richard Selman, Jr., 1027 N. McKinley Rd. Arlington,Va. JE 3-8951
Hallock F. Swift,3034 P St., N. W., Wash. D.C. FE 3-4476
David O. Walkinshaw, 103 S.Hallman St., Fairfax,Va. CR 3-1710
Mr. and Mrs. Worthington H. Talcott, 8007 Overhill Rd. Bethesda 14, Md. OL 4-2235

* * * * * *

Jewell Boling, Editor, 1717 P St., N.W. EX 3-2420, extension 3150

☆ STAR DUST

June, 1958 Vol. 15 No. 10

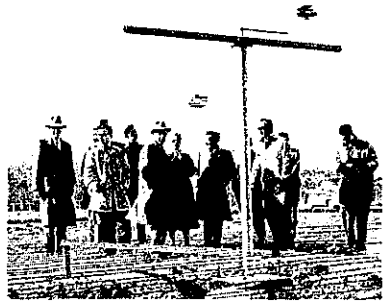
DR. S. L. SHARPLESS TO SPEAK ON PROBLEMS IN PHOTOMETRY

Dr. Stewart L. Sharpless graduated from the University of Chicago in 1952. He was a Carnegie Fellow at Mount Wilson and Palomar Observatories in 1952 and 1953. Since 1953 he has been on the staff of the U. S. Naval Observatory.

Using the method of low-dispersion spectroscopy and photometry, he investigates stellar distances in order to determine the distribution in space of various types of stars. He will discuss photometry and photometric problems that have a bearing on this type of work.

* * * * *

DID YOU SEE THEM? . . .



Belvoir Minitrack

Springfield Moonwatch

JUNE-JULY CALENDAR

JUNE 2 (Monday) Last telescope-making class until fall. Date will be announced later for opening of 1958-1959 classes.

JUNE 7 (Saturday) Lecture Series: Dr. Stewart L. Sharpless of the Naval Observatory will speak on PHOTOELECTRIC PHOTOMETRY. 8:15 P. M., Department of Commerce Auditorium.

JUNE 8 (Sunday) "EXPLORING THE SKY" - Joint program of the National Capital Astronomers and the National Capital Parks. Fort Reno Park, 40th and Chesapeake Streets, N. W. 9:00 P. M. Slides if cloudy, canceled if rain. Observations of Jupiter, etc.

(Continued)

JUNE-JULY CALENDAR (Continued)

JUNE 14 (Saturday) Maryland and D. C. Juniors over 12 meet with Leith Holloway at 2:00 P. M., at the Chevy Chase Community Center, 5601 Connecticut Avenue, N. W. Discussion Topic: THE SUN.

JUNE 22 (Sunday) "EXPLORING THE SKY" - Joint program of the National Capital Astronomers and the National Capital Parks. Fort Reno Park, 40th and Chesapeake Streets, N. W. 9:00 P. M. Slides if cloudy, canceled if rain. Observations of the moon, etc.

JUNE 27 (Friday) GROUP OBSERVING at the newly reconditioned 5" refractor at the Naval Observatory, starting at 8:00 P.M. Your NCA membership card will admit you. The group will be instructed by Mr. Isherwood.

Note there is no DISCUSSION GROUP in June.

JULY 4-6 ASTRONOMICAL LEAGUE CONVENTION, Cornell University, Ithica, New York

JULY 19 (Saturday) "EXPLORING THE SKY" - Joint program of the National Capital Astronomers and the National Capital Parks. Fort Reno Park, 40th and Chesapeake Streets, N.W. 9:00 P.M. Slides if cloudy, canceled if rain. Bring your friends and telescopes.

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1958-1959 NCA OFFICERS ELECTED AT MAY MEETING

President	Robert McCracken
Vice-President	Nelson M. Griggs
Secretary	Loraine K. Dickerson
Treasurer	Lillian R. Gregor
Trustee (Four-year term)	Glenn E. Neville

ASTRONOMICAL LEAGUE SLATE VOTED BY NCA at May Meeting

President, Chandler H. Holton, 833 Drewry Street, N.E. Atlanta 6, Ga.
Vice-President, Norman C. Dalke, 8017 Stroud Avenue, Seattle, Wash.
Secretary, Ralph Dalkins, 720 Pittsford-Victor Road, Pittsford, N.Y.
Treasurer, Leonard G. Pardue, 641 Falcon Avenue, Miami Springs, Fla.

WINDOW, DOORWAY, FIRE ESCAPE, ET CETERA, OBSERVING

This page is about satellite observations (also comets) but rather different from those reported on other pages of STAR DUST by Larry White, Lyle Johnson, Bob McCracken, et al. These are observations aided by instruments in favorable locations such as Moonwatch stations. They are rigorous observations and have scientific value. I want to say a word about another kind of satellite observations that can be made, just for fun. Many people feel that if they can't get to an observatory, Moonwatch station, or remote mountainside, seeing comets and sputniks is not for them.

This just isn't so and it is for these people I want to report my observing experiences. 1958 Delta (the new Russian satellite) will begin a morning series of passes on June 6. Take heart, all of you who haven't seen an artificial satellite. It really isn't difficult and it is a very thrilling experience, especially the first time.

Last year I didn't miss any of the unusual visual objects and all my observations were made in the heart of the city, right through the city lights. My observing sites were only windows, porches, sidewalks, doorways, and the fire-escape landing outside my back door.

I carried a chair out on this fire-escape landing and spent many hours viewing the Arend-Roland comet last May and June. With 7 x 50's I could see it to within perhaps 15 degrees of the horizon. I had one night's excellent viewing of the comet Mkos, from the same spot.

Came the sputniks. I had my first view of Sputnik II's carrier rocket as it went through the bowl of the Big Dipper on the morning of October 15 - from my fire-escape landing. I saw it through a break in the clouds the next morning, again from the landing. When Sputnik II came along I saw it on the morning of my very first try. As I stood on the fire-escape landing it appeared just east of overhead and sped away to the southeast. Later I learned it had just popped out of the earth's shadow.

Shortly before Sputnik I's carrier rocket came to earth in November I saw it on three occasions. I was working on a rush job on Sunday, November 24. The rocket was due over shortly after six. I stationed myself at an east window in the GAO building at 5th and G. I saw the rocket out of the window shortly after it crossed the meridian near the zenith. Even inside the building I could see it was of Jupiter-like brightness. I was able to follow it with unaided eyes until it disappeared low in the east, considerably reddened in a cloud bank. From the sidewalk in front of the GAO building I saw the rocket again the next night, considerably dimmer. I

(Continued)

SCIENCE FAIR WINNERS

Eight Science Fair winners were elected as NCA members at the May meeting. These winners, whose names appear under NEW MEMBERS as JUNIOR AWARD WINNERS, together with John Comulada, who was elected at the April meeting, and David S. Wehrly, already a club member, were each presented with a year's membership, including a subscription to SKY AND TELESCOPE and SPACE.

Bob McCracken welcomed the winners and asked each to tell briefly of his project. The subjects covered were varied and included research on the theory of a universe composed of anti-matter, analysis of micrometeorites, observation and special charting of the earth's revolution around the sun, Jupiter's moons, Saturn, and time. Projects constructed were a radiotelescope, grinding and mounting a mirror, and a rocket. With the last project, the work of two boys, a description was prepared of how a satellite when launched would make its orbit.

The new members and winners were given a special word of congratulation by Dr. Keller, the speaker. Dr. Keller pointed out that with the shortage of professional astronomers in this country, the need is for good serious young people to develop their interests in the field of amateur astronomy and thus to be encouraged to come into the profession. The present shortage will increase, he believes, as the indications are that astronomy will become a more active science within the next few years.

Salome Betts.

JUNIOR AWARD WINNERS

Joel H. Dressler, 830 So. Barton St., Arlington 4, Va. JA 7-1693
Charlotte R. Fisher, 3434 Dix St., N. E., Wash. 19, D.C. LU 3-2627
William Fricke, 1809 Powder Mill Rd., Silver Spring, Md. HE 4-5871
Eric Lewis, 3512 Porter St., N. W., Washington, D. C.
Stephen L. Mintz, 1 C West Way, Greenbelt, Md. GR 3-3592
George Parsons, 3616 Ordway St., N. W., Wash. 16, D. C. EM 2-9795
Robert Proctor, 2309 Weisman Rd., Wheaton, Md. WH 2-6806
Dorn Lewis Schmidt, 90 Wrightson Dr., McLean, Va. Elmwood 6-4052

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ROBERT MCCRACKEN'S RECORDINGS OF 1958 DELTA

Bob made recordings on his tape machine of 1958 Delta's first passages. He also has recordings of previous satellites, Russian, and our own Vanguard and Explorers. These would be interesting to hear, perhaps at a Discussion Group.

LYLE JOHNSON MAKES VISUAL SIGHTING OF VANGUARD SATELLITE

The Naval Research Laboratory predicted that the little Vanguard satellite would be 78° above the horizon and on the meridian at the Blossom Point Minitrack Facility at 9:35:15 PM EST April 14 1958. Its distance was 2385 miles. As I live only two miles from the Minitrack station I used their prediction without correction in setting up my 10" reflector with Erfle eyepiece giving 38X and a 1.9° field. The sky was clear and dark.

At about 9:35:37 I suddenly became aware of something moving rapidly across the field from west to east. It was very faint, fading to invisibility and immediately brightening with a period of a second or two. It was nearly to the center of the field when I spotted it and had already passed a group of bright (9th magnitude) stars I had intended to use for plotting positions.

I swung the telescope about a degree to the east and timed it at the first star it passed. This star was only 11th or 12th magnitude but with the aid of some nearby 9th magnitude stars I plotted the position in Webb's atlas with an error of less than one-tenth degree. The satellite was about one-tenth degree higher than the NLR prediction and about 20 seconds late.

I estimated that in 13 seconds it travelled a little more than one degree. The variation in brightness was due to the solar cells on the spinning sphere which caused it to be sometimes brighter, sometimes fainter than a smooth sphere. The brightness was 13th or 14th magnitude, 1000 times too faint to be seen with the naked eye, and barely visible in the 10" telescope.

Lyle T. Johnson

ASTRONOMY LESSON TO CUB PACK 256 - DEN 2

On the evening of April 25th, Mr. John Leonard and Morton Schiff gave an astronomy lesson to cub pack 256 - Den 3. Den Mother Mrs. Roger Hilsman assisted by parents Dr. Charles Goodman and Mrs. Earl F. C. Payne, all of Chevy Chase, Maryland. The 10 boys were shown the planet Jupiter and its moons through Mr. Leonard's 3" reflector. A brief nontechnical description of eight constellations, all that were visible at this location, was given by Mr. Schiff. The telescopic observations of Jupiter were handled by Mr. Leonard.

Morton Schiff

1958 NATIONAL ASTRONOMICAL LEAGUE CONVENTION

JULY 4-5-6, 1958

AT CORNELL UNIVERSITY, ITHICA, NEW YORK

ALL MEMBERS OF THE NCA AND THEIR FAMILIES ARE INVITED. PLAN ON A 4TH OF JULY WEEKEND HOLIDAY OF IT.

Remittances for registration ($2. per person or $3.50 per family) as well as room and banquet reservations should be mailed to:

Mr. Stephen Weber, Registrar
302 Beresford Road
Rochester 10, N.Y.
Please make checks payable to Stephen Weber.

Housing will be in the University dormitories at the following rates: $4.00 per night, per room for two persons and $4.00 per night per room for one person. These rooms will be available from Thursday night, July 3rd through Monday morning, July 7th. Delegates desiring rooms should state their preference for type of room as well as the nights to be occupied.

As usual, the convention banquet will be held on Saturday evening, July 5th. The menu will feature a roast prime ribs of beef dinner at $3.75 per plate including tip. Since we must determine the number of banquet reservations by July 1st, it would help greatly if you include your reservation at the time of mailing your convention registration.

Send in your registration today before you forget. Plan to come early, stay late, and enjoy all the fun. Please note that the convention is at Cornell University in Ithica even though the Rochester Society is handling the registration. Call me at OT-4-6835 for further information or if you need transportation. Program is on the following page.

Dana Law, Regional Chairman
Astronomical League

THE RESULTS OF RECENT SOLAR RESEARCH

Dr. Goeffrey Keller, Program Director for Astronomy, National Science Foundation, Washington, D.C., spoke on this subject at the May meeting of the NCA. Dr. Keller is a member of the Columbus, Ohio Astronomical Society. He brought their greetings to the National Capital Astronomers.

The material Dr. Keller presented, which was illustrated with slides, represents work done by many people and has been supported by the Office of Naval Research, the National Science Foundation, and many observatories and universities.

As background, Dr. Keller recounted various facts regarding the sun. The earth is about 100 solar diameters from the sun. The sun's mass is about 330,000 times greater than the mass of the earth. All that we know about the center of the sun has been obtained by calculation from the known conditions at the surface. The temperature of the sun at the center is about 13,000,000° centigrade. At this temperature the material is gaseous. The temperature is high enough to cause nuclear fusion. The gas does not dissipate into space because its mass causes sufficient gravitational attraction to hold it together. Its center is five times as dense as the densest material found on earth. The conversion of hydrogen into helium is the source of the sun's energy. The energy comes to the surface by convection and radiation.

Dr. Keller concluded his talk with a discussion of the findings resulting from recent solar research. Prominences are now thought to be the result of the "magnetic pinch effect"; that is, magnetism pinches the material together and causes it to retain a curved shape.

A recent development is the finding of heavy hydrogen in solar flares. This finding is of great theoretical importance.

Dr. Martin Schwarzschild sent a 12-inch telescope into the stratosphere by means of a balloon and obtained the best photographs of granulation made in the past 60 years. The telescope and camera were guided by an automatic computer. Dr. Schwartzschild formulated a theory to account for the granulated appearance of the sun's surface. He believes that the bright parts of the granulation is matter being forced out from the interior of the sun. The dark spots are where it returns.

A very recent theory of astronomers is that the sun's corona extends out beyond the earth's surface. Artificial satellite observations provide additional evidence to support this view. It is believed that the zodiacal light and related phenomena are actually views of substance in the sun's corona showing up when the earth's position is at a favorable angle.

Loraine K. Dickerson

OBSERVATIONAL DATA FOR JUNE

Mercury is too close to the sun for observation in June, superior conjunction occurring on the 18th. Venus is a morning star and rises about two hours before the sun. Mars is in Pisces and rises three hours before sunrise. Jupiter is near Spica and sets soon after midnight. The planet is stationary in right ascension on the 19th and will then move eastward among the stars. Saturn is in opposition on the 13th and consequently rises about sunset.

LUNAR OCCULTATIONS FOR JUNE

Date	Star	Mag.	Age	Phase	Time (E.S.T.)	P
June 3	BD-18° 5155	6.3	16.4	R	11:44.0 P. M.	269°
20	Kappa Cne	5.1	3.7	D	8:55.0 P. M.	91

SATELLITE OBSERVING

1957 Beta

Attemps were made by Moonwatch teams to observe 1957 Beta during its final revolutions about the earth. A Civil Air Patrol broadcast on April 10th stated that the rocket had broken into pieces and that the visibility condition was red. We watched for two passes over the Washington area that evening without success. It was soon apparent that this information was incorrect. On the 12th newspapers gave predictions that the rocket would pass over New England on its southeast course. The next night Steve Nagy (E.R.D.L.) spotted beta around 8:47 somewhat east of Polaris. It was white, of second magnitude brightness and appeared quite normal. It attained a maximum altitude of 30 degrees in the northeast. It was seen in New York, Pennsylvania, and Connecticut. The observation was compared to the one at New Haven and agreed closely with the time and position of the passage. The rocket apparently came to earth near the West Indies some ten minutes later. This indicates that the luminous period of a satellite is quite short. There was, however, an additional observation of a fourth magnitude object at Alamogordo two revolutions later. Another conflicting point is that the passage over Washington was calculated to be in the earth's shadow.

1958 Delta

The new Russian satellite was seen by Bob Bellar on May 16, low in the southwest. At 8:48 P. M. (E.S.T.) he determined its altitude as 27° and azimuth as 222°. It was of first magnitude brightness. One of the interesting features of this satellite is that it has two bright components and perhaps two faint ones also. The satellite was also observed in Falls Church, only one component being seen at each location. It is expected to be visible again in the morning sky around June 6.

A. L. White, Astronomy Editor

ASTRONOMICAL LEAGUE PROGRAM OUTLINE

Thursday, July 3

2:30 - 10 P. M. Council Meetings and Registration.

Friday, July 4

Registration all day.
10:30 - 12 A. M. Convention opening.
1:30 - 3 P. M. I.G.Y. Session - Satellites and Moonwatch.
3:30 - 5 P. M. I.G.Y. Session - Aurora, Solar, Meteors.
9:00 - ? Observing at Fuertes Observatory.

Saturday, July 5

9:00 - 10:45 A. M. Instrumentation Session.
11:00 - 12:00 A. M. A. L. P. O. Session.
1:30 - 3:00 P. M. Junior Session.
3:15 - 5:00 P. M. Panel of Experts.
6:30 - 8:30 P. M. Convention Banquet.
9:00 - ? Observing at Fuertes Observatory.

Sunday, July 6

8:30 - 9:30 A. M. Northeast Regional Meeting.
9:30 - 11:30 A. M. A. L. P. O. Session
11:30 - 12:00 A. M. Final Convention Session.

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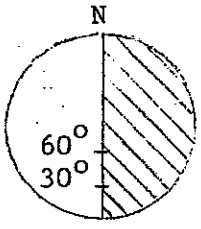
VISIBILITY OF SATELLITES

The drawings on pages 6 and 7 may be used to determine whether a satellite will be illuminated by sunlight when it passes overhead. The inclination of the earth's shadow to the meridian at the time the shadow reaches your zenith is also given. The data was obtained for 39° N latitude and may be used anywhere along this parallel. Referring to the second drawing of the section under vernal equinox, we find that we have until one hour thirty-four minutes after sunset on that date to see a satellite at 200 miles height cross through our zenith. An approximate correction may also be made for objects crossing the meridian at 30 and 60 degrees, two minutes being subtracted from this period in the case of a satellite crossing at 60° S. The same time intervals apply before sunrise in the morning, but the shadow position may be reversed. Objects above 500 miles may be watched all night at the summer solstice, providing they cross to the north.

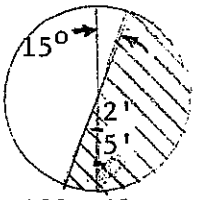
A. L. White, Astronomy Editor

SATELLITE VISIBILITY INTERVALS

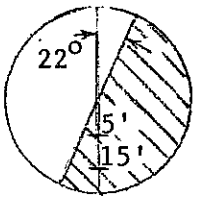
VERNAL AND AUTUMNAL EQUINOX



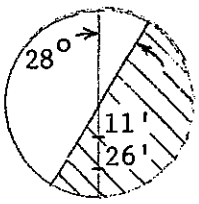
Sunset



200 miles
1hr 34min



400 miles
2hrs 12min



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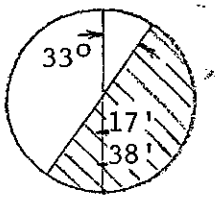
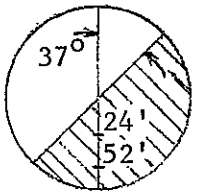
2hrs 40min



800 miles
3hrs 4min



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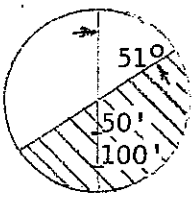
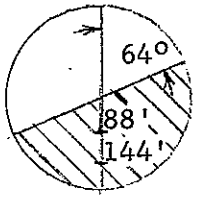
3hrs 23min



1500 miles
4hrs 14min



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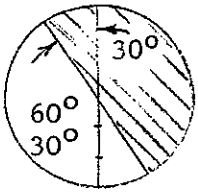
4hrs 52min

WINTER SOLSTICE



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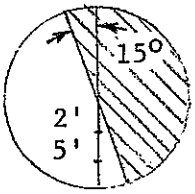
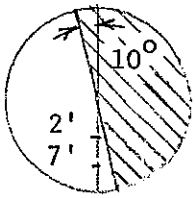
Sunset



200 miles
1hr 40min



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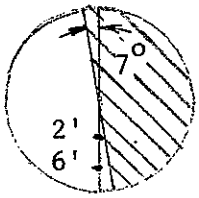
2hrs 18min



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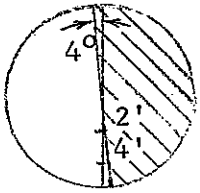
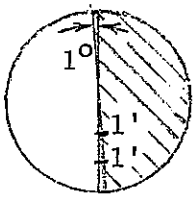
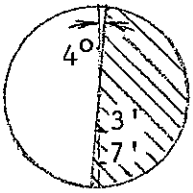
2hrs 43min



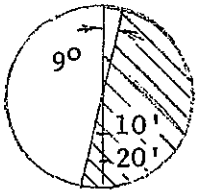
800 miles
3hrs 4min



1000 miles
3hrs 20min

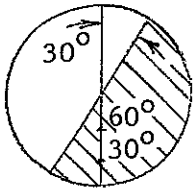


1500 miles
3hrs 56min

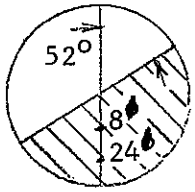


2000 miles
4hrs 16min

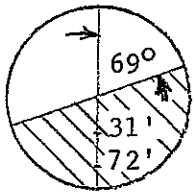
SUMMER SOLSTICE



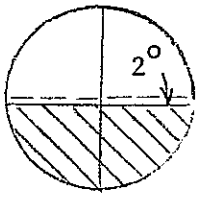
0
Sunset



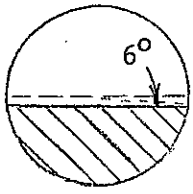
200 miles
2hrs 4min



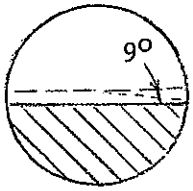
400 miles
3hrs 16min



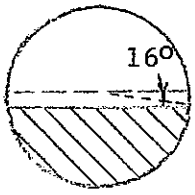
600 miles
Midnight



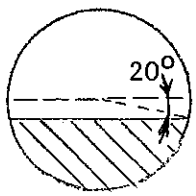
800 miles
Midnight



1000 miles
Midnight



1500 miles
Midnight



2000 miles
Midnight