

THE W.A.S.P.

WARREN
ASTRONOMICAL
SOCIETY
PAPER

LYRA

SEPT. 1975

VEGA

Shellak

M00

M56

M57

13 R

18h40m

18h00m

19h

+30°

20m

19h

19

17

6791

η

θ

ε_{1,2}

α

μ

τ

ζ

δ₁
δ₂

γ

λ

September	Event
4	Messier Club Meeting at 8 p.m., contact Frank McCullough (791-8752) for details.
5	New Moon.
11	Astrophotography Club Meeting at 8 p.m., contact Larry Kalinowski (776-9720) for details. Carl Zeiss born in 1816-German manufacturer, developed optical instruments.
12	First Quarter Moon.
14	Gregorian Calendar adopted in Britain in 1752.
18	Warren Astronomical Society monthly General Meeting at 8 p.m. contact Frank McCullough (791-8752) for details. Leon Foucault born, French physicist, demonstrated with pendulum that the earth rotates. Also invented Foucault test for precision optical testing.
20	Full ("Harvest") Moon.
23	Autumnal Equinox (autumn begins).
28	Last Quarter Moon.

CLUB NEWS

by
Kenneth Wilson

For the past few years the W.A.S. has been meeting in room 311 of "B" building at Macomb County Community College. Recent renovation of B building, however, has rendered this room useless for our purposes. At the time of this writing, no definite room has been found for either the August or September meetings. As usual, we may not know until the last minute. So, if you plan to attend the September general meeting, you are advised to check with one of the club officers (preferably Carl Noble (573-0937) or Louis Faix (781-3338)) before the meeting to find out when and where.

*

Mr. and Mrs. Frank McCullough and Mr. and Mrs. Dave Harrington attended the recent Apollo-Soyuz launch at Cape Canaveral, Florida.

*

Donald Mission and Mr. and Mrs. Frank McCullough attended the 1975 National Convention of the Astronomical League held in Atlanta, Georgia.

*

Ray Bullock has just ordered a Celestron 8 telescope.

*

CLUB PICNIC -- 30 AUGUST, 1975 CAMP ROTARY, 29 MILE RD.

WOW AND NEATERS! Come to our Club Picnic/Star Party this Sat., 30 Aug. We will start around 6:30, and first eat our picnic lunch (dinner?) then end the evening (into

morning) looking at the various objects in the sky. Don't forget your telescopes and your dinner. You can bring barbecue equipment along with you to cook your hot-dogs, etc. on. Bring your friends and relatives along also. Unfortunately, the public can't be invited due to the fact that it will be held at the Rotary Grounds, but guests who are interested in Astronomy are more than welcome.

SO COME ALONG, HAVE FUN, AND GET TO MEET SOME REAL STARS! SATURDAY, 30 AUGUST, 1975 FROM 6: 30 P.M. UNTIL ??

*

A special thanks to Cary White for the donation of the fine digital clock for the observatory. This will greatly help the sleepy-eyed observer to see what, time it is!

*

PUZZLE CORNER:

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A N D R O M E D A L E G I R
A S P A C E A R T H H F E R
U X T S K Y S E O P L U T O
R R A R X L E I M D E N E B
O A I A O U A S E P M O O N
R Y L V E N U S R A S L U P
A A T A Z A O E O R U E S Q
G S P R E R A M S A N C R U
U Y S I A R C A Y L A L A A
A N T A R E S R T L D I L S
M O L B T N G T I A L ? U A
A D Y L R U U I T X R I B R
R I R E S S R A A E E I E S
S C A O R I O N N C L C N L

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All the words listed below appear in the puzzle – horizontally, vertically, diagonally, and even backwards! Find them and circle their letters. The leftover letters (read from left to right, top to bottom) answer the question. (18 letter answer)

HOW DID RUSSELL GET OUT OF PRISON?

ANDROMEDA	ERIDANIS	MOON	SKY
ANTARES	EROS	NEBULA	SPACE
ARC	FUN	ORION	SYNODIC
ASTRONOMY	GALAXY	PARALLAX	TAIL
ATOM	LUNAR	PLUTO	TITAN
AURORA	LYRA	PULSAR	VARIABLE
CETUS	MARE	QUASARS	VENUS
DENEK	MARS	RIGEL	X RAY
EARTH	MARTIAN	SATURN	
ECLIPTIC	MESSIER	SEA	

TWINKLE, TWINKLE, LITTLE STAR

Twinkle, twinkle little star,
We know exactly what you are:
Nuclear furnace in the sky,
You'll burn to ashes by and by.

But tick, tick, tick pulsating star,
We wonder what YOU are:
Magneto-nucleo-gravity ball,
Making monkeys of us all!

And twinkle, twinkle quasi-star,
You're the limit, yes you are:
with such indecent energy,
Did God not say you couldn't be?

.Anon

Taken from "Violent Universe" by
Nigel Calder, Page 30.

submitted by Dolores Hill of the
Sunset Astronomical Society

The Warren Astronomical Society is a local, nonprofit organization of amateur astronomers. Membership is open to all interested persons. Annual dues are as follows: \$2.00 for Student (K through college) Membership, \$4.00 for General Membership, and \$5.00 for a Family Membership. Add \$5.00 for a one year subscription to Sky and Telescope magazine. General meetings are held on the third Thursday of every month.

The Warren Astronomical Society Paper (W.A.S.P.) is published monthly, by and for the members of the Warren Astronomical Society. Subscriptions are free to all Warren Astronomical Society members. Personal advertisements by Warren Astronomical Society members are also free. Non-member subscriptions and advertisements are available upon arrangement with any of the editors of the W.A.S.P. Contributions, literary or otherwise, are always welcome. Contributions to the W.A.S.P. should be submitted to either of the editors listed below.

EDITORS:	Kenneth Wilson	Carl Noble
	11157 Grenada	11508 Newbern
	Sterling Heights,	Warren,
	Michigan, 48077	Michigan, 48093
	268-9337	573-0937

The editors of the W.A.S.P. will exchange copies of this publication with other club publications on an even exchange basis. If your club would like to participate in such an exchange, please contact one of the above listed editors. The Warren Astronomical Society maintains correspondence, sometimes intermittent, with the following organizations:

THE ADAMS ASTRONOMICAL SOCIETY

THE ASTRONOMICAL LEAGUE

THE DETROIT ASTRONOMICAL SOCIETY

THE DETROIT OBSERVATIONAL AND ASTROPHOTOGRAPHIC ASSOCIATION

THE FORT WAYNE ASTRONOMICAL SOCIETY

THE GRAND RAPIDS AMATEUR ASTRONOMICAL ASSOCIATION

THE KALAMAZOO ASTRONOMICAL SOCIETY

THE MIAMI VALLEY ASTRONOMICAL SOCIETY

THE OLGELTHORPE ASTRONOMICAL SOCIETY

THE OLYMPIC ASTRONOMICAL SOCIETY

THE ORANGE COUNTY ASTRONOMICAL SOCIETY

THE SUNSET ASTRONOMICAL SOCIETY

Other organizations are invited to join this list.

THIS MONTH'S COVER BY: Carl Noble

THIS MONTH'S STAFF INCLUDES: Louis Faix, Ray Bullock, Carl L. Noble

FALL IS HERE -- A SEASON TO OBSERVE

It is hard to believe, but the summer is just about over, and with it the warm (but usually cloudy) weather we all enjoy in which to observe. So are the vacations almost gone, now all you can do is observe on a Friday or Saturday evening.

By early October the nights will begin to get chilly but some of the best observing weather in the entire year will be at hand. The Messier objects in the region of Lyra and Cygnus remain to be covered followed by those in Capricornus and Aquarius. Also, in the sky Cassiopeia, Perseus and our old favorite Andromeda will be coming back, and with them the chance to renew old acquaintances.

If you are fairly new at Messier hunting, some of the best objects can be found in September. Among some of them is the rich area in LYRA and VULPECULA. Some of the easier objects can be seen even in the heart of Warren. M57, the famous *Ring Nebula*, is a very exciting object when you first glance at it. M56, a small, but clear and bright globular cluster is in the same Lyra region. M27, the again famous *Dumbell Nebula*, is a striking sight. M57 seems to give you a 3-D affect with the background stars. 50-100 X gives a very fine view of the *Dumbell Nebula*.

For those who are new at even finding the constellations, below is a list of the most prominent constellations with the months they can be most easily seen. Once you have mastered the visual art of picking out the constellations, you will have no trouble finding the Messier Objects. Have fun!

Constellations Visible from 40° N

Circumpolar (visible all year)

Ursa Major
Ursa Minor
Draco
Cepheus
Cassiopeia
Camelopardalis

Constellations listed below will be on or near the meridian at 8:30 P.M., local time, on the fifteenth of each month:

<i>January</i> (4 hours)	<i>February</i> (6 hours)	<i>March</i> (8 hours)	<i>April</i> (10 hours)	<i>May</i> (12 hours)	<i>June</i> (14 hours)
Auriga Perseus Caelum Eridanus	Taurus Orion Lepus Columba Canis Major	Lynx Gemini Cancer Canis Minor Monoceros Puppis Pyxis	Leo Minor Leo Sextans Hydra Antlia Vela	Canes Venatici Coma Berenices Virgo Crater Corvus	Bootes Centaurus
<i>July</i> (16 hours)	<i>August</i> (18 hours)	<i>September</i> (20 hours)	<i>October</i> (22 hours)	<i>November</i> (0 hours)	<i>December</i> (2 hours)
Corona Borealis Hercules Serpens Caput Libra Scorpius Lupus Norma	Lyra Ophiuchus Serpens Cauda Scutum Sagittarius Corona Australis Telescopium	Cygnus Vulpeculla Sagitta Delphinus Aquila Capricornus Microscopium	Lacerta Pegasus Aquarius Piscis Austrinus Grus Equuleus	Andromeda Pisces Sculptor Phoenix	Triangulum Aries Cetus Fornax



THE ASTRONOMICAL LEAGUE

Bi-Centennial Convention Committee

P.O. Box 105

Parker Ford, Pa. 19457

1976 ASTRONOMICAL LEAGUE BICENTENNIAL CONVENTION KUTZTOWN 1 PENNSYLVANIA

AUGUST 19 through 22

The convention will be hosted by the Lehigh Valley Amateur Astronomical Society jointly with the Astronomical Society of Harrisburg and the Rittenhouse Astronomical Society.

Kutztown State College is located in the heart of the Pennsylvania Dutch Country as featured in a issue of the National Geographic. Time and information will be available for delegates to tour the countryside.

FEATURES OF THE CONVENTION

A telescope Fair

A national contest for Astronomical Photographs

A panel exhibit of 200 years of amateur astronomy

An address by NASA on 200 years of exploration of Mars and a special feature by Carl Sagan on the first soft landing on Mars July, 1976.

Three nationally known speakers

Special guided tours to areas of Bi-centennial interest as: Valley Forge, Hopewell Village, 1976 Philadelphia sites, etc.

Observing sessions at the 18" Kutztown College telescope and at Pulpit Rock Astronomy Park

Interesting paper sessions by delegates

Special interest group meetings

We expect to offer the 3 days of Convention, including meals and banquet for about \$50.00 per person. THIS INCLUDES A ROOM FOR THE ENTIRE WEEK in new dormitories for those who wish to tour the bicentennial sites on their own before the convention.

In commemoration of the BI-CENTENNIAL YEAR the theme of the convention will be "TWO HUNDRED YEARS OF AMATEUR ASTRONOMY."

Plan to attend this great event now by advance registration. Dormitory capacity is limited to 500 occupants. First come registrations; first given reservations! We anticipate maximum attendance for a memorable convention.

Please use the registration form below and make your checks payable to: George Maurer, Treas., Bi-Centennial Convention Comm. All payments will be acknowledged and further information sent.

TO: George Maurer, Treas., Bi-Cent. Conv. Comm.
R.F.D. #3 - Box 140, Cooperburg, Pa. 18036

NAME: _____ Single (\$4) _____ Family (\$5) _____

ADDRESS: _____ CITY: _____

ADVANCE REGISTRATION FORM

ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS
Comets Section July, 23, 1975

COMET KOBAYASHI-BERGER-HILON 1975h. The enclosed ephemeris was furnished by R.B. Minton of Tucson, Arizona, who used parabolic elements by Brian G. Marsden on IAU Circular 2800 for July 18th. The columns refer to: Delta, Earth to comet distance in astronomical units; R, sun to comet distance (A.U); CES, comet-Earth-sun angle in degrees; TL, tail length as millions of kilometers per degree at R of comet; Mag, predicted total visual magnitude from $\text{mag.} = 7.1 + 5.0 \log \Delta + 10.0 \log R$; PA, possible tail position angle or apparent position angle of radius vector through comet; ALT, altitude of comet when the sun is 102 degrees from the zenith (nautical twilight); Time, end of evening nautical twilight or beginning of morning nautical twilight. The time is local standard time at latitude +40°. To adjust this to daylight saving time, add one hour and a correction based on your longitude east or west of a standard meridian, as explained in the Graphic Time Table on page 33 of the January Sky and Telescope. The RA and Dec of 75h is given for 0 hour Universal time.

The comet will be visible in the evening sky when it enters the twilight. After perihelion on to the morning sky, but never reaches an altitude the start of nautical twilight.

Thus far the tail is narrow and shown best on photographs. James and Karen Young at Table Mountain Observatory in California photographed a 1° tail in PA 2050 on July 14.3 with a two-hour exposure on 103a-F. John Sanford of Orange, Calif. recorded a 30' spike in PA 210° on July 13.36 using 103a-E film exposed six minutes in a Schmidt.

UT Date	Observer	Total Mag.	Source	Coma Diameter
July 11.27	Morris	6.5	8X52	SAO 15'
12.25	Morris	6.3	8X52	SAO 12'
12.58	Matchett	7.0	12½ refl.	SAO
13.95	Lukas	6.5	20X70	12'
14.15	Krobusek	6.2	7X35	S.P.
14.47	Minton	6.0	7X50	SAO 10'
14.96	Lukas	5.5	20X70	
15.24	Sherrod	7.0	6" refr.	SAO 8'
15.32	Minton	5.6	7X50	SAO 18'
15.94	Lukas	5.2	20X70	AAVSO 15'
16.14	Krobusek	6.3	7135	S.P.
16.14	Stephan	6.3	7X35	S.P.
16.28	Sherrod	6.1	6" refr.	SAO 12'
17.17	Milon	4.8	7X35	AZ, Yale 30'
17.17	Krobusek	6.3	7X35	S.P.
17.22	Minton	5.2	7X50	SAO 15'
17.25	Sherrod	6.4	6" refr.	SAO 17'
18.25	Sherrod	5.9	6" refr.	SAO 12'
18.26	Weier	4.9	8X40	S.P.
18.36	Minton	5.0	7X50	SAO 15'
18.38	Wallentine	4.6	7X35	S.P. 11'
19.22	Weier	4.7	7X50	S.P. 13'

The observers are Bruce A. Krobusek, Chagrin Falls, Ohio; Rainer Lukas, Bonn, West Germany; Vic Matchett, Indooroopilly, Queensland; Dennis Milon, Harvard, Mass.; R.B. Minton, Tucson, Arizona; Charles S. Morris, West Lafayette, Indiana; Clay Sherrod, North Little Rock, Arkansas; Chris Stephan, Chagrin Falls, Ohio; Derek Wallentine, Albuquerque, New Mexico; and David Weier, Madison, Wisconsin.

Please send reports on the standard ALPO forms for visual and photographic observations. All observations sent to this address will be acknowledged with a postcard: Dennis Milon, 378 Broadway, Cambridge, Mass. 02139.

COMET KOBAYASHI -BERGER-MILON (1975h)

T = 1975 Sept. 5.341 ET

 $\omega = 116^\circ.968$ $\Omega = 295.652$ $i = 80.774$

1950

q = 0.42568 AU

26	16	30.15	58	8.0	.293	1.053	89.2	.8	4.7	-2.07	.022	128.0	71.8	20	29
27	15	56.66	58	45.2	.306	1.035	85.0	.8	4.7	-2.57	.015	120.1	69.8	20	28
28	15	25.52	56	50.0	.321	1.016	81.1	.8	4.7	-2.47	.007	112.1	67.2	20	27
29	14	57.40	58	30.1	.337	.998	77.5	.9	4.7	-2.30	-.001	106.0	64.3	20	25
30	14	32.13	51	52.7	.355	.980	74.1	.9	4.9	-2.25	-.009	100.2	61.4	20	24
31	14	11.22	57	4.0	.373	.961	71.0	1.0	4.8	-2.14	-.017	95.1	58.6	20	23

1975 AUG

	R	A	DEC		DELTA	R	CES	TL	MAG	ζ LOGD	LOGR	P.A.	ALT	TIME
1	13	52.60	56	8.5	.392	.943	68.2	1.0	4.8	-2.03	-.026	90.6	55.9	20 22
2	13	36.50	55	9.6	.412	.924	65.5	1.1	4.8	-1.93	-.034	86.7	53.4	20 20
3	13	22.53	54	9.6	.432	.905	63.1	1.1	4.8	-1.82	-.043	83.3	51.0	20 19
4	13	10.35	53	9.9	.463	.887	60.8	1.2	4.9	-1.72	-.052	80.2	48.7	20 18
5	11	59.66	52	11.4	.475	.868	58.6	1.2	4.9	-1.62	-.061	77.5	46.6	20 16
6	12	50.20	51	14.7	.496	.849	56.6	1.3	4.9	-1.52	-.071	74.9	44.6	20 15
7	12	41.77	50	20.1	.518	.831	54.7	1.4	4.9	-1.43	-.080	72.6	42.7	20 14
8	12	34.20	49	27.6	.540	.812	52.9	1.4	4.9	-1.34	-.090	70.3	40.9	20 12
9	12	27.34	48	37.2	.563	.794	51.2	1.5	4.8	-1.25	-.100	68.2	39.2	20 11
10	12	21.08	47	48.8	.585	.775	49.6	1.5	4.8	-1.10	-.111	66.2	37.5	20 9
11	12	15.33	47	2.3	.609	.756	48.0	1.6	4.8	-1.06	-.121	64.2	35.9	20 8
12	12	10.00	46	17.5	.631	.738	46.5	1.7	4.8	-1.00	-.132	62.3	34.4	20 6
13	12	5.03	45	34.2	.654	.720	45.0	1.7	4.6	-.92	-.143	60.3	32.9	20 5
14	12	.36	44	52.2	.677	.701	43.6	1.8	4.7	-.85	-.154	58.4	31.5	20 3
15	11	55.94	44	11.2	.700	.683	42.3	1.8	4.7	-.77	-.165	56.5	30.1	20 2
16	11	51.7	43	31.2	.724	.665	41.0	1.9	4.6	-.70	-.177	54.5	28.8	20 0
17	11	7.73	42	51.9	.747	.647	39.7	2.0	4.6	-.63	-.189	52.5	27.4	19 59
18	11	43.87	42	13.0	.770	.630	38.4	2.0	4.5	-.57	-.201	50.5	26.1	19 57
19	11	40.14	41	34.4	.793	.613	37.2	2.1	4.5	-.50	-.213	48.4	24.8	19 55
20	11	36.52	40	55.8	.817	.596	36.0	2.1	4.4	-.44	-.225	46.3	23.5	19 54
21	11	33.00	40	17.1	.640	.579	34.9	2.2	4.3	-.38	-.231	44.1	22.3	19 52
22	11	29.56	39	38.1	.863	.563	33.8	2.3	4.3	-.32	-.250	41.8	21.0	19 51
23	11	26.18	38	58.5	.886	.347	32.7	2.3	4.2	-.26	-.262	39.4	19.7	19 49
24	11	22.87	38	18.1	.910	.532	31.6	2.4	4.2	-.21	-.274	37.0	16.4	19 47
25	11	19.62	37	36.3	.133	.517	30.5	2.5	4.1	-.15	-.286	34.4	11.1	19 40
26	11	16.42	36	54.3	.955	.503	29.5	2.5	4.0	-.10	-.298	31.8	15.9	19 44
27	11	13.27	36	10.4	.978	.490	28.5	2.6	4.0	-.05	-.310	29.0	14.5	19 42
28	11	10.17	35	25.1	1.001	.478	27.5	2.7	3.9	.00	-.320	26.1	13.2	19 41
29	11	7.14	34	38.0	1.023	.467	26.5	2.6	3.8	.05	-.331	23.1	11.9	19 39
30	11	4.10	33	49.0	1.045	.457	25.6	2.9	3.8	.10	-.340	19.9	10.6	19 37
31	11	1.26	32	58.1	1.067	.446	24.7	3.0	3.8	.14	-.349	16.6	9.2	19 35

1975 SEPT

	R	A	DEC	DELTA		R	CES	TL	MAG	ζ LOGD	LOGR	P.A.	ALT	TIME
1	10	58.43	32	5.1	1.086	.441	23.9	3.1	3.7	.18	-.356	13.1	1.8	19 34
2	10	55.70	31	10.0	1.109	.435	23.1	3.2	3.7	.22	-.362	9.5	6.4	19 32
3	10	53.06	30	12.7	1.129	.430	22.3	3.3	3.7	.26	-.366	5.7	5.0	19 30
4	10	50.54	29	13.4	1.149	.427	21.6	3.5	3.7	.30	-.369	1.7	3.6	19 28
5	10	48.14	28	12.1	1.168	.426	21.0	3.6	3.7	.34	-.371	357.6	3.2	4 28
6	10	45.87	27	8.8	1.186	.426	20.4	3.8	3.8	.37	-.371	353.3	3.7	4 29
7	10	43.75	26	3.8	1.204	.428	19.9	3.9	3.8	.40	-.369	348.9	4.1	4 30
8	10	41.77	24	57.3	1.221	.431	19.5	4.1	3.9	.43	-.365	344.4	4.5	4 31
9	10	39.94	23	49.4	1.238	.436	19.1	4.3	4.0	.46	-.360	339.8	4.9	4 32
10	10	38.26	22	40.4	1.253	.443	18.9	4.5	4.1	.49	-.354	335.1	5.3	4 33
11	10	36.73	21	30.5	1.268	.451	16.7	4.6	4.2	.52	-.346	330.5	5.6	4 34
12	10	35.35	20	20.0	1.282	.460	10.7	4.8	4.3	.54	-.337	323.9	6.0	4 35
13	10	34.11	19	8.9	1.296	.470	18.7	4.9	4.4	.56	-.328	321.3	6.3	4 36
14	10	33.01	17	57.6	1.308	.482	13.8	5.1	4.5	.58	-.317	316.9	6.7	4 37
15	10	32.04	16	46.1	1.320	.494	19.0	5.2	4.6	.60	-.306	312.7	7.0	4 38
16	10	31.19	15	34.6	1.332	.508	19.3	5.3	4.6	.62	-.294	308.6	7.3	4 39
17	10	30.45	14	23.3	1.343	.522	19.7	5.4	4.9	.64	-.283	304.8	7.6	4 41
18	10	29.82	13	12.2	1.353	.536	20.1	5.5	5.1	.66	-.210	301.2	7.9	4 42
19	10	29.29	12	1.4	1.363	.552	20.6	5.5	5.2	.67	-.258	297.8	8.2	4 43
20	10	28.64	10	51.1	1.373	.566	21.2	5.6	5.3	.69	-.246	294.7	8.5	4 44
21	10	28.48	9	41.1	1.382	.584	21.8	5.7	5.5	.70	-.233	291.8	8.8	4 45
22	10	26.20	8	31.7	1.391	.601	22.4	5.7	5.6	.72	-.221	289.1	9.1	4 46
23	10	27.99	7	22.8	1.399	.618	23.1	5.7	5.7	.73	-.209	286.6	9.3	4 47
24	10	27.83	6	14.5	1.4013	.635	23.8	5.8	5.9	.74	-.197	284.3	9.6	4 48
25	10	27.74	5	6.7	1.415	.653	24.5	5.8	6.0	.75	-.185	282.2	9.8	4 49
26	10	27.70	3	59.4	1.423	.671	25.3	5.8	6.1	.77	-.173	280.3	10.0	4 50
27	10	27.10	2	52.8	1.430	.689	26.1	5.8	6.3	.78	-.162	278.6	10.3	4 51
28	10	27.75	1	40.7	1.438	.707	26.8	5.9	6.4	.79	-.160	277.0	10.5	4 52
29	10	27.84	0	41.2	1.445	.725	27.6	5.9	6.5	.80	-.139	275.5	10.1	4 53
30	10	21.96	-0	23.7	1.451	.744	28.4	5.9	6.6	.81	-.129	274.2	10.9	4 54

1975 OCT

	R	A	DEC	DELTA		R	CES	TL	MAG	ζ LOGD	LOGR	P.A.	ALT	TIME
1	10	28.11	-1	28.1	1.458	.762	29.3	5.9	6.7	.82	-.118	272.9	11.1	4 55
2	10	28.29	-2	31.9	1.465	.781	30.1	6.0	6.9	.83	-.107	271.8	11.3	4 56
3	10	28.50	-3	35.1	1.471	.799	30.9	6.0	7.0	.84	-.097	270.8	11.5	4 57
4	10	28.72	-4	37.9	1.477	.818	31.7	6.0	7.1	.85	-.087	269.9	11.6	4 58
5	10	28.96	-5	40.1	1.483	.837	32.6	6.0	7.2	.86	-.077	269.1	11.8	4 59
6	10	29.22	-6	41.7	1.489	.855	33.4	6.0	7.3	.87	-.068	268.3	11.9	5 0
7	10	29.50	-7	42.9	1.495	.874	34.2	6.1	7.4	.87	-.058	267.6	12.1	5 1
8	10	29.78	-8	43.6	1.501	.893	35.1	6.1	7.5	.88	-.049	267.0	12.2	5 2
9	10	30.09	-9	43.6	1.507	.911	35.9	6.1	7.6	.89	-.040	266.5	17.3	5 3
10	10	30.38	-10	43.5	1.513	.930	36.7	6.1	7.7	.90	-.032	266.0	12.4	5 4
11	10	30.09	-11	42.8	1.519	.948	37.6	6.2	7.8	.91	-.023	265.5	12.5	5 5
12	10	31.01	-12	41.6	1.525	.967	38.4	6.2	7.9	.92	-.015	265.1	12.0	5 6
13	10	31.32	-13	40.0	1.530	.985	39.2	6.2	8.0	.92	-.006	264.8	12.6	5 7
14	10	31.64	-14	37.9	1.536	1.004	40.0	6.3	8.0	.93	.002	264.5	12.7	5 8
15	10	31.96	-15	35.4	1.542	1.022	40.8	6.3	8.1	.94	.010	264.3	12.7	5 9
16	10	32.27	-16	32.5	1.547	1.041	41.7	6.3	8.2	.95	.017	264.1	12.1	5 10
17	10	32.58	-17	29.1	1.553	1.069	42.5	6.4	8.3	.96	.025	263.9	12.7	5 11
18	10	32.89	-18	25.4	1.558	1.077	43.3	6.4	8.4	.96	.032	263.8	12.7	5 12
19	10	33.20	-19	21.3	1.564	1.095	44.1	6.5	8.5	.97	.040	263.7	12.7	5 13
20	10	33.49	-20	16.7	1.570	1.114	44.9	6.5	8.5	.98	.047	263.6	12.1	5 14
21	10	33.18	-21	11.8	1.575	1.132	45.7	6.5	8.6	.99	.054	263.6	12.6	5 15
22	10	34.06	-22	6.5	1.581	1.150	46.4	6.6	8.7	.99	.061	263.6	12.5	5 10
23	10	34.33	-23	.9 1	1.587	1.168	47.2	6.6	8.8	1.00	.061	203.6	12.4	5 17
24	10	34.59	-23	54.8	1.593	1.186	48.0	6.7	8.9	1.01	.074	263.7	12.3	5 16
25	10	34.84	-24	48.4	1.598	1.203	48.8	6.7	8.9	1.02	.080	263.8	12.2	5 19
26	10	35.01	-25	41.7	1.604	1.221	49.5	6.8	9.0	1.03	.087	263.9	12.1	5 20
27	10	35.29	-26	34.5	1.610	1.239	50.3	6.6	9.1	1.03	.093	264.0	11.9	5 21
28	10	35.41	-27	27.0	1.616	1.257	51.0	6.9	9.1	1.04	.099	264.2	11.8	5 22
29	10	35.61	-28	19.2	1.622	1.274	51.8	6.9	9.2	1.05	.105	264.4	11.6	5 23
30	10	35.84	-29	11.0	1.628	1.292	52.5	7.0	9.3	1.06	.111	264.6	11.4	5 24
31	10	35.99	-30	2.5	1.634	1.309	53.3	7.0	9.3	1.01	.117	264.8	11.1	5 25

A.L.P.O. COMETS SECTION

COMET

Observer

Date (UT)

Address

Time

Distance from horizon

Place of observation

Approximate R.A.

Approximate declination

Sky conditions (Transparency, haze, moonlight, twilight, city lights, faintest naked eye star near comet)

MAGNITUDE ESTIMATES (State method and telescopes used)

Total magnitude Tel. Magnitude of nucleus Tel.
Comparison stars, magnitudes, and catalog used. Were they in the same field of view?

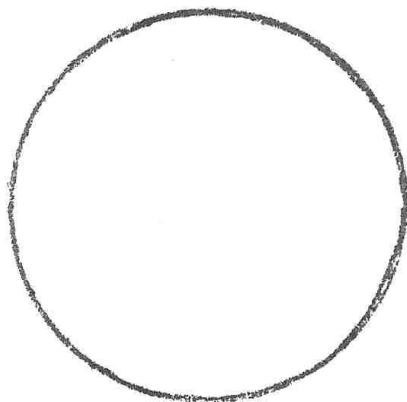
DESCRIPTION (State methods and instruments used)

Tail length Position angle of tail from head. (Plot on an atlas and measure.
North is 0° , East is 90° .)
Remarks on tail (details, color, shape, etc.):

Coma description (diameter by drift method, shape, jets with P.A.):

Degree of coma condensation. Scale: 0=diffuse, 9=stellar.
(A sketch will be of value.)

FIELD SKETCH: Draw on an atlas and re-copy.



Power
Diameter of field
Field orientation

Drawing paper may be used instead. If the sketch is intended for publication, it should not be folded.

APOLLO-SOYUZ- IT WAS A BLAST !!!

Cruise control switch on, with Pepsi in hand and legs outstretched over the dashboard of the car, Dave was leading us through the southern terrain to our final destination - Cape Kennedy, Florida. We would view the spectacular event of the launch of Apollo-Soyuz -the first American/Russian combined effort to dock in space, on July 15, 1975 at 3:50 p.m. Fellow crew members consisted of Linda Harrington, Frank McCullough, and myself - Diane.

Frank and I arrived at the door of the Harrington household at approximately midnight of July 11. My husband was garbed in a Lion's football rain cape with hood to haunt Dave, and maybe even to wake him up a bit. The party moved under-way at approximately 1:00 p.m., we continued to drive on and on and on until 23 hours later when we reached Ruskin, Florida and a very comfortable mobile home for our stay.

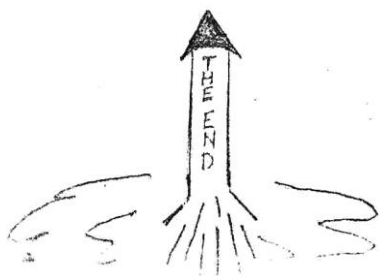
Needless to say, we did make a few stops on the way to refuel, release our fuel, and to eat. Speaking of eating ... reminds me of breakfast at a reputable Holiday Inn where our foursome could easily have been asked to leave! The waitress came to our table to refill the coffee cups and found floating in them whole packets of sugar (paper and all!) and packages of fruit jelly. (The girls had to play while the boys were away - and well, it was somewhat humorous to the guys when they returned to the table - anxiously awaiting their morning cups of coffee (minus the additives!).

Moving right along ... Places of interest included Kennedy Space Center. The museum as well as a bus tour of the VAB (Vehicle Assembly Building), control towers, and various missiles and historical remains of previous flights into space.

Finally, the day of the launch had arrived. With a special guest pass from Washington D. C. headquarters, our sight was 3 to 4 miles from the rocket. The pavement on which we stood was the actual Space Shuttle run-way which has been partially constructed for use in future years. A mass of bodies and cameras wallpapered the area (somewhat similar to "tripod city" on board the Canberra African eclipse cruise). Only ten minutes before blast-off the steady stream of cars continued to flow into the observing sight. All radios were tuned in for the countdown and our tape recorder was set to receive the vibrating roar of the Saturn IB. Dave and Frank were ready with 35mm cameras; Linda and I had the movie cameras ... 4 - 3 - 2 - 1 ! ! ! ! ! ... a brilliant splendor of white light, gaseous billowing clouds of smoke, and a mighty bird suspended in space! Like a soaring arrow it continued its steady curve upward - into the heavens (as my knees began to knock while following it with the movie camera) 1st staging, then 2nd staging followed by a jet trail of white smoke. Then appeared a downward floating motion until ... nothing. The vastness of the sky seemed to swallow its existence. The actual sound took about 30 seconds to reach us and it was magnificent. Although this Saturn IB was approximately half the size of the Apollo Saturn V, it was large enough to enhance a breath-taking event and one which I shall always remember.

The foursome of gleaming white W.A.S. t-shirts loaded our gear and headed home - very slowly, Traffic was bumper to bumper for miles, while passing a number of cars that suffered from "heat-stroke".

Our journey back to Michigan was approximately 21 hours long - but the pleasant company and the poor humor made a good time and an enjoyable trip home.



submitted by~

Diane McCullough

PLANETARIUM GAZING

Raymond Bullock

Blast! Here it's September already. Good-bye summer. Good-bye good times. Hello school. (How many days until Christmas vacation?)

Actually, all is not lost. There are still two months of decent weather left. (Well, one month anyway.) Just because you can't pack up and go to Tahquamenon Falls doesn't mean you have to sit at home and wait for the snow to fly. What I hope to do in this series is to promote alternatives to dull stay-at-home week-ends. What better way (for those of us interested in astronomy) than to visit a planetarium? There are plenty to pick from in Southern Michigan, and it is surprising the number of people who don't know about them.

Now before you all hoot and holler (who needs a planetarium when we can see the real thing?) consider: you don't have to wait for clear skies in a planetarium, you don't have to wait for a dark sky at awkward hours, there's air conditioning, and best of all no mosquitoes! Fathers, you will be able to spend time with your family and have a pleasant drive (if you must have your week-end Tiger baseball game you can get it on the radio). Mothers, you might get out of cooking dinner if you can talk hubby into eating out. Children will learn something painlessly too. A planetarium is educational as well as entertaining, and often causes one to do a lot of pondering. In most cases there is more at your destination than "just" a planetarium, so everyone should find something to enjoy in these excursions.

Consider the Robert T. Longway Planetarium in Flint. A mere one hour drive up I-75. There are only three planetariums in the world this size, one in Buenos Aires, another in Denver, the third here. Longway planetarium contains numerous ultra-violet exhibits and displays around the theatre. Unfortunately, the people of Flint don't realize what a great resource they have here. The planetarium is usually only ten percent filled, and the week-end shows have been cut from five to three.

Now showing, through September 21, is "Space Puzzles", this program is composed of eight mini-shows unified by the theme of "what we DON'T know about the Universe". In each segment, the puzzle is presented 'with enough explanation to enable the audience to understand the question. Each of the eight segments also suggest possible answers to the puzzles. The puzzles are "What Do Sunspots and Bunny Rabbits Have in Common?", "Why is the Moon's Backside Weird?", "Where Did All the Tektites Come From? All the What?", "How Did Venus Get Turned Over?", "By Jove! What's That Spot?", "Planet X, Where Are You?", "Why Do Galaxies Have Arms?", and "Can We Travel To the stars?". There ought to be one question there you'd like to find out about.

If that program doesn't turn you on, try "Explorers From the Stars" starting September 26 through November 23. This program investigates the possibilities of life (as we know it) on other worlds. The major stellar classes are examined to determine which stars may reign over Earth-like planets. Next, given a sun type star, the program investigates the conditions necessary for an Earth-like planetary environment. Contact by intelligent, extra-terrestrial beings is considered as a possible cause of UFO sightings. A "how to" section is included in the program, informing the audience about the proper ways of observing and reporting a UFO. The program concludes with speculations about future contact with alien civilizations.

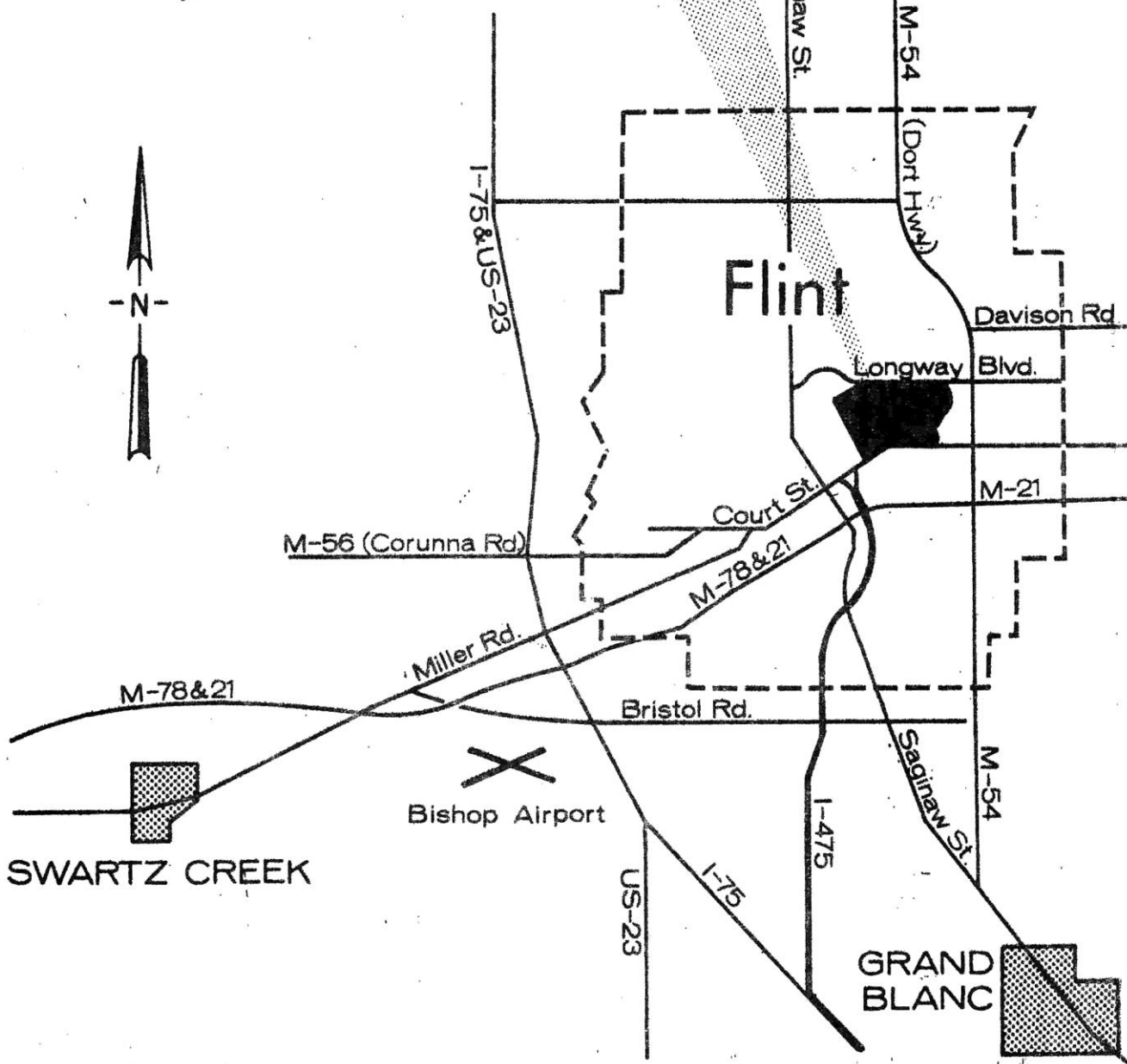
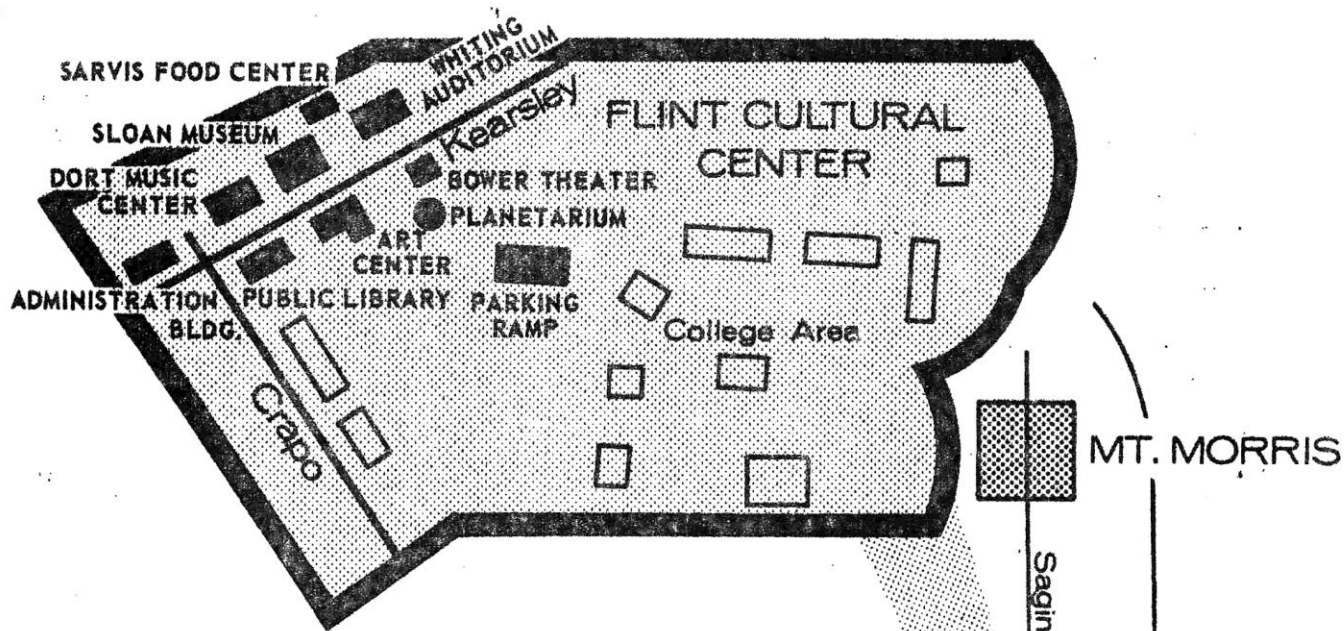
"The Christmas Story" is offered from November 28 to December 21 and is probably the best program done at Longway. I believe it is a better and more dramatic Christmas show than those done by any other planetarium in the state. If you only go once to Flint, this is the show to go for. The program is divided into three parts, opening with a Christmas as it may have been celebrated at the turn of the century and quickly progresses to our present day Christmas. After an exploration of the current winter sky, the scene is set for the possible astronomical explanation of what the Christmas Star may have been, including a nova, comet, or conjunction of the

planets. The program concludes with the pageantry of the first Christmas retold from the first four books of the New Testament set to a backdrop of seasonal music. (I quote from the Longway brochure.)

For those of you who would like more information, the planetarium will send you its free 1975-76 brochure if you write to Longway Planetarium, 923 E. Kearsley Street, Flint, 48502, or call 238-6360. Admission is surprisingly cheap: 25¢ for children, 50¢ for adults. Programs are scheduled for Friday at 7.30 p.m. and Saturday and Sunday at 1:00, 2:30 and 4:00 p.m. Doors open 30 minutes before the programs begin, however the exhibit hall is open from 12:30 p.m. Please note: children under five are NOT allowed in the planetarium.

How to get there. The opening of the Buick Freeway (I-475) from I-75 near Grand Blanc has made driving into Flint a lot easier. Take 475 (marked: DOWNTOWN) from I-75 to its end at Court Street and turn right (East) onto Court. The second traffic light is Crapo (believe it or not, that's the street's name!), turn left on Crapo and drive North to Kearsley (watch out for stop signs!). Turn right on Kearsley, the planetarium is the green domed building ¼ mile, on the South side of the street. Free parking right next to it.

You're in the heart of Flint's Cultural Center (see map). What else to do there? Next to the planetarium is Flint's Art Center, admission free. Across the street is the Sloan Museum of transportation, for all you old car buffs, unfortunately not free. Don't try to do everything in one day though, better you should wait till you come to Flint again rather than rush through. Take your time and enjoy. Next month we'll try a trip to Abrams Planetarium on the beautiful MSU campus in East Lansing.



"TO SEE OR NOT TO SEE"

by

Lou Faix

What's more frustrating than a finder scope obscured by dew? What winter time astrophotographer hasn't silently cursed the frost on his refractor guide scope? It usually forms halfway through that critical long exposure shot gradually obliterating the guide star. For over a year I utilized the hair drier technique to repeatedly dry the refractor lenses. This method never seemed very satisfactory since it meant interrupting the observing session and had to be repeated every half hour or so. Last winter I finally adapted the tried and true electric lens heaters and have no trouble with dew or frost since. It's easy to construct and requires little or no experience with electrical wiring.

For a three inch or smaller objective lens, five watts of heating dispersed directly in front of the lens is quite adequate to keep the telescope clear even on the most humid or coldest night. The heat is provided by a ring of six stock electrical resistors placed inside the dew cap. The resistors are wired in series as shown on the next page and connected directly to the power supply. If 110v ac is used, resistors of 330 ohms and one watt are ideal. Resistors from 300 to 420 ohms can be used with satisfactory results. If 12v dc batteries are the electrical supply, resistors between 4 and 7 ohms, one watt, are satisfactory. The current draw on 110v ac voltage will be about 1/20 of an ampere. With 12v batteries, it will be about 1/2 ampere and will cause small cells to discharge more quickly. If a car battery is being used, the drain effect is negligible.

Construction is started by laying out six holes on the dew cap, equally spaced and about 1/8" in front of the objective lens. Drill five of the holes with a 1/16" diameter drill. CAUTION: Place a cardboard mask in front of the lens to be sure it isn't scratched by the drill. At the sixth position drill two holes, a quarter inch either side of the mark. (See Fig. 1) Now drill two more 1/8" holes about a quarter inch forward of the last two small holes. These will be for the terminal lugs.

Measure the distance between the equally spaced holes (x") and bend four of the resistors wire as shown in Figure 2A and two as shown in Figure 2B. Place the resistors inside the dew cap and push the wires out the holes. Twist the adjoining pairs of wires together and cut off 1/4" from the outside of the dew cap and bend flat. Place 3/4" long 10-32 brass bolts in the 1/8" holes and secure the end wires of the first and last resistors with nuts and washers.

Cut the female socket end off a light duty extension cord and attach eye crimp lugs. (See Fig. 3) Attach these ends to the brass bolts with a second nut. Wrap three or four layers of electrical tape around the dew cap to cover the exposed wires to eliminate a shock hazard.

The five watts of heat will cause the resistors to be hot to the touch. The warm air in front of a low power finder scope will not have any visual effect. In a high power guide scope (200+ power), some shimmering of the star image will be detected but not enough to bother the guiding function.

Plug it in and enjoy dew and frost free observing.

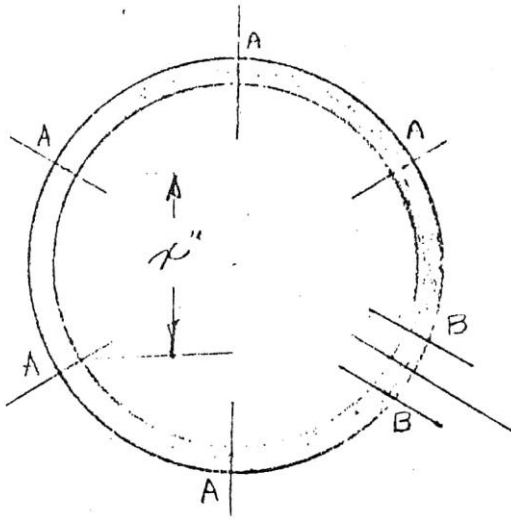


FIGURE 1
 Drill five 1/8" holes, equally spaced at positions marked "A",
 Drill two 1/16" holes at positions marked "B".

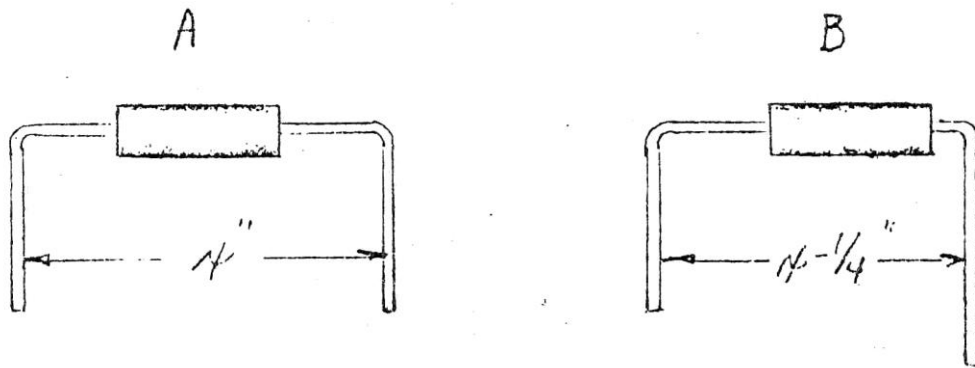
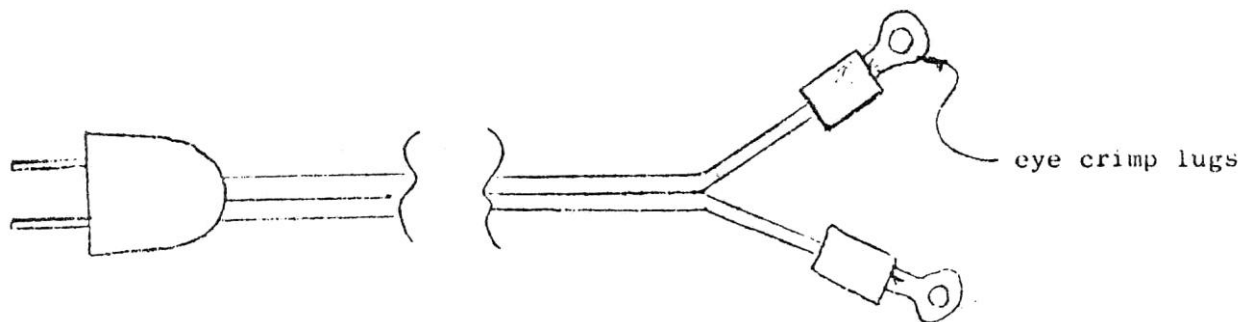


Figure 2 - Pre-bend resistor wires



Consumer's Corner

by

Carl Noble and Ken Wilson

1.) 20MM ERFLE EYEPIECE (UNIVERSITY OPTICS, INC. 2122 EAST DELHI RD., ANN ARBOR, MICHIGAN, 48106.)

Excellent. That's a one word description of the "U" Optics 20mm Erfle eye-piece. Its wide (65°) apparent field provides sharp, well-corrected views. Coupled with my 6" f/8 telescope, it yields 63.5X and a field of view over 1°! In comparison, my 40mm Kelner produces about the same field of view but at only half the power!

No eyepiece is perfect, and this 20mm erfle does have one noticeable flaw. At the extreme edges of the field there is apparent coma. Such coma is to be expected in any wide-field eyepiece of this design and the "U" Optics 20mm Erfle had far less coma than I expected.

Within a few days after I bought it, this Erfle became the most used eyepiece in my collection. And, I soon found that, attached to my 3X Barlow, it was also an excellent high power lunar and planetary eyepiece.

After a year of use, I think this is one the best bargains left today (\$25.95 when Edmund is asking over \$40.00 for its 20mm Erfle). -KW

2.) 8" COULTER MIRROR -- COULTER OPTICAL COMPANY, 8217 Lankershim Blvd., North Hollywood, Calif. 91605

Superb and outstanding -- these are the words I would pick to explain this fine mirror. When I was assembling my 8 inch 'scope, I was at first going to grind my own. But as it turned out, I didn't: When I asked some of the members of our club which company I should purchase a mirror from, the overwhelming response was, "Coulter Optics." When I found out their prices, I wondered if it would not be a "rip-off". I am glad I went ahead and purchased the 8 inch mirror, because it has turned out to be the best \$70.00 I ever spent. The whole purpose of Coulter Optical Company is to bring to the amateur astronomer "optimum optics at minimum costs." Believe me, this is true. I have looked in many scopes, and of the commercial ones, the mirror in my scope rates as high, if not higher in performance in my opinion.

If you are just getting started, and you want an excellent mirror, for a reasonable price, pick Coulter Optics for your choice.

A six inch f/10 mirror runs \$29.95

A six inch f/8 mirror runs \$39.95

An eight inch f/7 mirror runs \$69.95

Without a doubt, you will be thrilled when you first look into your eyepiece and see perfect images. -cn

(WHAT HAVE YOU BROUGHT LATELY? WAS IT ANY GOOD? WHY NOT LET YOUR FELLOW MEMBERS KNOW ABOUT IT? WRITE UP AN EVALUATION FOR THE CONSUMER'S CORNER!) The editors

Here is the answer to last month's WONDERWORD:
"OBSERVATION"

CRANBROOK INSTITUTE OF SCIENCE
POST OFFICE BOX 807
BLOOMFIELD HILLS, MICH. 48013

SPECIAL SEPTEMBER STARTIME WORKSHOP

Participants in these new single-session workshops, to be held on the first three Wednesdays in September (3, 10 and 17) from 3:30 to 5:00 p.m., will learn how star charts are made and how to tell time and the seasons merely by using that most familiar of constellations, the Big Dipper. This portion of the workshop will be followed by a session in the planetarium.

Materials to be brought to the workshop by each participant include: a piece of flat cardboard 10 inches square, and a piece of dark, heavy paper, such as construction paper, at least 8 inches square.

Workshops are free to members and available to museum visitors at no additional charge beyond museum admission. Children under 10 years of age must be accompanied by an adult. Registration must be made in advance by calling the museum at 645-3201.

Special rates are available for scheduled groups wishing to participate in this workshop on other days or at other times. Arrangements may be made by calling 645-3201.

SKY CALENDAR SEPTEMBER 1975

Information for helping teachers and students observe the sky

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Evening Planets: Jupiter rises just N of E within 2 hrs after sunset Sept 1, decreasing to 1/2 hr by Oct 1. Jupiter is brightest "star" in sky until Venus rises in morning. Mars rises in NE about 4 hrs after sunset. See Morning Planets, below.</p> <p>40 min after sun- set (face WSW): These objects appear higher and easier to see from southern states.</p> <p>1 hr before sunrise 14 (face east): Venus and Regulus 8 1/2° apart.</p> <p>In two weeks Venus will be closest to Regulus, 4.2° to the south of that star.</p> <p>Last Quarter. If you face the rising sun this morning, the moon will be 90° to your right. The moon is entering the last quarter of its cycle of phases.</p>	<p>Exactly at sunrise this morning, look for Venus 11° to right of rising sun and 4° above horizon. 7X binoculars show Venus as a very slender crescent.</p> <p>40 min after sun- set: Mercury about 12° to lower right of Spica. Moon easier to see than last night.</p> <p>The bright reddish object rising in NE 4 hrs after sunset is Mars. As it rises higher, look for reddish twinkling Aldebaran 10° to right. In mid-December Mars will stand at opposition to the sun and reach its greatest brightness.</p> <p>2 hrs after sunset 22 (face east):</p> <p>1 hr before sunrise 29 (high ESE):</p>	<p>1 hr before sunrise 2 (face east):</p> <p>1 hr before sunrise 9 (face east): Venus and Regulus 9° apart.</p> <p>Venus now rises in east two hours before sunrise. This autumn it will be a spectacular "morning star".</p> <p>Equinox. Sun rises 23 due east and sets due west. At midday sun is due south, and its altitude equals 90° minus your latitude. Autumn begins as sun moves southward across equator at 11:55 a.m. EDT.</p> <p>1 hr before sunrise 30 rise:</p>	<p>1 hr before sunrise: 3 Castor</p> <p>1 hr after sunset 10 (face southwest):</p> <p>This month is best 17 for seeing phase of Venus in binoculars. Look during bright twilight or at sunrise. This morning the disk of Venus appears 0.8 minute of arc across and one-seventh illuminated.</p> <p>1 hr before sunrise 24 (7° apart):</p> <p>The apparent angular diameters of Venus and Jupiter are about equal this month. Observe both with binoculars or telescope in morning twilight and compare their brilliance. Why does Jupiter appear less bright even though it is full?</p>	<p>1/2 hr before sun- rise (face east): Last chance to see waning crescent moon.</p> <p>1 hr after sunset: 11</p> <p>After this Saturday's Harvest Moon, the moon rises before the end of twilight next 3 nights. Look for Milky Way in evening sky beginning Sept. 24.</p> <p>It is very easy to see Venus in the daytime sky. Just locate it in the eastern sky before sunup and keep track of it until after sun rises. Try the same with Jupiter in western morning sky.</p> <p>Morning Planets: Venus makes spectacular sudden rise into eastern sky this month. On Sept 1 it rises less than 1/2 hr before sunup. See Sept 1, 6, 16, 17, 21, 25. By the 30th it rises 3 hrs before sun. The crescent Venus is very interesting to observe with telescopes and binoculars this month. Best time to look is at sunrise or in bright twilight, to avoid contrast of brilliant crescent against dark sky. Jupiter, an hour before sunrise, is well up in SW to WSW. It appears as 2nd brightest "star" in morning sky. Mars an hr before sunrise is the reddish object very high up in SE to S. It is 4th brightest morning object, after Venus, Jupiter, and Sirius. Saturn an hr before sunrise is well up in eastern sky, below Castor and Pollux. See Sept 2, 3, 29, and 30.</p>	<p>Moon rises at sunrise and sets at sunset. Dark side is toward earth. The invisible New Moon ends one cycle of the moon's phases and begins the next.</p> <p>First Quarter. If you face the setting sun, the moon is about 90° (1/4 turn) to your left. The moon has completed the first quarter of its cycle of phases.</p> <p>1 hr before sunrise 19 (face east): Venus and Regulus 8° apart.</p> <p>1 hr before sunrise 26 (high in south):</p>	<p>10 days ago Venus passes nearly between earth and sun (inferior conjunction). Now it is easily seen as a morning "star" rising in east 1 hr before sunrise.</p> <p>The brilliant object rising just north of east within 1 1/2 hrs after sunset is Jupiter. One month from now it will rise at sunset and be visible all night. It will then be at opposition to the sun.</p> <p>Full Moon rises in east very shortly before sunset. Choose a place with unobstructed view toward east and west to see sun and moon simultaneously. Bright Jupiter rises 1 hr after sunset.</p> <p>1 hr before sun- rise:</p>

Magnitudes of the Planets: Venus -3.6 to -4.3; Jupiter -2.3 to -2.5; Mars +0.2 to -0.2; Saturn +0.5 to +1.0. Positions of the Planets: Venus 15° eastward in Taurus, passing 1.8° N of Zeta Tauri Sept 30; Mars 10° eastward in Cancer; Saturn 2.9° eastward in Leo. (Sept 16-30) 2.8° eastward in Leo.

East Lansing Sunrise: Sept 1 7:02 a.m.; Sept 16 7:18 a.m.; Sept 30 7:33 a.m. EDT
Sunset: Sept 1 8:14 p.m.; Sept 16 7:47 p.m.; Sept 30 7:23 p.m. EDT