U. S. NAVAL OBSERVATORY COMPLETE LUNAR OCCULTATION PREDICTIONS COMPUTED FOR WASHINGTON (LAT 38.920 LONG 77.065)
FOR 1968, STANDARD STATION AT LAT 38.920 LONG 77.065 (DISTANCE = 0 MILES)

DATE	TIME(UT) H	M	S	ACC SEC	V	D	Z.C.	USNO REF NO	S.A.O. NUMBER	MAG	SP	PH	PERCENT SUNLIT	ELG	PA DEG	CUSP ANGL	VA DEG	MOON ALT	MOON AZI	SUN ALT	SUN AA DEG	LIBRATION LONG	LIBRATION LAT	MIN MAG
SEP 29	1	22	44	23	2	5		Z18348	186615	8.7	B9	D	48	WAX	87	158	215	129	13	213		160	2.7	7.6
SEP 29	1	54	13	6	2	3	A	Z18391	186646	9.0	K0	D	48	WAX	88	43	44N	9	10	219		45	2.6	7.6
SEP 29	1	59	31	10	2	5		Z18396	186651	8.2	K0	D	48	WAX	88	140	39S	105	9	220		142	2.6	7.5
SEP 29	1	57	14	5	1	3		Z18404	186657	9.0	G5	D	48	WAX	88	58	59N	24	10	219		60	2.6	7.6
SEP 29	2	6	33	5	1	2		Z18418	186666	9.2	K5	D	48	WAX	88	68	69N	32	9	221		70	2.6	7.5
SEP 29	2	15	2	5	1	2		Z18432	186676	9.2	K0	D	48	WAX	88	76	78N	39	8	222		77	2.6	7.5
SEP 29	2	48	29	7	1	1		Z18491	186688	9.0	K2	D	48	WAX	86	32	34N	350	3	228		34	2.5	7.5
SEP 29	2	47	31	10	2	1		Z18458	186694	8.8	K2	D	48	WAX	88	138	40S	95	3	228		140	2.5	7.5
SEP 29	23	19	59	12	2	6		Z20090	187948	8.5	K0	D	59	WAX	100	144	27S	150	22	173	-6	151	4.0	7.7
SEP 29	23	17	27	6	2	4		Z20092	187949	8.4	K2	D	59	WAX	100	41	50N	48	22	172	-5	49	4.0	7.7
SEP 29	23	52	29	14	2	7		Z20104	187958	9.0	G0	D	59	WAX	100	8	17N	7	23	181	-12	15	3.9	7.6
SEP 29	23	31	28	7	2	7		Z20114	187965	8.8	F8	D	59	WAX	100	121	50S	126	22	175	-8	129	4.0	7.6
SEP 29	23	46	25	11	2	7	A	Z20119	187969	8.8	G0	D	59	WAX	100	142	29S	143	22	179	-11	149	3.9	7.6
SEP 30	0	30	8	9	2	8		Z20156	188000	8.6	K0	D	59	WAX	100	131	40S	123	22	189		139	3.8	7.6
SEP 30	0	38	23	10	2	8		Z20163	188007	8.5	K0	D	59	WAX	100	133	38S	123	22	191		141	3.8	7.6
SEP 30	0	40	37	5	2	8		Z20170	188013	8.6	G5	D	59	WAX	100	72	81N	62	22	191		80	3.8	7.6
SEP 30	2	22	20	7	2	4		Z20242	188066	9.4	M3	D	60	WAX	101	28	37N	359	15	213		36	3.6	7.5
SEP 30	2	27	53	7	2	6		Z20250	188073	8.5	K0	D	60	WAX	101	30	39N	0	14	214		37	3.5	7.5
SEP 30	2	30	24	6	6	9	2831	Z20258	188079	5.9	B3	D	60	WAX	101	40	49N	10	14	215		48	3.5	7.5
SEP 30	2	30	51	5	3	5		Z20274	188090	9.0	K0	D	60	WAX	101	92	79S	62	14	215		100	3.5	7.5
SEP 30	3	3	52	9	2	3		Z20278	188094	9.0	K0	D	60	WAX	101	12	21N	337	10	221		20	3.5	7.4
SEP 30	2	49	0	6	2	4		Z20294	188103	9.2	G0	D	60	WAX	101	98	73S	65	12	218		105	3.5	7.4
SEP 30	3	3	35	5	2	3		Z20309	188114	9.1	A0	D	60	WAX	101	64	23N	28	10	221		71	3.5	7.4
SEP 30	3	30	4	6	2	2		Z20317	188119	9.3	F5	D	60	WAX	101	33	42N	354	7	226		41	3.4	7.4
SEP 30	3	40	23	8	2	1		Z20330	188131	9.2	F5	D	60	WAX	101	121	50S	80	5	227		129	3.4	7.3

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☆ STAR DUST

September 1968 Vol. XXVI, No. 1

THE CHASE OF THE TRANS-URANIAN PLANET

Mr. Dennis Rawlins

Our speaker for September is Dennis Rawlins, who in December 1967 spoke to NCA on the discovery of Uranus. Now Mr. Rawlins will continue the drama of planetary discovery.

For almost sixty-five years after the discovery of Uranus in 1781, mathematical and observational astronomers wrestled with the question of the existence of a planet beyond this first planet to be "discovered." Mr. Rawlins draws on unpublished documents from Cambridge and Paris to provide a unique analytical account of the events leading to discovery of Neptune in 1846. In doing so, he emphasizes that an international competition to achieve this discovery developed which was, for its day, as intense as competition in space travel is our own. Particularly interesting is the interaction of theoretical and observational methods which led to ultimate success, for such interaction is the hallmark of modern astronomy and astrophysics.

Mr. Rawlins is instructor of Physics at Notre Dame College, Baltimore, specializes in the history of astronomy, and is active in the Baltimore Astronomical Society. He holds physics degrees from Harvard and Boston Universities.

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CALENDAR

SEPTEMBER 7 DINNER WITH THE SPEAKER. For further information, call Bill Winkler - 736-3553.

7 THE CHASE OF THE TRANS-URANIAN PLANET by Mr. Dennis Rawlins 8:15 P.M. in the Dept. of Commerce Auditorium. Business Meeting follows.

7 JUNIOR DIVISION GENERAL MEETING 7:15 P.M. in the Dept. of Commerce Auditorium. All Juniors who wish to be considered active, please attend.

21 DISCUSSION GROUP - ROUNDTABLE DISCUSSION on summer conventions. 8:15 P.M. in Dept. of Commerce.

22 PRINCE GEORGES JUNIORS MEETING at the home of Ted Noble in Crofton. Please call for further information. 301 721-2225

SHORT NOTES FROM YOUR PRESIDENT

Your officers held an Executive meeting in July. A program of Youth Leadership in conjunction with local Toastmaster Clubs was approved. The purpose is to help the Juniors prepare and give good technical papers on Astronomy before other Junior groups and at local schools.

The Executive Committee and the Trustees approved the purchase of a non-profit mailing permit from the Post Office. This will cut our mailing costs from a six cent per Stardust to a 1.4 cent mailing charge. As long as we mail our notices out a week before the meeting, every member should receive his Stardust two or three days before the regular meeting night.

Regarding our speaker lineup- VP Bill Winkler is doing a good job. Our Dec.7 meeting will be held on the previous Saturday night Nov. 30, to accommodate our speaker, J. Roland Cumberland, who makes the Questar Optics. If you want to examine and look through Questars including the new 7" model, please put Nov. 30 on your calendar. I believe that Mr. Cumberland should be ranked up with Clark, Schmitt and other famous lens grinders. Mr. Cumberland will give about a 30 minute talk and spend the rest of his 30 minutes answering questions regarding lens grinding. This will be a great opportunity to our members and friends to hear an accomplished speaker who is an expert in our field of astronomy. Be sure to bring a friend as a prospective member for NCA. Dues are due now. Let's help our treasurer, Jerry Schnall, get caught up in financial matters. See you in September.

- George Gould

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NEW MEMBERS

REGULAR

Rene G. Lamadrid 585-5569
1608 East West Highway
Silver Spring, Maryland 20910

William R. Meyers 462-8361
2070 Belmont Road, N.W.
Washington, D. C. 20009

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SEPTEMBER 21 DISCUSSION GROUP

On the agenda will be a roundtable discussion of the Summer's conventions around the country. Everyone who attended one or more of the many astronomical gatherings between May and Labor day is cordially invited to come and compare notes and share experiences. If you have pictures or slides, bring them too. A projector will be available. If you did not attend a convention, come and find out what you missed!

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REMEMBER TO PAY YOUR DUES ----- SEE JERRY SCHNALL

U. S. NAVAL OBSERVATORY COMPLETE LUNAR OCCULTATION PREDICTIONS COMPUTED FOR WASHINGTON (LAT 38.920 LONG 77.065)
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DATE	TIME(UT) H M S	ACC SEC	V	O	Z.C.	USNO REF NO	S.A.O. NUMBER	MAG	SP	PH	PERCENT SUNLIT	ELG	PA DEG	CUSP ANGL	VA DEG	MOON ALT	MOON AZI	SUN ALT	AA DEG	LIBRATION LONG	LIBRATION LAT	MIN MAG
SEP 9	9 41 53	42	9	6	132	Z00818	109563	6.9	G5	R	94 WAN	151	318	19N	274	40	241		339	3.9	-0.5	
SEP 10	2 59 54	5	8	5	232	Z01403	92528	8.3	K0	R	89 WAN	142	215	57S	267	25	97		234	4.5	-1.1	
SEP 10	4 26 52	13	6	4		Z01446	92550	8.5	K0	R	89 WAN	141	164	6S	211	41	112		184	4.3	-1.3	
SEP 10	6 27 44	20	8	4		Z01470	92564	8.9	F8	D	89 WAN	140	334	3N	359	60	149		354	3.9	-1.6	
SEP 10	6 48 26	20	8	4		Z01470	92564	8.9	F8	R	89 WAN	140	305	32N	322	61	159		325	3.9	-1.6	
SEP 10	8 19 25	5	8	5		Z01506	92584	8.4	G0	R	88 WAN	140	240	83S	220	61	205		260	3.5	-1.8	
SEP 10	10 34 43	5	9	1		Z01551	92609	8.9	F8	R	88 WAN	139	255	82N	207	42	249	-3	275	3.1	-2.0	
SEP 11	1 39 5	5	6	1		Z01984	92881	9.3		R	83 WAN	131	222	63S	273	5	74		240	3.6	-2.4	
SEP 11	3 25 11	7	7	7	347	Z02017	92901	7.7	K0	R	82 WAN	130	282	58N	336	25	89		300	3.5	-2.6	
SEP 11	3 27 7	5	7	7		Z02019	92903	8.1	F5	R	82 WAN	130	240	80S	294	25	90		258	3.5	-2.6	
SEP 11	3 55 10	6	7	5		Z02023	92906	9.2		R	82 WAN	130	264	76N	318	31	94		281	3.5	-2.6	
SEP 11	3 46 35	5	7	5		Z02026	92909	9.2		R	82 WAN	130	224	64S	278	29	93		241	3.5	-2.6	
SEP 11	6 41 46	8	6	8	363	Z02084	92957	7.3	F0	R	82 WAN	129	181	21S	219	60	132		199	3.0	-3.0	
SEP 11	10 14 52	9	9	9	371	Z02132	92983	6.4	G5	R	81 WAN	128	296	44N	251	56	239	-7	313	2.3	-3.3	
SEP 12	3 28 17	5	6	8		Z02582	75758	8.5		R	74 WAN	119	239	76S	294	20	79		253	2.4	-3.8	
SEP 12	4 30 17	7	5	8		Z02614	75778	8.7	K2	R	74 WAN	119	285	58N	342	32	88		300	2.4	-3.9	
SEP 12	5 6 25	7	7	7		Z02641	75797	8.9	G5	R	74 WAN	118	196	33S	252	38	93		210	2.3	-4.0	
SEP 12	6 29 16	6	9	9	472	Z02663	75810	5.0	A0	R	73 WAN	118	207	44S	260	54	109		221	2.1	-4.1	
SEP 12	7 5 59	6	7	9		Z02677	75819	8.2	F2	R	73 WAN	118	206	43S	253	60	119		220	1.9	-4.2	
SEP 12	10 23 9	6	7	3	A	Z02721	75866	9.1	F5	R	73 WAN	117	207	44S	166	65	232	-5	221	1.2	-4.5	
SEP 13	3 14 4	5	4	7		Z03303	76358	7.8	B9	R	66 WAN	108	267	80N	319	11	68		277	1.2	-4.7	
SEP 13	3 12 19	5	4	3		Z03306	76360	9.0	F5	R	66 WAN	108	225	58S	277	10	60		236	1.2	-4.7	
SEP 13	3 6 47	6	4	3		Z03307	76361	9.0	K5	R	66 WAN	108	211	44S	262	9	67		222	1.2	-4.7	
SEP 13	5 7 9	6	6	6		Z03356	76401	9.1	G5	R	65 WAN	107	273	74N	331	32	83		284	1.1	-4.9	
SEP 13	5 49 13	6	6	7		Z03374	76417	8.9	K2	R	65 WAN	107	215	47S	273	39	89		225	1.0	-5.0	
SEP 13	7 24 38	5	6	7		Z03413	76450	8.7	M0	R	64 WAN	106	231	63S	286	58	106		241	0.8	-5.2	
SEP 13	10 30 2	5	4	1		Z03460	76482	9.3	G0	R	64 WAN	106	243	75S	212	73	217	-4	253	0.1	-5.5	
SEP 14	4 5 15	6	2	4		Z03937	76791	9.0	M0	R	56 WAN	97	287	66N	340	13	66		293	-0.1	-5.6	
SEP 14	4 38 52	5	2	9	732	Z03956	76804	7.3	K2	R	56 WAN	97	268	85N	323	19	70		274	-0.1	-5.6	
SEP 14	5 20 6	5	3	7		Z03979	76825	8.9	K5	R	56 WAN	96	237	64S	294	26	76		243	-0.1	-5.7	
SEP 14	8 30 5	5	4	9	746A	Z04045	76880	6.6	B9	R	55 WAN	95	268	86N	326	62	105		273	-0.6	-6.0	
SEP 15	3 46 8	5	2	2	868A	Z04806	77478	7.8	A0	R	47 WAN	86	238	59S	284	2	55		239	-1.3	-6.0	
SEP 15	4 21 19	5	1	3		Z04848	77514	8.9	K0	R	46 WAN	86	254	75S	304	8	60		255	-1.3	-6.1	
SEP 15	4 29 0	5	1	3		Z04857	77521	9.1	A	R	46 WAN	86	273	86N	324	9	61		275	-1.3	-6.1	
SEP 15	6 34 19	6	6	9	885	Z04982	77625	5.7	K0	R	46 WAN	85	220	41S	280	31	77		221	-1.4	-6.3	
SEP 15	7 3 25	6	3	7		Z04999	77637	9.0	G9	R	45 WAN	85	282	78N	343	37	81		283	-1.5	-6.3	
SEP 15	7 0 54	5	3	9		Z05000	77638	8.0	A0	R	45 WAN	85	244	64S	305	36	81		245	-1.5	-6.3	
SEP 15	7 15 27	5	3	7		Z05010	77645	6.7	B5	R	45 WAN	85	279	81N	340	39	82		279	-1.5	-6.3	
SEP 15	7 23 10	10	3	7		Z05033	77662	9.0	G0	R	45 WAN	84	197	17S	259	40	84		198	-1.5	-6.4	
SEP 15	7 34 25	14	3	7		Z05035	77664	8.9	G5	R	45 WAN	84	326	34N	28	42	85		327	-1.6	-6.4	
SEP 15	8 2 53	5	3	8		Z05047	77674	8.2	K5	R	45 WAN	84	266	86S	328	48	89		266	-1.6	-6.4	
SEP 15	9 2 28	5	3	8		Z05087	77708	8.5	B9	R	45 WAN	84	275	85N	336	59	99		275	-1.8	-6.5	
SEP 15	9 19 2	5	3	6		Z05104	77719	9.4	F0	R	45 WAN	84	254	74S	314	62	103		254	-1.9	-6.5	
SEP 15	10 25 58	27	3	4		Z05180	77777	8.7	B8	R	44 WAN	83	184	4S	231	73	126	-5	184	-2.1	-6.6	
SEP 16	6 32 2	8	3	9	1035	Z06426	78710	6.8	K0	R	36 WAN	74	215	29S	272	21	71		211	-2.5	-6.4	
SEP 16	7 4 34	5	4	7		Z06437	78719	8.7	A0	R	36 WAN	73	250	64S	306	27	75		245	-2.5	-6.5	
SEP 16	8 35 35	5	4	7		Z06508	78772	8.9	G5	R	35 WAN	73	254	68S	316	44	87		249	-2.7	-6.6	
SEP 16	9 37 41	8	4	7		Z06552	78801	9.0	K5	R	35 WAN	73	219	32S	281	55	97		214	-2.9	-6.6	
SEP 17	6 48 59	6	5	5		Z07657	79595	9.0	F2	R	27 WAN	67	301	71N	355	14	67		297	-3.4	-6.3	
SEP 17	7 42 41	13	5	7		Z07706	79629	9.0	G5	R	27 WAN	62	204	12S	261	23	74		194	-3.4	-6.4	
SEP 17	9 16 5	8	5	8		Z07767	79672	8.1	K0	R	26 WAN	61	224	31S	284	41	87		214	-3.6	-6.4	
SEP 17	10 4 25	6	5	6		Z07781	79683	9.4	F8	R	26 WAN	61	244	51S	304	50	95	-10	234	-3.7	-6.5	
SEP 17	10 3 44	6	5	7		Z07782	79684	9.0	K7	R	26 WAN	61	239	46S	299	50	94	-10	229	-3.7	-6.5	
SEP 17	10 14 14	6	5	6		Z07785	79685	8.6	G5	R	26 WAN	61	245	52S	305	52	96	-8	235	-3.7	-6.5	
SEP 18	8 15 50	5	5	7	A	Z08696	80288	8.8	K0	R	18 WAN	50	300	78N	355	19	74		286	-4.1	-5.9	
SEP 19	8 21 20	14	9	3		Z09582	98603	8.7		R	11 WAN	38	354	29N	46	8	72		337	-4.4	-5.1	
SEP 19	10 33 32	6	9	4		Z09638	98640	7.8	K0	R	10 WAN	37	323	61N	18	32	91	-4	305	-4.5	-5.1	
SEP 24	23 38 40	7	6	1		Z13369	158377	9.1	F0	D	8 WAX	33	159	46S	112	5	245	-8	141	-2.2	3.8	
SEP 25	23 55 32	6	5	3		Z14277	183175	8.7	G5	D	16 WAX	47	82	67N	39	7	235	-11	67	-0.9	5.3	
SEP 25	23 59 51	5	6	7	2157	Z14278	183176	6.1	K0	D	16 WAX	47	119	81S	75	6	235	-12	104	-0.9	5.3	
SEP 26	0 7 50	5	5	1		Z14280	183180	9.1	K2	D	16 WAX	47	128	72S	83	5	236		113	-1.0	5.3	
SEP 26	23 36 1	12	5	2		Z15363	184108	9.4	F2	D	25 WAX	60	16	22N	4	14	216	-8	26	0.4	6.4	
SEP 26	23 43 26	5	4	4		Z15373	184118	8.8	M1	D	25 WAX	60	107	87S	73	13	219	-9	96	0.4	6.4	
SEP 27	0 3 21	9	3	3		Z15374	184119	9.2	A0	D	25 WAX	60	155	39S	110	11	221		145	0.4	6.4	
SEP 27	0 2 6	5	4	4		Z15389	184132	9.0	K5	D	25 WAX	60	102	88N	65	11	223		91	0.4	6.4	
SEP 27	0 30 6	5	7	9	2312	Z15406	184144	5.6	M0	D	25 WAX	60	117	77S	77	7	226		107	0.3	6.4	
SEP 28	0 13 56	15	4	5		Z16496	185104	9.1	A2	D	36 WAX	74	163	24S	135	16	212		159	1.6	7.2	
SEP 28	0 13 3	7	2	5	A	Z16508	185115	9.0	K2	D	36 WAX	74	52	45N	24	15	212		48	1.6	7.2	
SEP 28	1 3 11	6	3	3		Z16559	185154	8.8	K2	D	36 WAX	74	123	64S	87	9	221		118	1.6	7.2	
SEP 28	1 14 22	9	4	3		Z16560	185155	8.7	F2	D	36 WAX	74	147	40S	109	7	223		142	1.5	7.2	
SEP 28	1 37 0	5	4	2		Z16591	185179	8.7	K0	D	37 WAX	74	71	65N	30	5	227		66	1.5	7.2	
SEP 28	1 51 34	6	4	1		Z16602	185187	9.0	F8	D	37 WAX	74	119	67S	76	3	229		114	1.5	7.2	
SEP 28	23 45 9	5	3	7		Z18269	186554	9.0	K2	D	47 WAX	87	92	87S	81	20	193	-10	94	2.9	7.7	
SEP 29	0 34 55	16	2	6		Z18292	186572	8.8	A2	D	48 WAX	87	155	24S	134	17	203		156	2.8	7.6	
SEP 29	0 38 17	5	2	6		Z18318	186592	9.1	K0	D	48 WAX	87	71	72N	50	17	204		73	2.8	7.6	
SEP 29	1 9 19	7	2	6		Z18339	186607	8.5	B8	D	48 WAX	87	35	36N	8	15	210		37	2.7	7.6	

REPORT OF AUDIT COMMITTEE

STATEMENT OF INCOME AND EXPENSES

July 1, 1967 - June 30,1968

INCOME		EXPENSES	
Dues	$1,290.67	Sky & Telescope	$697.64
Observer's Handbook	53.90	Stardust & Directory	511.53
Graphic Time Table	11.25	Lecture Meetings	105.57
		Treasurer & Supplies	45.97
TOTAL INCOME	$1,355.82	Publicity	14.09
		Observer's Handbook.....	51.25
Balance, July, 1967	432.56	Graphic Time Table	37.50
		Astro. League Dues.....	43.00
	$1,788.38	Misc.	10.30
Less expenses	1,516.85	TOTAL EXPENSES	$1,516.85
Balance	$ 271.53		

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JUNE'S JUNIOR DIVISION MEETING

Despite difficulties in reaching quorum, a number of amendments to the Junior Division by-laws were passed. These included definitive statements concerning active member-and a lowering of the quorum from ten to eight. Provisions were also made for executive committee meetings and executive expenditure restraints.

Vice President, Sam Bacasse, reported on the tentative radio advertising of exploring the Sky programs, and the idea of NCA sponsored astronomy lectures and star parties for various youth organizations was proposed. Provision was made for a form letter concerning such activities to be composed by the Secretary-Treasurer.

Finally it was suggested that an updated NCA brochure be compiled; this idea was submitted to the Senior Division during the regular business meeting.

One reason for the formation of any club or organization is to bring together everyones ideas for the interests and advancement of the group. The necessity of lowering quorum reflects the poor attendance of past Junior Meetings. Those who would complain that nothing is ever accomplished, can so something about this, if they are genuinely interested, by attending meetings and adding their voice and vote to the others.

See you all in September.

- Ken Crowley
Sec.-Treas. Junior Division

U. S. NAVAL OBSERVATORY COMPLETE LUNAR OCCULTATION PREDICTIONS COMPUTED FOR WASHINGTON (LAT 38.920 LONG 77.065)
FOR 1958, STANDARD STATION AT LAT 38.920 LONG 77.065 (DISTANCE = 0 MILES)

DATE	TIME(UT) H M S	ACC SEC	V	D	Z.C.	USNO REF NO	S.A.O. NUMBER	MAG	SP	PH	PERCENT SUNLIT	ELG	PA DEG	CUSP ANGL	VA DEG	MOON ALT	MOON AZI	SUN ALT	SUN AA DEG	LIBRATION LONG	LIBRATION LAT	MIN P-D
SEP 1	0 22 19	5	2	7		Z16894	185423	9.2	G0	D	62	WAX	104	91	89N	85	22	187	-9	88	1.0	7.3
SEP 1	0 34 26	5	2	6		Z16896	185425	9.3	A0	D	62	WAX	104	115	67S	107	21	190	-11	112	0.9	7.3
SEP 1	0 39 34	5	4	9	2519	Z16900	185429	7.5	K5	D	62	WAX	104	77	75N	68	21	191	-12	74	0.9	7.3
SEP 1	0 54 16	7	2	6		Z16901	185430	9.3	K0	D	62	WAX	104	46	44N	34	21	194		43	0.9	7.3
SEP 1	0 43 15	5	4	7		Z16902	185431	8.9	K2	D	62	WAX	104	92	90S	81	21	192		89	0.9	7.3
SEP 1	1 10 42	6	2	7		Z16918	185449	8.7	A3	D	62	WAX	104	55	53N	39	20	198		52	0.8	7.3
SEP 1	1 42 27	5	2	6		Z16940	185461	9.1	K0	D	62	WAX	104	105	77S	84	18	204		102	0.8	7.3
SEP 1	2 0 29	5	4	5		Z16946	185465	9.1	F5	D	62	WAX	104	71	69N	46	16	208		68	0.7	7.3
SEP 1	2 31 24	5	2	4		Z16963	185477	9.0	K0	D	63	WAX	104	69	67N	39	13	214		67	0.7	7.3
SEP 1	3 0 44	6	3	3		Z16975	185488	9.2	G5	D	63	WAX	105	56	55N	21	10	220		53	0.6	7.3
SEP 1	3 3 29	5	4	3		Z16978	185491	8.8	K0	D	63	WAX	105	90	89N	56	9	220		88	0.6	7.3
SEP 1	3 28 56	6	2	1		Z16992	185502	9.3	G	D	63	WAX	105	46	45N	8	6	224		44	0.6	7.3
SEP 1	3 31 5	6	3	3		Z17000	185508	8.5	K5	D	63	WAX	105	116	85S	77	6	225		114	0.6	7.3
SEP 1	3 55 53	7	4	1		Z17016	185518	8.5	K2	D	63	WAX	105	120	93S	86	3	229		126	0.5	7.2
SEP 1	3 55 58	5	2	1		Z17021	185521	9.9	G0	D	63	WAX	105	103	78S	61	3	229		100	0.5	7.2
SEP 2	0 10 9	13	3	6		Z18762	186924	9.0	B8	D	73	WAX	117	22	26N	31	21	170	-7	25	2.2	7.6
SEP 1	23 58 58	6	3	7	2688	Z18771	186932	6.9	G0	D	73	WAX	117	50	56N	62	21	167	-5	53	2.2	7.6
SEP 2	0 10 2	5	2	6		Z18789	186947	9.4	G0	D	73	WAX	117	76	82N	85	21	170	-7	79	2.2	7.6
SEP 2	0 20 47	5	2	6		Z18796	186954	7.5	F8	D	73	WAX	117	83	89N	90	21	172	-9	86	2.1	7.6
SEP 2	1 6 1	5	3	6		Z18803	186960	9.2	F2	M	73	WAX	117	175	-1S	173	21	183		178	2.0	7.6
GRAZING OCCULTATION NEARBY-- APPROXIMATE S. LIMIT LAT. = 39.67 - 0.24(W. LONG. - 77.06)																						
SEP 2	0 45 54	6	3	8		Z18812	186967	8.6	K2	D	73	WAX	117	50	56N	52	22	178		53	2.1	7.6
SEP 2	2 33 43	9	2	8		Z18914	187050	8.3	G5	D	73	WAX	118	85	88S	66	18	202		89	1.8	7.6
SEP 2	3 3 12	34	3	9		Z18918	187053	7.7	F5	D	73	WAX	118	160	13S	135	16	208		164	1.7	7.6
GRAZING OCCULTATION NEARBY-- APPROXIMATE S. LIMIT LAT. = 38.56 - 0.70(W. LONG. - 77.06)																						
SEP 2	2 46 26	7	2	6		Z18924	187056	9.0	A0	D	73	WAX	118	122	51S	100	17	204		125	1.8	7.6
SEP 2	2 52 30	5	2	6		Z18930	187062	9.2	K0	D	73	WAX	118	67	74N	44	17	206		70	1.8	7.6
SEP 2	4 14 4	20	3	2		Z18976	187100	9.5	D	D	74	WAX	118	151	22S	115	8	221		155	1.6	7.5
SEP 2	3 58 10	5	3	3		Z18977	187101	9.4	G0	D	74	WAX	118	68	75N	35	10	218		72	1.6	7.5
SEP 2	4 50 49	6	3	3		Z19007	187128	7.9	D8	D	74	WAX	119	60	47N	359	4	228		64	1.6	7.4
SEP 2	4 47 54	9	3	1		Z19017	187135	8.9	A0	D	74	WAX	118	73	80N	32	4	227		77	1.6	7.4
SEP 3	0 25 43	7	4	6		Z20603	188343	8.4	K0	D	82	WAX	130	39	53N	58	20	159	-10	48	3.2	7.5
SEP 3	0 20 46	5	4	5		Z20610	188351	9.0	K0	D	82	WAX	130	81	85S	100	20	158	-9	90	3.3	7.5
SEP 3	1 30 38	10	4	6		Z20635	188369	6.7	K0	D	82	WAX	130	15	30N	21	23	174		25	3.1	7.5
SEP 3	1 5 19	7	4	5		Z20636	188370	8.9	K2	D	82	WAX	130	119	47S	130	22	168		128	3.1	7.5
SEP 3	1 4 22	5	4	5		Z20641	188374	8.9	K0	D	82	WAX	130	92	74S	103	22	168		101	3.1	7.5
SEP 3	1 39 51	7	4	6	2869	Z20652	188387	8.3	K0	D	83	WAX	130	31	46N	34	24	176		40	3.0	7.5
SEP 3	1 31 2	9	4	5		Z20654	188389	9.4	G5	D	82	WAX	130	62	77N	68	23	174		71	3.1	7.5
SEP 3	1 34 22	6	4	5		Z20657	188393	9.1	G5	D	82	WAX	130	113	52S	116	23	175		122	3.1	7.5
SEP 3	2 5 50	12	4	4		Z20674	188404	9.4	G5	D	83	WAX	131	140	25S	138	23	182		149	3.0	7.5
SEP 3	1 56 14	5	4	5		Z20683	188410	8.9	F0	D	83	WAX	131	82	83S	82	24	180		91	3.0	7.5
SEP 3	2 30 41	6	5	6		Z20708	188426	8.4	A0	D	83	WAX	131	39	54N	32	23	188		48	2.9	7.4
SEP 3	2 40 17	14	4	7		Z20712	188429	7.7	K2	D	83	WAX	131	141	24S	132	23	190		150	2.9	7.4
SEP 3	2 57 26	5	4	5		Z20732	188446	9.3	G5	D	83	WAX	131	49	64N	37	22	194		59	2.9	7.4
SEP 3	4 43 54	6	4	2		Z20795	188500	9.6	K0	D	83	WAX	132	31	46N	359	14	217		41	2.6	7.3
SEP 3	4 44 23	6	4	4		Z20798	188503	8.9	G5	D	83	WAX	132	33	48N	1	14	217		42	2.6	7.3
SEP 3	5 18 13	12	6	3		Z20808	188513	8.4	F2	D	83	WAX	132	2	17N	325	10	223		11	2.6	7.2
SEP 3	5 48 39	15	7	1		Z20832	188532	9.0	F5	D	84	WAX	132	357	12N	316	6	228		6	2.5	7.2
SEP 3	5 33 4	5	7	3		Z20851	188548	8.5	K0	D	83	WAX	132	85	80S	46	8	225		94	2.6	7.2
SEP 3	6 0 41	5	6	2		Z20873	188564	8.1	A2	D	84	WAX	132	65	80N	23	4	230		75	2.5	7.1
SEP 3	23 53 9	8	5	2		Z21983	189485	9.1	K2	D	90	WAX	143	25	47N	59	14	139	-4	39	4.3	7.0
SEP 4	0 7 52	5	6	3		Z22005	189498	8.8	A0	D	90	WAX	143	82	76S	115	16	142	-7	96	4.3	7.0
SEP 4	0 27 27	5	6	7	3012	Z22017	189509	6.7	A3	D	90	WAX	143	58	80N	87	18	146	-11	72	4.2	7.0
SEP 4	1 8 49	6	5	3		Z22039	189524	9.0	K2	D	90	WAX	143	60	62N	62	22	154		56	4.1	7.0
SEP 4	1 2 34	6	5	3		Z22048	189530	9.0	M3	D	90	WAX	143	100	58S	123	22	153		114	4.1	7.0
SEP 4	1 34 13	5	4	6		Z22066	189548	8.9	G5	D	90	WAX	143	80	78S	97	24	160		94	4.1	7.0
SEP 4	1 45 26	5	5	6		Z22072	189555	7.1	G0	D	90	WAX	144	72	86S	87	25	163		86	4.0	7.0
SEP 4	4 23 33	8	3	5		Z22144	189617	7.9	F8	D	91	WAX	144	13	36N	354	24	202		27	3.6	6.7
SEP 4	4 44 25	8	6	4	A	Z22170	189640	8.5	G0	D	91	WAX	145	112	45S	90	22	206		127	3.6	6.7
SEP 4	5 26 36	6	7	4		Z22196	189671	8.7	F5	D	91	WAX	145	95	62S	65	19	215		109	3.5	6.6
SEP 4	7 6 17	9	8	2		Z22239	189708	7.9	A2	D	91	WAX	146	3	26N	320	6	234		18	3.4	6.4
SEP 5	1 44 37	53	7	4		Z23176	164498	8.0	F5	D	96	WAX	136	338	8N	3	26	149		356	4.8	6.1
SEP 5	1 53 3	6	9	9	3164A	Z23205	164520	4.7	B5P	D	96	WAX	156	90	60S	115	26	150		108	4.8	6.1
SEP 5	2 22 4	5	7	5		Z23218	164528	7.3	B9	D	96	WAX	157	58	88N	77	28	157		76	4.8	6.0
SEP 5	4 20 5	5	7	4		Z23276	164567	7.4	K5	D	96	WAX	157	77	73S	70	32	168		95	4.4	5.8
SEP 5	8 4 49	5	7	3		Z23376	164637	7.5	K0	D	97	WAX	159	74	76S	30	9	238		92	4.0	5.4
SEP 6	7 26 5	5	9	2		Z24150	165191	8.5	G0	D	99	WAX	171	68	69S	33	26	226		88	4.9	4.2
SEP 7	2 18 39	5	9	7	3421	Z24737	146612	5.1	M8	R	100	WAN	176	262	45S	290	27	128		274	5.6	3.5
SEP 7	3 0 22	5	9	2		Z24747	146619	8.3	K2	R	100	WAN	176	255	51S	288	33	137		277	5.5	3.4
SEP 7	2 40 56	16	9	2		Z24754	146625	8.5	F5	D	100	WAN	176	343	42N	18	31	133		5	5.6	3.4
SEP 7	3 5 50	16	9	2		Z24754	146625	8.5	F5	R	100	WAN	176	305	78N	336	34	139		326	5.5	3.4
SEP 7	3 26 38	5	9	3		Z24780	146629	7.8	K5	R	100	WAN	176	255	53S	282	37	144		276	5.4	3.3
SEP 7	7 4 22	5	9	2		Z24822	146677	8.5	K0	R	100	WAN	175	229	42S	203	39	213		250	4.8	2.9
SEP 8	3 47 52	7	9	3	9	Z00044	120584	8.0	K2	R	98	WAN	165	190	28S	224	39	134		212	5.4	1.8
SEP 9	6 17 14	6	8	4	120	Z00767	109527	8.2	G5	R	94	WAN	152	266	71N	277	56	167		288	4.6	-0.1
SEP 9	9 33 2	42	9	6	192	Z00818	109563	6.9	G5	D	94	WAN	151	331	6N	288	41	239		352	4.0	-0.5
GRAZING OCCULTATION NEARBY-- APPROXIMATE N. LIMIT LAT. = 39.04 - 0.33(W. LONG. - 77.06)																						