Occultation Newsletter

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FROM THE PUBLISHER

This is the first issue of 1985.

When renewing, please give your name and address exactly as they appear on your mailing label, so that we can locate your file; if the label should be revised, tell us how it should be changed.

If you wish, you may use your VISA or MasterCard for payments to IOTA; include the account number, the expiration date, and your signature. Card users must pay the full prices, which are shown below, FOLLOWED BY THE DISCOUNT PRICES IN BRACKETS FOR THE USE OF THOSE PAYING BY CASH, CHECK, OR MONEY ORDER. These are corrected prices, which supersede those shown in *O.N. 3* (9), 190.

O.N.'s price is $1.46[1.40]/issue, or $5.73[5.50]/year (4 issues) including first class surface mailing. Back issues through *Vol.2*, No. 13 still are priced at only $1.04[1.00]/issue; later issues at $1.46[1.40]. Air mail shipment of *O.N.* back issues and subscriptions, if desired, is 47¢[45¢]/issue ($1.88[1.80]/year) extra, outside the U.S.A., Canada, and Mexico. IOTA membership, subscription included, is $11.46[11.00]/year for residents of North America (including Mexico) and $16.67[16.00] for others, to cover costs of overseas air mail. For IOTA members, the following items are available without extra charge; non-members pay $1.04[1.00] for local circumstance (asteroidal occultation) predictions, and $1.56[1.50] per graze limit prediction.

Observers from Europe and the British Isles should join IOTA/ES, sending DM 20.-- to Hans-J. Bode, Bartold-Knaust Str. 8, 3000 Hannover 91, German Federal Republic.

IOTA NEWS

David W. Dunham

There will be no IOTA session during the Texas Star Party on May 18th, as indicated might be the case on p. 204 of the last issue. Earlier we had hoped that we could hold our annual meeting then, but we will not have a quorum of the board of directors due to conflicting travel by one of the directors. If another IOTA member planning to attend the Texas Star Party wants to organize an IOTA session, let me know, but it can not count as an annual meeting. Contact TSP '85; Dept. A; 128 N. Commerce; Burleson, TX 76028 for more information about the Texas Star Party in May. The annual IOTA meeting will be held in Houston, TX, sometime during November. We still want to hold an IOTA meeting with the Texas Star Party in a future year, perhaps 1986.

A copy of the IOTA travel expense report needed to subtract legitimate expenses from your income reported to the Internal Revenue Service, and an explanation, were distributed to members in the U.S.A. with the last issue. The form was prepared by Charles Herold, following a handwritten draft which I wrote on the plane trip to Houston for the IOTA meeting last November; I did not have a copy. After giving the draft to Herold, a couple of minor changes subsequently were discussed by telephone. Chuck sent me a copy of the form by special delivery on December 18, but the postal service did not deliver it to me until January 2, by which time the last issue already had been distributed. Hence, I did not have a copy of the form when I wrote the explanation, and a few discrepancies resulted. Under expenses, item 6 (postage) should not have been listed separately, since it is a subset of mailing expense (item 5). Under travel (item 3) auto, personal automobile travel was intended, and the mileage as well as the the cost (at 9 cents per mile for 1984) should be reported (if you have not already sent your form for 1984 to DaBoll, write the mileage above the auto travel expense on the form). The cost of renting a car in a distant city should be included in "other" travel expenses, along with tolls and parking fees, airplane tickets, taxi, etc. The cost of maps needed for an expedition can be included under "Misc." expense; any other expense more than $5 in this category needs an explanatory note. A place for reporting the grand total expense for all expeditions was not included in the form. If you are listing expenses for more than one trip, the grand total should be written in just to the right of the word "TOTAL," and left of all the individual trip totals.

Tony Murray, an IOTA member in Georgetown, GA, works in a print shop and has offered to print IOTA letterhead and envelopes for the cost of the plates, paper, envelopes, and postage. I sent him a design using the moon symbol from the *O.N.* masthead. Murray is working on the letterhead and envelopes for a few of the IOTA officers, and will produce versions with only the symbol and IOTA (not abbreviated) for use by the other officers. The latter also may be of use by other members, for example to write to the director of a park or other facility for permission to observe an early morning graze. Send me a large (wider than 10.6 cm, longer than 24.2 cm), self-addressed (and stamped, if you live in the U.S.A.) if

you want 2 (one ounce) or 5 (two ounces) copies of the letterhead and envelopes. We have decided to use dark blue ink. We will design an IOTA membership card, which Murray will duplicate and send to DaBoll, probably for distribution with the next issue of *O.N.*

ILOC recently sent residuals for 1982 lunar occultation observations to several observers. We hope their operation is smoother now, so that residuals for 1983 and 1984 might be produced with less delay.

The 1985 January issue of *Sky and Telescope* is now out of print. This is unfortunate, since it contains my annual articles on the 1985 lunar and planetary occultations, which new subscribers no longer will be able to buy. As noted in the last issue, *Sky and Telescope* sometimes can publish more up-to-date information about specific asteroidal occultations due to their more frequent publication. Also, *Sky and Telescope* sometimes publishes finder charts which are better than the ones in *O.N.*; see p. 245 of their March issue. Also in the March *Sky and Telescope* is an interesting account of the creation of the new Lowell 18-inch astrographic telescope, mentioned in *O.N. 3* (8), 161-162.

The telephones for asteroidal occultation updates in Houston, TX, (713,488-6871) and in Silver Spring, MD, (301,585-0989) are also the home telephones for Paul Maley and me, respectively. Hence, you will get the recorded message only if we are not there; some callers have been surprised when someone answers the phone. The person who answers the phone usually has the latest information, so this is rarely a problem. Some observers call during the early morning hours to take advantage of cheaper phone rates. For five days before asteroid occultations potentially visible from North America listed in *Sky and Telescope* and *O.N.*, I usually will disconnect the phones when I go to bed except for the one with the answering machine, so you can obtain the messages then. On other dates, useful asteroidal occultation updates are rarely available and non-emergency late-night (Eastern Time Zone) calls are discouraged. If you get the recorded message, you always can leave a message after it is played, and are encouraged to do so if you are organizing observers in your area and the latest information indicates that the path may be nearby. See also Joan's article about an astronomy computer bulletin board on p. 233.

Unfortunately, my work with eclipses has left no time to work on the observations of the 1983 occultations by (2) Pallas and (51) Nemausa. By July, other project deadlines will have passed, and I then will concentrate on the final analysis of these events. I plan to have a final draft of a paper about Pallas written before the American Astronomical Society's Division on Planetary Science meets in Baltimore October 29 to November 1.

The eclipse work also has delayed the star catalog and asteroid occultation search work mentioned in the last issue; I do not expect to undertake this work in earnest until April. It will need to be completed in June, since we need to produce the next issue no later than the end of June. Since the work is not done now, the photoelectric supplement mentioned in previous issues will not be initiated until the next issue. Occultations of stars by the coma of Comet Giacobini-Zinner will be most important during the months preceding the encounter with the Interplanetary Cometary Explorer on September 11, since observations of these events could give important information about the dust hazard which can affect the spacecraft targeting strategy. As of late February, the comet had not been recovered, and this is desirable for computing an orbit accurate enough for occultation predictions. A CCD observation of an unpredicted occultation of a 15th-mag. star by the coma of another comet using the 1.54-m reflector at Catalina Observatory, AZ, is described by S. Larson and M. A'Hearn in an article, "Comet Bowell (1980b): Measurement of the Optical Thickness of the Coma and Particle Albedo from a Stellar Occultation," in *Icarus 58*, pp. 446-450 (1984). Predictions of occultations by Halley's Comet are given by E. Bowell, L. Wasserman, W. Baum, R. Millis, and K. Lumme in "Occultations of Stars and Radio Sources by Comets: Predictions and Observing Prospects," in *Cometary Astrometry*, pp. 105-122. This book contains the proceedings of a workshop held June 18-19, 1984, at the European Southern Observatory Headquarters in Garching, G.F.R. in conjunction with the International Halley Watch. The book is Jet Propulsion Laboratory Publication 84-82, edited by D. Yeomans, R. West, R. Harrington, and B. Marsden. The first listed observable occultation of a star is not until October; these events will be included in my list of additional occultations in the next issue.

GRAZING OCCULTATIONS, CONTINUED

David W. Dunham

The table given with this article is a completion of the one started on p. 207 of the last issue, including the reports of grazes not in that table which I received since preparing the one in *O.N. 2* (16), 220. Reports of all grazes received since the last issue was published are listed in the table with Don Stockbauer's article on p. 230. As noted in the last issue, graze reports now should be sent to Don Stockbauer; 2846 Mayflower Landing; Webster, TX 77598; U.S.A., and preferably a copy also should be sent to ILOC (Geodesy and Geophysics Division).

I have received some inquiries about general information for observing grazing occultations. I have not answered these, since the desired material will be included in IOTA's occultation manual, which will replace the currently used out-of-date papers. Some of the questions have been asked by new members who joined IOTA about a year ago and who were not sent a copy of the old papers to which they were entitled. If you are in this category, write to me at P.O. box 7488; Silver Spring, MD 20907. I plan to have a preliminary version of the manual ready within two weeks. Although some sections will not be complete, up-to-date essential information describing the predictions and their use will be included. Since this will be a big improvement over the old set of papers, the latter no longer should be requested, and the preliminary manual should be used instead. Copies will be distributed to a few experienced observers for comments, and to new observers who don't have the old papers, as soon as possible. Sometime before the next issue of *O.N.* (at worst, simultaneous with its distribution), copies of the preliminary manual will be distributed to all IOTA members. It will be available to others from IOTA for $2.50 ($2.60 if VISA or MasterCard is used). The copies

will be sent unbound so that update pages and sections can be added later; storage in a ring binder will be recommended. Help in finishing the incomplete sections will be solicited; a "complete" manual might be ready about a year from now.

It is truly amazing that the most successful graze expedition to date, involving a 5.3-mag. star, took place on a January workday morning (see p. 231). Paul Maley must be congratulated for this remarkable feat, involving mostly observers from the Houston, TX, area; ...ould observers in your ...ty do half as well with a brighter star during a warm evening? In our area, we would have trouble coming anywhere close to this record. Even more remarkable, Don Stockbauer led a second expedition from the same city for the simultaneous graze of 2.9-mag. Alpha 2 Librae, obtaining more timings than were made during any graze observed in 1984 by a wide margin, as far as I know. Since Maley's group had a sizable south shift, they missed the top of the profile, which was recorded well by Stockbauer's expedition. An ...count of the January ...5th efforts, including a plot of the observed profile, will appear in *Sky and Telescope*, probably in either the May or June issue.

[The table continues on the two pages following this one.]

Mo	Dy	Star Number	Mag	Z Sn1	CA	Location	# Sta	# Tm	S S	Ap cm	Organizer	St	WA	b
1978														
1	18	093562	8.8	73+	S	Kiev, Ukraine	1	1		24	A. A. Shitetsky			
6	13	118833	8.1	49+	N	Shtompelevka, Ukr.	1	2		8	N. P. Kalinichenko			
6	15	139143	8.3	69+	N	Kiev, Ukraine	1	3		24	V. I. Mazur			
10	19	0692	1.1	86–	N	Beregovo, Ukraine	1	1	2	7	V. Mikhailets & E. Barnaya			
1980														
3	21	0692	1.1	32+	N	Tolochin, Belorussia	2	5		6	V. A. Golubev			
3	21	0692	1.1	32+	N	Sosnovka, Russia	5	18		8	Alexander Osipov			
4	21	097448	8.9	47+		Poltava, Ukraine	1	3		20	B. F. Sincheschul			
1981														
1	17	094767	8.2	92+	N	Kiev, Ukraine	1	4		24	V. I. Mazur			
1	31	2463	6.9	20–	11S	Melbourne, FL	8	25	2	8	Harold Povenmire			
2	9	109577	7.8	20–	5S	Mims, FL	2	4	1	15	Harold Povenmire			
2	12	0692	1.1	64+	–S	Gorredijk, Holland	10	50	1	8	D. Schmidt			
2	26	2280	6.8	56–	14S	Miami, FL	1	2	1	15	Harold Povenmire			
3	28	2591	6.5	57–		Harrisburg, RSA	3	8	1	6	M. D. Overbeek			
5	8	1129	5.3	27+		Warmbad, R.S.Africa	3	37	1	8	J. Barsby			
5	11	1504	5.7	58+		Babsfontein, RSA	9	75			J. Barsby			
5	27	3339	6.7	48–	N	Grootvlei, R.S.Af.	3	3			M. D. Overbeek			
6	6	1355	7.6	23+	N	Kameneis-Pod., Ukr.	1	2			D. G. Zvoleiko			
9	3	140042	7.8	79+		Pienaarsrivier, RSA	2	7			M. D. Overbeek			
9	17	0454	5.8	88–	N	Boksburg, R.S.Afr.	9	23			J. Barsby			
10	7	163462	7.0	64+		Johannesburg, RSA	7	12			J. Barsby			
10	20	080019	7.9	47–	9	Gober, TX	2	9	1	20	Paul Newman			–2
11	1	2618	6.6	20+	S	Edenvale, R.S.Afr.	9	28			J. Barsby			
11	6	3303	6.2	68+	S	Heidelberg, R.S.A.	6	13			J. Barsby			
1982														
1	20	2361	4.8	19–	11S	Key Largo, FL	4	20	2	15	Harold Povenmire			
1	21	2498	4.5	12–	14S	Titusville, FL	5	35	1	9	Harold Povenmire			
1	31	0249	4.7	36+	4S	Auckland, N.Zealand	4	14		20	G. Herdman			
3	5	1047	5.2	74+		Valdeavero, Spain	1	2		25	Jose Ripero			
4	14	2595	5.7	70–	16S	Wimamua, FL	6	21	2	15	Tom Campbell		198	–14
4	27	0843	7.2	16+	1S	Charmhaven, Austrl.	5	34	2	7	Roger Giller	5S	179	16
4	28	079113	8.3	31+		Benicarlo, Spain	1	2	1	8	Vicente Borras			
4	29V	1129	5.3	34+	1S	Pikesville, MD	4	11	1	20	David Dunham			
5	1	098554	7.2	56+	4N	Rockland, Ontario	3	17	2	10	Brian Burke	5	3	–29
5	12	2725	5.8	83–	14S	Mangamaunu, N.Z.	1	6		20	Brian Loader			
5	17	3419	4.5	33–	5N	Wyong, Australia	3	7	1	15	Greg Hayward		354	56
5	25	1433	6.8	9+		Bloemfontein, RSA	2	4	1	10	G. Walker			
5	26	1191	7.0	19+	–3S	Sevilla, Spain	1	3	4	20	Manuel Cruz		181	–8
5	29	1485	7.2	42+	7N	Baytown, TX	9	24	1	15	Don Stockbauer	2N	6	–42
7	6	187543	8.4	0E	U	Stigler, OK	4	49	1	13	Thomas Williams		6	
7	6	187547	9.3	0E	65U	Damon, TX	1	4	1	20	Don Stockbauer	11N	185	7
7	6	187581	7.7	0E	U	Stigler, OK	4	31	1	13	Thomas Williams		0	
7	6	C1527410	.6	0E	U	Australia	1	6			?			
7	17	0620	6.3	18–	N	Ane, Spain	1	1		25	Jose Ripero			
7	17	0663	6.9	16–	8N	Byhalia, MS	1	2	1	20	Benny Roberts		347	46
7	18	077287	8.1	8–	N	Little Lake, CA	2	10	1	20	Richard Lasher			
7	26	1856	6.6	33+	5N	Munger, IL	4	33	1	15	Berton Stevens	3N	3	–60
7	26	1856	6.6	33+	5N	Bluffton, OH	1	1	2	20	Ronald Rich			–60
7	29	2223	4.0	66+	10N	Orroroo, S.Austral.	1	0	2	11	David Steicke			
7	29	2223	4.0	66+	5N	Sussex Inlet, N.S.W.	5	23	1	12	Roger Giller	1S	7	–53
7	30	2391	7.2	77+	10N	Pietermaritzbg., RSA	1	1	1	15	Christopher Lake			

OBSERVATIONS OF ASTEROIDAL APPULSES AND OCCULTATIONS

Jim Stamm

(114) Kassandra and SAO 95572, Feb 14, 1983: (*O.N. 3* (8) 166). An attempt to observe the occultation was made by Marco Cavagna and Oreste Meliga from the island of Digiri, Republic of Maldives. They report no occultation from 18:39 UT to 18:59 UT.

(128) Nemesis and SAO 139402, May 2, 1983: (*O.N. 3* (9) 186). Jorge Polman reports that two teams observed no occultation from La Paz, Bolivia: Miranda Trujillo and Espinoza Yamaguchi, and Ortiz Mauser and Salm. Oporto.

(386) Siegena and AGK3 +5° 2112, Jul 16, 1984: (*O.N. 3* (9) 187). J. Pinson, observing from La Seyne, France, saw no occultation from 00:28 to 00:47, and none were seen from 00:25 to 00:45 at Haute-Provence Observatory at St. Michel, France.

(87) Sylvia and SAO 211985, Aug 8: (*O.N. 3* (9) 187). David Dunham had telephoned updates on this

Mo	Dy	Star Number	Mag	% Snl	CA	Location	# Sta	# Tm	S S	Ap cm	Organizer	St	WA	b
1982														
8	13	0610	6.2	39-	13N	Fisher, TX	1	5	1	12	Rick Baldridge	4N	345	-37
8	14	0765	5.3	28-	N	Elmore City, OK	2	22	1	20	Carl Schweers			
8	15	0928	6.0	18-	12N	Strongsville, OH	3	10	1	11	Mark Allman			
8	15	0946	3.2	17-	14N	Rock Mountain, TX	1	16	1	12	Rick Baldridge	0	344	14
8	27	2446	7.2	60+	4S	Corrimal, N.S.W.	3	8	1	20	Russell Oldham	1N	179	-32
8	27	2446	7.2	60+	4S	Bellambi, N.S.W.	3	16	2	20	Roger Giller	1N	179	-32
9	10	0766	6.0	50-	15N	Bathurst, N.W.W.	6	55	1	7	Roger Giller	2S	344	20
9	11	077553	8.2	43-	13N	N. Robinson, Ont.	1	4	1	15	Michael Watson		345	21
9	22	159310	7.7	22+	3N	Wortham, TX	1	1	1	20	Don Stockbauer	1N	2	-40
9	25	2661	7.1	52+	4S	Schofields,Austrl.	4	14	1	7	Greg Hayward		179	-8
9	29	3150	6.5	84+	2S	Chapel Hill, NC	3	8	2	25	Mark Lang		176	49
10	8	0843	7.2	67-	15N	Camarillo, CA	2	13	2	15	Richard Nolthenius	0	344	19
10	10	1118	6.0	48-	N	P.SantaMaria,Spain	5	13	1	8	L. Quijano			
10	10	1118	6.0	48-	9N	Roma, Italy	2	6	2	15	Adriano Filipponi		350	-9
10	23	2694	6.4	32+	4S	Poplarville, MS	1	5	1	20	Benny Roberts		178	8
10	23	2694	6.4	32+	5S	Waverly, VA	2	7	2	20	David Dunham	5S	175	8
10	24	2850	7.5	41+	6S	Magma, AZ	1	10	1	25	Gerald Rattley	2S	177	22
10	26	3092	6.2	60+	4S	Thornton, MS	1	10	1	20	Benny Roberts		177	47
10	26	190146	7.9	60+	8S	Kenney, TX	1	7	1	20	Don Stockbauer	3N	173	46
10	27	3228	7.2	70+	7S	Powhatan, NC	3	32	2	20	Mark Lang			
11	8	098510	7.3	49-	11N	Seminary, MS	1	5	1	20	Benny Roberts		349	-41
11	21	2961	6.0	27+	6S	Whangarei, N.Z.	1	4		25	G. Hudson			
11	23	3228	7.2	46+	13S	Manila, P.I.	1	7	1	8	Ernesto Calpo	0	169	56
12	10	139356	8.0	22-	3S	Garrisonville, VA	2	8	2	20	David Dunham			
12	22	3428	5.2	38+	10S	Torbanlea,Queensl.	1	15	1	20	Dennis Lowe		171	
12	25	0249	4.7	69+	14S	Bundaberg,Queensl.	3	22	1	8	Dennis Lowe		164	59
12	30	078519	9.1	0E	89U	Garland, TX	1	3	1	20	Paul Newman		2	0
12	30	078519	9.1	0E	90U	Timpson, TX	1	2	1	20	Don Stockbauer	0	2	0
12	30	C0374710.2		0E	U	Kailua, HI	1	10	1	20	Paul Maley			-5
12	30	C0374710.2		0E	U	Pahala, HI	1	6	1	25	William Albrecht			-5
12	30	078665	8.2	46E	U	Bulacan, P.I.	1	9	1	8	Rodrigo Nieva	18	163	-6
1983														
1	18	146764	8.4	19+	14S	Thornburg, VA	2	8	1	20	David Dunham		172	70
1	19	0018	6.0	26+	S	Burguillos, Spain	3	20	1	20	L. Quijano			
2	3	1950	5.8	67-	S	San Fernando,Spain	4	15	1	8	L. Quijano			
2	18	110072	8.7	22+	14S	Moss Hill, TX	1	4	1	20	Don Stockbauer	0	169	63
2	18	110072	8.7	22+	12S	Magee, MS	1	8	1	33	Benny Roberts		171	63
2	18	0249	4.7	23+	-7N	Potomac, MD	1	5	3	20	Jay Miller		355	64
2	19	0404	5.2	35+	9S	New Plymouth, N.Z.	1	1		15	J. Walmsley			
2	21	0668	6.0	55+	2S	Cor. de Tucson, AZ	6	26	2	15	Gerald Rattley	3S	180	29
2	21	0700	5.7	58+		Bundaberg, Austrl.	1	3		7	G. Walters			
3	7	185674	7.1	41-	17S	Petronila, TX	1	2	1	20	Don Stockbauer	12S	199	-0
3	10	2921	6.1	20-	S	Bloemfontein, RSA	2	8	1	9	G. N. Walker	0		
3	21	0752	4.7	38+	1N	Bay View, MD	3	18	1	11	Richard Taibi			
3	21	0752	4.7	38+	1N	Glasgow, DE	2	8	1	20	David Dunham		0	18
3	21	0752	4.7	38+	1N	Millville, NJ	1	3			Fred Schaaf			
3	22	0923	6.9	50+	3N	Chester, TX	5	22	1	20	Don Stockbauer	1N	2	0
3	23V	078963	7.0	60+	5S	Doswell, VA	2	7	1	20	David Dunham		174	-14
4	5	2850	7.6	47-		Brisbane,Queensld.	1	8		41	P. Anderson			
4	17	0725	6.9	16+	1N	Riverdale, TX	4	34	1	15	Don Stockbauer	0	1	18.
4	17	0761	6.7	18+	1N	Appin, N.S.Wales	1	11	1	25	Russell Oldham		0	4
4	19	1041	8.0	35+	2N	Richwood, TX	1	3	1	20	Don Stockbauer	5N	1	-14
4	29	2302	2.9	95-	16S	Henderson, NC	1	2	2	20	Mike Kazmierczak			
4	29V	2302	2.9	95-	16S	Linden, NC	4	15	1	13	David Dunham		196	-19
4	29	2303	5.1	95-	16S	Cary, NC	2	4	2	28	Mark Lang			
5	3	2921	6.1	63-	2N	Waikanae,N.Zealand	2	5		15	Graham Blow			
5	6	3304	6.4	36-		Melbourne,Victoria	6	24			P. Raw			
5	18	080293	8.5	32+	8N	Flora, MS	1	5	1	25	Ben Hudgens		6	-40
5	18	1308	4.7	33+	6N	McComb, MS	2	17	1	25	Benny Roberts		4	-39

event to Danie Overbeek in South Africa, who notified only a few observers, since a miss now was predicted for South Africa. Overbeek reports the following results: Misses were reported by Blane, Bodenstein, Fraser, Learmonth, and Overbeek at Witwatersrand; Van Ellinckhuyzen at Bloemfontein; and Pazzi at Nigel. However, J. Strobos and V. Hirsch, observing at Port Elizabeth, recorded a disappearance at 18:01:37.2 ±0^{s}4, and a reappearance at 18:01:59.3 ±0^{s}8. The significance of this observation is summarized in the last issue of *O.N.*

47) Winchester and BD +4° 978, Sep 2: (*O.N. 3* (9), 187). Thomas Langhans, at San Bruno, CA, monitored the star from 10:00 until 10:24 without observing an occultation.

(188) Menippe and SAO 143998, Sep 3: B. Thooris, at Wervik, Belgium, observed from 18:55 to 19:27 without seeing an occultation. Clouds prevented observations from 19:03:15 to 19:05:22, 19:09:38 to 19:13:45, and 19:22:18 to 19:26:32.

(209) Dido and SAO 188498, Sep 4: *O.N. 3* 187). Under cloudy skies, Ferruccio Ginnelli, at Fortaleza, Brazil, found an interval from 1:13 until 1:26 with good transparency and stability, but observed no event.

(6) Hebe and anonymous star, Sep 14: From Meudon Observatory at Meudon, France, it was determined that Hebe passed about 2 arc seconds south of the star, with least distance at 4:11:24. The observation lasted from 4:07:30 until 4:19.

(47) Aglaja and SAO 146599, Sep 16: (*O.N. 3* (9) 182). Four chords were obtained by members of the Saguaro Astronomy Club for this event. Peter Manly, observing from 2:15 to 2:36, recorded a 12^{s}7 disappearance starting at 2:26:05.9. Scott Stiers got a 12^{s}25 extinction at 2:26:06.75, while monitoring from 2:15 to 2:31. Gerald Rattley began at 2:21:44, and observed a couple of blinks before timing a 13^{s}6 chord beginning at 2:26:08.7. He reports a possible 0^{s}5 step event just before the end of the occultation. His observing ended at 2:39:11. Chris Schur

Mo	Dy	Star Number	Mag	% Snl	CA	Location	# Sta	# Tm	S S	Ap cm	Organizer	St	WA	b
1983														
6	2	3243	7.4	62-	2S	Auckland,N.Zealand	2	9		13	F. Herdman			
6	16	1514	6.1	31+	8N	Lacygne, KS	5	34		8	Robert Sandy		6-56	
6	23	2343	6.4	95+	10N	Media, PA	2	3	2	10	David Dunham		14-14	
6	25	186624	9.0	70E	81U	Oxford,New Zealand	1	9		20	G. Evans			
7	2V	3536	4.7	60-	10N	Cor.de Tucson, AZ	11	99	1	20	Derald Nye	6S		
7	7	076632	8.7	10-		Bundaberg,Queensl.	1	3		20	Dennis Lowe			
7	17	2033	4.3	58+	-5S	S.F.Saserra, Spain	3	12	3	14	Carles Schnabel		187-5	
7	22	2672	2.9	96+	-14S	Stege Bugt,Denmark	1	4	2	6	N. P. Wieth-Knudsen	191	23	
7	31	0188	7.9	66-	18N	Vinton, LA	3	12	1	20	Don Stockbauer	9N344	66	
7	31	0188	7.9	66-	16N	New Concord, OH	1	2			Mark Allman	N		
8	3	0527	6.3	36-	10N	Columbus, OH	1	8?			Mark Allman			
8	4	076687	8.8	25-	13N	Myersville, MD	2	6	2	20	David Dunham			
8	5	0859	6.5	16-	14N	Salvo, NC	3	28	1	12	David Dunham	0344	3	
8	27	0106	6.8	90-		Sabadell, Spain	1	2	1	21	Ricard Casas			
8	31	076850	7.5	44-	12N	C.Campo Leoni,Italy	1	0	2	20	Filipponi Adriano	347	16	
9	2	078308	9.0	28-	14N	Los Angeles, CA	1	2	1	42	Richard Nolthenius	345-11		
9	2	C0259710	.1	28-	15N	Los Angeles, CA	1	2	1	42	Richard Nolthenius	345-12		
9	4	1285	7.8	10-	15N	San Fernando, CA	1	4	1	15	Richard Nolthenius	0359-43		
9	15	P186844	8.5	63+	15S	Mt. John,N.Zealand	1	5	1	60	Graham Blow			
9	15	187515	9.1	68+	S	Fortaleza, Brazil	1	4	2	32	Ferruccio Ginelli			
9	16	2834	5.0	72+	3S	Ilford, N.S. Wales	2	8	2	20	Greg Hayward			
9	16	2850	7.5	73+	3S	Oxford,New Zealand	1	6		20	G. Evans	178	30	
9	29	078040	8.6	54-	11N	Lick Obs., CA	1	0	1	91	Richard Nolthenius	347-12		
10	13	2790	6.2	46+	6S	Kawakawa,N.Zealand	2	8		15	G. Hudson			
10	21	0170	6.2	99+	19W	Tisvildeleje,Denmark	1	2	2	30	N. Wieth-Knudsen	354	63	
10	27	1030	3.2	70-	N	Tifton, GA	2	12	1	11	Harold Povenmire			
10	27V	1030	3.2	70-	12N	Charleston, SC	3	14	1	20	David Dunham	2S346-24		
10	28	1170	3.7	59-	13N	McHenry, MS	2	14	1	25	Benny Roberts	345-37		
10	28	1170	3.7	59-	N	Forsythe, GA	2	18	1	11	Harold Povenmire			
10	28	1170	3.7	59-	14N	Columbia, SC	2	10	1	20	John Safko			
10	28	1170	3.7	59-	N	Fayetteville, NC	7	60	1	15	Mark Lang			
10	28	1170	3.7	59-	N	Fayetteville, NC	1	14	1	15	Jan Dabrowski			
10	28	1170	3.7	59-	10N	Greenville, NC	2	4	1	9	Floyd Mattheis			
10	28	1170	3.7	59-	11N	Duck, NC	2	15	1	20	David Dunham	5N347-37		
10	30	098813	8.2	35-	0N	Layhill, MD	2	2	2	20	David Dunham	C180-59		
11	12	3116	6.7	47+	10S	Warkworth, N.Z.	3	18		6	G. Hudson			
11	13	3304	6.4	61+	S	Bloemfontein, RSA	3	15	2	10	G. N. Walker	0		
11	14	3343	5.8	64+	11S	Redwood City, CA	1	9	2	15	Rick Baldridge	1S168-17		
11	27	1544	5.7	50-	5S	Andover, NJ	5	15	1	12	David Dunham	C5S184-63		
11	27	1544	5.7	50-	5S	North Merrick, NY	7	25	1	8	Samuel Storch			
11	29	119317	8.2	28-	1S	Hazlehurst, MS	2	6	1	25	Benny Roberts	C184-64		
11	29	119349	8.7	27-	6S	Webster, TX	2	10	1	20	Don Stockbauer	3S189-63		
12	11	165389	8.5	43+	S	Herk deStad,Belgium	1	3	1	25	Patrick Poitevin			
12	11	3374	6.3	43+	8S	Falkenberg, Sweden	1	7	2	6	N. Wieth-Knudsen	174	74	
1984														
1	9V	3484	6.8	28+	13S	Mercersburg, PA	7	19	2	9	David Dunham	3S171-36		
1	9	3484	6.8	28+	S	Portland, CT	1	4	1	25	Philip Dombrowski			
1	9	0018	6.0	35+	S	Mezieres, France	1	8		20	Ginat			
1	12	110169	8.7	56+	18S	Damon, TX	1	6	1	20	Don Stockbauer	6S161	53	
1	12	110217	8.7	57+	17S	Acton, CA	1	1	3	15	Richard Nolthenius	162	53	
1	22	1702	4.2	80-	12S	Cruger, MS	2	21	1	25	Benny Roberts	189-64		
1	22	1702	4.2	80-	15S	St. Augustine, FL	3	16		11	Harold Povenmire	10N		
1	25	2064	6.5	48-	S	Springer, OK	3	33		13	Carl Schweers			
1	25	2064	6.5	47-	18S	Florida City, FL	2	20		15	Harold Povenmire			
2	8	110003	9.3	30+	12S	Jackson, MS	1	5	1	33	Benny Roberts	169	53	
2	9	0354	5.5	39+	6S	St. Paul, MN	3	20	2	15	James Fox	174-75		
2	23V	2267	5.1	53-	16S	Englishtown, NJ	5	25	1	20	David Dunham	3S198	-6	
3	10	077375	7.1	54+	3N	Kennet Square, PA	1	1	3	20	David Dunham			
4	10	080764	8.0	71+	5N	Ashton, MD	1	4	3	20	David Dunham			
6	13	2513	4.3	100-		Albion Park,N.S.W.	2	9	2	20	David Wheeler			
7	19	0066	6.8	67-	12N	North Miami, FL	1	6		15	Harold Povenmire			
8	20	0664	5.4	41-	17N	Shell Harbour,NSW	2	8	2	11	James Ashton			
9	17	0709	4.3	61-	14N	Stacy, MN	4	21	1	15	James Fox	345	-7	
10	16	1061	6.1	60-	N	Maasdam, Holland	1	4	2	15	Henk Bulder			

timed a 13.1 event beginning at 2:26:09.2. He monitored from 2:22:07 to 2:40. All of these observations were made near Phoenix, AZ. Ken Guyton recorded a 2-sec. occultation at Macon, GA. This chord was the closest to the southern limit that was reported. At Tucson, AZ, James McGaha began observing at 2:18, and reported a possible 0.5-magnitude drop at 2:26:10, and a full 2-magnitude drop at 2:26:13.2, which lasted 10.7. His observation ended at 2:32. Richard Nolthenius searched out a site that he felt would not be covered by other observers. He monitored the star from 2:19 until 2:32, observing a blink at 2:26:02.5, and a 0.3-magnitude drop from 2:26:08 to 2:26:11. He feels that these observations could be spurious. (See *O.N. 3* (10), 203 for Chuck Herold's notes on a secondary occultation.) Michael Mooney and Scott Ireland, observing at Southern Cross Observatory in Florida, detected no events from 2:23 to 2:30, and I monitored from 2:21 to 2:31 at London, KY, without observing any events.

(334) Chicago and SAO 1723, Oct 2: After timing a graze at Pine Log, GA, I hastily moved my equipment down the road to join John Helton and Hal Povenmire, and with their help I monitored the star from 1:08 to 1:28, detecting no event. F. Hubner, observing from Las Palmas, Canary Islands, saw no occultation from 00:43 to 1:23.

(365) Corduba and SAO 145486, Oct 6: (*O.N. 3* (9), 181. Under good skies, I observed no event from 3:01 to 3:17, at London, KY. I had no trouble finding the star, which was only 15 degrees from the 87%-lit moon, but the glare hindered my observation. Peter Manly, Gerald Rattley, and Rick Rotramel, observing from central Arizona, reported that glare also prevented them from seeing

the asteroid. They did not see an occultation either. Times were 2:54-3:15, 2:55-3:25, and 3:03-3:07, respectively. Manly taped the appulse with an intensified TV camera. Gregory Lyzenga, at Cow Canyon Saddle, on Mt. Baldy, CA, did not feel that the moon interfered significantly, and he observed from 2:56-3:24 without seeing any extinctions.

(6) Hebe and anonymous star, Oct 9: Peter Anderson, at Brisbane, Australia, saw no event from 15:12 to 15:25. He states that there was "a 52% chance that the asteroid passed south of the star."

(747) Winchester and BD +02° 1330, Oct 15: Steve Hutcheon, at Sheldon, Australia, monitored from 15:22 to 15:33. He saw no occultation, and felt that the asteroid passed north of the star.

(735) Marghanna and AGK3 +13° 0253, Oct 16: At Besancon, France, P. Rousselot monitored the star from 00:30 until 00:50. No events were detected, and he was able to separate the pair with 70 power throughout the observation. It took 300 power to separate the two at closest approach at Tavagnacco, Italy. G. Sostero observed from there from 00:00 to 00:57, seeing no occultation.

(545) Messalina and AGK3 +36° 0536, Oct 21: No fewer than 17 European observations were made of this event, all of which produced negative results. Troublesome clouds interfered with T. Midavaine at Paris, France (4:17-4:29); J. Van Camp at Waarloos, Belgium (3:50-4:07 and 4:12-4:35); and at Meudon Observatory, France (3:58-4:02, 4:07:10-4:09:10, and 4:13-4:18). The other observers had good conditions. From France were B. Candela at Sollies-Pont (4:05-4:30), J. Pinson at La Seyne (3:59:50-4:35), the C.E.R.G.A. Observatory at Caussols (3:55-4:23), and the Haute-Provence Observatory at St. Michel. The latter reported that the asteroid seemed to have passed east of the star. Observers from Belgium were M. Deconinck (4:04-4:29), A. Lheureux (4:14-4:30), L. Louys (3:55:15-4:26:48), and L. Zimmermann (3:55-4:26:25) at Brussels; B. Thooris at Wervik (4:05-4:40); and F. Van Loo at Heist/Berg (4:00-4:19). German observers were: at Wiesbaden, W. Palzer and M. Kretlow (4:00-4:24); at HPH Observatory, F. Hubner (3:50-4:21); at Mainz-Lerchenberg, R. Riemann (4:10-4:25); and at Mz.-Klein-Winternheim, A. Gabel (4:00-4:20).

(712) Boliviana and SAO 108591, Oct 24: Ferruccio Ginelli at Fortaleza, Brazil, began observing at 20:55, and watched the asteroid pass to the west of the star, giving an elongated image at about 21:19. His observation stopped at 21:29, with no events detected.

(121) Hermione and anonymous star, Nov 4: Pete Manly and Gerry Rattley were glad to finally get an event away from the horizon, moon, and twilight, and this one was straight up in the dark sky. Unfortunately, they couldn't point their TV camera straight up, and they had to make their observation visually. Observations were begun at 12:46, and at 12:53:16.5 a 1§8 disappearance occurred. Manly reported that the disappearance lasted about 0§4, and the "in" had the "crisp snap of reappearance." In addition, he detected a $^1/_3$-second blink at 12:57:51. Observations ceased at 13:06.

(790) Pretoria and BD +23° 6, Nov 8: I monitored this star at London, KY, from 5:17 until 5:30, seeing no occultation. Benny Roberts, at Jackson, MS, also observed no events from 5:15-5:35. He did not observe from 5:24-5:25 because of clouds. Despite fatigue and having to set up in a hurry, Gerry Rattley, in central Arizona, monitored the star from 5:15:30 to 5:30, with a 17^S break at 5:20:09, and a 6^S break at 5:24:23. He only observed a miss.

(238) Hypatia and AGK3 +6° 0528, Nov 12: There was no occultation from 23:50 to 00:35 according to German observers W. Palser and M. Palzer at Wiesbaden Observatory, nor at HPH Observatory according to F. Hubner. R. Riemann at Mainz-Lerchenberg reports none from 00:00 to 00:26. Misses were also reported by Belgian observers C. Baetens (Boechout), J. Bourgeois (Conneux), and H. Riemig (Boechout); and French observers S. Kuchto (Guyancourt), P. Mazalrey (Vernon), and at the Meudon Observatory.

(1) Ceres and BD +8° 471, Nov 13: Eight portable photoelectric stations travelled to Mexico for this event, with the help of a National Geographic Society grant. Seven were successful (3 from Lowell, 3 from the University of Arizona, and 1 from the University of Maryland). David Dunham reports that the longest chord obtained was 75 seconds, and this indicates a diameter of 1000 km when the rotation of the earth is taken into account. Two groups from the Southern Cross Astronomical Society obtained photoelectric dimmings. Scott Ireland, Michael Mooney, and Dan Leibow recorded a 1^S drop in light level at 4:42:05 from Burn's Lake, FL, while Donald Parker, William Douglas, and Jeff Beish obtained a 75§29 chord from South Miami, FL. Hal Povenmire reports that about 9 other photoelectric chords were obtained in Florida and the Bahamas, including 3 from mobile photoelectric observers from the Massachusetts Institute of Technology. He claims to have seen the 0.1-magnitude drop visually. He saw a flicker and called out "That's it!", which was later confirmed with the tape recording and photoelectric record. Povenmire states that he noticed a slight color change, but did not notice the reappearance.

P/Halley and anonymous star, Nov 23: Benny Roberts and Ben Hudgens monitored the 12.9-magnitude star from 6:50 to 7:15 at Jackson, MS, without observing any occultation. This is the first attempt at observing an occultation by Halley that has been reported to IOTA.

(751) Faina and BD +17° 796, Nov 24: According to astrometry done at Lowell Observatory, the path of this event was shifted close to the equator. Gregory Lyzenga observed quite a lot of activity while monitoring the star from 9:15 to 9:38:10 at La Verne, CA. He reports 4 disappearances and 3 fadings. He feels certain about the first 3 disappearances (9:15:12.8-14.0, 9:16:07.1-09.4, and 9:16:24.9-25.8), but feels the others could be spurious. John Sanford, at Orange, CA, reports no occultation from 9:24-9:35. He believed that closest approach was about 9:28. Gerry Rattley and Chris Schur reported that the asteroid passed noticeably south of the star, from central Arizona. They monitored from 9:09:15.5 to 9:35. Also from central Arizona, Leroy Paller and Pete Manly used an intensified TV camera from 9:21 to 9:40 to record a miss.

P/Halley and unnamed 12.9-mag. star, Nov 24: Pete Manly and Leroy Paller used their intensified video with WWV-synchronized timer to monitor the star from

12:32:13 to 12:52:29. They had to use a hair drier to remove dew, and a flashlight to check the corrector of their C14, which caused interruptions at 12:34:15 (73^{s}), 12:38:49 (48^{s}), 12:43:10 (10^{s}), and 12:46:46 (11^{s}). A miss was recorded.

(747) Winchester and 7 stars, Nov 28, Dec 9, 11, 12, 22, and two on the 23rd: On Oct 26th, three exposures were taken at Lick Observatory, and the astrometry for these events showed all paths to be close to the predictions from the new ephemeris by Landgraf. See below for details of individual events.

(747) Winchester and SAO 114569, Nov 28: The path of this event was predicted to cross Mexico (near Mexico City), Venezuela, and northern Brazil. Dunham called Josephine Mallén in Mexico City, and sent telegrams to Merida, Venezuela, and Recife, Brazil. From Merida, Ignacio Ferrin reports that Yamandu Fernandez observed a miss at Montevideo, Uruguay, but Antonio Mendez recorded a 27^{s}3 extinction at Valencia, Venezuela, beginning at 6:08:58. At Coral Gables, FL, Donald Parker and Michael Mooney decided to use a filar micrometer to determine the position of the asteroid relative to the star. They determined that Winchester passed 1".41 south-southwest (PA=204°) of the star at 6:13:43.09. From central Arizona, Gerry Rattley observed a miss. He monitored from 6:17:01.5 to 6:47:00.5 with a 2^{s} break at 6:28:01, and feels that the asteroid passed slightly south of the star.

(717) Wisibada and SAO 75930, Dec 1: Dunham called me several hours before the event, and indicated that astrometry now placed the path over Kentucky. Despite the full cloud cover, I called several observers. It cleared up an hour before the predicted time, but clouded over again 4 minutes before the event. Charles Evans, at Hampton, VA, was able to observe from 4:30 to 5:04, but did not see any drops in light. Richard Dietz at the university of Northern Colorado (Greeley) saw no occultation from 4:40-4:51. Joe Senne reported no event from Rolla, MO. Michael Crist monitored the star at Burns, TN, from 4:38 until 4:50 without seeing any occultation. From central Arizona, misses were reported by Gerry Rattley (4:34:26-5:00), Chris Schur (4:20-4:50), and Pete Manly (4:37-4:57). Three Belgian observers also reported misses: D. Baise and A. Lheureux at Brussels, and R. Boninsegna at Dourbes.

(40) Harmonia and SAO 78926, Dec 3: A preliminary report from Roland Boninsegna states that A. Lheureux, at Brussels, Belgium, observed a miss.

(418) Alemania and unknown star, Dec 9: Eleven European misses were received in Boninsegna's report. Belgian observers were D. Baise, A. Lheureux, L. Louys, Y. Thirionet, and L. Zimmermann at Brussels; J. Fruru at Merksem; B. Thooris at Wervik; and P. Van Cauteren at Aartselaar. Italian observers were M. Cavagna and C. Gualdoni at Gravedona, and G. Sostero at Tavagnacco.

1983 TB and SAO 55826, Dec 15: Brian Marsden at the Smithsonian Astrophysical Observatory computed an improved orbit from very recent observations by Arnold Klemola at Lowell Observatory. Since this asteroid has an orbit very close to that of the Geminid meteor stream, it is speculated that it may be the parent body of the famous December meteor shower (see *Astronomy* (Jan 85) pp. 68-70). Although the diameter probably is less than 15 km, there may be a lot of material close to the asteroid (or dying comet), and some extra effort was put into observing this occultation. Mike A'Hearn (University of Maryland) and David Dunham distributed a notice based on Lowell Observatory calculations to observers within 200 miles of the predicted path, which was from Trenton, NJ; thru Erie, PA; north of Detroit and Minneapolis; and on thru North Dakota; Montana; and over Vancouver Island. The time was from 7:55 to 7:57. Bad weather occurred everywhere except in North Dakota, and we've received no reports.

(6) Hebe and anonymous star, Dec 16: From the Oct 26 plates taken by Klemola, it was determined that the path would be shifted 0".40 S, similar to the predicted path for the 1983 TB event described above. See the map published on p. 196 of *O.N. 3* (9). Notices were also sent to photoelectric observers, but clouds were nearly everywhere. David Skillman at Laurel, MD, did record 2 possible occultations during a photoelectric run from 4:20:45 to 4:27:19. But his light curve was not sharp, and the drops were larger than expected. Skillman also mentioned that he did not recognize the drops as typical occultation events. The first one was 31^{s} long, beginning at 4:23:13, and the second was 15^{s} long, beginning at 4:24:56. David Dunham reported that there were widespread fog and low clouds throughout much of the area that night.

(161) Athor and SAO 59154, Dec 17: Under partly cloudy skies, I found the star easily, but one of those clouds placed itself under the star throughout the time of the event, except for one second, at precisely the time the event was supposed to be central at London, KY. I observed a 9th-magnitude flash at the time that I was hoping for an extinction.

(747) Winchester and star A on S&T finder chart, Dec 22: The path shift was predicted to be 1".32 N from the EMP82 position, placing it over Gaspe and northern Nova Scotia. Dunham sent letters to observers in the area, but no reports have been received yet.

(747) Winchester and star B on S&T finder chart, Dec 23: The path of this event was predicted to cross Brazil between Recife and Rio de Janeiro.

(747) Winchester and BD +4° 1312, Dec 25-26: I monitored the star at London, KY, from 00:01 until 00:13:10. High cirrus clouds were present immediately before the observation began, and I noticed a lot of dimming activity up until 00:06:30, when the star appeared to go out for one second. Another extinction occurred at 00:06:58, and lasted 4 seconds, with a blink at precisely 00:07. Because of the clouds and the star's altitude (6°), I would have recorded all of this activity as "certainly spurious," except that I saw no more dimmings during the next 6 minutes, so I used "probably" instead, for the two distinct dimmings. Wolfgang Palzer and W. Landgraf monitored the star from 23:50 to 00:15 at Wiesbaden (Observatory), German Federal Republic. They determined that the asteroid passed from 0".5 to 1".0 from the star at 00:05 ±3^{m}. Clifford and George Stowers, observing at Fairfield, ME, saw no occultation from 23:50 to 00:13. David Dunham observed from Virginia Beach, VA. He timed a lunar occulta-

tion disappearance of a 5.5-mag. star at 00:01, and then monitored from 00:04 to 00:12, seeing the closest approach. Dunham, noticing that the star was just off Klemola's October plate, was unable to obtain last-minute astrometry, until a card arrived 3 days after the event, from Bob Millis of Lowell Observatory, giving the measurements of the star. Ironically, the path shifted south from the nominal prediction with Landgraf's ephemeris by 0".30, or 1".37 north of the nominal path using the EMP 1982 ephemeris, placing the event over virtually all of Massachusetts, southern New York, and other populated areas in southern New England. A further irony – despite warm weather and generally clear skies, we did not get a single report from anyone in the path. Perhaps Christmas and other competing events caused this opportunity to be lost.

(111) Ate and SAO 78743, Dec 30: At Wiesbaden, West Germany, W. Palzer, W. Landgraf, H. R. Schneider, and H. Ibler observed from 18:45 to 19:15, and determined that Ate passed within 3" of the star at 19:05. Other German observers who also recorded negative results were F. Hubner at HPH Observatory (18:50-19:30), and R. Riemann at Mainz-Lerchenberg (19:12-19:22).

(150) Nuwa and SAO 96300, Dec 31, 1984: Gerry Rattley monitored this star from 4:55 until 5:15, in central Arizona, and noticed a "most probably spurious" event at 5:00:15.2. A 0^{s}.2 "wink" was followed by a similar wink of a 10.5-mag. star just northwest of SAO 96300. Gerry notes that it did not have the appearance of a real event, and probably was something "flittering by."

(40) Harmonia and SAO 78419, Jan 1, 1985: Tony Freeman saw the asteroid blend into the star at 11:57 and emerge at 12:09, from Berkeley, CA. He believes that the asteroid went south of the star. From central Arizona, Gerry Rattley also saw the images merge, but reports that the south shift was obvious. He monitored from 11:50:58 until 12:15. Thomas Langhans, at San Bruno, CA, observed from 11:52 until 12:13, seeing no occultation.

(6) Hebe and SAO 113607, Jan 3: Gerry Rattley, observing from central Arizona, monitored the star from 7:35 to 7:55. The seeing was so poor that he feels the 0.6-mag. drop could have escaped his detection, if it did occur. Wolf Fahrenbach had similar problems from (unreported), Oregon, with his "visually negative" observation.

(815) Coppelia and SAO 57393, Jan 6: Benny Roberts observed two "probably spurious" dimmings of the star at 6:41:31 and 6:41:35 at Jackson, MS. His "cloudy" observation lasted from 6:20 to 6:45. Five observations were carried out from central Arizona; all produced negative results. Gerry Rattley observed from 6:26:57 until 6:50, Chris Schur and Rick Rotramel from 6:28 to 6:50 (different locations), Kent Hepburn from 6:20 to 6:30, and Pete Manly from 6:25 to 6:50 with an intensified video camera. Other negative observations were made by David Dunham, Silver Spring, MD; Richard Taibi and Terry Losonsky at separate locations in Temple Hills, MD; and Paul Maley and other observers in Houston, TX.

(97) Klotho and SAO 130148, Jan 10: Danie Overbeek reports that misses were observed from Cape Town, Sutherland, and Henly on Klip, South Africa.

(206) Hersilia and SAO 94422, Jan 18: From central Arizona, Pete Manly, with his intensified video camera, monitored the star from 1:38 to 1:58, and recorded a miss.

(566) Stereoskopia and SAO 139116, Jan 21: Danie Overbeek reports that misses were observed from Cape Town, Henly on Klip, and Potchefstroom, South Africa.

(747) Winchester and SAO 95375, Jan 22: Danie Overbeek reports that misses were observed from Cape Town, Edenvale, Johannesburg, and Potchefstroom, South Africa.

(1227) Geranium and SAO 41172, Feb 6: Harold Povenmire monitored this 'Goffin' event photoelectrically at Melbourne, FL, and saw no occultation. A few other observers in central Florida also monitored without seeing an occultation.

(535) Montague and SAO 93598, Feb 10: David Dunham saw no occultation from 3:18 to 3:30 at Silver Spring, MD. Despite his scope dewing up, his WWV receiver conking out, stray lights, and annoying passers-by, Greg Lyzenga determined that no occultation longer than one second occurred between 3:10 and 3:27. At 3:16:50 ±5^{s}, as he was being disturbed by lights, Lyzenga may have seen an 8th- or 9th-mag. star appear for one or two seconds, a few arc minutes north of SAO 93598. He does not give this observation much weight, however.

(579) Sidonia and SAO 78450, Feb 16, 1985: David Dunham saw no occultation from 5:11 to 5:25 at Silver Spring, MD.

GRAZING OCCULTATIONS

Don Stockbauer

Lunar grazing occultation reports should be sent to me at 2846 Mayflower Landing; Webster, TX 77598; U.S.A. Also, sending a copy to ILOC would be greatly appreciated. ILOC's full address is International Lunar Occultation Centre; Geodesy and Geophysics Division; Hydrographic Department; Tsukiji-5; Chuo-Ku; Tokyo, 104 Japan. Please note the new division.

I enthusiastically agreed to collect the graze reports and write the articles because grazes are my primary observing interest. As some background information on myself, I first became interested in occultations after meeting Dr. David Dunham at the University of Texas in 1974. Between then and 1981, my efforts were either solo ones, or as a member of someone else's expedition. In 1981 I formed a group within the Houston Astronomical Society dedicated to the proposition that any observable graze is worth doing, not just favorable "cream of the crop" events. Currently I am a programmer for Computer Sciences Corporation (Houston) working with the telemetry data bases of the space transportation system.

The largest change I have seen in our organization since 1974 is the waning of interest in lunar grazes and the waxing of interest in asteroidal occultations. The value of occultation observations increases greatly with time, and it would be a shame if graze observations will have highly valuable, esoteric applications for future astronomers, but that

not enough data were collected. Perhaps our current organizers can keep an eye on upcoming events in both areas and not abandon grazes.

The list of grazes reported to me appears on this page. For some of them, I received no report directly, but was informed of the effort secondhand. If any anecdotal information is sent with the reports, I will include it as space permits.

Mo	Dy	Star Number	Mag	% Snl	CA	Location	# Sta	# Tm	C C	Ap cm	Organizer	St	WA	b
1983														
8	3	0527	6.3	37-	N	Martintown, Ont.	3	20	1	9	Brian Burke			38
9	3	079257	8.3	19-	S	North Gower, Ont.	2	13	1	15	Brian Burke			-25
1984														
1	22	1702	4.2	80-	4S	Foothill Coll.,CA	2	3	3	20	Rick Baldridge	3S	181	-64
5	7	1225	8.5	35+	N	Kantala, Ontario	5	17	2	10	Brian Burke			-49
10	1	K07211	8.2	41+	5S	Chocolt. Bayou,TX	3	39	2	20	Don Stockbauer	6S	177	40
12	1	3458	6.5	58+	10S	Woodland, CA	2	15	2	20	Rick Baldridge	4N	170	67
12	31	109786	8.7	59+	11S	Crystl Sprngs, MS	2	11	1	33	Benny Roberts		168	43
1985														
1	15	2117	5.3	33-	17S	La Porte, TX	65	269	1		Paul D. Maley	5S	199	-09
1	15	2118	2.9	33-	16S	Lubbock, TX	1	6			Jim Stevens			
1	15	2118	2.9	33-	16S	Waco, TX	3	16			George Ellis			
1	15	2118	2.9	33-	17S	Madisonville, TX	14	82	1	3	Don Stockbauer	1S	199	-08
1	27	109557	8.0	30+	S	Mayflower, AR	7	49			Clay Sherrod			
1	27	109557	8.0	30+	11S	Myersville, MD	7	20	2	20	David W. Dunham	3S	169	45
1	30	093315	8.2	58+	13S	California, MD	3	9	1	20	David W. Dunham	2S	166	8
2	1	0742	6.0	77+	16S	Corte Madera, CA	4	22	2	20	Rick Baldridge	3S	163	-21
2	8	1709	6.7	90-	16S	Thornburg, VA	2	6	2	20	David W. Dunham	3S	193	-52
2	8	1728	6.9	89-	14S	Centerville, VA	2	6	2	20	David W. Dunham	2N	193	-45
2	9	1821	2.9	82-	14S	East Haven, CT	1	4	2	25	Philip Dombrowski		193	-41

Notes on individual events:

K07211 (CD -26°12457) t 1, 1984: This was an 8.2-magnitude non-SAO star which was grazed under fairly favorable circumstances. The profile had huge features which sprawled for over five miles on the ground. The lunar altitude was 14°, and the seeing was only fair. Carl Sexton, an experienced observer, called out 41 events for it; by combining calls closer than one second, I reduced this to 31. Carl believes the events were real, and not seeing variations. The main problem is that the coarse features on the predicted profile do not look conducive to a multitude of contacts. For anyone wishing to duplicate the conditions, the latitude libration was 3°.98, Watts angle = 176°.8, and the site was 0".34 south of the predicted southern limit.

SAO 109786 Dec 31, 1984: Benny Roberts timed 11 contacts of this star using only the USNO "graze nearby" message for a prediction. This is quite remarkable; having no profile or precise limit prediction is very risky. Proceed with caution.

ZC 2117 Jan 15, 1985: This was the first of two grazes to sweep across Texas that morning. The star was 8 Librae, the 5.3-magnitude companion of the wide double star α Librae. Paul Maley was the organizer, and through extensive pre-graze canvassing for observers, had 75 stations manned near La Porte, TX, of which 65 obtained data. This site did not permit coverage of the profile adequately to the south, and unfortunately, a 0.6-mile south shift occurred. Gary Nealis, the southernmost observer, had the largest number of events (10); stations farther south would have had quite a show. The dilemma of grazes is that the area which has the greatest potential for a lot of action is usually very close to the miss zone. Most members of this expedition had only four contacts; it was the sheer number of stations that established a new record for total events timed during a single expedition. Maley published his grand total as 268, but I get 269 when I add up his individual station counts.

ZC 2118 Jan 15: This was the 2.9-magnitude primary of α Librae. I led a 14-station expedition to Madisonville, 90 miles northwest of Houston, TX, while George Ellis and Jim Stevens mounted efforts near Waco and Lubbock, respectively. The primary is an FK4 reference star, so no large shift was expected; we observed a 0".1 south shift. Our coverage of the profile picked up where 8 Librae left off, since I concentrated my stations in the prime area very near the southern tip of the shadow. Only the expected accuracy of the prediction made this feasible. Observers from Austin; Dallas; Houston; and Jackson, MS; helped to record this rare event.

ZC 742 Jan 2, 1985: Rick Baldridge reports that Brian White was unable to obtain data due to an unusual circumstance; his car was rear-ended on the way to his own station after dropping Rick off at his station! The damage was minor, but when Brian got out of his van looking up at the moon, the poor lady almost went into shock figuring she surely would be sued for whiplash!

An issue was raised prior to the two grazes on Jan. 15, 1985: Which are more valuable; a few 'high resolution' graze expeditions with a huge number of stations; or very frequent 'low resolution' efforts? At this point, David Dunham and I feel that we need the more frequently obtained data. Anyone familiar with the Watts data knows they refer to whole mountains that don't exist, and exclude others that do. Very infrequent expeditions with huge numbers of stations will never catch all these errors; frequent low resolution ones will. Trying to map the lunar profile with only high resolution grazes would be like the first explorers of America charting only one square mile of land in great detail every few years; the overall view needs to come first. What is particularly distressing is to hear an expedition leader say that these smaller efforts are not worthwhile and don't get good data. In light of the above argument, 30 grazes, collecting a total of 300 timings, would be much more valuable than one record-breaking 300-event expedition. Actually, the high-resolution organizer has to space observers so closely that many of the data collected are redundant.

I hope to make the grazing occultation section of *O.N.* not just a dry report of the data, but a forum for expressing opinions about all aspects of the prediction and observation processes. Opposing viewpoints are welcome.

ECLIPSE NEWS

David W. Dunham

1984 May 30: All videotapes, movies, and still pictures of this eclipse have not been reduced, as erroneously stated in C. Herold's minutes of the IOTA meeting on p. 203 of the last issue. I have analyzed 51 timings of Baily's bead events obtained from my videotape, as described on p. 202; no other timings of this eclipse have been reduced or analyzed. Alan Fiala and I still have not been able to complete a composite videotape, as we have promised, but this should be accomplished within 2 or 3 weeks. Fiala has found a convenient 3/4-inch VHS VCR. Tom Harmon, a local observer, is trying to set up equipment that I can use to add a moving cursor to a copy of my record. I will use it to point out the individual beads, and dub in the Watts angle. For most events, this probably will be more useful than any plots we can produce for identifying the Watts angles of features causing bead events in other records. More information about the composite videotape is in the last issue.

Results of my (preliminary) analysis of this eclipse were given in the last issue, and results for other recent eclipses, including revised solar radii for eclipses back to 1925, have been given in earlier issues. These have been reported only in *O.N.* and *Stardust*, the bulletin of the local National Capital Astronomers. Dr. Fiala will present these results at the March 28th meeting of the American Astronomical Society's Division on Dynamical Astronomy in Austin, TX. They will be published in an abstract, for which I am a co-author, in a future issue of the *Bulletin of the A. A. S.*

1984 November 22-23: Some of Paul Maley's photographs, and an account of IOTA's effort to measure the solar diameter, are included in "November's Chancy Eclipse" in *Sky and Telescope 69* (2) 183-186. Maley has determined times of numerous Baily's beads from his videotape of the event, and from another one recorded by G. Nealis at a nearby site in Papua New Guinea. We plan to add these records to the May 4th composite videotape mentioned above. I performed the reduction calculations and sent Maley the printout, including printer plots of the predicted profile near each event, for determination of the Watts angles of the features. W. Beisker tells me that H. Bode's 35-mm photographs taken with an automatic winder clearly show many Baily's beads, but his position in the southern part of the zone of totality has not been measured accurately. Jay Pasachoff obtained a videotape near the centerline at Hula, P.N.G., but only 2nd and 3rd contact are apparent due to the short 48-mm focal length of his lens. A filter was in place at 2nd contact, but was removed before totality ended.

1985 May 4: David Herald's floppy disk of Astrographic Catalog data for the 1985 and 1986 lunar eclipse star fields were received in January, and a local observer, Terry Losonsky, read and copied the files with his Commodore computer. A co-worker with Commodore and a modem is working on transferring the data to another computer, from which we eventually can get it to magnetic tape or otherwise transferred to the U. S. Naval Observatory computer. By the end of March, I plan to have used the data at USNO to generate predictions for the 1985 and 1986 lunar eclipses, and distribute them to observers in eastern Brazil and the Eastern Hemisphere, from which the May 4th eclipse will be visible. Herald wants a subset of Watts' data on floppy disk in return, and we will try to reverse the above procedure to produce them for him.

The most interesting event during the May 4th eclipse will be the occultation of 2.9-mag. Alpha 2 Librae (Zubenelgenubi = 9 Librae = Z.C. 2118), described in *O.N. 3* (9), 184-185 (the components were reversed in that article; Alpha 1 = 5.3-mag. 8 Librae). Besides being a spectacular naked-eye event, it will provide the best opportunity to accurately measure the moon's polar diameter for at least 19 years. This will provide a precise calibration for solar eclipse diameter determinations from solar eclipse Baily's bead and contact timings. Both limits of the Zubenelgenubi occultation cross desert areas with high probabilities of clear skies.

The very successful observations of the southern-limit grazes of both components of Alpha Librae in Texas on January 15 (see p. 231) trace the lunar profile in detail in the same Watts-angle range where the southern-limit graze will occur in southern Africa on May 4th. Hence, this detail can be combined with only a few timings of the May 4th south-limb graze to give a very strong southern limb fit to Watts' data. The Jan. 15 and May 4 librations differ by less than 2° in longitude and about ½° in latitude.

Sudan is the only country where observation at the northern limit is practical. The limit for Alpha 2 passes within 100 km of Khartoum, the capital, and the graze occurs close to the time of central eclipse there. Paul Maley has made several useful contacts via the American Embassy in Khartoum, including professors on the Sudanese National Council of Research and in the Physics Department at the University of Khartoum, as well as the superintendent of the Khartoum American School. Local help will be essential for equipment clearance through customs, transport to the northern limit, and assistance in the graze path. Since the graze should be visible without optical aid, we plan to organize local observers to obtain approximate timings at many intermediate stations. Maley also has talked with Chevron Oil Company officials, who have said. that it should be possible to loan us a dual-frequency navigational satellite receiver, which they have in Sudan for surveying, to determine accurate geographical coordinates for our sites.

I also have corresponded with Prof. A. Woodruff, a member of the lunar section of the British Astronomical Society who has observed some occultations from his home at Juba, Sudan. He has sent us 1:250,000-scale maps of the area and has put us in touch with a professor of geography at the University of Wad Medini, which is near the graze path. Woodruff plans to observe the graze with us. We have applied for N.S.F. support for travel to set up video cameras to record the graze at three stations, but the lateness of application decreases the chances for getting the support. During the week preceding the eclipse, my employer is sending me to a meeting of the European Space Agency in Garching, G.F.R., and I plan to travel from there to Sudan. Contact me at P. O. Box 7488, Silver Spring, MD 20907 (or by telephone, 301,585-0989) for further details if you

might be interested in joining IOTA's efforts to observe this unique occultation.

ASTBBS — ASTRONOMY BULLETIN BOARD SYSTEM

Joan Dunham

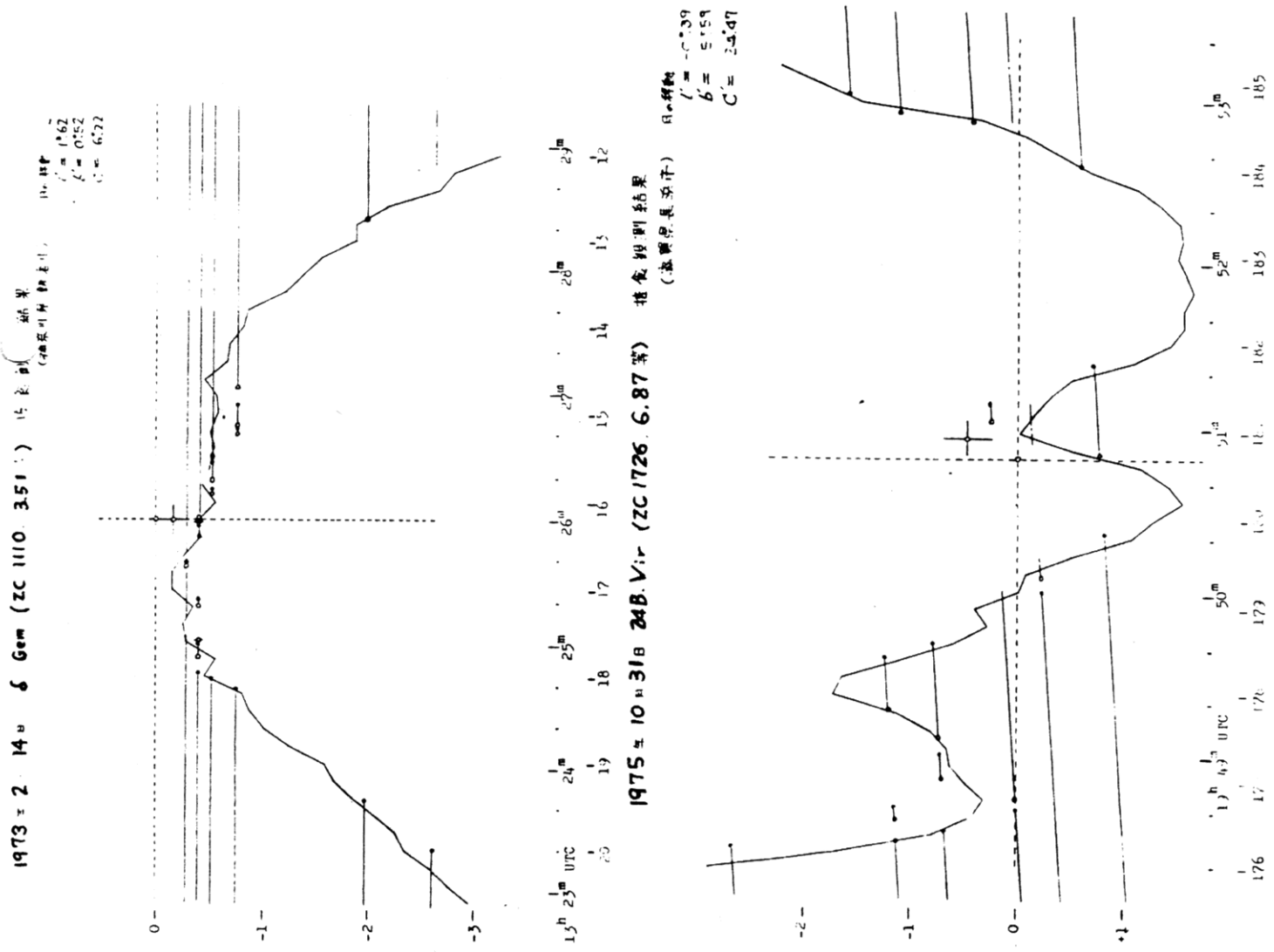
We are in the process of building a computer bulletin board system for astronomy. This will be an Apple Bulletin Board System, built by modifying the ABBS sold by Washington Apple Pie, the Apple computer users' group in the Washington, DC, area. The emphasis will be on providing announcements of astronomical events, observations planned, and the results of observations. Message service will be provided, but we intend that to be secondary to the announcements. Members of this BBS will be able to use the message service, and non-members will be able to read messages, bulletins, and announcements. Information will be provided on occultations by asteroids, on Comet Halley and Comet Giacobini-Zinner, on grazing occultation expeditions planned from the Washington, DC, area, and meetings or public events astronomy in our area. Bulletins will be provided on novas, new comets, satellite barium cloud releases, etc.

The equipment we will use for this BBS is an Apple II+ with two disk drives and a RAM pseudo disk; an internal clock, and a US Robotics Password modem. This equipment is ours, and we are providing this BBS service free of charge. We don't know how useful the ASTBBS really will be. Initially, this will be an experiment.

The software for this system is public domain software, written by volunteers, and, of course, full of bugs waiting to attack. Copies can be provided on request (we will want you to supply 2 diskettes, and it will work only on an Apple II+ with our equipment configuration.

For more information, or to request membership, send us a note at P.O. Box 7488; Silver Spring, MD 20907. We expect that it will take a few months to get it really working well. Any member of IOTA or of the local National Capital Astronomers with a terminal and a modem may ask for an ASTBBS membership. The ASTBBS will be a 300/1200 baud system, changing to match the rate of the incoming calls.

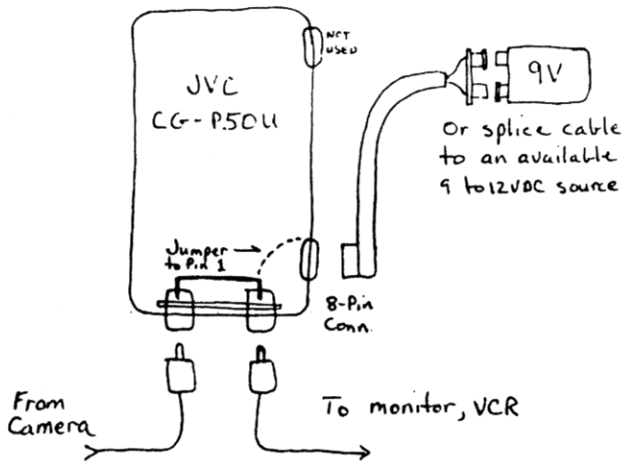
[Ed: Seven grazing occultation reduction profiles produced by ILOC appear below and on pages 234 and 235. Three grazing occultation reduction profiles produced by Robert Sandy appear on pages 236 and 237. Figures produced by M. Sôma and D. Dunham, continuing the article PLANETARY OCCULTATIONS DURING 1985 (see *O.N.* 3 (10), 208-222), appear on pages 237-242.]



CHARACTER GENERATOR CONVERSION

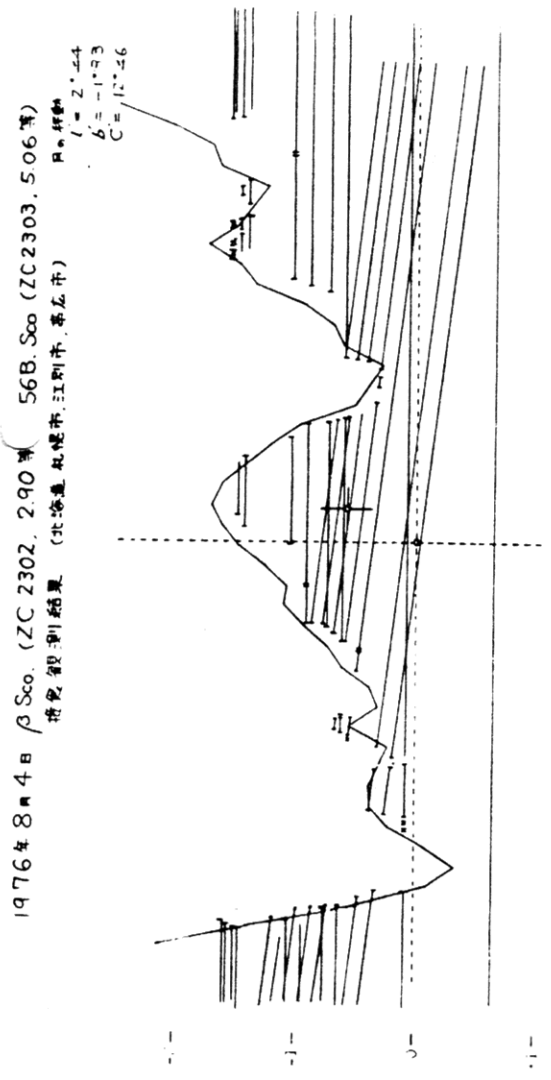
Rob Peterson

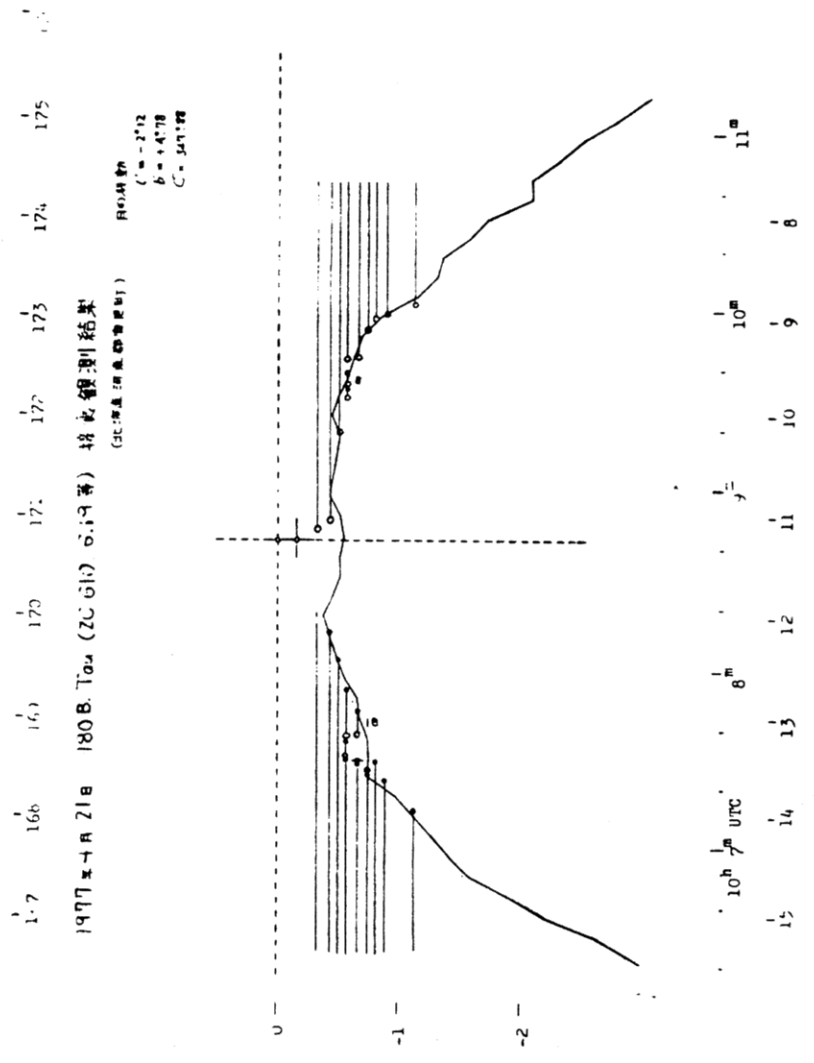
The following is a brief description of how to convert the JVC CG-P50U character generator for use with any camera which generates standard negative-synch composite video (e.g., RCA TC2055/U and many others). The CG-P50U was designed for use with a specific JVC camera, but its low cost (less than $100), useful features (12 title screens held by continuous memory and a six-digit interval timer), and convenient size (4 oz.) may make the simple conversion worthwhile to some. The required mods are: 1) one wire soldered inside the case; and 2) a battery clip soldered to a cable to provide power. Some details: 1) remove the case bottom (3 screws) and solder a single small wire (e.g., #24 stranded, insulated) from the center of the phono plugs to pin 1 of the adjacent 8-pin connector; replace the cover and install the small memory batteries; 2) the short cable with 8-pin connectors at each end can be used to provide 9 to 12 VDC to the unit. I cut the cable in half and soldered a standard clip-on 9 V battery connector (Radio Shack) to the red (+) and black (-) wires in the cable; the six unused wires were disabled with electrical tape. This crude scheme requires removing the battery when the unit is not in use. Save the other cable half.



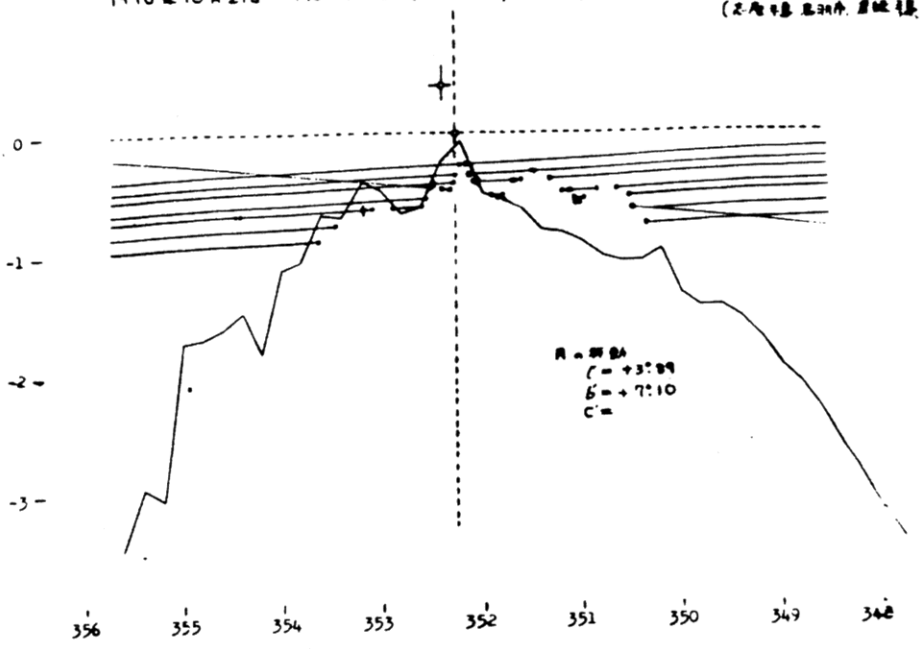
The unit's manual explains the many functions of the device, but remember that only one of the two operation modes will be available — the "monitor" mode. After cabling the unit and providing power, "press the CREATE key while holding the MONITOR key pressed" to initialize the unit. The first title screen will be superimposed on the camera video, ready for text entry or timer initialization. Careful reading of the manual may help.

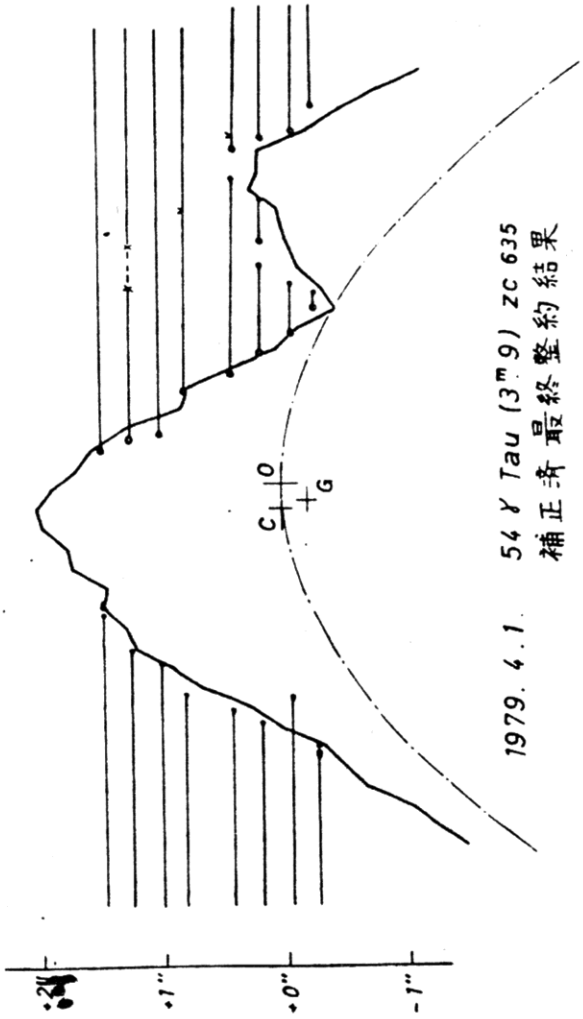
3738 Arnold; Houston, TX 77005





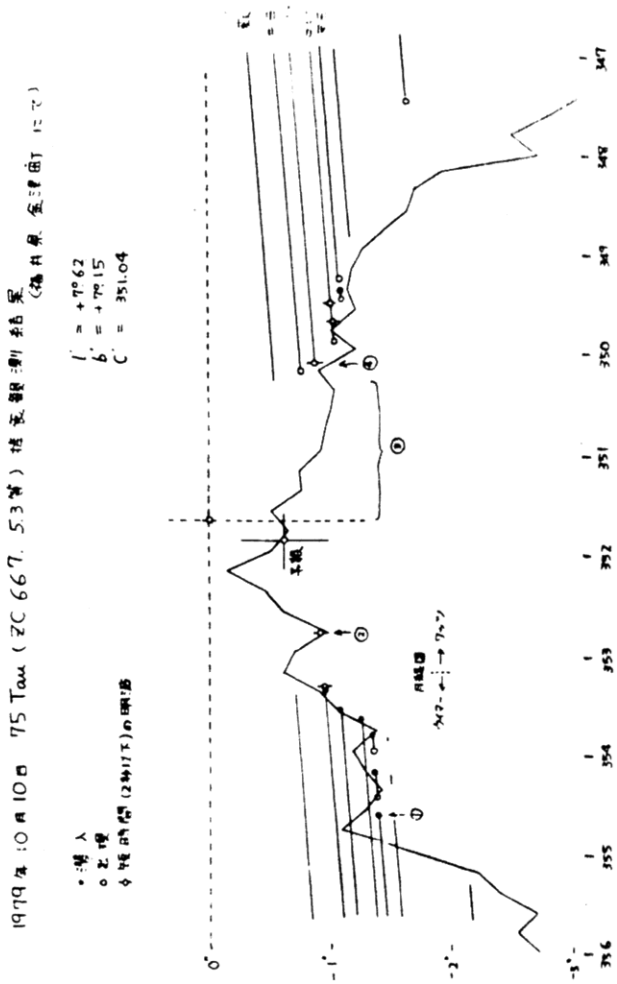
1978 年 10 月 21 日 +18° 1112 (ZC 934, 6.44等) 掩食観測結果

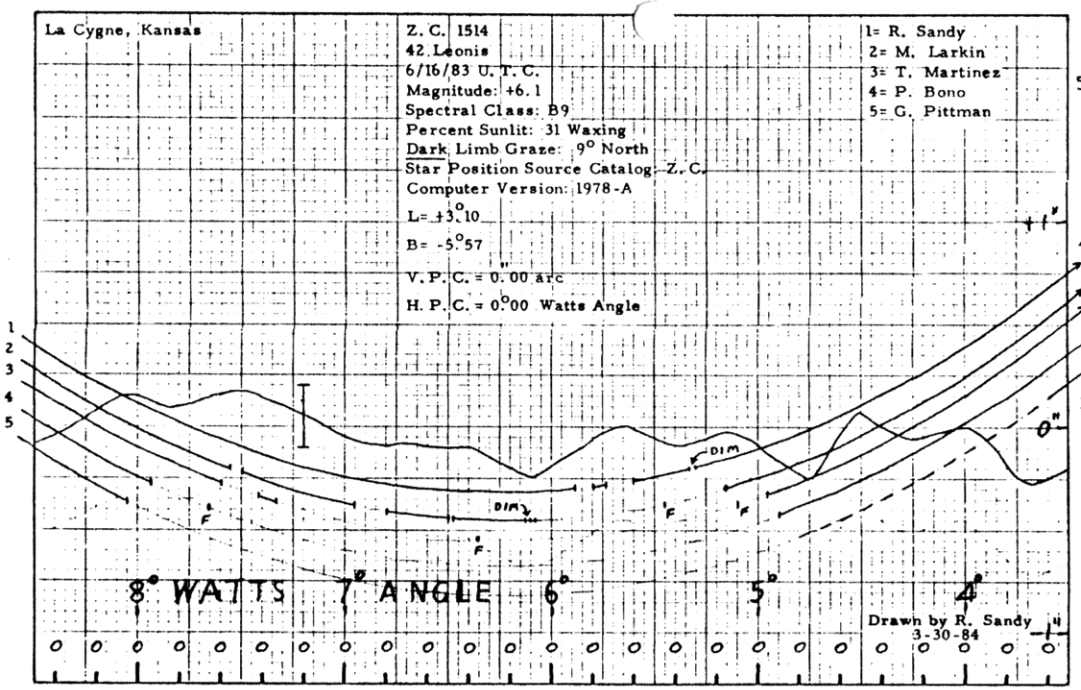


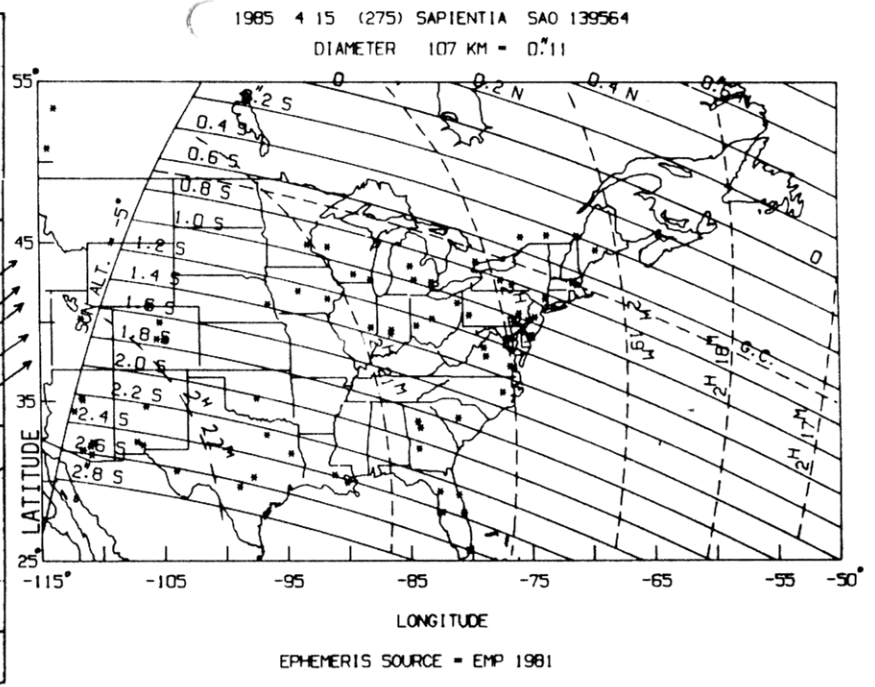


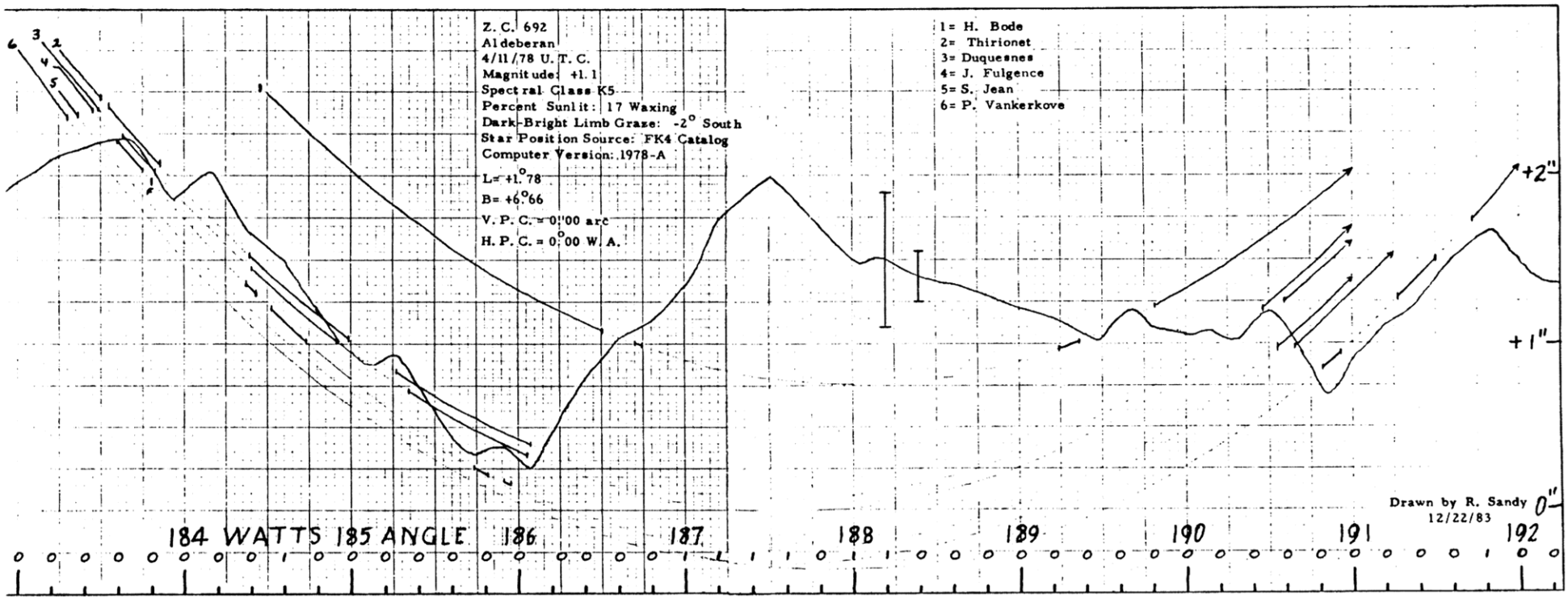
1979. 4. 1. 54 γ Tau (3m 9) ZC 635
補正済 最終整約結果

1979年10月10日 75 Tau (ZC 667. 53等) 掩食観測結果




La Cygne, Kansas
Z. C. 1514
42 Leonis
6/16/83 U. T. C.
Magnitude: +6.1
Spectral Class: B9
Percent Sunlit: 31 Waxing
Dark Limb Graze: 9° North
Star Position Source Catalog: Z. C.
Computer Version: 1978-A
L= +3.°10
B= -5.°57
V. P. C. = 0.00 arc
H. P. C. = 0.°00 Watts Angle
1= R. Sandy
2= M. Larkin
3= T. Martinez
4= P. Bono
5= G. Pittman
+1"
0"
DIM
DIM
8° WATTS 7° ANGLE 6° 5° 4°
Drawn by R. Sandy
3-30-84


1985 4 15 (275) SAPIENTIA SAO 139564
DIAMETER 107 KM = 0."11
LATITUDE
LONGITUDE
55°
45°
35°
25°
-115°
-105
-95
-85
-75
-65
-55
-50°
EPHEMERIS SOURCE = EMP 1981


Z. C. 692
Aldeberan
4/11/78 U. T. C.
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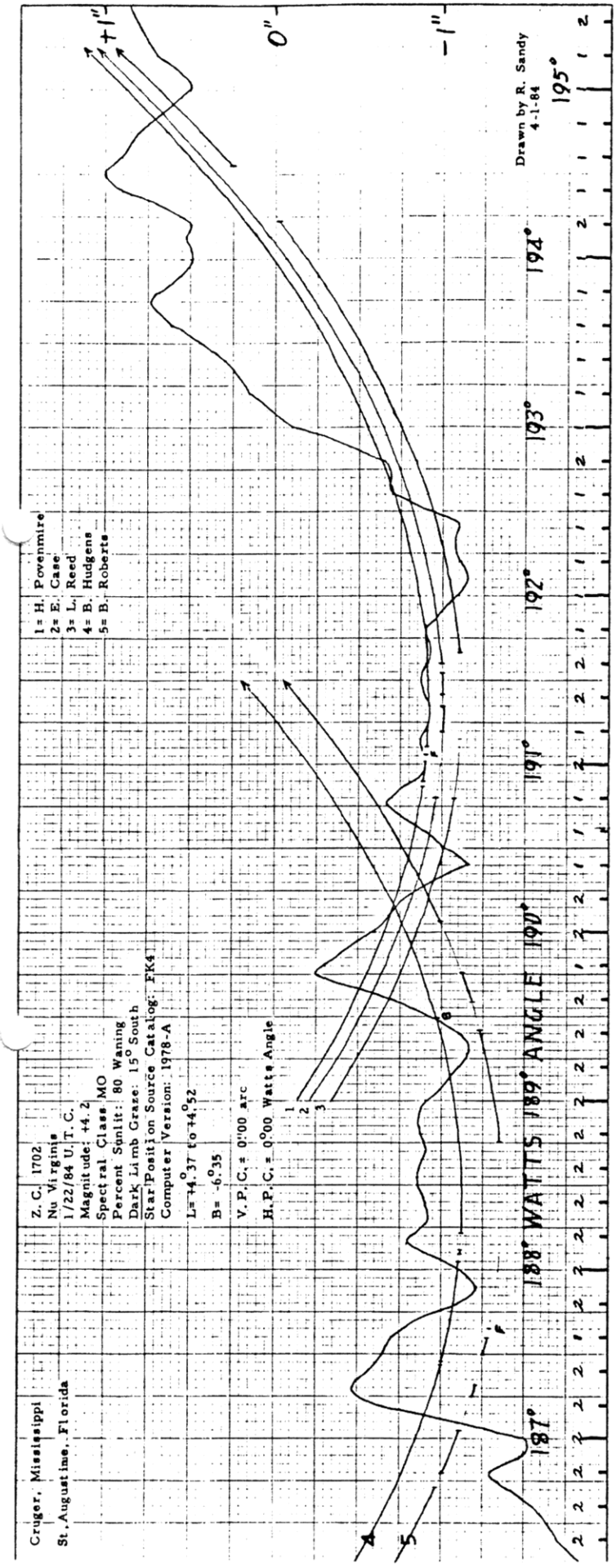
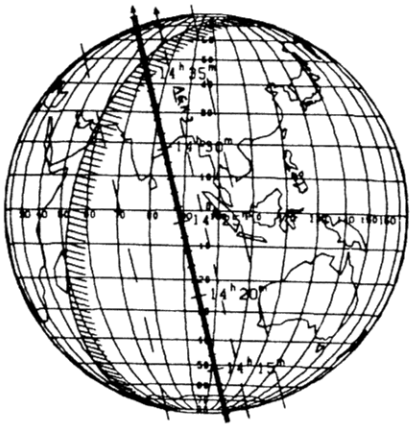
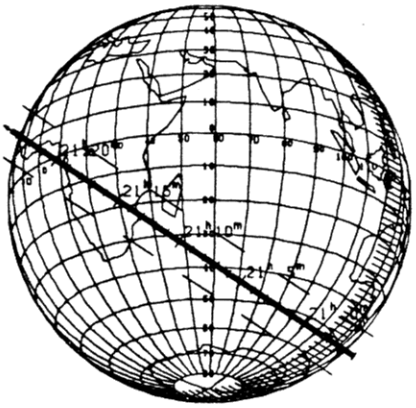
Spectral Class K5
Percent Sunlit: 17 Waxing
Dark-Bright Limb Graze: -2° South
Star Position Source: FK4 Catalog
Computer Version: 1978-A
L= +1.°78
B= +6.°66
V. P. C. = 0.'00 arc
H. P. C. = 0.°00 W. A.
1= H. Bode
2= Thirionet
3= Duquesnes
4= J. Fulgence
5= S. Jean
6= P. Vankerkove
+2"
+1"
0"
184 WATTS 185 ANGLE 186 187 188 189 190 191 192
Drawn by R. Sandy
12/22/83



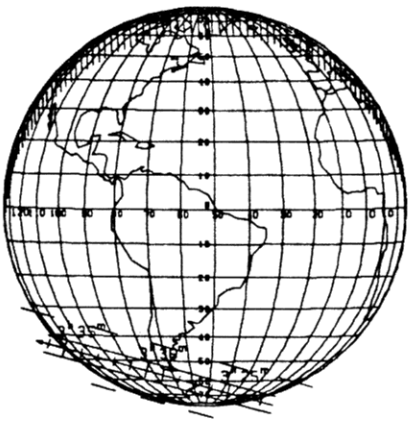
Anonymous by Nemausa 1985 Apr 16



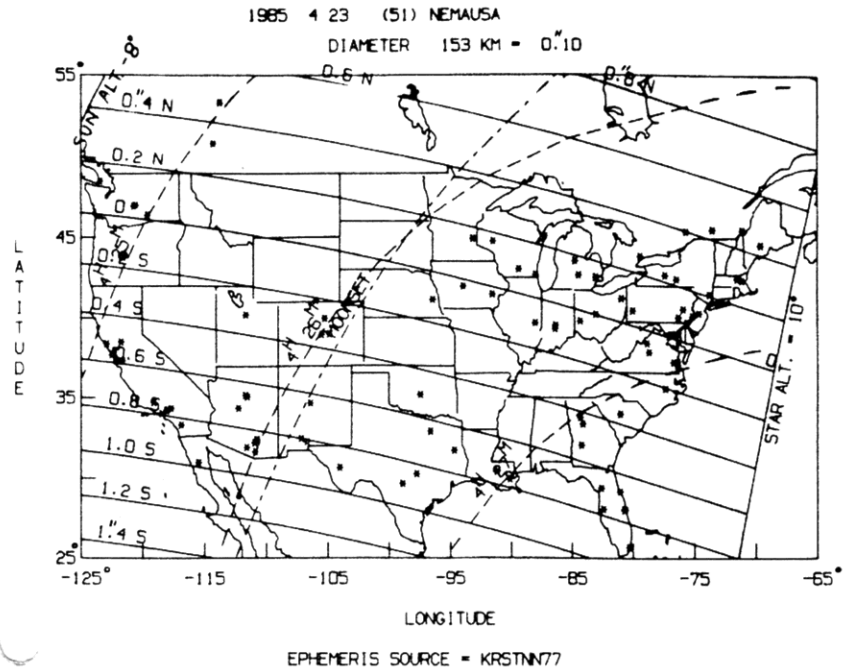
SAO 137722 by Mnemosyne '85 Apr 19



SAO 183095 by Victoria 1985 Apr 21



SAO 120229 by Vesta 1985 Apr 23



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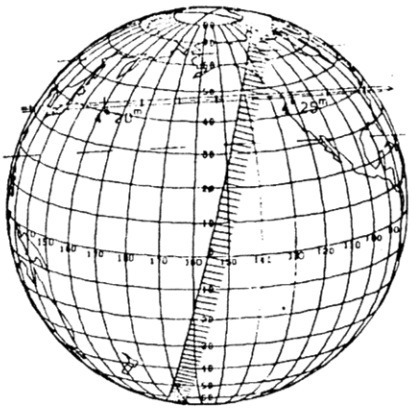

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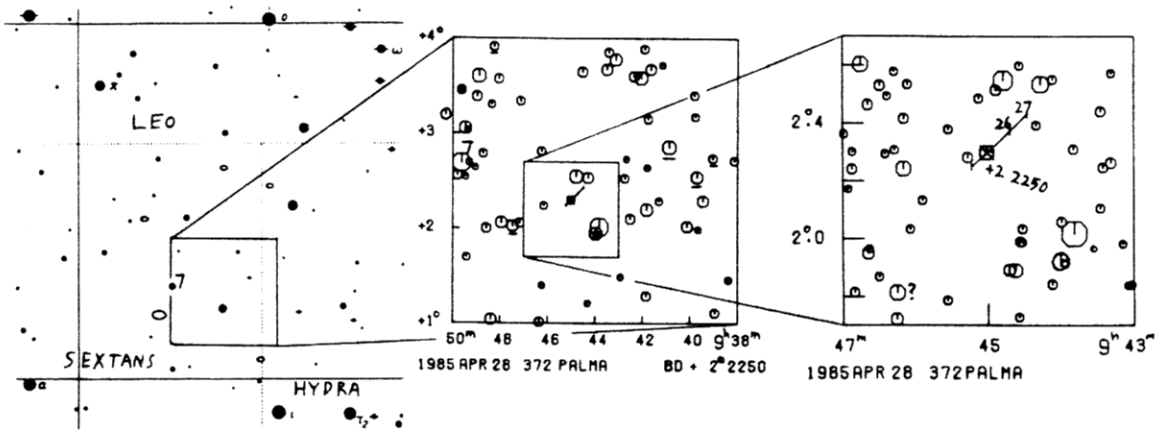
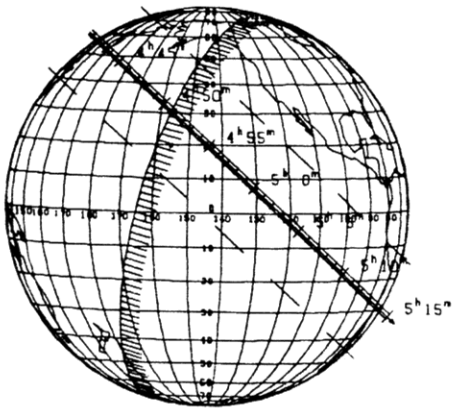
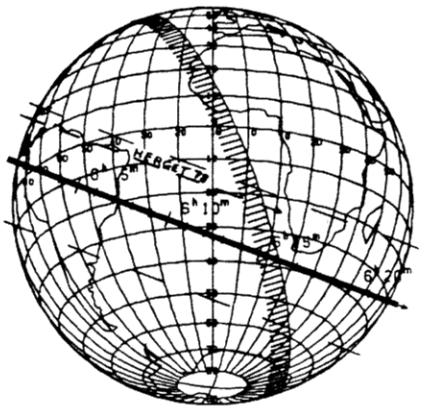
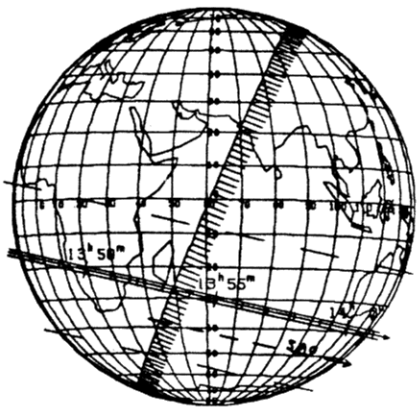




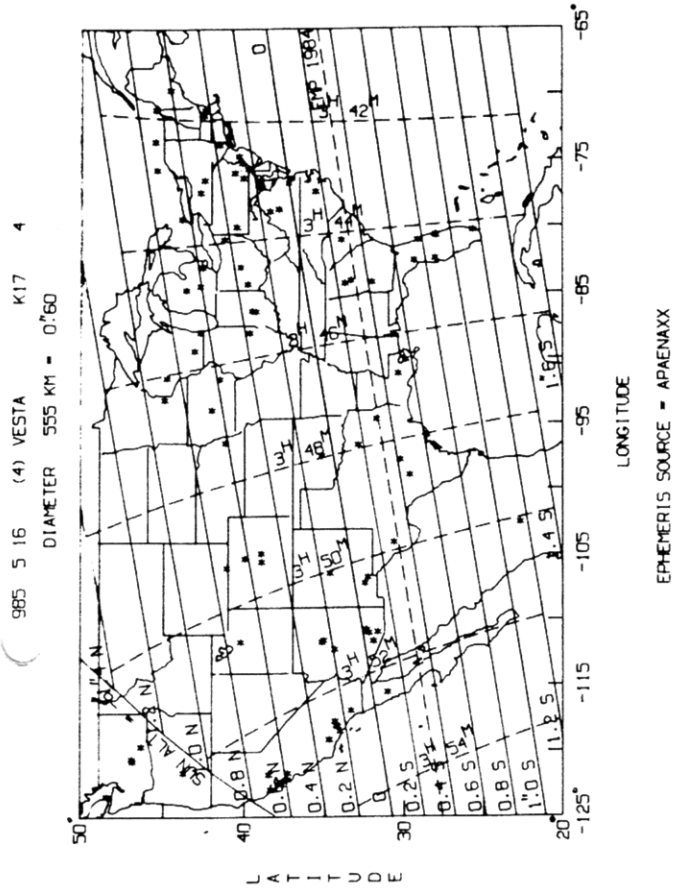
+02°2250 by Palma 1985 Apr 28

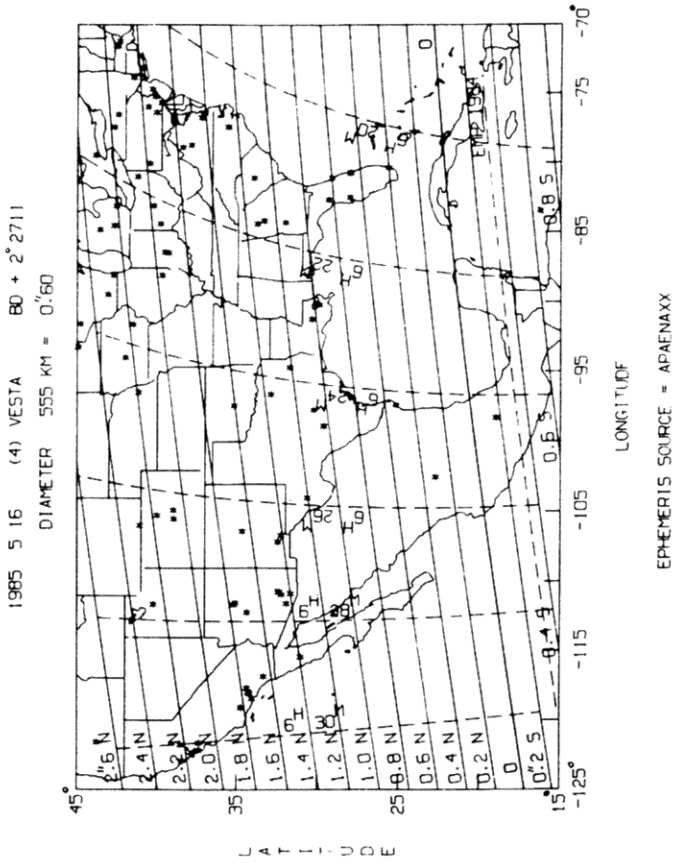


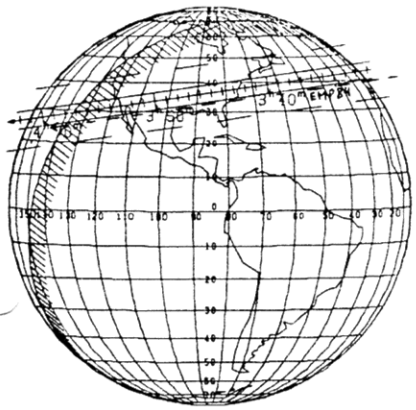
SAO 190841 by Adeona 1985 May 30



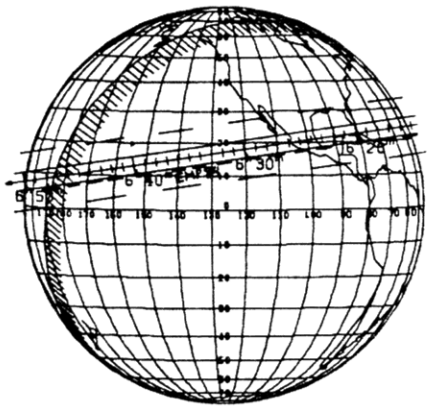
SAO 137693 by Loreley 1985 May 31



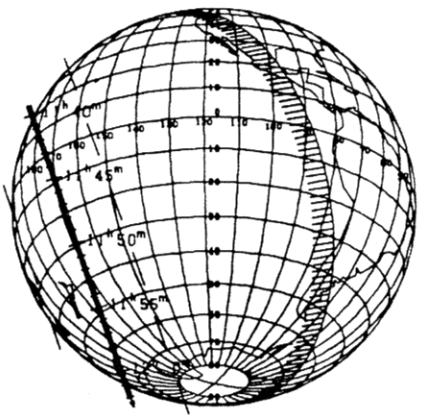




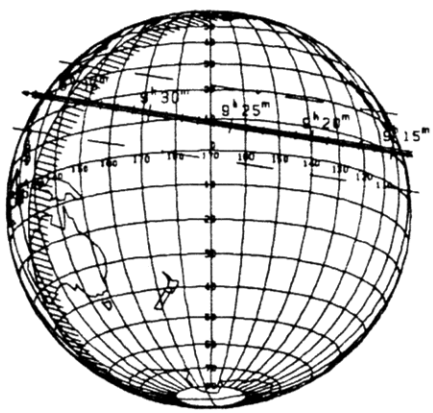
Anonymous by Vesta 1985 May 16



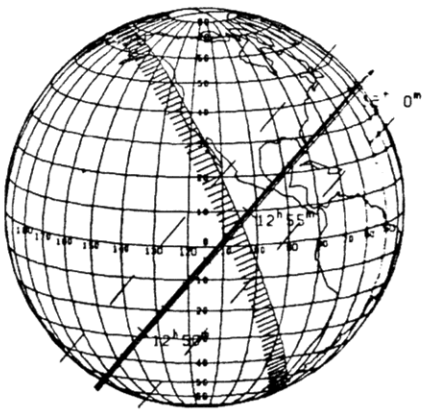
+02°2711 by Vesta 1985 May 16



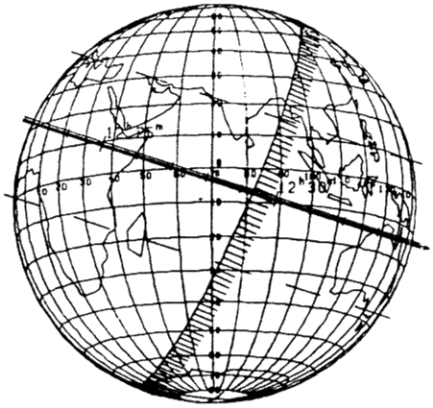
SAO 189954 by Papagena 1985 Jun 6



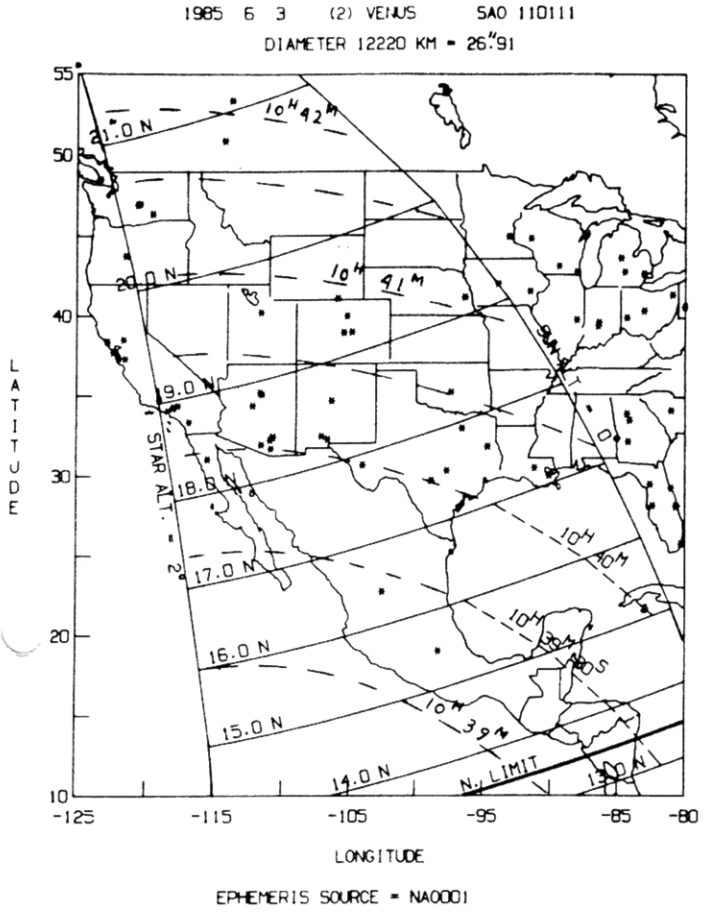
SAO 159657 by Hestia 1985 Jun 21

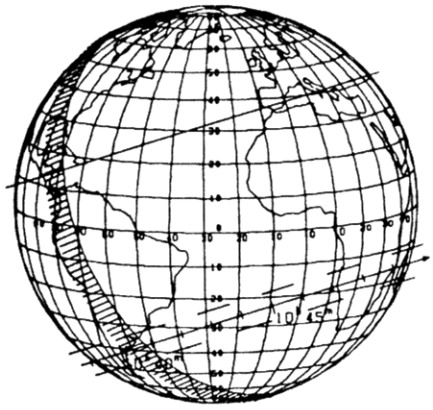


+10° 94 by Marianna 1985 Jul 16

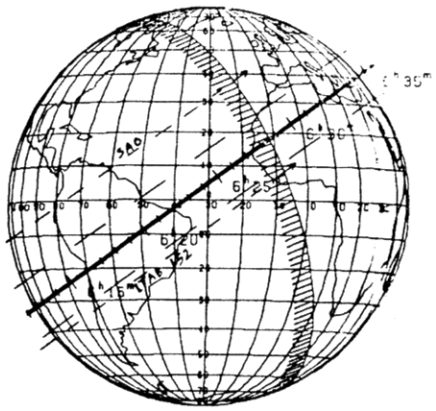


SAO 157588 by Medea 1985 Jul 17

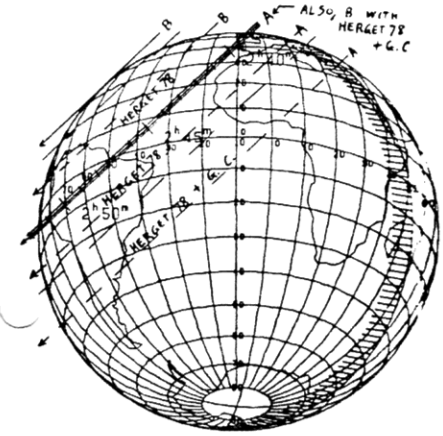




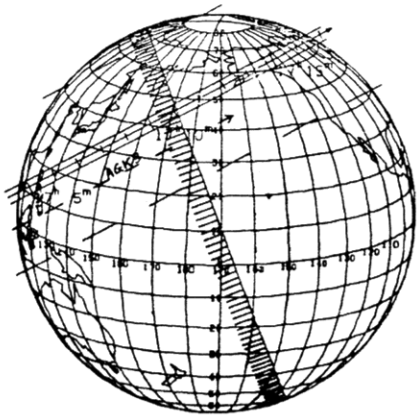
SAO 110111 by Venus 1985 Jun 3



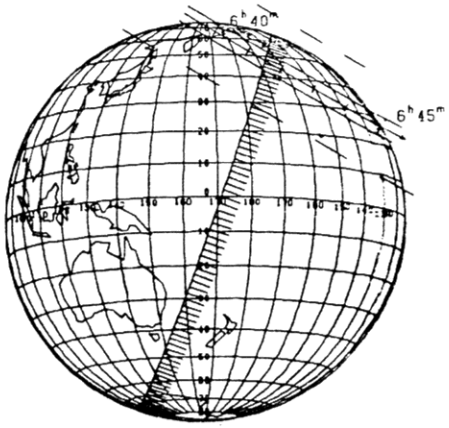
SAO 128570 by Nausikaa 1985 Jul 18



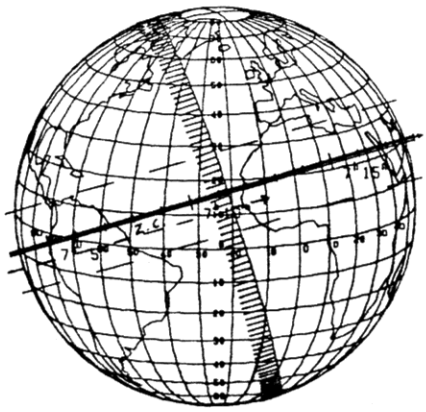
SAO 190822 by Adeona 1985 Jul 20



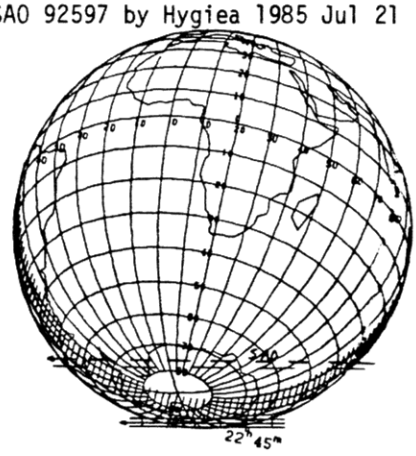
SAO 92597 by Hygiea 1985 Jul 21



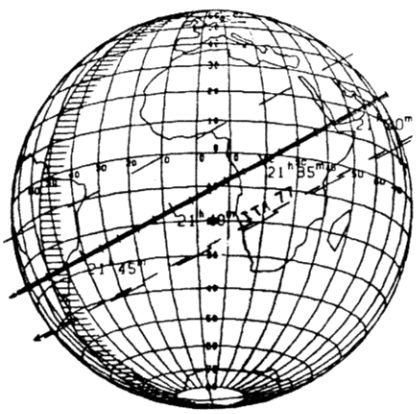
SAO 139767 by Vesta 1985 Jul 28



SAO 93083 by Lutetia 1985 Aug 9



SAO 213017 by Bettina 1985 Aug 12



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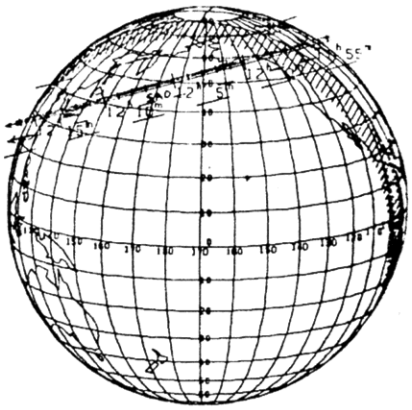
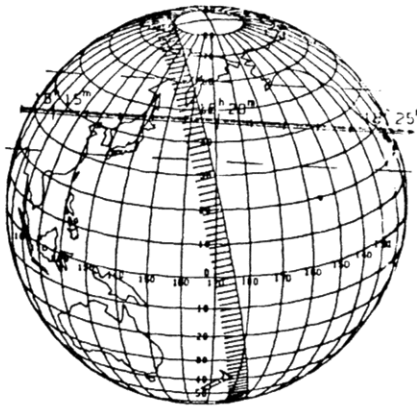
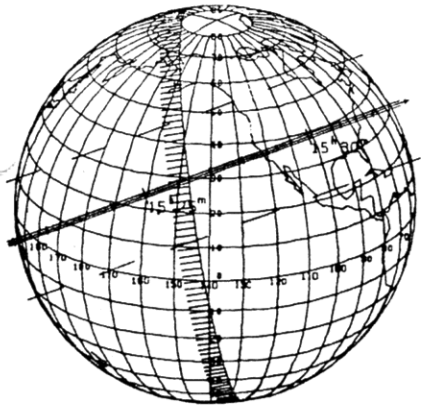


SAO108412 by Athamantis '85 Aug 25

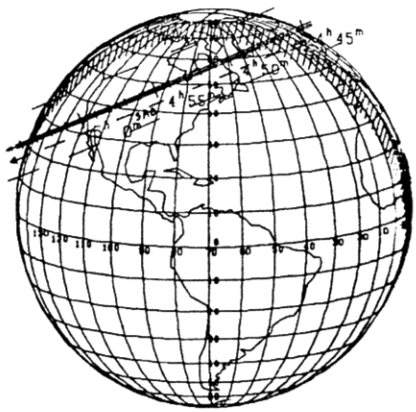
SAO 75635 by Isolda 1985 Aug 25



+20° 626 by Kleopatra 1985 Aug 26

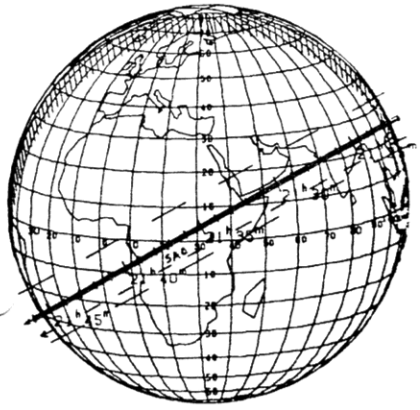


+22° 722 by Panopaea 1985 Aug 27



SAO 108346 by Athamantis '85 Sep 1

SAO 95210 by Melpomene 1985 Sep 7



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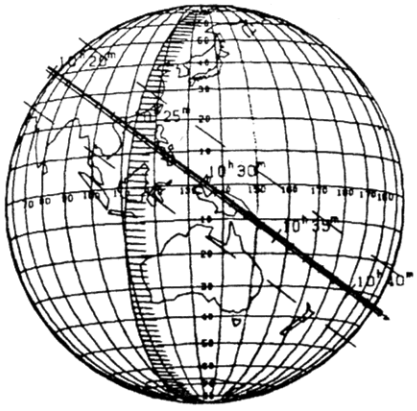
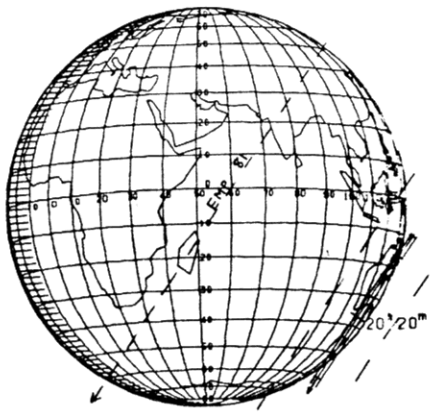
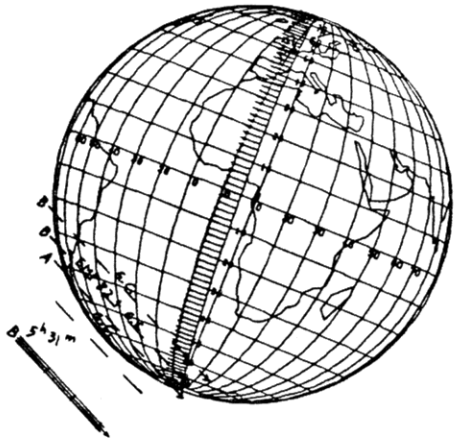


SAO 142583 by Meliboea 1985 Sep 9

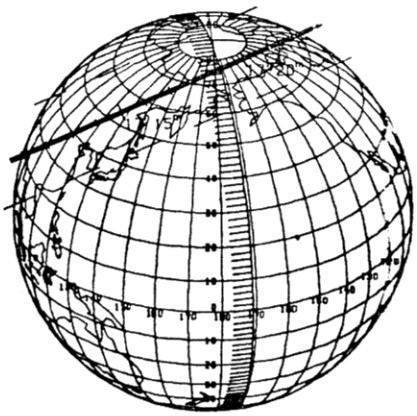


SAO 146494 by Siegena 1985 Sep 9

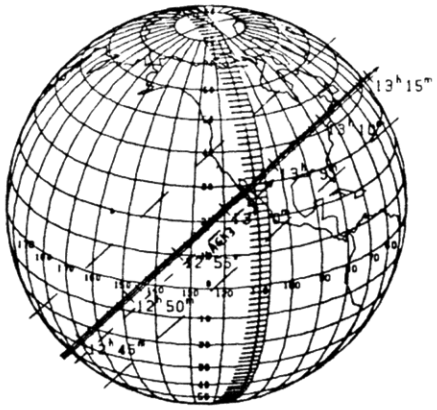
SAO 159188 by Vesta 1985 Sep 12



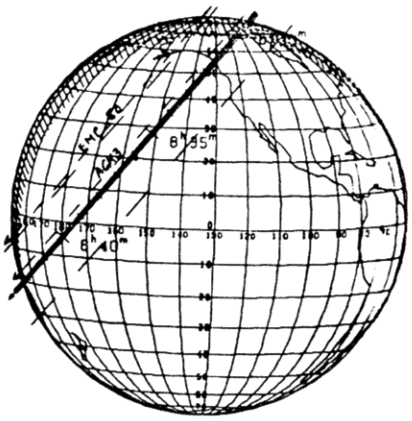
SAO 132709 by Eunike 1985 Sep 18



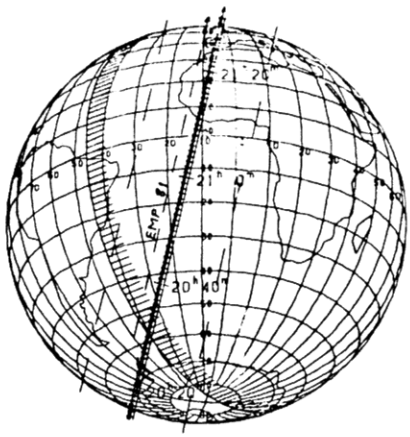
+30° 781 by Terpsichore '85 Sep 21



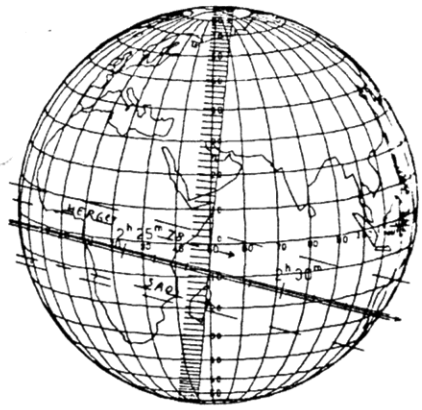
SAO 76868 by Panopaea 1985 Sep 26



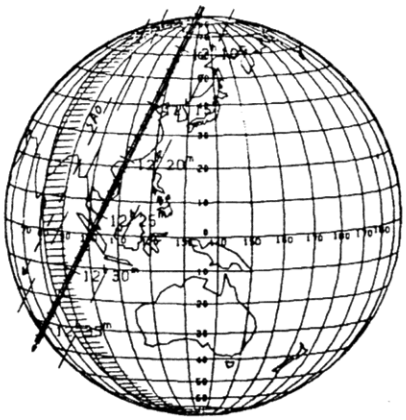
SAO 109095 by Artemis 1985 Sep 28



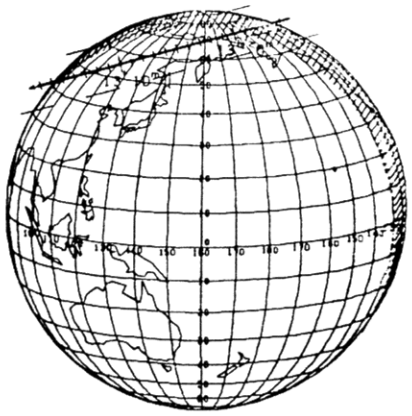
SAO 189888 by Philomela '85 Sep 30



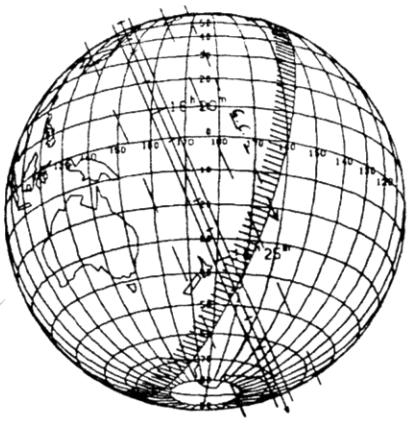
SAO 96175 by Melpomene 1985 Oct 5



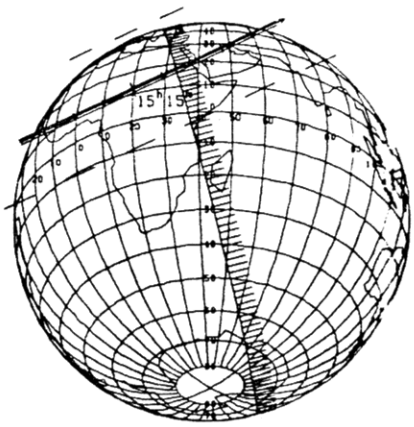
SAO 127622 by Athamantis '85 Oct 9



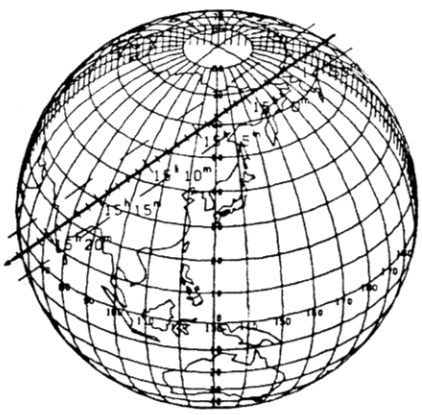
+10° 203 by Polyhymnia 1985 Oct 17



SAO 171571 by Pallas 1985 Oct 24

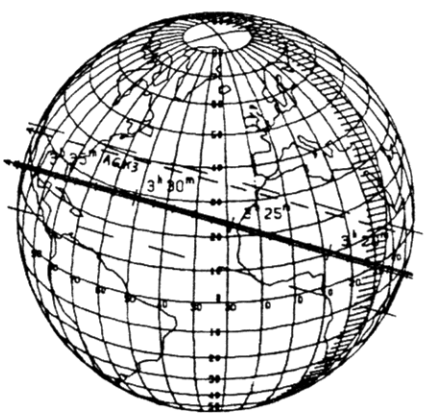


SAO 212168 by Papagena 1985 Oct 26



SAO 55372 by Semiramis 1985 Oct 27

SAO 96895 by Aemilia 1985 Oct 31



SAO 76770 by Panopaea 1985 Nov 5

SAO 80435 by Brixia 1985 Nov 10

[Ed: The following articles were received on March 2nd and 3rd, via telephone, after the newsletter material had been taken to the printer. The correction also is based on the March 2nd conversation. If space is available, these items may be reprinted in the next issue of *O.N.*]

PLUTO-CHARON OCCULTATIONS BEGIN

David W. Dunham

R. Binzel, University of Texas; E. Tedesco, Jet Propulsion Laboratory; and D. Tholen, University of Hawaii, report detection of partial occultation of Charon (1978 P1) by Pluto, on Feb. 20.585, and partial transits of Charon across Pluto, on Jan. 16.467 and Feb. 17.385, according to I.A.U. Circular 4040. Tholen suggests that the difference in magnitude drop (0.04 for the transits, and 0.02 for the occultation) might be due to a higher albedo for Pluto on the western limb. The symmetry of event times relative to the synodic period defines a nearly circular orbit. The synodic period of 6.38726 days can be used to predict future events, which will decrease during March and April as Pluto's retrograde motion carries it away from the eclipse zone. Deeper events will occur next year. Potential observers are invited to contact IOTA member Rick Binzel; Department of Astronomy; University of Texas; Austin, TX 78712 for more information.

LATE NOTE FOR GRAZING OCCULTATIONS

David W. Dunham

Observers are reminded that graze reports should be completed with pencil, not ink. Send ILOC the original if you make copies of the report.

Be prepared for poor time signal reception when solar activity disrupts the ionosphere. Fifty feet of wire attached to the antenna and suspended above ground enhances reception. Back-up use of a selected AM radio station with one time-calibrated master tape will provide a time base. Also, use of digital watches, preferably with seconds display and/or beeping alarm to record on the tape, can save the situation. The watch can be compared with time signals after the event, and one watch on the expedition should be compared before it. Some graze data have been lost due to too much reliance on the convenient Timekube; don't let it happen to you.

GALILEAN SATELLITE MUTUAL PHENOMENA

David W. Dunham

Predictions of the upcoming series of mutual phenomena of the Galilean satellites are given by K. Aksnes and F. Franklin in *Sky and Telescope 69* (2), 116-118. Observations of these will be valuable for planning for the Galileo spacecraft mission. Photoelectric observers are encouraged to record as many of these events visible from their observatories as they can.

ASTEROID RESULTS FROM SPECKLE INTERFEROMETRY

David W. Dunham and Richard Nolthenius

Jack Drummond and K. Heqe, University of Arizona, published an abstract, "Speckle Interferometry Results for 12 Victoria and 4 Vesta," in *Bulletin of the American Astronomical Society 16* (4), 922. in which they state: "Recent detailed modelling of our speckle interferometry observations of Herculina and Pallas have provided such stringent upper limits to the size and brightness of any possible satellites that we consider them moon-less, although both Pallas and Herculina show strong albedo markings." They also report that "4 Vesta is the most obviously spotted asteroid." In the corresponding presentation which they gave at the American Astronomical Society meeting in January in Tucson, AZ, they said that they did not have all of the stated results, primarily due to computer problems. In later discussions, Drummond set upper limits for a possible satellite of Herculina at 50 km out to a distance of 1500 km, and 11 km for a satellite of Pallas to 2000 km. The 50-km limit for Herculina is just above the 45-km diameter of the largest possible satellite inferred from the 1978 June occultation, so it can not be ruled out on the basis of the speckle data. To date, there is no good occultation evidence for a satellite of Pallas. The large possible satellite claimed for Pallas was based solely on the speckle data and appears to be ruled out by the more complete recent analysis. In other results, ellipticities have not yet been determined from the speckle data for (433) Eros, (511) Davida, and (532) Herculina. The next projects include more analysis of the data on Pallas and (12) Victoria, the latter being a good candidate for having a satellite, based on previous speckle work.

CORRECTION

On page 233, it was incorrectly stated that the reduction profiles on pages 233 through 235 had been prepared by the ILOC. They were provided by Toshio Hirose of the Lunar Occultation Observation Group in Japan.