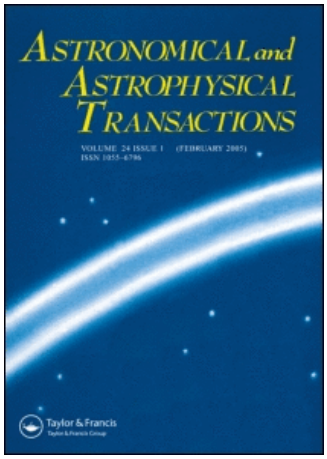

Astronomical & Astrophysical Transactions
The Journal of the Eurasian Astronomical Society
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713453505

The astrometric observations of candidates to asteroids at the schmidt telescope of ESO, La Silla, Chile

H. Debehogne [a]; I. Voloshina [b]
[a] Observatoire Royal de Belgique, Brussels, Belgium
[b] Sternberg Astronomical Institute, Moscow, Russia

Online Publication Date: 01 January 1996
To cite this Article: Debehogne, H. and Voloshina, I. (1996) 'The astrometric observations of candidates to asteroids at the schmidt telescope of ESO, La Silla, Chile', Astronomical & Astrophysical Transactions, 9:2, 111 - 125
To link to this article: DOI: 10.1080/10556799608208217
URL: http://dx.doi.org/10.1080/10556799608208217

Astronomical and Astrophysical Transactions, 1995, Vol. 9, pp. 111–125
Reprints available directly from the publisher
Photocopying permitted by license only

THE ASTROMETRIC OBSERVATIONS OF CANDIDATES TO ASTEROIDS AT THE SCHMIDT TELESCOPE OF ESO, LA SILLA, CHILE

H. DEBEHOGNE[1] and I. VOLOSHINA[2]

[1] *Observatoire Royal de Belgique, Av. Circulaire 3, B-1180 Brussels, Belgium*
[2] *Sternberg Astronomical Institute, Universitetsky pr. 13, 119899 Moscow, Russia*

The present paper contains 525 photographic observations of minor planets at the equinox 1950.0 obtained at the European Southern Observatory (ESO), La Silla, Chile, on September 16, 1993. The detected asteroids are named here by a provisional designation: E for ESO, followed by a number. The bijection (7, 2, 1; 13, 18; 15) was used for well defined reasons. The comparison with the positions at equinox 2000.0, computed by means of the bijection (2, 0, 0) or the complete polynomial of degree 2, can be obtained from the 1994 Minor Planet Circulars (MPC).

KEY WORDS Asteroids – determination of positions

1 INTRODUCTION

We are continuing the observational programme started in 1976 at the European Southern Observatory (ESO), La Silla, in Chile by H. Debehogne from the Observatoire Royal de Belgique (ORB). A lot of photographic plates was taken during 1993 at the Schmidt Telescope (diameter 1 m, focal length 3 m) by O. and G. Pizarro. These plates were used for the determination of positions of asteroids selected from "Ephemerides of minor Planets for 1993", edited by the Institute of Theoretical Astronomy of S-Petersburg (ITA) in 1992. They permit also discoveries of new celestial objects and reindentifications of lost or badly observed asteroids during the last years. Theoretical works will be performed: the TEST STARS (external accuracy) (Debehogne, 1970a, 1970b), the LOCAL ERROR or LOCAL ACCURACY METHOD (Debehogne, 1970b), the ERROR SIMULATION METHOD (Debehogne, 1969) in order to compute the Einstein Effect during a total star eclipse (Debehogne, 1977) by means of a network of fictitious stars (Debehogne, 1969, 1983) or to replace the use of the residuals by the real error.

2 METHOD

All plates were measured on the Ascorecord coordinatograph of the ORB as already described (Debehogne and Machado, 1979). The positions were computed by the solution of two "rectangular" algebraic systems of polynomial equations (more equations than unknowns). The known elements, in each of both systems, are in the left side, matrices (defined below) multiplying respectively the two vectors constituted by the unknowns a_{ij} for the first system, by b_{ij} for the second one. The unknowns, when determined, give the bijection between plate and sky. The reductions were performed by means of the Apollo computer of the ORB. The SAO Star Catalogue (Smithsonian Astrophysical Observatory 1966) was used for the positions and the proper motions of the reference (basis) stars; ninety reference stars were used because we take the seven degree (Debehogne, 1972, 1983) in the following transformation between plate and sky. We use *Bijection* when we consider the mathematical or general aspects of the problem: in this case the *Bijection* is constituted by the initial *Transformation* and its inverse following the Sets Theory Language (Debehogne, 1986).

2.1 The Transformation

The *Transformation* (from the plate to the sky) will be determined by two independent polynomial equations where the X, Y are the rectangular celestial or standard coordinates and x, y, the measured ones for the same star on the sky and the plate:

$$X = \sum_{i+j=k=0}^{n} a_{ij} x^i y^j, \quad Y = \sum_{i+j=k=0}^{n} b_{ij} x^i y^j \tag{1}$$

i and j being entires, with i decreasing and j increasing in $i + j = k$, where k takes successively the entire values from 0 to n, the $N = (n + 1)(n + 2)/2$ unknowns a_{ij} and N unknowns b_{ij} being or not different from 0 (complete or incomplete ordered polynomials). The *Transformation* can be defined by the unknowns a_{ij} and b_{ij}.

2.2 The Method for determining the Transformation

The *Bijection* between plate and sky can be computed by solving SEPARATELY the two rectangular algebraic systems which GENERAL FORM OF ONE EQUATION can be written, respectively:

1) for the first system, as the scalar or also the matrix product of the horizontal vector $(x^i y^j)$ by the vertical vector $v(a_{ij})$, both with $N = (n + 1)(n + 2)/2$ components eventually zero,

$$\sum_{i+j=k=0}^{n} a_{ij} x^i y^j = X \tag{2}$$

or, in matrix language,

$$(x^i y^j) \cdot v(a_{ij}) = (X) \tag{3}$$

2) for the second system, as the scalar or also matrix product of the horizontal vector $(x^i y^j)$ by the vertical vector $v(b_{ij})$, both with $N = (n+1)(n+2)/2$ components eventually zero,

$$\sum_{i+j=k=0}^{n} b_{ij} x^i y^j = Y \tag{4}$$

or, in matrix language,

$$(x^i y^j) \cdot v(b_{ij}) = (Y) \tag{5}$$

The $M(\gg N)$ basis or reference stars give two rectangular systems of M equations containing N unknowns and M independent terms represented by the two vertical vectors (X) and (Y) of M components. The two systems are written

$$(Sx^i y^j) \cdot v(a_{ij}) = (X) \tag{6}$$

$$(S' x^i y^j) \cdot v(b_{ij}) = (Y) \tag{7}$$

$(Sx^i y^j)$ and $(S' x^i y^j)$ being two rectangular matrices of M lines and N columns $(M \gg N)$.

Each rectangular system becomes square system by multiplying, both sides, respectively by

$\mathrm{T}(Sx^i y^j)$ and $\mathrm{T}(S' x^i y^j)$

which are the transposed matrices of

$(Sx^i y^j)$ and $(S' x^i y^j)$.

Both square systems are solved by one of the well known methods. Here, we give the results for bijection (7, 2, 1; 13, 18; 15) the polynomial of degree 7 ($36 - 2 = 34$ terms or unknowns for the first system, and $36 - 1 = 35$ terms or unknowns for the second one). In the first system, the following terms are omitted:

term 13, it is to say, $a_{22} x^2 y^2$,

term 18, it is to say, $a_{32} x^3 y^2$.

In the second one, is only omitted

term 15, it is to say, $b_{04} y^4$.

This bijection was chosen to show the possibilities of our computation's programme and to permit comparison in future works with other bijections. Moreover this choice permits to show that the general form of the equation can be different for the first system (in X) and for the second one (in Y).

3 RESULTS

3.1 Tables

Table 1 presents the ordinal number of each position, provisional designation, the number of the plate as given in the Observational Night Note Book at La Silla, the date (UT) by year, month and day with 6 decimals, the positions by the spherical celestial coordinates (α, δ) at the equinox 1950.0.

3.2 Intermediary Stars

We don't use here the intermediary stars, because we have a good sample of Catalogue stars.

Acknowledgments

We are grateful to O. and G. Pizarro for performing the observations and developing the plates. We also express our gratitude to ESO for the possibility to use the Schmidt Telescope for our observations.

References

Debehogne, H. (1969) *Bull. Acad. roy. de Belgique, Cl. Sc.* **54**, 1434.
Debehogne, H. (1970a) *Astron. Astrophys.* **8**, 189.
Debehogne, H. (1970b) *COSPAR Transactions, Prague 1968* **7**, 107.
Debehogne, H. (1972) *Astron. Astrophys. Suppl.* **5**, 185.
Debehogne, H. (1977) *Bull. Acad. roy. de Belgique, Cl. Sc.* **2**, 5, 43.
Debehogne, H. (1983) *Astron. Astrophys. Suppl.* **54**, 365.
Debehogne, H., Machado, L.E. (1979) *Astron. Astrophys. Suppl.* **36**, 313.
Debehogne, H. (1986) *Acta Astronomica* **36**, 301.
ITA (1993) *Ephemerides of Minor PLanets*, St.-Petersburg.
Smithsonian Astrophysical Observatory (1966) *Star Catalog*, Washington.

Appendix

Table 1. Positions

No.	*Object*	*Plate*	*Date UT 1993* *Mon.*	*Day*	*α 1950* *h m s*	*δ 1950* ° ′ ″
1	E240	10762	9	16.255188	0 10 27.566	4 38 13.34
2	E240	10762	9	16.276031	0 10 26.451	4 38 4.00
3	E240	10762	9	16.296875	0 10 25.279	4 37 54.52
4	E241	10762	9	16.255188	0 9 44.324	4 59 29.48
5	E241	10762	9	16.276031	0 9 43.363	4 59 23.12
6	E241	10762	9	16.296875	0 9 42.333	4 59 16.71
7	E242	10762	9	16.255188	0 10 48.566	4 49 16.59
8	E242	10762	9	16.276031	0 10 47.449	4 49 8.22
9	E242	10762	9	16.296875	0 10 46.297	4 48 59.70
10	E243	10762	9	16.255188	0 11 0.108	4 51 56.01
11	E243	10762	9	16.276031	0 10 59.000	4 51 48.25
12	E243	10762	9	16.296875	0 10 57.913	4 51 40.78
13	E244	10762	9	16.255188	0 12 27.967	4 55 5.43
14	E244	10762	9	16.276031	0 12 26.844	4 55 3.20
15	E244	10762	9	16.296875	0 12 25.797	4 55 1.13
16	E245	10762	9	16.255188	0 12 47.882	5 15 9.39
17	E245	10762	9	16.276031	0 12 46.641	5 15 4.21
18	E245	10762	9	16.296875	0 12 45.460	5 14 59.00
19	E246	10762	9	16.255188	0 11 39.080	5 15 29.57
20	E246	10762	9	16.276031	0 11 38.200	5 15 21.00
21	E246	10762	9	16.296875	0 11 37.263	5 15 13.21
22	E247	10762	9	16.255188	0 13 57.958	5 8 31.75
23	E247	10762	9	16.276031	0 13 56.994	5 8 28.51
24	E247	10762	9	16.296875	0 13 55.841	5 8 26.10
25	E248	10762	9	16.255188	0 14 47.306	5 15 14.27
26	E248	10762	9	16.276031	0 14 46.139	5 15 10.06
27	E248	10762	9	16.296875	0 14 44.881	5 15 4.90
28	E250	10762	9	16.255188	0 13 57.414	4 39 5.64
29	E250	10762	9	16.276031	0 13 56.479	4 38 55.61
30	E250	10762	9	16.296875	0 13 55.499	4 38 45.18
31	E252	10762	9	16.255188	0 15 46.926	5 0 38.47
32	E252	10762	9	16.276031	0 15 45.888	5 0 31.43
33	E252	10762	9	16.296875	0 15 44.874	5 0 23.70
34	E253	10762	9	16.255188	0 16 24.110	4 38 9.56
35	E253	10762	9	16.276031	0 16 23.206	4 37 58.61
36	E253	10762	9	16.296875	0 16 22.372	4 37 49.05
37	E254	10762	9	16.255188	0 15 5.781	5 5 41.04
38	E254	10762	9	16.276031	0 15 4.617	5 5 34.54
39	E254	10762	9	16.296875	0 15 3.434	5 5 28.13
40	E255	10762	9	16.255188	0 10 23.317	4 49 48.89
41	E255	10762	9	16.276031	0 10 22.440	4 49 38.60
42	E255	10762	9	16.296875	0 10 21.517	4 49 28.59
43	E260	10762	9	16.255188	0 20 17.023	4 32 55.59
44	E260	10762	9	16.276031	0 20 15.869	4 32 49.13
45	E260	10762	9	16.296875	0 20 14.720	4 32 43.37
46	E261	10762	9	16.255188	0 19 11.784	4 36 31.92
47	E261	10762	9	16.276031	0 19 10.721	4 36 25.63
48	E262	10762	9	16.296875	0 19 9.598	4 36 18.68
49	E263	10762	9	16.255188	0 20 15.394	5 11 35.43

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
50	E263	10762	9	16.276031	0	20	14.454	5	11	28.90
51	E263	10762	9	16.296875	0	20	13.487	5	11	22.07
52	E264	10762	9	16.255188	0	20	24.751	5	18	45.16
53	E264	10762	9	16.276031	0	20	23.834	5	18	39.37
54	E264	10762	9	16.296875	0	20	22.930	5	18	33.51
55	E267	10762	9	16.255188	0	20	9.238	4	53	20.00
56	E267	10762	9	16.276031	0	20	8.360	4	53	12.55
57	E267	10762	9	16.296875	0	20	7.422	4	53	4.53
58	E271	10762	9	16.255188	0	22	20.015	5	23	49.52
59	E271	10762	9	16.276031	0	22	19.054	5	23	44.73
60	E271	10762	9	16.296875	0	22	18.171	5	23	40.23
61	E272	10762	9	16.255188	0	22	52.351	5	17	15.74
62	E272	10762	9	16.276031	0	22	51.356	5	17	10.84
63	E272	10762	9	16.296875	0	22	50.350	5	17	5.20
64	E273	10762	9	16.255188	0	24	0.469	5	17	43.70
65	E273	10762	9	16.276031	0	23	59.349	5	17	41.73
66	E273	10762	9	16.296875	0	23	58.281	5	17	39.74
67	E274	10762	9	16.255188	0	23	53.735	4	51	41.55
68	E274	10762	9	16.276031	0	23	52.514	4	51	36.00
69	E274	10762	9	16.296875	0	23	51.318	4	51	30.20
70	E276	10762	9	16.255188	0	23	49.257	4	56	59.16
71	E276	10762	9	16.276031	0	23	48.381	4	56	53.26
72	E276	10762	9	16.296875	0	23	47.570	4	56	48.20
73	E277	10762	9	16.255188	0	23	47.166	4	57	51.81
74	E277	10762	9	16.276031	0	23	46.138	4	57	44.90
75	E277	10762	9	16.296875	0	23	44.906	4	57	37.62
76	E279	10762	9	16.255188	0	24	26.662	4	59	39.81
77	E279	10762	9	16.276031	0	24	25.639	4	59	32.52
78	E279	10762	9	16.296875	0	24	24.448	4	59	23.25
79	E280	10762	9	16.255188	0	24	18.398	4	31	19.56
80	E280	10762	9	16.276031	0	24	17.453	4	31	13.11
81	E280	10762	9	16.296875	0	24	16.521	4	31	7.74
82	E282	10762	9	16.255188	0	25	10.845	4	27	38.44
83	E282	10762	9	16.276031	0	25	9.720	4	27	29.14
84	E282	10762	9	16.296875	0	25	8.581	4	27	20.58
85	E286	10762	9	16.255188	0	24	10.627	4	19	25.90
86	E286	10762	9	16.276031	0	24	9.734	4	19	20.15
87	E286	10762	9	16.296875	0	24	8.716	4	19	13.86
88	E287	10762	9	16.255188	0	25	56.174	4	48	35.51
89	E287	10762	9	16.276031	0	25	55.164	4	48	30.84
90	E287	10762	9	16.296875	0	25	53.897	4	48	24.55
91	E288	10762	9	16.255188	0	26	37.887	4	32	3.69
92	E288	10762	9	16.276031	0	26	36.850	4	31	55.79
93	E288	10762	9	16.296875	0	26	35.848	4	31	48.69
94	E289	10762	9	16.255188	0	28	22.718	4	43	3.80
95	E289	10762	9	16.276031	0	28	21.818	4	42	49.43
96	E289	10762	9	16.296875	0	28	20.897	4	42	35.19
97	E290	10762	9	16.255188	0	28	21.054	4	28	7.50
98	E290	10762	9	16.276031	0	28	19.916	4	27	57.15
99	E290	10762	9	16.296875	0	28	18.781	4	27	48.00
100	E291	10762	9	16.255188	0	8	15.601	3	44	50.80

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
101	E291	10762	9	16.276031	0	8	14.214	3	44	43.53
102	E291	10762	9	16.296875	0	8	12.960	3	44	38.00
103	E292	10762	9	16.255188	0	10	13.201	3	38	52.50
104	E292	10762	9	16.276031	0	19	11.821	3	38	52.12
105	E292	10762	9	16.296875	0	10	10.531	3	38	52.00
106	E293	10762	9	16.255188	0	10	15.716	3	40	52.86
107	E293	10762	9	16.276031	0	10	14.546	3	40	52.53
108	E293	10762	9	16.296875	0	10	13.379	3	40	52.24
109	E294	10762	9	16.255188	0	8	58.317	3	23	9.13
110	E294	10762	9	16.276031	0	8	57.072	3	23	8.92
111	E294	10762	9	16.296875	0	8	55.878	3	23	7.66
112	E295	10762	9	16.255188	0	9	49.479	3	59	52.24
113	E295	10762	9	16.276031	0	9	48.345	3	59	43.69
114	E295	10762	9	16.296875	0	9	47.281	3	59	35.74
115	E296	10762	9	16.255188	0	11	21.521	4	4	17.37
116	E296	10762	9	16.276031	0	11	20.381	4	4	15.37
117	E296	10762	9	16.296875	0	11	19.258	4	4	13.26
118	E297	10762	9	16.255188	0	10	9.835	3	26	55.57
119	E297	10762	9	16.276031	0	10	8.981	3	26	40.41
120	E297	10762	9	16.296875	0	10	8.129	3	26	25.76
121	E298	10762	9	16.255188	0	10	16.016	3	14	3.51
122	E298	10762	9	16.276031	0	10	14.381	3	13	55.93
123	E298	10762	9	16.296875	0	10	13.011	3	13	50.65
124	E299	10762	9	16.255188	0	9	55.126	3	11	54.20
125	E299	10762	9	16.276031	0	9	54.001	3	11	42.35
126	E299	10762	9	16.296875	0	9	52.926	3	11	31.24
127	E300	10762	9	16.255188	0	10	52.980	3	33	1.53
128	E300	10762	9	16.276031	0	10	52.114	3	32	53.27
129	E300	10762	9	16.296875	0	10	51.257	3	32	44.40
130	E301	10762	9	16.255188	0	11	34.042	4	25	43.80
131	E301	10762	9	16.276031	0	11	32.869	4	25	33.88
132	E301	10762	9	16.296875	0	11	31.769	4	25	24.71
133	E302	10762	9	16.255188	0	12	30.881	3	28	8.04
134	E302	10762	9	16.276031	0	12	29.724	3	28	2.07
135	E302	10762	9	16.296875	0	12	28.599	3	27	56.48
136	E303	10762	9	16.255188	0	12	44.982	3	51	54.10
137	E303	10762	9	16.276031	0	12	43.886	3	51	41.35
138	E303	10762	9	16.296875	0	12	42.730	3	51	40.46
139	E304	10762	9	16.255188	0	12	49.690	4	38	25.00
140	E304	10762	9	16.276031	0	12	48.657	4	38	17.18
141	E304	10762	9	16.296875	0	12	47.532	4	38	9.70
142	E308	10762	9	16.255188	0	13	24.921	3	10	38.21
143	E308	10762	9	16.276031	0	13	23.699	3	10	37.58
144	E308	10762	9	16.296875	0	13	22.570	3	10	37.20
145	E310	10762	9	16.255188	0	14	44.319	3	41	7.52
146	E310	10762	9	16.276031	0	14	43.160	3	41	3.63
147	E310	10762	9	16.296875	0	14	42.010	3	40	59.46
148	E311	10762	9	16.255188	0	16	20.276	3	47	33.11
149	E311	10762	9	16.276031	0	16	19.027	3	47	27.37
150	E311	10762	9	16.296875	0	16	17,764	3	47	22.22
151	E312	10762	9	16.255188	0	16	17.194	3	28	52.07

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
152	E312	10762	9	16.276031	0	16	15.976	3	28	28.56
153	E312	10762	9	16.296875	0	16	14.733	3	28	46.60
154	E313	10762	9	16.255188	0	14	11.775	3	26	42.00
155	E313	10762	9	16.276031	0	14	10.826	3	26	36.42
156	E313	10762	9	16.296875	0	14	9.831	3	26	30.58
157	E314	10762	9	16.255188	0	12	46.648	2	58	21.23
158	E314	10762	9	16.276031	0	12	45.653	2	58	15.22
159	E314	10762	9	16.296875	0	12	44.724	2	58	9.76
160	E315	10762	9	16.255188	0	13	6.084	2	54	55.33
161	E315	10762	9	16.276031	0	13	5.060	2	54	48.44
162	E315	10762	9	16.296875	0	13	4.040	2	54	41.92
163	E316	10762	9	16.255188	0	12	58.507	2	51	2.67
164	E316	10762	9	16.276031	0	12	57.389	2	50	53.51
165	E316	10762	9	16.296875	0	12	56.296	2	50	43.02
166	E317	10762	9	16.255188	0	16	13.245	3	45	10.36
167	E317	10762	9	16.276031	0	16	12.133	3	45	4.74
168	E317	10762	9	16.296875	0	16	11.099	3	44	59.88
169	E318	10762	9	16.255188	0	15	23.841	3	38	46.30
170	E318	10762	9	16.276031	0	15	23.022	3	38	36.57
171	E318	10762	9	16.296875	0	15	22.158	3	38	27.00
172	E319	10762	9	16.255188	0	15	38.802	4	22	0.89
173	E319	10762	9	16.276031	0	15	37.851	4	21	57.35
174	E319	10762	9	16.296875	0	15	36.984	4	21	54.33
175	E320	10762	9	16.255188	0	16	57.919	4	26	55.27
176	E320	10762	9	16.276031	0	16	56.864	4	26	51.38
177	E320	10762	9	16.296875	0	16	55.801	4	26	47.20
178	E321	10762	9	16.255188	0	17	42.367	4	24	37.93
179	E321	10762	9	16.276031	0	17	41.394	4	24	35.41
180	E321	10762	9	16.296875	0	17	40.430	4	24	32.19
181	E322	10762	9	16.255188	0	15	17.746	4	13	39.60
182	E322	10762	9	16.276031	0	15	16.689	4	13	34.16
183	E322	10762	9	16.296875	0	15	15.602	4	13	28.43
184	E323	10762	9	16.255188	0	22	38.234	2	9	3.88
185	E323	10762	9	16.276031	0	22	36.187	2	9	15.61
186	E323	10762	9	16.296875	0	22	34.120	2	9	27.38
187	E324	10762	9	16.255188	0	16	15.549	2	58	58.91
188	E324	10762	9	16.276031	0	16	14.645	2	58	54.09
189	E324	10762	9	16.296875	0	16	13.815	2	58	49.70
190	E325	10762	9	16.255188	0	16	45.426	3	5	47.91
191	E325	10762	9	16.276031	0	16	44.497	3	5	43.32
192	E325	10762	9	16.296875	0	16	43.416	3	5	36.93
193	E326	10762	9	16.255188	0	18	23.410	3	38	24.83
194	E326	10762	9	16.276031	0	18	22.496	3	38	17.37
195	E326	10762	9	16.296875	0	18	21.537	3	38	9.51
196	E327	10762	9	16.255188	0	18	45.160	3	34	38.14
197	E327	10762	9	16.276031	0	18	44.058	3	34	34.01
198	E327	10762	9	16.296875	0	18	42.935	3	34	29.93
199	E328	10762	9	16.255188	0	18	50.791	3	43	4.90
200	E328	10762	9	16.276031	0	18	49.657	3	43	0.53
201	E328	10762	9	16.296875	0	18	48.520	3	42	56.34
202	E330	10762	9	16.255188	0	20	45.622	4	4	5.35

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
203	E330	10762	9	16.276031	0	20	44.556	4	3	58.70
204	E330	10762	9	16.296875	0	20	43.404	4	3	52.07
205	E332	10762	9	16.255188	0	21	20.889	3	26	56.05
206	E332	10762	9	16.276031	0	21	19.607	3	26	53.48
207	E332	10762	9	16.296875	0	21	18.319	3	26	51.61
208	E333	10762	9	16.255188	0	21	3.423	4	13	19.03
209	E333	10762	9	16.276031	0	21	2.458	4	13	15.08
210	E333	10762	9	16.296875	0	21	1.498	4	13	11.15
211	E334	10762	9	16.255188	0	22	2.934	4	11	27.27
212	E334	10762	9	16.276031	0	22	1.631	4	11	27.30
213	E334	10762	9	16.296875	0	22	0.267	4	11	27.51
214	E335	10762	9	16.255188	0	21	42.676	3	38	30.68
215	E335	10762	9	16.276031	0	21	41.795	3	38	26.52
216	E335	10762	9	16.296875	0	21	40.859	3	38	22.00
217	E336	10762	9	16.255188	0	21	11.118	3	28	38.40
218	E336	10762	9	16.276031	0	21	10.220	3	28	32.72
219	E336	10762	9	16.296875	0	21	9.331	3	28	27.26
220	E337	10762	9	16.255188	0	21	26.669	3	43	23.43
221	E337	10762	9	16.276031	0	21	25.547	3	43	15.91
222	E337	10762	9	16.296875	0	21	24.438	3	43	7.30
223	E338	10762	9	16.255188	0	19	56.398	3	20	46.17
224	E338	10762	9	16.276031	0	19	55.625	3	20	34.05
225	E338	10762	9	16.296875	0	19	54.821	3	20	22.00
226	E339	10762	9	16.255188	0	21	16.291	4	42	56.81
227	E339	10762	9	16.276031	0	21	15.413	4	42	46.01
228	E339	10762	9	16.296875	0	21	14.363	4	42	32.21
229	E340	10762	9	16.255188	0	22	25.103	3	53	46.85
230	E340	10762	9	16.276031	0	22	23.881	3	53	44.59
231	E340	10762	9	16.296875	0	22	22.426	3	53	40.89
232	E341	10762	9	16.255188	0	24	31.204	3	49	45.32
233	E341	10762	9	16.276031	0	24	30.030	3	49	40.61
234	E341	10762	9	16.296875	0	24	28.734	3	49	35.42
235	E342	10762	9	16.255188	0	24	51.490	3	23	46.22
236	E342	10762	9	16.276031	0	24	50.383	3	23	43.54
237	E342	10762	9	16.296875	0	24	49.314	3	23	40.74
238	E343	10762	9	16.255188	0	23	30.667	3	3	40.08
239	E343	10762	9	16.276031	0	23	29.676	3	3	33.49
240	E343	10762	9	16.296875	0	23	28.746	3	3	27.50
241	E344	10762	9	16.255188	0	26	15.196	3	49	56.78
242	E344	10762	9	16.276031	0	26	14.095	3	49	52.82
243	E344	10762	9	16.296875	0	26	12.991	3	49	49.50
244	E345	10762	9	16.255188	0	26	14.862	3	42	37.39
245	E345	10762	9	16.276031	0	26	13.691	3	42	28.91
246	E345	10762	9	16.296875	0	26	12.539	3	42	20.39
247	E346	10762	9	16.255188	0	26	12.127	3	31	32.39
248	E346	10762	9	16.276031	0	26	11.076	3	31	25.00
249	E346	10762	9	16.296875	0	26	10.029	3	31	17.70
250	E350	10762	9	16.255188	0	27	51.203	4	4	10.11
251	E350	10762	9	16.276031	0	27	50.156	4	4	1.20
252	E350	10762	9	16.296875	0	27	49.238	4	3	53.33
253	E351	10762	9	16.255188	0	27	14.332	3	15	50.68

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
254	E351	10762	9	16.276031	0	27	13.324	3	15	42.76
255	E351	10762	9	16.296875	0	27	12.170	3	15	35.30
256	E352	10762	9	16.255188	0	27	49.295	3	10	49.39
257	E352	10762	9	16.276031	0	27	48.241	3	10	49.45
258	E352	10762	9	16.296875	0	27	47.098	3	10	50.20
259	E353	10762	9	16.255188	0	25	13.113	2	56	0.00
260	E353	10762	9	16.276031	0	25	12.185	2	55	51.03
261	E353	10762	9	16.296875	0	25	11.248	2	55	42.25
262	E354	10762	9	16.255188	0	24	4.544	2	51	48.46
263	E354	10762	9	16.276031	0	24	3.702	2	51	40.94
264	E354	10762	9	16.296875	0	24	2.862	2	51	33.67
265	E355	10762	9	16.255188	0	27	4.196	2	50	42.47
266	E355	10762	9	16.276031	0	27	3.315	2	50	34.24
267	E355	10762	9	16.296875	0	27	2.412	2	50	25.82
268	E360	10762	9	16.255188	0	7	51.628	2	46	35.54
269	E360	10762	9	16.276031	0	7	50.527	2	46	29.35
270	E360	10762	9	16.296875	0	7	49.402	2	46	23.47
271	E363	10762	9	16.255188	0	9	24.069	2	32	4.67
272	E363	10762	9	16.276031	0	9	23.140	2	32	0.75
273	E363	10762	9	16.296875	0	9	22.183	2	31	55.88
274	E367	10762	9	16.255188	0	8	6.397	2	3	50.33
275	E367	10762	9	16.276031	0	8	5.420	2	3	43.48
276	E367	10762	9	16.296875	0	8	4.401	2	3	36.44
277	E369	10762	9	16.255188	0	10	29.485	1	44	48.24
278	E369	10762	9	16.276031	0	10	28.317	1	44	45.40
279	E369	10762	9	16.296875	0	10	27.204	1	44	43.03
280	E370	10762	9	16.255188	0	10	39.523	2	30	19.17
281	E370	10762	9	16.276031	0	10	38.340	2	30	15.19
282	E370	10762	9	16.296875	0	10	37.266	2	30	11.27
283	E371	10762	9	16.255188	0	11	17.614	2	34	59.25
284	E371	10762	9	16.276031	0	11	16.564	2	34	47.88
285	E371	10762	9	16.296875	0	11	15.388	2	34	36.84
286	E372	10762	9	16.255188	0	12	15.322	1	46	44.19
287	E372	10762	9	16.276031	0	12	14.047	1	46	39.86
288	E372	10762	9	16.296875	0	12	12.753	1	46	35.06
289	E374	10762	9	16.255188	0	14	13.009	2	19	45.04
290	E374	10762	9	16.276031	0	14	12.055	2	19	39.45
291	E374	10762	9	16.296875	0	14	11.200	2	19	34.40
292	E375	10762	9	16.255188	0	10	36.171	2	10	18.92
293	E375	10762	9	16.276031	0	10	35.423	2	10	8.85
294	E375	10762	9	16.296875	0	10	34.692	2	9	59.05
295	E376	10762	9	16.255188	0	13	29.494	1	44	0.69
296	E376	10762	9	16.276031	0	13	28.275	1	43	53.79
297	E376	10762	9	16.296875	0	13	26.983	1	43	45.76
298	E377	10762	9	16.255188	0	13	24.244	1	52	36.18
299	E377	10762	9	16.276031	0	13	23.280	1	52	30.50
300	E377	10762	9	16.296875	0	13	22.275	1	52	25.02
301	E378	10762	9	16.255188	0	14	7.243	2	26	51.00
302	E378	10762	9	16.276031	0	14	6.151	2	26	41.62
303	E378	10762	9	16.296875	0	14	5.067	2	26	32.55
304	E380	10762	9	16.255188	0	15	35.507	2	22	28.24

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
305	E380	10762	9	16.276031	0	15	34.475	2	22	17.00
306	E380	10762	9	16.296875	0	15	33.472	2	22	5.19
307	E382	10762	9	16.255188	0	16	29.556	2	4	3.60
308	E382	10762	9	16.276031	0	16	28.551	2	3	56.22
309	E382	10762	9	16.296875	0	16	27.604	2	3	49.72
310	E383	10762	9	16.255188	0	16	45.951	2	3	7.24
311	E383	10762	9	16.276031	0	16	44.963	2	3	1.01
312	E383	10762	9	16.296875	0	16	43.966	2	2	53.88
313	E384	10762	9	16.255188	0	16	44.270	1	47	3.23
314	E384	10762	9	16.276031	0	16	43.268	1	46	55.69
315	E384	10762	9	16.296875	0	16	42.257	1	46	49.10
316	E386	10762	9	16.255188	0	17	42.590	1	50	19.84
317	E386	10762	9	16.276031	0	17	41.624	1	50	13.80
318	E386	10762	9	16.296875	0	17	40.741	1	50	8.15
319	E390	10762	9	16.255188	0	17	34.986	2	31	11.82
320	E390	10762	9	16.276031	0	17	34.024	2	31	6.61
321	E390	10762	9	16.296875	0	17	33.000	2	31	1.58
322	E391	10762	9	16.255188	0	19	19.372	2	28	3.73
323	E391	10762	9	16.276031	0	19	18.391	2	27	57.35
324	E391	10762	9	16.296875	0	19	17.340	2	27	51.61
325	E392	10762	9	16.255188	0	19	37.310	2	9	8.00
326	E392	10762	9	16.276031	0	19	36.276	2	9	3.12
327	E392	10762	9	16.296875	0	19	35.180	2	8	58.91
328	E393	10762	9	16.255188	0	18	55.447	1	58	24.73
329	E393	10762	9	16.276031	0	18	54.520	1	58	19.16
330	E393	10762	9	16.296875	0	18	53.587	1	58	14.78
331	E394	10762	9	16.255188	0	21	53.313	1	21	51.34
332	E394	10762	9	16.276031	0	21	52.109	1	21	49.34
333	E394	10762	9	16.296875	0	21	50.865	1	21	46.92
334	E395	10762	9	16.255188	0	22	4.544	2	22	45.55
335	E395	10762	9	16.276031	0	22	3.445	2	22	42.63
336	E395	10762	9	16.296875	0	22	2.341	2	22	39.53
337	E397	10762	9	16.255188	0	23	49.033	1	55	27.56
338	E397	10762	9	16.276031	0	23	47.752	1	55	23.77
339	E397	10762	9	16.296875	0	23	46.539	1	55	20.12
340	E398	10762	9	16.255188	0	23	57.196	2	13	25.93
341	E398	10762	9	16.276031	0	23	55.951	2	13	18.28
342	E398	10762	9	16.296875	0	23	54.718	2	13	11.15
343	E400	10762	9	16.255188	0	24	36.435	2	19	12.42
344	E400	10762	9	16.276031	0	24	35.327	2	19	7.68
345	E400	10762	9	16.296875	0	24	34.244	2	19	1.76
346	E401	10762	9	16.255188	0	23	20.904	2	19	55.73
347	E401	10762	9	16.276031	0	23	19.948	2	19	52.48
348	E401	10762	9	16.296875	0	23	19.012	2	19	49.39
349	E402	10762	9	16.255188	0	23	58.922	1	33	33.11
350	E402	10762	9	16.276031	0	23	57.835	1	33	31.62
351	E402	10762	9	16.296875	0	23	56.754	1	33	30.22
352	E404	10762	9	16.255188	0	24	1.799	1	37	51.76
353	E404	10762	9	16.276031	0	24	0.884	1	37	46.63
354	E404	10762	9	16.296875	0	24	0.006	1	37	41.80
355	E405	10762	9	16.255188	0	25	22.488	1	49	20.39

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
356	E405	10762	9	16.276031	0	25	21.153	1	49	13.53
357	E405	10762	9	16.296875	0	25	19.710	1	49	8.13
358	E407	10762	9	16.255188	0	26	58.312	2	31	0.27
359	E407	10762	9	16.276031	0	26	57.137	2	30	51.54
360	E407	10762	9	16.296875	0	26	55.969	2	30	43.00
361	E408	10762	9	16.255188	0	25	47.180	2	8	1.64
362	E408	10762	9	16.276031	0	25	46.253	2	7	56.20
363	E408	10762	9	16.296875	0	25	45.334	2	7	51.19
364	E409	10762	9	16.255188	0	25	50.476	2	11	56.69
365	E409	10762	9	16.276031	0	25	49.292	2	11	57.89
366	E409	10762	9	16.296875	0	25	48.104	2	11	58.91
367	E416	10762	9	16.255188	0	10	46.480	1	6	41.83
368	E416	10762	9	16.276031	0	10	45.354	1	6	38.12
369	E416	10762	9	16.296875	0	10	44.233	1	6	34.39
370	E420	10762	9	16.255188	0	9	13.486	0	41	42.74
371	E420	10762	9	16.276031	0	9	12.603	0	41	34.09
372	E420	10762	9	16.296875	0	9	11.725	0	41	25.53
373	E423	10762	9	16.255188	0	8	22.343	1	8	50.53
374	E423	10762	9	16.276031	0	8	21.474	1	8	40.78
375	E423	10762	9	16.296875	0	8	20.583	1	8	31.64
376	E424	10762	9	16.255188	0	9	50.232	0	31	58.59
377	E424	10762	9	16.276031	0	9	49.316	0	31	53.25
378	E424	10762	9	16.296875	0	9	48.405	0	31	47.80
379	E426	10762	9	16.255188	0	10	44.850	0	22	46.68
380	E426	10762	9	16.276031	0	10	43.722	0	22	42.09
381	E426	10762	9	16.296875	0	10	42.637	0	22	37.44
382	E427	10762	9	16.255188	0	11	20.730	0	17	6.04
383	E427	10762	9	16.276031	0	11	19.560	0	17	6.19
384	E427	10762	9	16.296875	0	11	18.347	0	17	6.03
385	E430	10762	9	16.255188	0	10	5.770	0	59	35.29
386	E430	10762	9	16.276031	0	10	4.858	0	59	29.35
387	E430	10762	9	16.296875	0	10	3.961	0	59	24.35
388	E432	10762	9	16.255188	0	11	26.201	1	8	57.32
389	E432	10762	9	16.276031	0	11	25.110	1	8	52.39
390	E432	10762	9	16.296875	0	11	24.055	1	8	47.00
391	E433	10762	9	16.255188	0	10	51.269	0	55	37.58
392	E433	10762	9	16.276031	0	10	50.479	0	55	23.00
393	E433	10762	9	16.296875	0	10	49.706	0	55	8.83
394	E434	10762	9	16.255188	0	11	11.200	0	25	24.37
395	E434	10762	9	16.276031	0	11	10.202	0	25	18.23
396	E434	10762	9	16.296875	0	11	9.238	0	25	11.71
397	E435	10762	9	16.255188	0	11	32.975	2	20	54.55
398	E435	10762	9	16.276031	0	11	32.095	2	20	37.69
399	E435	10762	9	16.296875	0	11	31.227	2	20	22.72
400	E436	10762	9	16.255188	0	12	5.297	1	0	14.42
401	E436	10762	9	16.276031	0	12	4.291	1	0	5.70
402	E436	10762	9	16.296875	0	12	3.232	0	59	55.62
403	E439	10762	9	16.255188	0	15	13.137	0	19	41.52
404	E439	10762	9	16.276031	0	15	11.629	0	19	37.81
405	E439	10762	9	16.296875	0	15	10.130	0	19	33.55
406	E440	10762	9	16.255188	0	13	52.901	0	14	22.00

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
407	E440	10762	9	16.276031	0	13	51.701	0	14	13.68
408	E440	10762	9	16.296875	0	13	50.492	0	14	4.79
409	E441	10762	9	16.255188	0	15	32.934	1	24	28.44
410	E441	10762	9	16.276031	0	15	31.651	1	24	22.51
411	E441	10762	9	16.296875	0	15	30.354	1	24	17.27
412	E442	10762	9	16.255188	0	15	28.649	0	28	5.66
413	E442	10762	9	16.276031	0	15	27.462	0	28	0.87
414	E442	10762	9	16.296875	0	15	26.269	0	27	55.35
415	E444	10762	9	16.255188	0	15	46.662	1	12	53.14
416	E444	10762	9	16.276031	0	15	45.539	1	12	48.00
417	E444	10762	9	16.296875	0	15	44.316	1	12	41.70
418	E445	10762	9	16.255188	0	14	50.797	1	41	20.21
419	E445	10762	9	16.276031	0	14	49.768	1	41	13.78
420	E445	10762	9	16.296875	0	14	48.758	1	41	5.68
421	E446	10762	9	16.255188	0	16	41.693	1	26	41.86
422	E446	10762	9	16.276031	0	16	40.576	1	26	36.26
423	E446	10762	9	16.296875	0	16	39.408	1	26	30.69
424	E449	10762	9	16.255188	0	17	28.552	1	20	16.58
425	E449	10762	9	16.276031	0	17	27.432	1	20	11.53
426	E449	10762	9	16.296875	0	17	26.27	1	20	7.51
427	E450	10762	9	16.255188	0	16	29.624	1	25	52.33
428	E450	10762	9	16.276031	0	16	28.781	1	25	43.91
429	E450	10762	9	16.296875	0	16	27.948	1	25	36.19
430	E452	10762	9	16.255188	0	15	27.821	1	59	35.22
431	E452	10762	9	16.276031	0	15	27.166	1	59	18.23
432	E452	10762	9	16.296875	0	15	26.435	1	59	0.49
433	E453	10762	9	16.255188	0	16	27.876	0	21	44.24
434	E453	10762	9	16.276031	0	16	26.813	0	21	40.00
435	E453	10762	9	16.296875	0	16	25.793	0	21	35.75
436	E454	10762	9	16.255188	0	17	23.506	0	18	30.86
437	E454	10762	9	16.276031	0	17	22.325	0	18	25.41
438	E454	10762	9	16.296875	0	17	21.226	0	18	21.44
439	E455	10762	9	16.255188	0	16	11.347	0	55	56.70
440	E455	10762	9	16.276031	0	16	10.447	0	55	50.80
441	E455	10762	9	16.296875	0	16	9.577	0	55	45.03
442	E456	10762	9	16.255188	0	17	46.464	0	45	0.47
443	E456	10762	9	16.276031	0	17	45.111	0	44	56.14
444	E456	10762	9	16.296875	0	17	43.778	0	44	51.85
445	E457	10762	9	16.255188	0	18	7.044	0	37	3.48
446	E457	10762	9	16.276031	0	18	5.951	0	36	57.65
447	E457	10762	9	16.296875	0	18	4.891	0	36	51.26
448	E460	10762	9	16.255188	0	19	2.332	0	50	42.21
449	E460	10762	9	16.276031	0	19	1.193	0	50	36.61
450	E460	10762	9	16.296875	0	19	0.095	0	50	31.92
451	E461	10762	9	16.255188	0	19	44.545	0	57	39.56
452	E461	10762	9	16.276031	0	19	43.315	0	57	33.26
453	E461	10762	9	16.296875	0	19	42.050	0	57	26.80
454	E462	10762	9	16.255188	0	18	53.327	0	55	26.93
455	E462	10762	9	16.276031	0	18	52.428	0	55	22.20
456	E462	10762	9	16.296875	0	18	51.500	0	55	16.40
457	E463	10762	9	16.255188	0	19	8.358	1	9	22.90

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993*		*α 1950*			*δ 1950*		
			Mon.	*Day*	*h*	*m*	*s*	°	′	″
458	E463	10762	9	16.276031	0	19	7.474	1	9	14.22
459	E463	10762	9	16.296875	0	19	6.523	1	9	5.68
460	E464	10762	9	16.255188	0	21	57.521	1	21	5.81
461	E464	10762	9	16.276031	0	21	56.436	1	21	0.68
462	E464	10762	9	16.296875	0	21	55.256	1	20	55.07
463	E465	10762	9	16.255188	0	19	48.243	1	10	28.63
464	E465	10762	9	16.276031	0	19	47.189	1	10	23.16
465	E465	10762	9	16.296875	0	19	46.111	1	10	17.25
466	E466	10762	9	16.255188	0	20	13.170	1	15	28.86
467	E466	10762	9	16.276031	0	20	12.002	1	15	16.53
468	E466	10762	9	16.296875	0	20	10.837	1	15	4.34
469	E467	10762	9	16.255188	0	20	4.521	1	33	5.84
470	E467	10762	9	16.276031	0	20	3.613	1	32	56.34
471	E467	10762	9	16.296875	0	20	2.657	1	32	46.74
472	E468	10762	9	16.255188	0	23	20.055	1	11	23.62
473	E468	10762	9	16.276031	0	23	18.900	1	11	15.54
474	E468	10762	9	16.296875	0	23	17.745	1	11	7.78
475	E469	10762	9	16.255188	0	22	13.285	0	30	58.55
476	E469	10762	9	16.276031	0	22	12.256	0	30	55.12
477	E469	10762	9	16.296875	0	22	11.214	0	30	51.74
478	E470	10762	9	16.255188	0	23	12.659	0	54	31.06
479	E470	10762	9	16.276031	0	23	11.577	0	54	22.31
480	E470	10762	9	16.296875	0	23	10.459	0	54	14.17
481	E471	10762	9	16.255188	0	22	22.689	0	55	32.75
482	E471	10762	9	16.276031	0	22	21.743	0	55	21.21
483	E471	10762	9	16.296875	0	22	20.815	0	55	9.41
484	E473	10762	9	16.255188	0	23	34.701	1	21	49.84
485	E473	10762	9	16.276031	0	23	33.805	1	21	36.72
486	E473	10762	9	16.296875	0	23	32.925	1	21	23.93
487	E474	10762	9	16.255188	0	25	50.424	0	49	13.36
488	E474	10762	9	16.276031	0	25	49.181	0	49	10.53
489	E474	10762	9	16.296875	0	25	48.000	0	49	8.44
490	E475	10762	9	16.255188	0	24	29.846	1	19	27.74
491	E475	10762	9	16.276031	0	24	28.744	1	19	24.41
492	E475	10762	9	16.296875	0	24	27.641	1	19	21.00
493	E476	10762	9	16.255188	0	25	36.951	1	26	16.47
494	E476	10762	9	16.276031	0	25	36.179	1	26	6.82
495	E476	10762	9	16.296875	0	25	35.420	1	25	58.13
496	E477	10762	9	16.255188	0	25	2.695	1	18	59.08
497	E477	10762	9	16.276031	0	25	1.717	1	18	49.57
498	E477	10762	9	16.296875	0	25	0.783	1	18	40.20
499	E478	10762	9	16.255188	0	25	37.057	1	26	32.60
500	E478	10762	9	16.276031	0	25	36.052	1	26	25.00
501	E478	10762	9	16.296875	0	25	35.068	1	26	18.49
502	E479	10762	9	16.255188	0	25	47.421	1	42	25.61
503	E479	10762	9	16.276031	0	25	46.445	1	42	18.41
504	E479	10762	9	16.296875	0	25	45.480	1	42	12.13
505	E480	10762	9	16.255188	0	27	42.120	2	12	12.44
506	E480	10762	9	16.276031	0	27	40.966	2	12	8.06
507	E480	10762	9	16.296875	0	27	39.833	2	12	4.00
508	E481	10762	9	16.255188	0	27	16.085	2	34	8.65

Table 1. Continued

No.	*Object*	*Plate*	*Date UT 1993* *Mon.*	*Day*	*α 1950* *h m s*	*δ 1950* ° ′ ″
509	E481	10762	9	16.276031	0 27 14.983	2 34 2.68
510	E481	10762	9	16.296875	0 27 13.882	2 33 56.72
511	E482	10762	9	16.255188	0 27 40.751	2 34 38.14
512	E482	10762	9	16.276031	0 27 39.697	2 34 34.30
513	E482	10762	9	16.296875	0 27 38.618	2 34 30.47
514	E483	10762	9	16.255188	0 26 45.133	0 28 24.62
515	E483	10762	9	16.276031	0 26 44.208	0 28 16.74
516	E483	10762	9	16.296875	0 26 43.337	0 28 8.70
517	E484	10762	9	16.255188	0 27 7.020	1 11 1.61
518	E484	10762	9	16.276031	0 27 6.263	1 10 54.51
519	E484	10762	9	16.296875	0 27 5.535	1 10 48.30
520	E485	10762	9	16.255188	0 28 17.827	2 23 49.44
521	E485	10762	9	16.276031	0 28 16.652	2 23 47.37
522	E485	10762	9	16.296875	0 28 15.478	2 23 45.55
523	E486	10762	9	16.255188	0 26 14.571	0 30 4.69
524	E486	10762	9	16.276031	0 26 13.631	0 29 58.32
525	E486	10762	9	16.296875	0 26 12.679	0 29 52.72