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**5,000- and 10,000-Year
Star Catalogs**

by Gerald S. Hawkins
and Shoshana K. Rosenthal

Washington, D.C.

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Publications of the Astrophysical Observatory

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5,000- and 10,000-Year Star Catalogs

Gerald S. Hawkins¹ and Shoshana K. Rosenthal²

5,000-year star catalog

For various aspects of the history of science it is useful to have the positions of stars at various dates in history and prehistory. These positions are affected by the precession of the earth's axis and by the proper motion of the stars. Corrections can be applied to the present positions to obtain the star coordinates at any other time. In this catalog star positions are given at intervals of 100 years for the period -2500 to +2500 (2501 B.C. to 2500 A.D.) for stars with visual magnitude brighter than +2.99 (table 2).

Star positions and proper motion have been taken from the Fourth Fundamental Catalogue (FK4) published by the Astronomischen Rechen-Institut, Heidelberg, and printed by G. Braun, Karlsruhe, 1963. When the position of a star was not available in the FK4 catalog, the quantities were obtained from the Smithsonian Astrophysical Observatory Star Catalog, Smithsonian publication 4652. The stars are listed in order of increasing right ascension for the equinox of 1950 A.D. A list of star names is also given in table 1.

The effects of precession were allowed for, using the equations given in the Smithsonian Astrophysical Observatory Star Catalog. A derivation of these equations is given in the explanatory supplement to the American Ephemeris and Nautical Almanac, 1961. These equations give the right ascension and declination of a star at any required date. The coordinates are with reference to the pole and vernal equinox of the particular date.

The effects of proper motion were computed following the equations given in the FK4 cata-

log. Only first-order terms were used for all stars except for the few stars listed in the FK4 catalog for which the effects of foreshortening are known.

The stars are identified in the catalog by the standard abbreviations for the constellations and by the Greek letter. An identification number is given for each star. The number is either the designation of the FK4 catalog or the number in the Smithsonian Astrophysical Observatory Star Catalog. If the latter numeration is used, it is indicated with an asterisk. The visual magnitude of the star is given in parentheses.

Errors in the positions given in this 5000-year catalog will be introduced by uncertainties in the precessional constants and proper-motion values. The precessional correction does not take account of nutation and other periodic changes, but these periodic changes will probably be less than 1 minute of arc. The uncertainties in the determinations of proper motion will introduce errors, but even in the worst examples in the measurements of the FK4 catalog, the errors will not amount to more than 1 minute of arc in 4000 years. The values given in this catalog should, therefore, be reliable to within $\pm 0.02^\circ$.

10,000-year star catalog

This catalog is an extension of the star positions given in the 5,000-year star catalog. The star positions have been obtained from the FK4 catalog and the Smithsonian Astrophysical Observatory Star Catalog.

The stars are identified in the catalog by the standard abbreviations for the constellations and by the Greek letter. An identification number is given for each star. The number is either the designation of the FK4 catalog

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or the number in the Smithsonian Astrophysical Observatory Star Catalog. If the latter numeration is used, it is indicated with an asterisk. The visual magnitude of the star is given in parentheses.

Precession and proper-motion corrections have been applied over the time interval of this catalog, following the methods outlined in the preceding catalog. The maximum errors expected in the 5,000-year catalog were $\pm 0.02^\circ$. This catalog covers a larger time span, and the uncertainties are therefore greater. It is estimated that the maximum errors are of the order $\pm 0.5^\circ$.

Star coordinates are given at 500-year intervals in table 3, where the right ascension and declination are referred to the vernal equinox of the particular date. An identifica-

tion list of star names is given in table 1. The period covered is $-10,000$ to 0 ($10,001$ to 1 B.C.).

References

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- NAUTICAL ALMANAC
1961. Explanatory Supplement to the Astronomical Ephemeris and the American Ephemeris and Nautical Almanac. Nautical Almanac Offices of the United Kingdom and the United States of America.
- STAFF OF THE SMITHSONIAN ASTROPHYSICAL OBSERVATORY
1966. Smithsonian Astrophysical Observatory Star Catalog. Smithsonian Institution, Washington, D.C.

TABLE 1.—A list of star names

Star	Catalog Number	Star	Catalog Number		
Achernar	Alpha Eri	54 *	Gienah	Gamma Crv	457
Acrab	Beta Sco	597	Hadar	Beta Cen	518
Acrux	Alpha Cru	462	Hamal	Alpha Ari	74
Adhara	Epsilon CMa	268	Izar	Epsilon Boo	83500 *
Al Na'ir	Alpha Gru	829	Kaus Australis	Epsilon Sgr	689
Alcaid	Eta UMa	509	Kochab	Beta UMi	550
Aldebaran	Alpha Tau	168	Markab	Alpha Peg	871
Alderamin	Alpha Cep	803	Menkalinan	Beta Aur	227
Algeiba	Gamma Leo	81298 *	Menkar	Alpha Cet	107
Algol	Beta Per	111	Menkent	Theta Cen	537
Alhena	Gamma Gem	251	Merak	Beta UMa	416
Alioth	Epsilon UMa	483	Miaplacidus	Beta Car	348
Almach	Gamma And	73	Mimosa	Beta Cru	481
Alnilam	Epsilon Ori	210	Mira	Omicron Cet	129825 *
Alnitak	Zeta Ori	132444 *	Mirach	Beta And	42
Alphard	Alpha Hya	354	Mirfak	Alpha Per	120
Alphecca	Alpha CrB	578	Mirzam	Beta CMa	243
Alpheratz	Alpha And	1	Mintaka	Delta Ori	206
Altair	Alpha Aql	745	Mizar	Zeta UMa	497
Aludra	Eta CMa	283	Muhlifain	Gamma Cen	223603 *
Ankaa	Alpha Phe	12	Naos	Zeta Pup	306
Antares	Alpha Sco	616	Nunki	Alpha Sgr	728
Arcturus	Alpha Boo	526	Peacock	Alpha Pav	764
Arneb	Alpha Lep	207	Phecda	Gamma UMa	447
Atria	Alpha TrA	625	Polaris	Alpha UMi	907
Avior	Epsilon Car	315	Pollux	Beta Gem	295
Bellatrix	Gamma Ori	201	Procyon	Alpha CMi	291
Betelgeuse	Alpha Ori	224	Ras-Alhague	Alpha Oph	656
Canopus	Alpha Car	245	Regulus	Alpha Leo	380
Capella (9)	Alpha Aur	193	Rigel	Beta Ori	194
Caph	Beta Cas	2	Rigil Kent	Alpha Cen	538
Castor	Alpha Gem	287	Sabik	Eta Oph	160332 *
Cih	Gamma Cas	32	Sadir	Gamma Cyg	765
Deneb	Alpha Cyg	777	Saiph	Kappa Ori	220
Denebola	Beta Leo	444	Scheat	Beta Peg	870
Diphda	Beta Cet	22	Schedar	Alpha Cas	21
Dubhe	Alpha UMa	417	Scutulum	Iota Car	351
Dzuba	Delta Sco	594	Shaula	Lambda Sco	652
El Nath	Beta Tau	202	Sirius	Alpha CMa	257
Eltanin	Gamma Dra	676	Spica	Alpha Vir	498
Enif	Epsilon Peg	815	Suhail	Lambda Vel	345
Fomalhaut	Alpha PsA	867	Vega	Alpha Lyr	699
Gacrux	Gamma Cru	468	Wezen	Delta CMa	273
Gienah	Epsilon Cyg	780	Zosma	Delta Leo	422

*From Smithsonian Astrophysical Observatory Star Catalog.

TABLE 2.—The 5,000-year star catalog

NO. (MAG)	0001 AND ALPHA	(2.15)	DEC.	0002 CAS BETA	(2.42)	DEC.	0007 PEG GAMMA	(2.87)	DEC.	0011 HYI BETA	(2.90)	DEC.	0012 PHE ALPHA	(2.44)	DEC.	0021 CAS ALPHA	(2.47)	DEC.
-2500	307.63	7.34	313.88	36.89	-6.75	306.31	178.42	-74.20	291.91	-62.85	318.89	33.19						
-2400	308.82	7.69	314.84	37.27	-6.41	307.61	179.55	-74.83	294.17	-62.64	319.90	33.62						
-2300	310.01	8.04	315.80	37.07	-6.06	308.91	180.72	-75.45	296.41	-62.41	320.91	34.05						
-2200	311.20	8.40	316.76	38.07	-5.70	310.21	181.93	-76.08	298.62	-62.16	321.92	34.49						
-2100	312.39	8.77	317.72	38.48	-5.33	311.50	183.18	-76.70	300.80	-61.89	322.93	34.94						
-2000	313.58	9.15	318.69	38.69	-4.96	312.79	184.50	-77.32	302.95	-61.61	323.95	35.39						
-1900	314.77	9.54	319.66	39.31	-4.57	314.07	185.87	-77.94	305.07	-61.30	324.97	35.85						
-1800	315.96	9.94	320.63	39.73	-4.17	315.36	187.32	-78.56	307.16	-60.98	325.99	36.32						
-1700	317.15	10.35	321.60	40.17	-3.76	316.64	188.85	-79.18	309.21	-60.65	327.01	36.79						
-1600	318.33	10.76	322.58	40.61	-3.35	317.91	190.49	-79.79	311.24	-60.29	328.04	37.26						
-1500	319.52	11.18	323.56	41.05	-2.93	319.19	192.24	-80.41	313.23	-59.93	329.07	37.74						
-1400	320.70	11.61	324.54	41.50	-2.50	320.46	194.14	-81.01	315.18	-59.54	330.10	38.23						
-1300	321.89	12.04	325.53	41.95	-2.06	321.73	196.21	-81.62	317.10	-59.15	331.14	38.72						
-1200	323.07	12.49	326.51	42.41	-1.61	323.00	198.50	-82.21	318.99	-58.74	332.18	39.22						
-1100	324.26	12.93	327.51	42.88	-1.16	324.26	201.04	-82.80	320.85	-58.32	333.23	39.72						
-1000	325.44	13.39	328.50	43.35	-0.70	325.53	203.91	-83.38	322.68	-57.89	334.28	40.22						
-900	326.63	13.85	329.51	43.83	-0.23	326.79	207.20	-83.95	324.47	-57.45	335.33	40.73						
-800	327.82	14.32	330.51	44.31	0.25	328.05	211.00	-84.50	326.24	-57.00	336.39	41.24						
-700	329.00	14.80	331.52	44.79	0.73	329.30	215.49	-85.03	327.97	-56.54	337.46	41.76						
-600	330.19	15.28	332.54	45.29	1.21	330.56	220.85	-85.54	329.68	-56.07	338.53	42.28						
-500	331.38	15.76	333.56	45.78	1.71	331.82	227.34	-86.01	331.36	-55.59	339.61	42.80						
-400	332.57	16.25	334.59	46.28	2.20	333.07	235.25	-86.42	333.01	-55.10	340.70	43.33						
-300	333.76	16.75	335.62	46.78	2.71	334.32	244.85	-86.76	334.63	-54.61	341.79	43.86						
-200	334.95	17.25	336.66	47.29	3.22	335.57	256.21	-87.01	336.23	-54.11	342.89	44.40						
-100	336.15	17.76	337.71	47.80	3.73	336.82	268.97	-87.14	337.81	-53.60	344.00	44.94						
0	337.35	18.27	338.77	48.32	4.25	338.07	282.23	-87.13	339.35	-53.09	345.12	45.48						
100	338.54	18.79	339.83	48.84	4.77	339.32	294.83	-86.99	340.88	-52.57	346.24	46.02						
200	339.75	19.31	340.90	49.36	5.30	340.57	305.95	-86.74	342.39	-52.05	347.38	46.56						
300	340.95	19.83	341.98	49.89	5.83	341.82	315.30	-86.40	343.87	-51.53	348.52	47.11						
400	342.16	20.36	343.07	50.42	6.36	343.07	323.00	-85.99	345.33	-51.00	349.68	47.66						
500	343.37	20.89	344.17	50.95	6.90	344.32	329.31	-85.53	346.77	-50.47	350.84	48.21						
600	344.58	21.42	345.26	51.48	7.44	345.57	336.91	-85.04	348.20	-49.93	352.02	48.77						
700	345.80	21.96	346.40	52.02	7.98	346.83	346.91	-84.52	349.60	-49.39	353.21	49.32						
800	347.02	22.50	347.53	52.56	8.53	348.08	356.64	-83.99	350.99	-48.85	354.41	49.88						
900	348.25	23.04	348.67	53.10	9.08	349.34	365.87	-83.45	352.37	-48.31	355.63	50.43						
1000	349.48	23.58	349.83	53.65	9.63	350.59	376.69	-82.90	353.72	-47.76	356.86	50.99						
1100	350.71	24.13	351.00	54.19	10.18	351.85	388.20	-82.34	355.06	-47.22	358.10	51.55						
1200	351.95	24.68	352.18	54.74	10.73	353.11	399.46	-81.78	356.39	-46.67	359.37	52.10						
1300	353.20	25.23	353.38	55.29	11.29	354.38	410.31	-81.22	357.70	-46.13	360.64	52.66						
1400	354.45	25.78	354.60	55.84	11.84	355.64	420.74	-80.65	359.01	-45.58	361.91	53.22						
1500	355.71	26.33	355.83	56.39	12.40	356.91	430.84	-80.08	360.29	-45.03	363.18	53.78						
1600	356.97	26.88	357.09	56.94	12.96	358.18	440.51	-79.51	361.57	-44.48	364.45	54.33						
1700	358.24	27.43	358.36	57.49	13.51	359.46	450.74	-78.94	362.84	-43.94	365.72	54.89						
1800	359.52	27.99	359.65	58.05	14.07	360.74	460.51	-78.38	364.11	-43.39	367.00	55.44						
1900	0.80	28.54	0.96	58.60	14.63	2.02	470.74	-77.82	365.38	-42.85	368.28	55.99						
2000	2.10	29.09	2.29	59.15	15.18	3.31	480.74	-77.25	366.65	-42.31	369.56	56.54						
2100	3.40	29.64	3.65	59.70	15.74	4.60	490.74	-76.69	367.92	-41.76	370.84	57.08						
2200	4.71	30.19	5.04	60.25	16.29	5.90	500.74	-76.13	369.19	-41.23	372.12	57.63						
2300	6.02	30.74	6.45	60.80	16.84	7.20	510.74	-75.58	370.46	-40.69	373.40	58.17						
2400	7.33	31.29	7.89	61.35	17.39	8.51	520.74	-75.02	371.73	-40.15	374.68	58.70						
2500	8.69	31.83	9.36	61.89	17.94	9.82	530.74	-74.47	373.00	-39.62	375.96	59.23						

TABLE 2.—*The 5,000-year star catalog—Continued*

NU. (MAG)	(2.24)		(2.80)		(2.37)		(2.80)		(0.60)		(2.12)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	ERI ALPHA	DEC.	UMI ALPHA	DEC.
-2500	307.86	-40.72	322.22	36.98	321.45	11.95	326.18	36.22	313.82	-81.12	331.47	65.05
-2400	309.49	-40.36	323.21	37.43	322.62	12.39	327.21	36.59	317.56	-80.72	332.13	65.55
-2300	311.12	-40.00	324.20	37.88	323.80	12.34	328.24	37.17	321.04	-80.29	332.80	66.05
-2200	312.73	-39.62	325.19	38.34	324.98	13.30	329.28	37.65	324.27	-79.84	333.47	66.56
-2100	314.32	-39.23	326.19	38.81	326.16	13.76	330.32	38.13	327.27	-79.38	334.14	67.06
-2000	315.91	-38.83	327.19	39.28	327.34	14.23	331.36	38.63	330.07	-78.89	334.82	67.57
-1900	317.48	-38.42	328.19	39.76	328.52	14.71	332.41	39.12	332.69	-78.40	335.49	68.09
-1800	319.03	-38.00	329.20	40.24	329.70	15.19	333.46	39.62	335.14	-77.89	336.16	68.60
-1700	320.58	-37.57	330.21	40.73	330.88	15.68	334.52	40.13	337.44	-77.38	336.83	69.12
-1600	322.11	-37.12	331.23	41.22	332.06	16.17	335.58	40.64	339.61	-76.85	337.51	69.64
-1500	323.63	-36.67	332.25	41.72	333.24	16.67	336.65	41.16	341.67	-76.32	338.18	70.16
-1400	325.13	-36.21	333.27	42.22	334.43	17.17	337.72	41.67	343.61	-75.78	338.86	70.69
-1300	326.63	-35.75	334.30	42.73	335.61	17.68	338.80	42.17	345.46	-75.24	339.54	71.21
-1200	328.11	-35.27	335.33	43.24	336.80	18.19	339.88	42.72	347.23	-74.69	340.22	71.74
-1100	329.58	-34.79	336.37	43.75	337.99	18.71	340.98	43.25	348.91	-74.14	340.90	72.27
-1000	331.03	-34.30	337.41	44.27	339.18	19.23	342.07	43.79	350.53	-73.59	341.59	72.81
-900	332.48	-33.80	338.47	44.79	340.38	19.75	343.18	44.32	352.08	-73.03	342.28	73.34
-800	333.92	-33.30	339.52	45.32	341.58	20.28	344.30	44.86	353.58	-72.47	342.97	73.88
-700	335.34	-32.79	340.59	45.85	342.78	20.82	345.42	45.40	355.02	-71.91	343.67	74.42
-600	336.76	-32.27	341.66	46.38	343.98	21.35	346.55	45.95	356.47	-71.35	344.37	74.96
-500	338.16	-31.75	342.74	46.91	345.19	21.89	347.70	46.50	357.77	-70.79	345.07	75.50
-400	339.55	-31.23	343.83	47.45	346.40	22.43	348.85	47.05	359.09	-70.23	345.78	76.05
-300	340.93	-30.70	344.93	47.99	347.61	22.98	350.01	47.60	0.36	-69.67	346.49	76.59
-200	342.31	-30.17	346.03	48.54	348.83	23.52	351.19	48.15	1.61	-69.11	347.21	77.14
-100	343.68	-29.63	347.15	49.08	350.06	24.07	352.37	48.71	2.83	-68.55	347.94	77.69
0	345.04	-29.09	348.28	49.63	351.29	24.62	353.57	49.26	4.02	-67.99	348.68	78.24
100	346.39	-28.54	349.42	50.18	352.52	25.18	354.79	49.82	5.18	-67.43	349.43	78.79
200	347.73	-27.99	350.57	50.74	353.76	25.73	356.01	50.38	6.32	-66.87	350.19	79.34
300	349.06	-27.44	351.73	51.29	355.01	26.29	357.25	50.94	7.44	-66.31	350.96	79.90
400	350.39	-26.89	352.90	51.84	356.26	26.84	358.51	51.49	8.54	-65.76	351.75	80.45
500	351.71	-26.34	354.09	52.40	357.52	27.40	359.78	52.05	9.62	-65.21	352.56	81.01
600	353.02	-25.78	355.29	52.96	358.79	27.96	1.07	52.61	10.69	-64.66	353.39	81.56
700	354.33	-25.22	356.51	53.52	0.06	28.51	2.37	53.17	11.74	-64.11	354.25	82.12
800	355.63	-24.66	357.75	54.08	1.34	29.07	3.70	53.73	12.78	-63.56	355.14	82.68
900	356.92	-24.11	359.00	54.64	2.63	29.62	5.04	54.29	13.80	-63.02	356.08	83.23
1000	358.22	-23.55	0.27	55.19	3.93	30.18	6.41	54.84	14.81	-62.48	357.07	83.79
1100	359.50	-22.99	1.55	55.75	5.23	30.73	7.80	55.40	15.81	-61.94	358.13	84.35
1200	0.78	-22.43	2.86	56.31	6.55	31.29	9.21	55.95	16.80	-61.40	359.28	84.91
1300	2.06	-21.87	4.19	56.87	7.87	31.84	10.64	56.50	17.78	-60.87	0.57	85.47
1400	3.33	-21.31	5.54	57.42	9.20	32.39	12.10	57.04	18.75	-60.34	2.03	86.03
1500	4.60	-20.75	6.91	57.98	10.55	32.93	13.59	57.59	19.71	-59.81	3.76	86.58
1600	5.86	-20.19	8.31	58.53	11.90	33.48	15.10	58.12	20.67	-59.29	5.92	87.14
1700	7.13	-19.64	9.74	59.08	13.27	34.02	16.64	58.66	21.62	-58.77	8.81	87.69
1800	8.39	-19.09	11.19	59.63	14.64	34.56	18.21	59.19	22.56	-58.26	13.11	88.24
1900	9.64	-18.54	12.67	60.18	16.03	35.09	19.82	59.72	23.50	-57.74	20.64	88.77
2000	10.90	-17.99	14.18	60.72	17.43	35.62	21.45	60.24	24.43	-57.24	37.96	89.26
2100	12.15	-17.44	15.72	61.25	18.85	36.15	23.12	60.75	25.35	-56.73	88.39	89.54
2200	13.40	-16.90	17.29	61.79	20.27	36.67	24.83	61.26	26.28	-56.23	140.58	89.80
2300	14.65	-16.36	18.90	62.32	21.71	37.18	26.58	61.76	27.19	-55.74	158.65	88.28
2400	15.90	-15.82	20.55	62.84	23.16	37.69	28.36	62.25	28.11	-55.25	166.41	86.26
2500	17.15	-15.29	22.24	63.36	24.63	38.20	30.18	62.73	29.02	-54.76	170.80	87.72

TABLE 2.—The 5,000-year star catalog—Continued

YEAR	0066 R.A.	(2.72) DEC.	0073 R.A.	(2.28) DEC.	0074 R.A.	(2.23) DEC.	129825*(2.011) R.A.	(2.011) DEC.	0107 R.A.	(2.82) DEC.	0111 R.A.	(2.20) DEC.
	ARI BETA		AND GAMMA		ARI ALPHA		CET OMICRON		CET ALPHA		PER BETA	
-2500	330.80	-3.29	332.73	18.17	333.56	-0.57	337.77	-26.78	348.75	-19.03	345.45	17.63
-2400	332.06	-2.79	333.89	18.67	334.81	-0.06	339.12	-26.26	350.03	-18.47	346.66	18.18
-2300	333.33	-2.29	335.06	19.18	336.07	0.45	340.46	-25.74	351.31	-17.91	347.87	18.73
-2200	334.59	-1.79	336.23	19.70	337.32	0.96	341.80	-25.21	352.59	-17.36	349.08	19.28
-2100	335.85	-1.28	337.40	20.21	338.57	1.48	343.13	-24.68	353.86	-16.80	350.29	19.84
-2000	337.10	-0.76	338.57	20.74	339.82	2.01	344.45	-24.14	355.12	-16.24	351.51	20.40
-1900	338.36	-0.24	339.75	21.26	341.07	2.54	345.77	-23.60	356.39	-15.67	352.73	20.96
-1800	339.62	0.28	340.93	21.80	342.32	3.07	347.08	-23.06	357.65	-15.11	353.96	21.52
-1700	340.87	0.81	342.11	22.33	343.57	3.61	348.38	-22.51	358.91	-14.55	355.19	22.08
-1600	342.12	1.34	343.29	22.87	344.82	4.15	349.68	-21.97	360.16	-13.99	356.43	22.64
-1500	343.38	1.88	344.48	23.41	346.07	4.69	350.97	-21.42	361.41	-13.42	357.67	23.21
-1400	344.63	2.42	345.67	23.95	347.32	5.23	352.26	-20.86	362.66	-12.86	358.92	23.77
-1300	345.88	2.96	346.87	24.50	348.57	5.78	353.54	-20.31	363.91	-12.30	360.17	24.34
-1200	347.13	3.51	348.07	25.05	349.82	6.33	354.82	-19.76	365.16	-11.74	361.43	24.90
-1100	348.38	4.06	349.28	25.60	351.07	6.88	356.09	-19.20	366.40	-11.18	362.70	25.46
-1000	349.64	4.61	350.49	26.15	352.32	7.44	357.36	-18.64	367.65	-10.63	363.97	26.03
-900	350.89	5.16	351.71	26.71	353.58	7.99	358.63	-18.09	368.89	-10.07	365.25	26.59
-800	352.14	5.71	352.93	27.27	354.83	8.55	359.89	-17.53	370.14	-9.52	366.54	27.15
-700	353.40	6.27	354.16	27.82	356.09	9.11	361.15	-16.98	371.38	-8.97	367.84	27.71
-600	354.65	6.82	355.39	28.38	357.35	9.67	362.40	-16.42	372.62	-8.42	369.14	28.26
-500	355.91	7.38	356.63	28.94	358.62	10.22	363.66	-15.86	373.86	-7.87	370.46	28.82
-400	357.17	7.94	357.88	29.50	359.88	10.78	364.91	-15.31	375.11	-7.33	371.78	29.37
-300	358.44	8.50	359.14	30.06	361.15	11.34	366.16	-14.76	376.35	-6.79	373.11	29.92
-200	359.70	9.06	0.40	30.62	2.42	11.90	7.40	-14.21	377.60	-6.26	374.45	30.46
-100	0.97	9.62	1.67	31.18	3.70	12.46	8.65	-13.66	378.84	-5.73	375.80	31.00
0	2.24	10.18	2.96	31.74	4.98	13.01	9.89	-13.11	380.09	-5.20	377.17	31.54
100	3.51	10.73	4.24	32.30	6.27	13.57	11.13	-12.56	381.34	-4.68	378.54	32.08
200	4.79	11.29	5.54	32.86	7.56	14.12	12.38	-12.02	382.59	-4.16	379.92	32.61
300	6.07	11.84	6.85	33.42	8.85	14.67	13.62	-11.48	383.84	-3.64	381.32	33.13
400	7.36	12.40	8.17	33.97	10.15	15.22	14.86	-10.94	385.09	-3.14	382.72	33.65
500	8.65	12.95	9.50	34.52	11.45	15.77	16.10	-10.41	386.35	-2.63	384.14	34.17
600	9.94	13.50	10.84	35.07	12.76	16.31	17.34	-9.88	387.61	-2.14	385.57	34.67
700	11.24	14.05	12.19	35.62	14.07	16.85	18.58	-9.36	388.87	-1.65	387.02	35.18
800	12.54	14.59	13.55	36.16	15.40	17.39	19.82	-8.83	390.14	-1.16	388.47	35.67
900	13.85	15.13	14.93	36.70	16.72	17.92	21.07	-8.32	391.40	-0.66	389.94	36.16
1000	15.17	15.67	16.32	37.24	18.06	18.45	22.31	-7.80	392.67	-0.21	391.43	36.64
1100	16.49	16.21	17.72	37.77	19.40	18.98	23.55	-7.29	393.95	0.25	392.92	37.11
1200	17.81	16.74	19.13	38.30	20.74	19.50	24.80	-6.79	395.22	0.71	394.44	37.58
1300	19.14	17.26	20.56	38.83	22.10	20.01	26.05	-6.29	396.50	1.16	395.96	38.03
1400	20.48	17.79	22.00	39.35	23.46	20.53	27.30	-5.80	397.79	1.61	397.50	38.48
1500	21.83	18.30	23.46	39.86	24.83	21.03	28.55	-5.31	399.07	2.04	399.05	38.92
1600	23.18	18.82	24.93	40.37	26.20	21.53	29.80	-4.83	400.37	2.47	400.62	39.35
1700	24.54	19.32	26.42	40.87	27.59	22.02	31.06	-4.36	401.66	2.89	42.20	39.77
1800	25.90	19.82	27.92	41.36	28.98	22.51	32.31	-3.89	402.96	3.30	43.80	40.17
1900	27.28	20.32	29.44	41.85	30.38	22.99	33.57	-3.43	404.26	3.70	45.41	40.57
2000	28.66	20.81	30.97	42.33	31.79	23.46	34.84	-2.98	405.57	4.09	47.04	40.96
2100	30.05	21.29	32.53	42.80	33.21	23.93	36.10	-2.53	406.88	4.47	48.68	41.33
2200	31.45	21.77	34.10	43.27	34.64	24.39	37.37	-2.09	408.20	4.85	50.34	41.69
2300	32.85	22.23	35.68	43.72	36.07	24.83	38.64	-1.66	409.52	5.21	52.01	42.04
2400	34.26	22.69	37.29	44.17	37.52	25.28	39.92	-1.24	50.84	5.56	53.70	42.37
2500	35.69	23.15	38.97	44.60	38.97	25.71	41.19	-0.82	52.17	5.91	55.40	42.70

TABLE 2.—*The 5,000-year star catalog—Continued*

NG.(MAG)	(1.90)		(2.96)		(2.91)		(2.96)		(1.06)		(2.90)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	TAU ALPHA	DEC.	R.A.	DEC.
-2500	346.98	26.88	356.41	10.27	356.41	10.27	356.37	18.39	9.16	-2.25	9.20	15.89
-2400	348.17	27.43	357.73	2.96	357.73	2.96	356.61	18.95	10.41	-1.69	10.47	15.44
-2300	349.36	27.99	358.98	3.53	358.98	3.53	357.85	19.52	11.66	-1.14	11.75	16.00
-2200	350.56	28.54	0.23	4.09	0.15	11.97	359.10	20.08	12.91	-0.60	13.04	16.55
-2100	351.76	29.10	1.49	4.65	1.40	12.53	0.35	20.65	14.17	-0.05	14.33	17.10
-2000	352.97	29.66	2.74	5.22	2.66	13.10	1.60	21.21	15.42	0.49	15.63	17.65
-1900	354.19	30.22	4.00	5.78	3.92	13.66	2.86	21.78	16.68	1.03	16.93	18.19
-1800	355.41	30.79	5.25	6.34	5.18	14.23	4.13	22.34	17.94	1.57	18.24	18.73
-1700	356.64	31.35	6.51	6.90	6.45	14.79	5.40	22.90	19.20	2.10	19.55	19.26
-1600	357.88	31.91	7.78	7.46	7.72	15.35	6.68	23.46	20.46	2.62	20.88	19.79
-1500	359.12	32.48	9.04	8.02	9.00	15.91	7.97	24.02	21.73	3.15	22.21	20.31
-1400	0.38	33.04	10.31	8.58	10.28	16.46	9.26	24.58	23.00	3.66	23.55	20.83
-1300	1.64	33.60	11.59	9.13	11.57	17.02	10.56	25.14	24.28	4.17	24.89	21.35
-1200	2.91	34.17	12.86	9.68	12.86	17.57	11.87	25.69	25.55	4.68	26.24	21.86
-1100	4.20	34.73	14.14	10.23	14.16	18.11	13.19	26.24	26.83	5.18	27.60	22.36
-1000	5.49	35.29	15.43	10.77	15.47	18.66	14.52	26.78	28.12	5.68	28.97	22.85
-900	6.79	35.85	16.72	11.31	16.78	19.20	15.85	27.33	29.41	6.17	30.35	23.34
-800	8.10	36.41	18.01	11.85	18.10	19.74	17.19	27.87	30.70	6.65	31.74	23.83
-700	9.43	36.96	19.31	12.38	19.42	20.27	18.55	28.40	32.00	7.13	33.13	24.30
-600	10.77	37.52	20.62	12.91	20.76	20.80	19.91	28.93	33.30	7.59	34.54	24.77
-500	12.11	38.07	21.93	13.43	22.10	21.32	21.28	29.46	34.61	8.06	35.95	25.23
-400	13.48	38.62	23.24	13.95	23.45	21.84	22.67	29.98	35.92	8.51	37.37	25.68
-300	14.85	39.16	24.56	14.46	24.80	22.35	24.06	30.49	37.24	8.96	38.80	26.12
-200	16.24	39.70	25.89	14.97	26.17	22.86	25.46	31.00	38.56	9.40	40.24	26.55
-100	17.64	40.24	27.22	15.47	27.54	23.36	26.88	31.51	39.89	9.83	41.69	26.97
0	19.06	40.77	28.56	15.96	28.92	23.85	28.31	32.00	41.22	10.25	43.15	27.39
100	20.49	41.30	29.91	16.45	30.31	24.34	29.74	32.49	42.56	10.66	44.62	27.79
200	21.94	41.82	31.26	16.93	31.71	24.82	31.19	32.98	43.90	11.06	46.10	28.19
300	23.40	42.34	32.62	17.41	33.12	25.29	32.66	33.45	45.25	11.46	47.59	28.57
400	24.88	42.85	33.99	17.88	34.54	25.76	34.13	33.92	46.60	11.84	49.09	28.94
500	26.38	43.35	35.36	18.33	35.96	26.22	35.62	34.38	47.96	12.22	50.60	29.30
600	27.89	43.85	36.75	18.79	37.40	26.67	37.12	34.83	49.33	12.58	52.11	29.65
700	29.42	44.34	38.13	19.23	38.85	27.11	38.63	35.27	50.70	12.94	53.64	29.99
800	30.97	44.82	39.53	19.66	40.30	27.54	40.15	35.70	52.07	13.28	55.18	30.31
900	32.54	45.30	40.93	20.09	41.77	27.96	41.69	36.12	53.46	13.61	56.72	30.63
1000	34.13	45.76	42.34	20.51	43.24	28.37	43.24	36.54	54.84	13.94	58.27	30.93
1100	35.73	46.22	43.76	20.91	44.73	28.77	44.81	36.94	56.23	14.25	59.84	31.21
1200	37.36	46.67	45.19	21.31	46.22	29.16	46.38	37.33	57.63	14.55	61.41	31.49
1300	39.00	47.11	46.62	21.70	47.73	29.55	47.97	37.71	59.03	14.84	62.99	31.75
1400	40.67	47.54	48.06	22.08	49.24	29.91	49.58	38.07	60.44	15.11	64.57	31.99
1500	42.35	47.95	49.51	22.44	50.77	30.27	51.19	38.43	61.85	15.38	66.17	32.23
1600	44.06	48.36	50.97	22.80	52.30	30.62	52.82	38.77	63.27	15.63	67.77	32.44
1700	45.78	48.75	52.43	23.14	53.84	30.95	54.46	39.10	64.69	15.87	69.38	32.65
1800	47.53	49.14	53.91	23.47	55.40	31.28	56.12	39.42	66.11	16.09	71.00	32.83
1900	49.29	49.51	55.38	23.80	56.96	31.59	57.79	39.72	67.55	16.31	72.62	33.01
2000	51.08	49.86	56.87	24.11	58.53	31.88	59.46	40.01	68.98	16.51	74.25	33.17
2100	52.89	50.20	58.36	24.40	60.11	32.17	61.15	40.29	70.42	16.70	75.88	33.31
2200	54.71	50.53	59.87	24.69	61.70	32.44	62.85	40.55	71.86	16.87	77.52	33.44
2300	56.56	50.84	61.37	24.96	63.30	32.69	64.57	40.79	73.31	17.03	79.16	33.55
2400	58.42	51.14	62.89	25.22	64.91	32.94	66.29	41.02	74.76	17.18	80.81	33.64
2500	60.30	51.43	64.41	25.46	66.52	33.16	68.02	41.24	76.21	17.31	82.46	33.72

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	0188 ERI BETA	(2.92)	DEC.	0193 AUR ALPHA	(0.21)	DEC.	0194 ORI BETA	(0.34)	DEC.	0201 ORI GAMMA	(1.70)	DEC.	0202 TAU BETA	(1.781)	DEC.	0204 LEP BETA	(2.96)	DEC.
-2500	23.61	-20.67	8.21	28.69	26.33	-23.18	23.90	-8.56	23.90	-8.56	16.73	12.74	16.73	12.74	35.03	33.56	35.03	33.56
-2400	24.78	-20.15	9.52	29.23	27.47	-22.68	25.11	-8.05	25.11	-8.05	18.02	13.27	18.02	13.27	36.06	33.10	36.06	33.10
-2300	25.94	-19.64	10.83	29.78	28.61	-22.18	26.33	-7.54	26.33	-7.54	19.31	13.80	19.31	13.80	37.10	32.65	37.10	32.65
-2200	27.09	-19.14	12.15	30.33	29.75	-21.68	27.55	-7.03	27.55	-7.03	20.61	14.33	20.61	14.33	38.13	32.20	38.13	32.20
-2100	28.25	-18.64	13.48	30.87	30.89	-21.20	28.76	-6.54	28.76	-6.54	21.92	14.86	21.92	14.86	39.16	31.76	39.16	31.76
-2000	29.41	-18.15	14.82	31.41	32.03	-20.71	29.98	-6.04	29.98	-6.04	23.23	15.37	23.23	15.37	40.19	31.33	40.19	31.33
-1900	30.57	-17.66	16.18	31.94	33.17	-20.24	31.21	-5.56	31.21	-5.56	24.55	15.89	24.55	15.89	41.22	30.90	41.22	30.90
-1800	31.73	-17.18	17.54	32.47	34.31	-19.77	32.43	-5.08	32.43	-5.08	25.87	16.39	25.87	16.39	42.25	30.49	42.25	30.49
-1700	32.89	-16.71	18.91	33.00	35.44	-19.30	33.66	-4.60	33.66	-4.60	27.20	16.89	27.20	16.89	43.28	30.07	43.28	30.07
-1600	34.05	-16.24	20.30	33.52	36.58	-18.85	34.89	-4.14	34.89	-4.14	28.54	17.39	28.54	17.39	44.31	29.67	44.31	29.67
-1500	35.21	-15.78	21.69	34.04	37.72	-18.40	36.12	-3.68	36.12	-3.68	29.88	17.88	29.88	17.88	45.34	29.27	45.34	29.27
-1400	36.37	-15.32	23.10	34.55	38.86	-17.95	37.35	-3.23	37.35	-3.23	31.24	18.36	31.24	18.36	46.37	28.88	46.37	28.88
-1300	37.53	-14.87	24.52	35.05	40.00	-17.52	38.59	-2.78	38.59	-2.78	32.59	18.83	32.59	18.83	47.40	28.50	47.40	28.50
-1200	38.69	-14.43	25.96	35.55	41.15	-17.09	39.83	-2.35	39.83	-2.35	33.96	19.30	33.96	19.30	48.43	28.12	48.43	28.12
-1100	39.86	-14.00	27.40	36.04	42.29	-16.67	41.07	-1.92	41.07	-1.92	35.33	19.76	35.33	19.76	49.47	27.75	49.47	27.75
-1000	41.02	-13.57	28.86	36.53	43.43	-16.26	42.32	-1.50	42.32	-1.50	36.71	20.21	36.71	20.21	50.50	27.39	50.50	27.39
-900	42.19	-13.16	30.34	37.01	44.58	-15.85	43.57	-1.09	43.57	-1.09	38.10	20.65	38.10	20.65	51.53	27.04	51.53	27.04
-800	43.36	-12.75	31.82	37.48	45.73	-15.45	44.82	-0.68	44.82	-0.68	39.50	21.09	39.50	21.09	52.57	26.70	52.57	26.70
-700	44.53	-12.34	33.33	37.95	46.88	-15.07	46.08	-0.29	46.08	-0.29	40.90	21.51	40.90	21.51	53.60	26.36	53.60	26.36
-600	45.70	-11.95	34.84	38.40	48.03	-14.69	47.34	0.10	47.34	0.10	42.31	21.93	42.31	21.93	54.64	26.03	54.64	26.03
-500	46.88	-11.56	36.37	38.85	49.18	-14.31	48.60	0.47	48.60	0.47	43.73	22.34	43.73	22.34	55.68	25.72	55.68	25.72
-400	48.06	-11.19	37.92	39.29	50.33	-13.95	49.87	0.84	49.87	0.84	45.16	22.73	45.16	22.73	56.72	25.41	56.72	25.41
-300	49.23	-10.82	39.47	39.71	51.49	-13.60	51.14	1.20	51.14	1.20	46.59	23.12	46.59	23.12	57.76	25.10	57.76	25.10
-200	50.41	-10.46	41.05	40.13	52.65	-13.25	52.41	1.54	52.41	1.54	48.04	23.50	48.04	23.50	58.80	24.81	58.80	24.81
-100	51.60	-10.11	42.64	40.54	53.81	-12.91	53.69	1.88	53.69	1.88	49.49	23.86	49.49	23.86	59.84	24.53	59.84	24.53
0	52.78	-9.77	44.24	40.94	54.97	-12.59	54.97	2.21	54.97	2.21	50.95	24.22	50.95	24.22	60.89	24.25	60.89	24.25
100	53.97	-9.43	45.86	41.32	56.13	-12.27	56.26	2.52	56.26	2.52	52.41	24.56	52.41	24.56	61.93	23.99	61.93	23.99
200	55.16	-9.11	47.49	41.69	57.30	-11.96	57.55	2.83	57.55	2.83	53.89	24.89	53.89	24.89	62.98	23.73	62.98	23.73
300	56.35	-8.80	49.14	42.06	58.46	-11.66	58.84	3.13	58.84	3.13	55.37	25.21	55.37	25.21	64.03	23.48	64.03	23.48
400	57.55	-8.49	50.81	42.41	59.63	-11.38	60.13	3.41	60.13	3.41	56.86	25.52	56.86	25.52	65.08	23.24	65.08	23.24
500	58.74	-8.20	52.49	42.74	60.81	-11.10	61.43	3.68	61.43	3.68	58.36	25.81	58.36	25.81	66.13	23.01	66.13	23.01
600	59.94	-7.92	54.18	43.07	61.98	-10.83	62.73	3.94	62.73	3.94	59.87	26.10	59.87	26.10	67.18	22.79	67.18	22.79
700	61.14	-7.65	55.89	43.37	63.16	-10.57	64.04	4.20	64.04	4.20	61.38	26.37	61.38	26.37	68.23	22.58	68.23	22.58
800	62.35	-7.38	57.61	43.67	64.34	-10.33	65.35	4.43	65.35	4.43	62.90	26.62	62.90	26.62	69.29	22.38	69.29	22.38
900	63.55	-7.13	59.34	43.95	65.52	-10.09	66.66	4.66	66.66	4.66	64.42	26.87	64.42	26.87	70.35	22.19	70.35	22.19
1000	64.76	-6.89	61.09	44.22	66.70	-9.86	67.98	4.88	67.98	4.88	65.96	27.10	65.96	27.10	71.41	22.01	71.41	22.01
1100	65.97	-6.66	62.85	44.47	67.88	-9.65	69.30	5.08	69.30	5.08	67.49	27.31	67.49	27.31	72.47	21.84	72.47	21.84
1200	67.18	-6.44	64.62	44.70	69.07	-9.44	70.62	5.27	70.62	5.27	69.04	27.51	69.04	27.51	73.53	21.68	73.53	21.68
1300	68.40	-6.23	66.41	44.92	71.94	-9.25	73.94	5.45	73.94	5.45	70.59	27.70	70.59	27.70	74.59	21.53	74.59	21.53
1400	69.62	-6.03	68.20	45.13	71.45	-9.06	73.27	5.62	73.27	5.62	72.15	27.88	72.15	27.88	75.65	21.39	75.65	21.39
1500	70.84	-5.85	70.01	45.32	72.64	-8.89	74.60	5.77	74.60	5.77	73.71	28.04	73.71	28.04	76.72	21.26	76.72	21.26
1600	72.06	-5.67	71.83	45.49	73.84	-8.73	75.93	5.91	75.93	5.91	75.27	28.18	75.27	28.18	77.78	21.14	77.78	21.14
1700	73.28	-5.51	73.65	45.64	75.03	-8.58	77.27	6.04	77.27	6.04	76.84	28.31	76.84	28.31	78.85	21.03	78.85	21.03
1800	74.51	-5.36	75.48	45.78	76.23	-8.44	78.60	6.16	78.60	6.16	78.41	28.47	78.41	28.47	79.92	20.93	79.92	20.93
1900	75.73	-5.22	77.32	45.90	77.43	-8.32	79.94	6.26	79.94	6.26	79.99	28.52	79.99	28.52	80.99	20.84	80.99	20.84
2000	76.96	-5.09	79.17	46.00	78.63	-8.20	81.28	6.35	81.28	6.35	81.57	28.61	81.57	28.61	82.06	20.76	82.06	20.76
2100	78.19	-4.97	81.02	46.08	79.84	-8.10	82.63	6.43	82.63	6.43	83.16	28.68	83.16	28.68	83.13	20.69	83.13	20.69
2200	79.43	-4.86	82.88	46.15	81.04	-8.01	83.97	6.49	83.97	6.49	84.74	28.73	84.74	28.73	84.21	20.63	84.21	20.63
2300	80.66	-4.77	84.74	46.20	82.25	-7.92	85.32	6.54	85.32	6.54	86.33	28.77	86.33	28.77	85.28	20.58	85.28	20.58
2400	81.89	-4.69	86.61	46.23	83.45	-7.86	86.66	6.58	86.66	6.58	87.92	28.79	87.92	28.79	86.36	20.55	86.36	20.55
2500	83.13	-4.62	88.47	46.24	84.66	-7.80	88.01	6.61	88.01	6.61	89.51	28.80	89.51	28.80	87.43	20.52	87.43	20.52

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0206 (2.48)		0207 (2.69)		0209 (2.89)		0210 (1.75)		0215 (2.75)		132444*(2.05)	
	R.A.	DEC.	LEP ALPHA	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	27.81	-14.27	34.88	-30.55	30.70	-19.24	29.16	-14.76	45.45	-44.55	30.52	-15.05
-2400	29.00	-13.78	35.94	-30.09	31.84	-18.75	30.33	-14.26	46.31	-44.16	31.69	-14.57
-2300	30.18	-13.28	36.99	-29.63	32.99	-18.27	31.51	-13.78	47.16	-43.77	32.87	-14.09
-2200	31.36	-12.80	38.05	-29.19	34.14	-17.80	32.69	-13.30	48.01	-43.39	34.04	-13.62
-2100	32.55	-12.32	39.10	-28.74	35.29	-17.34	33.86	-12.83	48.87	-43.02	35.21	-13.15
-2000	33.73	-11.84	40.16	-28.31	36.44	-16.88	35.04	-12.36	49.72	-42.65	36.39	-12.69
-1900	34.92	-11.38	41.21	-27.88	37.59	-16.43	36.23	-11.90	50.58	-42.29	37.57	-12.24
-1800	36.10	-10.92	42.27	-27.46	38.74	-15.98	37.41	-11.45	51.43	-41.93	38.74	-11.80
-1700	37.29	-10.46	43.32	-27.04	39.84	-15.55	38.59	-11.00	52.29	-41.58	39.92	-11.36
-1600	38.48	-10.02	44.38	-26.63	41.04	-15.12	39.78	-10.57	53.15	-41.24	41.11	-10.93
-1500	39.68	-9.58	45.44	-26.23	42.20	-14.69	40.97	-10.13	54.01	-40.91	42.29	-10.51
-1400	40.87	-9.15	46.49	-25.84	43.35	-14.28	42.15	-9.71	54.87	-40.58	43.47	-10.10
-1300	42.07	-8.73	47.55	-25.46	44.51	-13.87	43.35	-9.30	55.73	-40.26	44.66	-9.69
-1200	43.27	-8.31	48.61	-25.08	45.67	-13.48	44.54	-8.89	56.59	-39.95	45.85	-9.29
-1100	44.47	-7.90	49.67	-24.71	46.83	-13.09	45.74	-8.49	57.45	-39.64	47.04	-8.91
-1000	45.67	-7.51	50.73	-24.35	47.99	-12.70	46.93	-8.11	58.32	-39.34	48.24	-8.53
-900	46.88	-7.12	51.79	-24.00	49.16	-12.33	48.14	-7.73	59.18	-39.05	49.43	-8.15
-800	48.09	-6.74	52.85	-23.65	50.33	-11.97	49.34	-7.35	60.05	-38.76	50.63	-7.79
-700	49.30	-6.36	53.91	-23.32	51.49	-11.61	50.54	-6.99	60.92	-38.46	51.83	-7.44
-600	50.51	-6.00	54.98	-22.99	52.67	-11.27	51.75	-6.64	61.79	-38.22	53.04	-7.10
-500	51.73	-5.65	56.05	-22.67	53.84	-10.93	52.96	-6.30	62.66	-37.96	54.24	-6.76
-400	52.95	-5.31	57.11	-22.36	55.01	-10.60	54.18	-5.96	63.54	-37.70	55.45	-6.44
-300	54.17	-4.97	58.18	-22.06	56.19	-10.29	55.39	-5.64	64.41	-37.46	56.66	-6.13
-200	55.40	-4.65	59.25	-21.77	57.37	-9.98	56.61	-5.32	65.29	-37.22	57.88	-5.82
-100	56.62	-4.33	60.32	-21.49	58.55	-9.68	57.83	-5.02	66.16	-36.99	59.09	-5.53
0	57.86	-4.03	61.40	-21.22	59.74	-9.39	59.06	-4.73	67.04	-36.77	60.31	-5.25
100	59.09	-3.74	62.47	-20.95	60.92	-9.11	60.28	-4.44	67.92	-36.55	61.54	-4.97
200	60.32	-3.45	63.55	-20.70	62.11	-8.85	61.51	-4.17	68.81	-36.35	62.76	-4.71
300	61.56	-3.18	64.63	-20.45	63.30	-8.59	62.75	-3.91	69.69	-36.15	63.99	-4.46
400	62.81	-2.92	65.71	-20.22	64.49	-8.34	63.98	-3.66	70.57	-35.96	65.22	-4.22
500	64.05	-2.67	66.79	-19.99	65.69	-8.11	65.22	-3.42	71.46	-35.78	66.45	-3.99
600	65.30	-2.43	67.87	-19.77	66.89	-7.88	66.46	-3.19	72.35	-35.61	67.68	-3.77
700	66.55	-2.20	68.95	-19.57	68.09	-7.67	67.70	-2.97	73.24	-35.44	68.92	-3.57
800	67.80	-1.99	70.04	-19.37	69.29	-7.46	68.95	-2.76	74.13	-35.28	70.16	-3.37
900	69.05	-1.78	71.13	-19.19	70.49	-7.27	70.19	-2.57	75.02	-35.14	71.40	-3.19
1000	70.31	-1.59	72.22	-19.01	71.70	-7.09	71.44	-2.38	75.91	-35.00	72.65	-3.01
1100	71.57	-1.40	73.31	-18.85	72.91	-6.92	72.70	-2.21	76.81	-34.87	73.89	-2.85
1200	72.83	-1.23	74.40	-18.69	74.12	-6.76	73.95	-2.05	77.70	-34.74	75.14	-2.70
1300	74.10	-1.07	75.49	-18.54	75.33	-6.61	75.21	-1.90	78.60	-34.63	76.39	-2.57
1400	75.36	-0.93	76.59	-18.41	76.54	-6.48	76.47	-1.77	79.50	-34.52	77.64	-2.44
1500	76.63	-0.79	77.68	-18.29	77.76	-6.36	77.73	-1.64	80.40	-34.43	78.90	-2.33
1600	77.90	-0.67	78.78	-18.17	78.97	-6.24	78.99	-1.53	81.30	-34.34	80.15	-2.23
1700	79.17	-0.56	79.88	-18.07	80.19	-6.14	80.25	-1.43	82.20	-34.26	81.41	-2.14
1800	80.45	-0.46	80.98	-17.98	81.41	-6.05	81.52	-1.34	83.10	-34.19	82.67	-2.06
1900	81.72	-0.37	82.08	-17.89	82.64	-5.98	82.78	-1.27	84.01	-34.13	83.93	-2.00
2000	83.00	-0.30	83.18	-17.82	83.86	-5.91	84.05	-1.20	84.91	-34.07	85.19	-1.94
2100	84.28	-0.24	84.29	-17.76	85.08	-5.86	85.32	-1.15	85.82	-34.03	86.45	-1.90
2200	85.56	-0.19	85.39	-17.71	86.31	-5.81	86.59	-1.11	86.73	-33.99	87.72	-1.87
2300	86.84	-0.15	86.50	-17.67	87.53	-5.78	87.87	-1.08	87.63	-33.95	88.98	-1.86
2400	88.12	-0.13	87.60	-17.64	88.76	-5.77	89.14	-1.07	88.54	-33.95	90.25	-1.85
2500	89.41	-0.12	88.71	-17.63	89.99	-5.76	90.41	-1.07	89.45	-33.94	91.51	-1.86

TABLE 2.—*The 5,000-year star catalog—Continued*

YEAR	0220 ORI KAPPA (2.20)		0224 ORI ALPHA (0.10)		0227 AUR BETA (2.07)		058636*(2.72)		0243 CHA BETA (1.99)		0245 CAR ALPHA (-0.86)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	35.19	-21.62	30.56	-5.06	17.00	30.19	20.33	23.16	47.30	-25.86	72.43	-55.43
-2400	36.31	-21.16	31.78	-4.58	18.35	30.73	21.67	23.69	48.34	-25.48	72.90	-55.26
-2300	37.43	-20.71	33.01	-4.10	19.70	31.26	23.02	24.21	49.39	-25.11	73.37	-55.09
-2200	38.55	-20.26	34.24	-3.63	21.07	31.79	24.38	24.73	50.44	-24.74	73.85	-54.93
-2100	39.67	-19.82	35.47	-3.16	22.45	32.32	25.74	25.24	51.49	-24.39	74.32	-54.78
-2000	40.79	-19.39	36.70	-2.70	23.85	32.84	27.11	25.74	52.54	-24.04	74.81	-54.62
-1900	41.91	-18.97	37.94	-2.25	25.25	33.35	28.50	26.24	53.59	-23.70	75.29	-54.48
-1800	43.03	-18.55	39.18	-1.81	26.66	33.86	29.89	26.73	54.64	-23.37	75.78	-54.34
-1700	44.16	-18.14	40.43	-1.38	28.09	34.36	31.29	27.22	55.70	-23.05	76.27	-54.20
-1600	45.28	-17.74	41.67	-0.95	29.53	34.85	32.70	27.69	56.75	-22.73	76.77	-54.06
-1500	46.41	-17.34	42.92	-0.53	30.98	35.34	34.12	28.16	57.81	-22.43	77.26	-53.94
-1400	47.54	-16.96	44.18	-0.12	32.45	35.82	35.55	28.63	58.87	-22.13	77.76	-53.81
-1300	48.67	-16.58	45.43	0.28	33.93	36.29	37.00	29.08	59.93	-21.84	78.27	-53.70
-1200	49.80	-16.22	46.69	0.67	35.42	36.76	38.45	29.52	60.99	-21.57	78.77	-53.58
-1100	50.93	-15.86	47.96	1.05	36.92	37.21	39.91	29.96	62.05	-21.30	79.28	-53.47
-1000	52.06	-15.50	49.23	1.43	38.44	37.66	41.38	30.38	63.11	-21.04	79.80	-53.37
-900	53.20	-15.16	50.50	1.79	39.98	38.09	42.87	30.80	64.18	-20.79	80.31	-53.27
-800	54.34	-14.83	51.77	2.14	41.53	38.52	44.36	31.21	65.25	-20.55	80.83	-53.18
-700	55.48	-14.51	53.05	2.49	43.09	38.93	45.85	31.60	66.32	-20.32	81.35	-53.09
-600	56.62	-14.19	54.33	2.82	44.66	39.34	47.39	31.99	67.39	-20.10	81.87	-53.01
-500	57.76	-13.89	55.62	3.14	46.25	39.73	48.91	32.36	68.46	-19.89	82.39	-52.93
-400	58.90	-13.59	56.91	3.46	47.86	40.11	50.45	32.72	69.53	-19.68	82.92	-52.86
-300	60.05	-13.31	58.20	3.76	49.48	40.49	52.00	33.07	70.60	-19.49	83.44	-52.79
-200	61.20	-13.03	59.50	4.05	51.11	40.84	53.56	33.41	71.68	-19.31	83.97	-52.73
-100	62.35	-12.77	60.80	4.33	52.76	41.19	55.13	33.74	72.76	-19.14	84.51	-52.67
0	63.50	-12.51	62.10	4.60	54.42	41.52	56.71	34.05	73.84	-18.98	85.04	-52.62
100	64.66	-12.27	63.41	4.86	56.09	41.84	58.30	34.35	74.92	-18.83	85.57	-52.57
200	65.82	-12.03	64.72	5.10	57.78	42.15	59.90	34.63	76.00	-18.69	86.11	-52.53
300	66.98	-11.81	66.04	5.34	59.48	42.44	61.51	34.91	77.08	-18.56	86.65	-52.49
400	68.14	-11.59	67.35	5.56	61.19	42.72	63.12	35.16	78.17	-18.44	87.19	-52.46
500	69.30	-11.39	68.68	5.77	62.92	42.98	64.75	35.41	79.25	-18.33	87.73	-52.44
600	70.46	-11.20	70.00	5.97	64.66	43.23	66.39	35.64	80.34	-18.23	88.28	-52.42
700	71.63	-11.02	71.33	6.15	66.41	43.46	68.03	35.85	81.43	-18.14	88.82	-52.40
800	72.80	-10.85	72.66	6.32	68.17	43.67	69.68	36.05	82.52	-18.06	89.37	-52.39
900	73.97	-10.69	73.99	6.49	69.94	43.87	71.34	36.24	83.61	-17.99	89.91	-52.39
1000	75.14	-10.54	75.33	6.63	71.72	44.06	73.01	36.41	84.70	-17.94	90.46	-52.39
1100	76.31	-10.40	76.66	6.77	73.51	44.22	74.68	36.56	85.80	-17.89	91.01	-52.40
1200	77.49	-10.27	78.00	6.89	75.30	44.37	76.36	36.70	86.89	-17.86	91.56	-52.41
1300	78.66	-10.16	79.35	7.00	77.11	44.51	78.04	36.82	87.98	-17.83	92.11	-52.42
1400	79.84	-10.05	80.69	7.10	78.92	44.62	79.73	36.92	89.08	-17.82	92.66	-52.45
1500	81.02	-9.96	82.04	7.18	80.74	44.72	81.42	37.01	90.18	-17.81	93.22	-52.48
1600	82.20	-9.88	83.39	7.25	82.56	44.80	83.12	37.09	91.28	-17.82	93.77	-52.51
1700	83.39	-9.81	84.74	7.31	84.39	44.86	84.82	37.14	92.37	-17.84	94.32	-52.55
1800	84.57	-9.75	86.09	7.36	86.22	44.91	86.52	37.18	93.47	-17.87	94.88	-52.59
1900	85.75	-9.71	87.44	7.39	88.05	44.94	88.23	37.21	94.57	-17.91	95.43	-52.64
2000	86.94	-9.67	88.79	7.41	89.88	44.95	89.93	37.21	95.67	-17.96	95.99	-52.70
2100	88.13	-9.65	90.15	7.41	91.72	44.94	91.64	37.20	96.78	-18.02	96.54	-52.76
2200	89.31	-9.63	91.50	7.40	93.55	44.91	93.34	37.18	97.88	-18.09	97.10	-52.82
2300	90.50	-9.63	92.86	7.38	95.38	44.87	95.05	37.13	98.98	-18.17	97.66	-52.89
2400	91.69	-9.64	94.21	7.35	97.21	44.81	96.75	37.07	100.08	-18.26	98.21	-52.97
2500	92.88	-9.67	95.57	7.30	99.04	44.73	98.45	37.00	101.19	-18.36	98.77	-53.05

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	(1.93)		(1.58)		(2.83)		(1.63)		(1.98)		(2.74)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	36.82	7.20	52.03	-20.85	75.20	-51.15	61.31	-32.10	62.16	-28.81	70.28	-37.29
-2400	36.12	7.65	53.11	-20.54	75.77	-51.01	62.25	-31.83	63.13	-28.54	71.12	-37.10
-2300	39.42	8.09	54.19	-20.24	76.35	-50.67	63.19	-31.57	64.11	-28.29	71.97	-36.92
-2200	40.73	8.53	55.27	-19.95	76.93	-50.74	64.13	-31.32	65.09	-28.05	72.81	-36.75
-2100	42.03	8.95	56.35	-19.67	77.51	-50.62	65.07	-31.07	66.06	-27.82	73.66	-36.59
-2000	43.35	9.37	57.43	-19.40	78.09	-50.50	66.01	-30.84	67.04	-27.59	74.51	-36.43
-1900	44.67	9.77	58.51	-19.13	78.67	-50.39	66.96	-30.61	68.02	-27.37	75.36	-36.28
-1800	45.99	10.17	59.60	-18.88	79.26	-50.28	67.90	-30.40	69.00	-27.17	76.21	-36.14
-1700	47.32	10.56	60.68	-18.63	79.85	-50.18	68.85	-30.19	69.99	-26.97	77.06	-36.01
-1600	48.66	10.93	61.77	-18.40	80.44	-50.08	69.80	-29.99	70.97	-26.78	77.92	-35.89
-1500	50.00	11.30	62.85	-18.17	81.03	-49.99	70.75	-29.80	71.95	-26.60	78.77	-35.78
-1400	51.34	11.66	63.94	-17.95	81.62	-49.91	71.70	-29.62	72.94	-26.43	79.63	-35.67
-1300	52.69	12.00	65.03	-17.75	82.22	-49.83	72.65	-29.44	73.93	-26.27	80.48	-35.57
-1200	54.05	12.34	66.12	-17.55	82.82	-49.76	73.60	-29.26	74.92	-26.12	81.34	-35.48
-1100	55.41	12.66	67.21	-17.36	83.42	-49.69	74.55	-29.12	75.91	-25.98	82.20	-35.40
-1000	56.78	12.98	68.30	-17.19	84.02	-49.63	75.51	-28.96	76.90	-25.84	83.06	-35.33
-900	58.15	13.28	69.39	-17.02	84.62	-49.58	76.47	-28.84	77.89	-25.72	83.93	-35.27
-800	59.52	13.57	70.48	-16.86	85.23	-49.53	77.42	-28.71	78.89	-25.61	84.79	-35.21
-700	60.90	13.85	71.58	-16.71	85.83	-49.49	78.38	-28.60	79.88	-25.50	85.65	-35.16
-600	62.29	14.12	72.67	-16.58	86.44	-49.45	79.34	-28.49	80.88	-25.41	86.52	-35.13
-500	63.68	14.37	73.77	-16.45	87.04	-49.42	80.31	-28.39	81.88	-25.32	87.38	-35.10
-400	65.07	14.61	74.86	-16.33	87.65	-49.39	81.27	-28.30	82.87	-25.25	88.25	-35.07
-300	66.47	14.84	75.96	-16.23	88.26	-49.36	82.23	-28.22	83.87	-25.18	89.12	-35.06
-200	67.88	15.06	77.06	-16.13	88.88	-49.36	83.20	-28.15	84.87	-25.13	89.99	-35.06
-100	69.28	15.26	78.15	-16.05	89.49	-49.36	84.16	-28.08	85.88	-25.08	90.86	-35.06
-0	70.69	15.45	79.25	-15.97	90.10	-49.36	85.13	-28.03	86.88	-25.05	91.73	-35.07
100	72.11	15.63	80.35	-15.91	90.72	-49.36	86.10	-27.99	87.88	-25.02	92.60	-35.10
200	73.53	15.80	81.45	-15.86	91.33	-49.37	87.07	-27.96	88.89	-25.01	93.47	-35.13
300	74.95	15.95	82.55	-15.81	91.95	-49.39	88.04	-27.93	89.89	-25.00	94.35	-35.16
400	76.38	16.09	83.65	-15.78	92.56	-49.42	89.01	-27.92	90.90	-25.00	95.22	-35.21
500	77.80	16.21	84.75	-15.76	93.18	-49.45	89.98	-27.91	91.91	-25.02	96.09	-35.27
600	79.24	16.32	85.86	-15.75	93.80	-49.48	90.96	-27.92	92.92	-25.04	96.97	-35.33
700	80.67	16.42	86.96	-15.75	94.42	-49.52	91.93	-27.93	93.92	-25.08	97.85	-35.48
800	82.11	16.50	88.06	-15.76	95.04	-49.57	92.90	-27.95	94.93	-25.12	98.72	-35.48
900	83.54	16.57	89.16	-15.78	95.66	-49.63	93.88	-27.99	95.94	-25.17	99.60	-35.57
1000	84.98	16.62	90.27	-15.81	96.28	-49.69	94.86	-28.03	96.96	-25.23	100.48	-35.67
1100	86.43	16.66	91.37	-15.86	96.90	-49.75	95.83	-28.08	97.97	-25.31	101.36	-35.77
1200	87.87	16.69	92.47	-15.91	97.52	-49.82	96.81	-28.14	98.98	-25.39	102.23	-35.89
1300	89.31	16.70	93.57	-15.97	98.14	-49.90	97.79	-28.21	99.99	-25.48	103.11	-36.01
1400	90.76	16.70	94.68	-16.05	98.76	-49.99	98.77	-28.29	101.01	-25.58	103.99	-36.14
1500	92.20	16.69	95.78	-16.13	99.38	-50.08	99.75	-28.39	102.02	-25.69	104.88	-36.28
1600	93.65	16.66	96.88	-16.23	100.00	-50.17	100.73	-28.48	103.03	-25.81	105.76	-36.43
1700	95.09	16.61	97.98	-16.34	100.62	-50.27	101.71	-28.59	104.05	-25.94	106.64	-36.58
1800	96.54	16.56	99.08	-16.45	101.24	-50.38	102.69	-28.71	105.07	-26.08	107.52	-36.75
1900	97.98	16.48	100.19	-16.58	101.86	-50.50	103.67	-28.84	106.08	-26.23	108.40	-36.92
2000	99.43	16.40	101.29	-16.72	102.48	-50.61	104.66	-28.97	107.10	-26.39	109.29	-37.10
2100	100.87	16.30	102.39	-16.86	103.10	-50.74	105.64	-29.12	108.11	-26.56	110.17	-37.29
2200	102.31	16.19	103.49	-17.02	103.72	-50.87	106.62	-29.27	109.13	-26.74	111.05	-37.48
2300	103.75	16.06	104.59	-17.19	104.34	-51.01	107.61	-29.44	110.15	-26.93	111.94	-37.68
2400	105.19	15.92	105.69	-17.37	104.96	-51.15	108.59	-29.61	111.17	-27.12	112.82	-37.90
2500	106.63	15.77	106.79	-17.56	105.58	-51.30	109.58	-29.79	112.19	-27.33	113.71	-38.12

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	0283 (2.43)		0287 (1.99)		0291 (0.48)		0295 (1.21)		0306 (2.27)		0308 (2.88)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	61.23	-29.78	42.52	26.86	55.57	4.55	47.34	24.67	81.84	-35.19	74.41	-20.93
-2400	68.18	-29.56	43.96	27.27	56.85	4.83	48.77	25.04	82.69	-35.11	75.45	-20.79
-2300	69.14	-29.35	45.41	27.67	58.14	5.10	50.20	25.40	83.55	-35.04	76.49	-20.65
-2200	70.09	-29.16	46.88	28.06	59.43	5.36	51.64	25.75	84.40	-34.98	77.53	-20.52
-2100	71.04	-28.97	48.35	28.44	60.72	5.61	53.10	26.08	85.26	-34.93	78.57	-20.40
-2000	72.00	-28.79	49.83	28.80	62.01	5.84	54.56	26.41	86.11	-34.89	79.61	-20.29
-1900	72.95	-28.62	51.32	29.16	63.31	6.07	56.02	26.72	86.97	-34.86	80.65	-20.20
-1800	73.91	-28.46	52.82	29.50	64.60	6.28	57.50	27.03	87.83	-34.83	81.70	-20.11
-1700	74.87	-28.30	54.33	29.83	65.91	6.49	58.98	27.32	88.69	-34.81	82.74	-20.03
-1600	75.83	-28.16	55.84	30.15	67.21	6.68	60.47	27.59	89.55	-34.80	83.79	-19.97
-1500	76.79	-28.03	57.37	30.46	68.52	6.86	61.97	27.86	90.41	-34.80	84.84	-19.91
-1400	77.76	-27.90	58.90	30.75	69.83	7.03	63.47	28.11	91.27	-34.81	85.89	-19.86
-1300	78.72	-27.79	60.45	31.03	71.14	7.18	64.98	28.35	92.13	-34.83	86.94	-19.83
-1200	79.68	-27.68	62.00	31.30	72.45	7.32	66.50	28.57	93.00	-34.85	87.99	-19.80
-1100	80.65	-27.59	63.56	31.55	73.77	7.45	68.02	28.78	93.86	-34.86	89.04	-19.79
-1000	81.62	-27.50	65.12	31.79	75.09	7.57	69.55	28.98	94.73	-34.93	90.09	-19.78
-900	82.59	-27.42	66.70	32.02	76.41	7.68	71.06	29.16	95.59	-34.98	91.14	-19.79
-800	83.56	-27.35	68.28	32.23	77.73	7.77	72.62	29.33	96.46	-35.04	92.20	-19.80
-700	84.53	-27.29	69.87	32.42	79.06	7.85	74.17	29.48	97.32	-35.11	93.25	-19.83
-600	85.50	-27.25	71.46	32.61	80.38	7.92	75.72	29.62	98.19	-35.18	94.31	-19.87
-500	86.47	-27.21	73.06	32.77	81.71	7.98	77.27	29.75	99.06	-35.27	95.36	-19.91
-400	87.44	-27.18	74.67	32.93	83.04	8.02	78.83	29.86	99.93	-35.36	96.42	-19.97
-300	88.42	-27.16	76.28	33.06	84.37	8.05	80.39	29.96	100.80	-35.46	97.48	-20.04
-200	89.39	-27.15	77.90	33.19	85.69	8.06	81.56	30.04	101.67	-35.57	98.53	-20.11
-100	90.37	-27.14	79.52	33.29	87.02	8.07	83.53	30.10	102.53	-35.69	99.59	-20.20
-U	91.35	-27.15	81.14	33.38	88.36	8.06	85.10	30.15	103.40	-35.81	100.65	-20.30
100	92.32	-27.17	82.77	33.46	89.69	8.04	86.67	30.19	104.28	-35.95	101.71	-20.41
200	93.30	-27.20	84.40	33.52	91.02	8.00	88.24	30.21	105.15	-36.05	102.77	-20.52
300	94.28	-27.23	86.03	33.56	92.35	7.95	89.82	30.21	106.02	-36.24	103.83	-20.65
400	95.26	-27.28	87.67	33.59	93.68	7.89	91.39	30.20	106.89	-36.40	104.89	-20.79
500	96.24	-27.34	89.30	33.60	95.01	7.82	92.97	30.18	107.76	-36.57	105.95	-20.94
600	97.22	-27.40	90.94	33.59	96.34	7.73	94.54	30.14	108.64	-36.74	107.01	-21.10
700	98.21	-27.48	92.58	33.57	97.67	7.63	96.11	30.08	109.51	-36.92	108.07	-21.26
800	99.19	-27.56	94.21	33.53	99.00	7.52	97.69	30.01	110.38	-37.11	109.13	-21.44
900	100.17	-27.66	95.85	33.48	100.32	7.40	99.26	29.92	111.26	-37.31	110.19	-21.63
1000	101.16	-27.76	97.48	33.41	101.65	7.26	100.83	29.82	112.13	-37.52	111.25	-21.83
1100	102.14	-27.87	99.12	33.33	102.98	7.11	102.39	29.71	113.00	-37.73	112.32	-22.03
1200	103.13	-28.00	100.75	33.23	104.30	6.95	103.96	29.58	113.88	-37.96	113.38	-22.25
1300	104.11	-28.13	102.37	33.12	105.62	6.78	105.52	29.43	114.76	-38.18	114.44	-22.47
1400	105.10	-28.27	104.00	32.98	106.94	6.59	107.08	29.27	115.63	-38.42	115.50	-22.71
1500	106.08	-28.42	105.62	32.84	108.26	6.39	108.63	29.10	116.51	-38.67	116.57	-22.95
1600	107.07	-28.58	107.23	32.68	109.58	6.18	110.18	28.91	117.38	-38.92	117.63	-23.20
1700	108.06	-28.74	108.85	32.50	110.89	5.96	111.72	28.71	118.26	-39.18	118.69	-23.47
1800	109.05	-28.92	110.45	32.31	112.21	5.73	113.26	28.50	119.14	-39.45	119.76	-23.74
1900	110.03	-29.11	112.05	32.11	113.52	5.48	114.80	28.27	120.02	-39.72	120.82	-24.02
2000	111.02	-29.30	113.65	31.89	114.83	5.22	116.33	28.03	120.90	-40.00	121.89	-24.30
2100	112.01	-29.51	115.24	31.66	116.13	4.96	117.85	27.77	121.78	-40.29	122.95	-24.60
2200	113.00	-29.72	116.82	31.41	117.64	4.68	119.37	27.50	122.66	-40.59	124.02	-24.91
2300	113.99	-29.94	118.40	31.15	118.74	4.39	120.88	27.22	123.54	-40.89	125.08	-25.22
2400	114.98	-30.17	119.97	30.87	120.04	4.09	122.39	26.93	124.42	-41.20	126.15	-25.54
2500	115.97	-30.41	121.53	30.59	121.33	3.78	123.89	26.63	125.30	-41.52	127.22	-25.87

TABLE 2.—The 5,000-year star catalog—Continued

NG.(MAG)	0309 VEL GAMMA	(1.92)	DEC.	0315 CAR EPSILON	(1.74)	DEC.	0345 VEL LAMBDA	(2.22)	DEC.	0348 CAR BETA	(1.80)	DEC.	0351 CAR IOTA	(2.25)	DEC.	0353 VEL KAPPA	(2.63)	DEC.
-2500	87.83	-40.89	100.25	-49.65	96.47	-32.37	117.91	-53.93	108.32	-45.36	106.00	-41.39	109.02	-45.54	106.76	-41.55		
-2400	88.59	-40.88	100.84	-49.75	97.36	-32.44	118.46	-54.20	109.02	-45.54	106.76	-41.55	109.72	-45.73	107.53	-41.89		
-2300	89.35	-40.87	101.43	-49.86	98.25	-32.51	119.01	-54.47	109.72	-45.73	107.53	-41.89	110.42	-45.92	108.30	-42.07		
-2200	90.11	-40.86	102.02	-49.98	99.14	-32.60	119.56	-54.75	110.42	-45.92	108.30	-42.07	111.13	-46.12	109.07	-42.26		
-2100	90.87	-40.87	102.61	-50.10	100.03	-32.69	120.10	-55.03	111.13	-46.12	109.07	-42.26	111.83	-46.33	109.84	-42.45		
-2000	91.63	-40.88	103.21	-50.22	100.93	-32.80	120.64	-55.32	111.83	-46.33	109.84	-42.45	112.53	-46.54	110.60	-42.64		
-1900	92.39	-40.90	103.79	-50.35	101.82	-32.91	121.18	-55.61	112.53	-46.54	110.60	-42.64	113.23	-46.76	111.37	-42.83		
-1800	93.16	-40.93	104.38	-50.49	102.71	-33.03	121.71	-55.90	113.23	-46.76	111.37	-42.83	114.93	-46.99	112.14	-43.02		
-1700	93.92	-40.96	104.97	-50.63	103.61	-33.15	122.25	-56.20	114.93	-46.99	112.14	-43.02	115.63	-47.22	112.91	-43.21		
-1600	94.68	-41.00	105.55	-50.78	104.50	-33.29	122.77	-56.50	115.63	-47.22	112.91	-43.21	116.38	-47.46	113.67	-43.40		
-1500	95.45	-41.05	106.14	-50.94	105.39	-33.44	123.30	-56.81	116.38	-47.46	113.67	-43.40	117.08	-47.70	114.44	-43.59		
-1400	96.21	-41.11	106.72	-51.10	106.29	-33.59	123.82	-57.12	117.08	-47.70	114.44	-43.59	117.78	-47.95	115.21	-43.78		
-1300	96.98	-41.17	107.31	-51.26	107.18	-33.75	124.34	-57.44	117.78	-47.95	115.21	-43.78	118.48	-48.21	116.04	-43.97		
-1200	97.75	-41.25	107.89	-51.43	108.08	-33.92	124.86	-57.76	118.48	-48.21	116.04	-43.97	119.18	-48.47	116.74	-44.16		
-1100	98.51	-41.33	108.47	-51.61	108.98	-34.10	125.37	-58.08	119.18	-48.47	116.74	-44.16	120.88	-48.74	117.51	-44.35		
-1000	99.28	-41.41	109.05	-51.79	109.87	-34.29	125.88	-58.41	120.88	-48.74	117.51	-44.35	121.58	-49.01	118.27	-44.54		
-900	100.05	-41.51	109.63	-51.97	110.77	-34.48	126.38	-58.74	121.58	-49.01	118.27	-44.54	122.27	-49.29	119.04	-44.73		
-800	100.82	-41.61	110.21	-52.17	111.66	-34.69	126.88	-59.08	122.27	-49.29	119.04	-44.73	122.96	-49.58	119.80	-44.92		
-700	101.59	-41.72	110.79	-52.36	112.56	-34.90	127.38	-59.41	122.96	-49.58	119.80	-44.92	123.65	-50.78	120.57	-45.11		
-600	102.35	-41.83	111.36	-52.57	113.46	-35.12	127.87	-59.76	123.65	-50.78	120.57	-45.11	124.34	-51.10	121.34	-45.30		
-500	103.12	-41.96	111.94	-52.77	114.35	-35.35	128.36	-60.10	124.34	-51.10	121.34	-45.30	125.03	-51.41	122.10	-45.49		
-400	103.89	-42.09	112.51	-52.98	115.25	-35.58	128.84	-60.45	125.03	-51.41	122.10	-45.49	125.71	-51.74	122.87	-45.68		
-300	104.66	-42.23	113.08	-53.20	116.15	-35.83	129.32	-60.81	126.84	-60.45	122.87	-45.68	126.40	-52.07	123.63	-45.87		
-200	105.43	-42.37	113.65	-53.43	117.05	-36.08	129.79	-61.16	127.87	-60.81	123.63	-45.87	127.09	-52.41	124.40	-46.06		
-100	106.20	-42.53	114.22	-53.65	117.95	-36.34	130.26	-61.52	128.36	-61.16	124.40	-46.06	127.77	-52.75	125.16	-46.25		
0	106.97	-42.69	114.79	-53.89	118.85	-36.60	130.72	-61.89	128.84	-61.52	125.16	-46.25	128.45	-53.09	125.93	-46.44		
100	107.74	-42.85	115.35	-54.12	119.75	-36.88	131.17	-62.25	129.32	-61.89	125.93	-46.44	129.14	-53.44	126.70	-46.63		
200	108.51	-43.03	115.92	-54.37	120.65	-37.16	131.62	-62.62	129.79	-62.25	126.70	-46.63	129.82	-53.80	127.46	-46.82		
300	109.28	-43.21	116.48	-54.61	121.55	-37.45	132.07	-62.99	130.26	-62.62	127.46	-46.82	130.50	-54.16	128.23	-47.01		
400	110.05	-43.40	117.04	-54.86	122.45	-37.75	132.51	-63.37	130.72	-62.99	128.23	-47.01	131.18	-54.50	129.00	-47.20		
500	110.82	-43.59	117.59	-55.12	123.35	-38.05	132.94	-63.74	131.18	-63.37	129.00	-47.20	131.86	-54.84	129.76	-47.39		
600	111.59	-43.80	118.15	-55.38	124.25	-38.36	133.36	-64.13	132.51	-63.74	129.76	-47.39	132.54	-55.18	130.52	-47.58		
700	112.36	-44.01	118.70	-55.65	125.16	-38.68	133.78	-64.51	133.00	-64.13	130.52	-47.58	133.22	-55.57	131.29	-47.77		
800	113.14	-44.22	119.25	-55.92	126.06	-39.00	134.18	-64.90	133.78	-64.51	131.29	-47.77	133.89	-55.96	132.06	-47.96		
900	113.91	-44.45	119.80	-56.20	126.97	-39.34	134.58	-65.29	134.58	-65.29	132.06	-47.96	134.57	-56.43	132.82	-48.15		
1000	114.68	-44.68	120.34	-56.48	127.87	-39.68	134.98	-65.68	135.00	-65.68	132.82	-48.15	135.24	-56.82	133.59	-48.34		
1100	115.45	-44.91	120.89	-56.76	128.78	-40.02	135.36	-66.07	135.49	-66.07	133.59	-48.34	135.90	-57.22	134.36	-48.53		
1200	116.22	-45.16	121.43	-57.05	129.69	-40.38	135.73	-66.47	136.00	-66.47	134.36	-48.53	136.67	-57.62	135.13	-48.72		
1300	116.99	-45.41	121.96	-57.34	130.60	-40.74	136.09	-66.87	136.45	-66.87	135.13	-48.72	137.44	-58.03	136.00	-48.91		
1400	117.76	-45.66	122.50	-57.64	131.51	-41.10	136.45	-67.27	136.88	-67.27	136.00	-48.91	138.21	-58.44	136.77	-49.10		
1500	118.53	-45.93	123.03	-57.94	132.42	-41.47	136.77	-67.67	137.36	-67.67	136.77	-49.10	139.00	-58.84	137.54	-49.29		
1600	119.30	-46.19	123.55	-58.25	133.33	-41.85	137.12	-68.08	137.74	-68.08	137.54	-49.29	140.73	-59.28	138.32	-49.48		
1700	120.07	-46.47	124.08	-58.56	134.25	-42.24	137.44	-68.49	138.00	-68.49	138.32	-49.48	141.47	-60.13	139.00	-49.67		
1800	120.84	-46.75	124.60	-58.87	135.16	-42.63	137.74	-68.89	138.50	-68.89	139.00	-49.67	142.21	-60.99	140.00	-49.86		
1900	121.61	-47.04	125.12	-59.19	136.08	-43.03	138.00	-69.31	139.00	-69.31	140.00	-49.86	143.00	-61.88	141.00	-50.05		
2000	122.38	-47.34	125.63	-59.51	137.00	-43.43	138.50	-69.72	139.50	-69.72	141.00	-50.05	143.79	-62.77	142.00	-50.24		
2100	123.15	-47.64	126.14	-59.84	137.92	-43.84	138.56	-70.13	140.00	-70.13	142.00	-50.24	144.58	-63.66	143.00	-50.43		
2200	123.92	-47.94	126.64	-60.16	138.84	-44.26	139.00	-70.55	140.50	-70.55	143.00	-50.43	145.37	-64.55	144.00	-50.62		
2300	124.70	-48.26	127.14	-60.50	139.77	-44.68	139.00	-70.97	141.00	-70.97	144.00	-50.62	146.16	-65.44	145.00	-50.81		
2400	125.47	-48.58	127.64	-60.84	140.70	-45.11	139.23	-71.38	141.50	-71.38	145.00	-50.81	146.95	-66.33	146.00	-51.00		
2500	126.24	-48.90	128.13	-61.18	141.63	-45.54	139.41	-71.80	142.00	-71.80	146.00	-51.00	147.74	-67.22	147.00	-51.19		

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0354 HYA ALPHA		(2.16)		0380 LEO ALPHA		(1.34)		081298*(2.61)		22321*(2.85)		0416 UMA BETA		(2.44)		0417 UMA ALPHA		(1.95)	
	YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.
-2500	85.64	1.12	87.67	24.17	86.33	32.42	117.32	-30.76	117.32	-30.76	117.32	-30.76	64.76	67.39	53.12	71.07	53.12	71.07	53.12	71.07
-2400	86.90	1.15	89.17	24.19	87.95	32.45	118.28	-31.03	89.57	32.46	119.23	-31.30	67.26	67.62	55.72	71.40	55.72	71.40	55.72	71.40
-2300	88.16	1.18	90.66	24.18	89.57	32.46	119.23	-31.30	91.19	32.46	120.18	-31.58	69.79	67.83	58.39	71.70	58.39	71.70	58.39	71.70
-2200	89.42	1.19	92.16	24.17	91.19	32.46	120.18	-31.58	92.81	32.44	121.13	-31.87	72.37	68.02	61.13	71.98	61.13	71.98	61.13	71.98
-2100	90.68	1.19	93.66	24.14	92.81	32.44	121.13	-31.87	94.43	32.40	122.09	-32.17	74.97	68.18	63.94	72.24	63.94	72.24	63.94	72.24
-2000	91.94	1.18	95.15	24.09	94.43	32.40	122.09	-32.17	96.05	32.35	123.04	-32.47	77.60	68.32	66.80	72.47	66.80	72.47	66.80	72.47
-1900	93.21	1.16	96.65	24.03	96.05	32.35	123.04	-32.47	97.67	32.28	123.99	-32.79	80.26	68.43	69.73	72.68	69.73	72.68	69.73	72.68
-1800	94.47	1.12	98.14	23.96	97.67	32.28	123.99	-32.79	99.29	32.20	124.95	-33.11	82.93	68.51	72.70	72.86	72.70	72.86	72.70	72.86
-1700	95.73	1.07	99.64	23.87	99.29	32.20	124.95	-33.11	101.13	32.10	125.90	-33.43	85.62	68.57	75.72	73.01	75.72	73.01	75.72	73.01
-1600	97.00	1.01	101.13	23.77	100.90	32.10	125.90	-33.43	102.51	31.98	126.86	-33.77	88.31	68.60	78.78	73.13	78.78	73.13	78.78	73.13
-1500	98.26	0.93	102.62	23.65	102.51	31.98	126.86	-33.77	104.12	31.85	127.81	-34.11	91.01	68.61	81.87	73.22	81.87	73.22	81.87	73.22
-1400	99.52	0.85	104.11	23.52	104.12	31.85	127.81	-34.11	105.73	31.70	128.77	-34.46	93.71	68.59	84.99	73.28	84.99	73.28	84.99	73.28
-1300	100.78	0.75	105.59	23.37	105.73	31.70	128.77	-34.46	107.33	31.54	129.73	-34.82	96.40	68.54	88.12	73.31	88.12	73.31	88.12	73.31
-1200	102.05	0.64	107.07	23.21	107.33	31.54	129.73	-34.82	108.92	31.36	130.68	-35.18	99.08	68.47	91.25	73.31	99.08	68.47	91.25	73.31
-1100	103.31	0.51	108.55	23.04	108.92	31.36	130.68	-35.18	110.51	31.17	131.64	-35.56	101.74	68.37	94.38	73.28	101.74	68.37	94.38	73.28
-1000	104.57	0.38	110.03	22.85	110.51	31.17	131.64	-35.56	112.10	30.96	132.60	-35.94	104.38	68.24	97.49	73.22	104.38	68.24	97.49	73.22
-900	105.83	0.23	111.50	22.65	112.10	30.96	132.60	-35.94	113.68	30.74	133.57	-36.32	107.00	68.09	100.58	73.13	107.00	68.09	100.58	73.13
-800	107.09	0.07	112.97	22.43	113.68	30.74	133.57	-36.32	115.25	30.51	134.53	-36.71	109.59	67.92	103.64	73.01	109.59	67.92	103.64	73.01
-700	108.35	-0.10	114.43	22.21	115.25	30.51	134.53	-36.71	116.82	30.26	135.49	-37.11	112.14	67.72	106.67	72.86	112.14	67.72	106.67	72.86
-600	109.61	-0.28	115.89	21.96	116.82	30.26	135.49	-37.11	118.38	29.99	136.46	-37.52	114.66	67.49	109.64	72.68	114.66	67.49	109.64	72.68
-500	110.87	-0.47	117.35	21.71	118.38	29.99	136.46	-37.52	119.93	29.72	137.43	-37.93	117.14	67.25	112.57	72.47	117.14	67.25	112.57	72.47
-400	112.12	-0.68	118.60	21.45	119.93	29.72	137.43	-37.93	121.48	29.43	138.40	-38.35	119.58	66.98	115.44	72.24	119.58	66.98	115.44	72.24
-300	113.38	-0.90	120.25	21.17	121.48	29.43	138.40	-38.35	123.02	29.13	139.37	-38.77	121.98	66.70	118.25	71.98	121.98	66.70	118.25	71.98
-200	114.63	-1.12	121.69	20.88	123.02	29.13	139.37	-38.77	124.56	28.81	140.32	-39.20	124.33	66.39	120.99	71.70	124.33	66.39	120.99	71.70
-100	115.88	-1.36	123.12	20.58	124.56	28.81	140.32	-39.20	126.08	28.48	141.34	-39.64	126.64	66.07	123.67	71.40	126.64	66.07	123.67	71.40
0	117.14	-1.61	124.55	20.26	126.08	28.48	141.34	-39.64	127.60	28.14	142.30	-40.08	128.90	65.73	126.28	71.08	128.90	65.73	126.28	71.08
100	118.39	-1.87	125.98	19.94	127.60	28.14	142.30	-40.08	129.11	27.79	143.28	-40.53	131.11	65.37	128.82	70.73	131.11	65.37	128.82	70.73
200	119.63	-2.14	127.40	19.66	129.11	27.79	143.28	-40.53	130.61	27.43	144.26	-40.98	133.28	64.99	133.70	70.37	133.28	64.99	133.70	70.37
300	120.88	-2.43	128.82	19.26	130.61	27.43	144.26	-40.98	132.11	27.06	145.25	-41.44	135.41	64.60	135.04	69.99	135.41	64.60	135.04	69.99
400	122.13	-2.72	130.23	18.90	132.11	27.06	145.25	-41.44	133.59	26.67	146.24	-41.90	137.49	64.19	136.04	69.59	137.49	64.19	136.04	69.59
500	123.37	-3.02	131.63	18.53	133.59	26.67	146.24	-41.90	135.07	26.26	147.24	-42.37	139.52	63.78	138.32	69.17	139.52	63.78	138.32	69.17
600	124.62	-3.33	133.03	18.15	135.07	26.26	147.24	-42.37	136.54	25.87	148.24	-42.85	141.51	63.35	140.52	68.75	141.51	63.35	140.52	68.75
700	125.86	-3.65	134.43	17.77	136.54	25.87	148.24	-42.85	138.01	25.46	149.24	-43.33	143.46	62.90	142.67	68.31	143.46	62.90	142.67	68.31
800	127.10	-3.99	135.82	17.37	138.01	25.46	149.24	-43.33	139.46	25.03	150.24	-43.81	145.37	62.45	144.76	67.85	145.37	62.45	144.76	67.85
900	128.34	-4.33	137.20	16.96	139.46	25.03	150.24	-43.81	140.91	24.60	151.26	-44.30	147.23	61.98	146.78	67.39	147.23	61.98	146.78	67.39
1000	129.58	-4.68	138.58	16.55	140.91	24.60	151.26	-44.30	142.35	24.16	152.27	-44.80	149.06	61.51	148.76	66.91	149.06	61.51	148.76	66.91
1100	130.81	-5.04	139.95	16.12	142.35	24.16	152.27	-44.80	143.78	23.71	153.29	-45.29	150.85	61.03	150.68	66.43	150.85	61.03	150.68	66.43
1200	132.05	-5.41	141.32	15.69	143.78	23.71	153.29	-45.29	145.21	23.25	154.32	-45.80	152.60	60.54	152.54	65.93	152.60	60.54	152.54	65.93
1300	133.28	-5.79	142.68	15.25	145.21	23.25	154.32	-45.80	146.63	22.78	155.35	-46.30	154.36	60.04	154.36	65.43	154.36	60.04	154.36	65.43
1400	134.52	-6.17	144.04	14.80	146.63	22.78	155.35	-46.30	148.04	22.31	156.39	-46.81	156.00	59.53	156.14	64.92	156.00	59.53	156.14	64.92
1500	135.75	-6.57	145.39	14.35	148.04	22.31	156.39	-46.81	149.44	21.83	157.42	-47.33	157.65	59.02	157.87	64.41	157.65	59.02	157.87	64.41
1600	136.98	-6.97	146.74	13.88	149.44	21.83	157.42	-47.33	150.84	21.34	158.49	-47.85	159.27	58.50	159.56	63.89	159.27	58.50	159.56	63.89
1700	138.21	-7.38	148.09	13.42	150.84	21.34	158.49	-47.85	152.23	20.85	159.55	-48.37	160.86	57.98	161.20	63.36	160.86	57.98	161.20	63.36
1800	139.44	-7.80	149.43	12.94	152.23	20.85	159.55	-48.37	153.61	20.35	160.62	-48.89	162.42	57.45	162.81	62.83	162.42	57.45	162.81	62.83
1900	140.67	-8.23	150.76	12.46	153.61	20.35	160.62	-48.89	154.99	19.84	161.69	-49.42	163.95	56.92	164.39	62.29	163.95	56.92	164.39	62.29
2000	141.90	-8.66	152.09	11.97	154.99	19.84	161.69	-49.42	156.36	19.33	162.78	-49.95	165.46	56.38	165.99	61.75	165.46	56.38	165.99	61.75
2100	143.12	-9.10	153.42	11.47	156.36	19.33	162.78	-49.95	157.73	18.81	163.87	-50.49	166.94	55.84	167.44	61.21	166.94	55.84	167.44	61.21
2200	144.35	-9.55	154.74	10.97	157.73	18.81	163.87	-50.49	159.09	18.29	164.97	-51.02	168.40	55.30	168.92	60.66	168.40	55.30	168.92	60.66
2300	145.58	-10.00	156.06	10.47	159.09	18.29	164.97	-51.02	160.45	17.77	166.09	-51.56	169.84	54.75	170.37	60.11	169.84	54.75	170.37	60.11
2400	146.81	-10.46	157.38	9.96	160.45	17.77	166.09	-51.56	161.80	17.24	167.21	-52.10	171.80	54.21	171.80	59.56	171.80	54.21	171.80	59.56
2500	148.03	-10.93	158.69	9.44	161.80	17.24	167.21	-52.10	163.17	16.72	168.09	-52.63	173.20	53.66	173.20	59.01	173.20	53.66	173.20	59.01

TABLE 2.—*The 5,000-year star catalog*—Continued

NO. (MAG)	0422 LEO DELTA	(2.58)	DEC.	0444 LEO BETA	(2.23)	DEC.	0447 UMA GAMMA	(2.54)	DEC.	0452 CEN DELTA	(2.88)	DEC.	0457 CRV GAMMA	(2.79)	DEC.	0462 CRU ALPHA	(1.10)	DEC.
-2500	100.69	37.81	113.71	34.84	84.98	70.64	132.31	-28.30	127.55	4.57	138.35	-39.89						
-2400	102.38	37.69	115.30	34.60	87.85	70.68	133.33	-28.68	128.83	4.22	139.28	-40.31						
-2300	104.06	37.56	116.89	34.34	90.72	70.69	134.35	-29.08	130.10	3.86	140.21	-40.74						
-2200	105.73	37.41	118.46	34.07	93.59	70.67	135.38	-29.48	131.38	3.49	141.15	-41.18						
-2100	107.40	37.25	120.03	33.79	96.45	70.62	136.40	-29.88	132.65	3.11	142.09	-41.63						
-2000	109.07	37.07	121.59	33.49	99.29	70.55	137.43	-30.29	133.91	2.72	143.03	-42.06						
-1900	110.73	36.88	123.14	33.19	102.12	70.44	138.46	-30.71	135.18	2.32	143.98	-42.53						
-1800	112.38	36.67	124.68	32.86	104.92	70.31	139.49	-31.14	136.44	1.92	144.93	-42.99						
-1700	114.02	36.44	126.22	32.53	107.69	70.16	140.52	-31.57	137.70	1.51	145.88	-43.46						
-1600	115.66	36.20	127.74	32.19	110.42	69.97	141.55	-32.01	138.96	1.08	146.83	-43.93						
-1500	117.29	35.95	129.26	31.83	113.11	69.76	142.58	-32.46	140.21	0.65	147.79	-44.40						
-1400	118.91	35.68	130.76	31.46	115.76	69.53	143.62	-32.91	141.47	0.22	148.75	-44.88						
-1300	120.52	35.40	132.26	31.08	118.36	69.28	144.66	-33.37	142.72	-0.23	149.71	-45.37						
-1200	122.12	35.10	133.75	30.69	120.91	69.00	145.70	-33.83	143.97	-0.68	150.68	-45.86						
-1100	123.71	34.79	135.22	30.29	123.41	68.70	146.74	-34.30	145.22	-1.14	151.66	-46.35						
-1000	125.30	34.47	136.69	29.88	125.85	68.38	147.79	-34.78	146.46	-1.61	152.64	-46.85						
-900	126.87	34.13	138.15	29.46	128.24	68.04	148.84	-35.25	147.71	-2.08	153.62	-47.35						
-800	128.44	33.79	139.61	29.03	130.58	67.69	149.89	-35.74	148.95	-2.56	154.61	-47.86						
-700	129.99	33.43	141.05	28.60	132.86	67.31	150.95	-36.23	150.19	-3.04	155.60	-48.37						
-600	131.54	33.06	142.48	28.15	135.08	66.92	152.01	-36.72	151.43	-3.53	156.60	-48.89						
-500	133.07	32.68	143.91	27.69	137.26	66.52	153.08	-37.22	152.67	-4.03	157.61	-49.41						
-400	134.60	32.28	145.32	27.23	139.38	66.10	154.15	-37.73	153.91	-4.53	158.63	-49.93						
-300	136.11	31.88	146.73	26.76	141.45	65.67	155.22	-38.24	155.15	-5.04	159.65	-50.45						
-200	137.62	31.47	148.13	26.28	143.46	65.22	156.30	-38.75	156.38	-5.55	160.68	-50.98						
-100	139.12	31.04	149.52	25.80	145.44	64.77	157.36	-39.27	157.62	-6.07	161.71	-51.51						
0	140.60	30.61	150.90	25.31	147.36	64.30	158.47	-39.79	158.86	-6.59	162.76	-52.05						
100	142.08	30.17	152.28	24.81	149.24	63.82	159.57	-40.31	160.10	-7.11	163.82	-52.59						
200	143.55	29.72	153.65	24.31	151.07	63.34	160.67	-40.84	161.33	-7.64	164.88	-53.13						
300	145.00	29.26	155.01	23.80	152.86	62.84	161.78	-41.37	162.57	-8.18	165.96	-53.67						
400	146.45	28.79	156.36	23.28	154.61	62.34	162.90	-41.90	163.81	-8.71	167.05	-54.22						
500	147.89	28.32	157.71	22.76	156.33	61.83	164.02	-42.44	165.05	-9.25	168.14	-54.76						
600	149.32	27.84	159.05	22.24	158.00	61.31	165.15	-42.98	166.29	-9.79	169.26	-55.31						
700	150.74	27.35	160.38	21.71	159.65	60.79	166.29	-43.52	167.54	-10.34	170.38	-55.86						
800	152.15	26.86	161.71	21.18	161.25	60.26	167.44	-44.07	168.78	-10.88	171.52	-56.42						
900	153.56	26.35	163.03	20.64	162.87	59.73	168.60	-44.62	170.03	-11.43	172.67	-56.97						
1000	154.95	25.85	164.35	20.10	164.37	59.20	169.76	-45.17	171.28	-11.99	173.84	-57.53						
1100	156.34	25.33	165.66	19.56	165.89	58.66	170.94	-45.72	172.53	-12.54	175.03	-58.08						
1200	157.72	24.82	166.97	19.01	167.38	58.11	172.13	-46.27	173.79	-13.09	176.23	-58.64						
1300	159.10	24.29	168.27	18.46	168.84	57.57	173.33	-46.82	175.04	-13.65	177.46	-59.20						
1400	160.46	23.77	169.57	17.91	170.28	57.02	174.54	-47.38	176.30	-14.20	178.70	-59.76						
1500	161.82	23.23	170.86	17.36	171.70	56.47	175.76	-47.94	177.57	-14.76	179.96	-60.32						
1600	163.18	22.70	172.15	16.80	173.09	55.92	177.00	-48.49	178.84	-15.32	181.25	-60.87						
1700	164.52	22.16	173.43	16.25	174.46	55.36	178.25	-49.05	180.11	-15.87	182.56	-61.43						
1800	165.86	21.62	174.71	15.69	175.81	54.81	179.51	-49.61	181.38	-16.43	183.90	-61.99						
1900	167.20	21.07	175.99	15.13	177.14	54.25	180.79	-50.17	182.67	-16.99	185.26	-62.54						
2000	168.53	20.52	177.26	14.57	178.46	53.69	182.09	-50.72	183.95	-17.54	186.65	-63.10						
2100	169.85	19.97	178.54	14.01	179.75	53.14	183.40	-51.28	185.24	-18.10	188.07	-63.65						
2200	171.17	19.42	179.81	13.45	181.04	52.58	184.73	-51.83	186.54	-18.65	189.53	-64.20						
2300	172.48	18.87	181.07	12.89	182.30	52.03	186.08	-52.39	187.84	-19.20	191.01	-64.75						
2400	173.79	18.31	182.34	12.33	183.55	51.47	187.45	-52.94	189.15	-19.75	192.54	-65.29						
2500	175.10	17.75	183.60	11.78	184.79	50.92	188.84	-53.49	190.46	-20.30	194.11	-65.83						

TABLE 2.—The 5,000-year star catalog—Continued

NU. (MAG)	0468 (1.61) CRU GAMMA		0471 (2.84) CRV BETA		0474 (2.94) MUS ALPHA		223603*(2.39) CEN GAMMA		138917*(2.91) VIR GAMMA		0481 (1.50) CRU BETA	
	YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	
-2500	137.46	-33.61	132.56	-0.46	141.46	-45.58	138.07	-25.59	131.96	21.53	140.76	-36.08
-2400	138.45	-34.03	133.81	-0.85	142.35	-46.03	139.13	-26.01	133.35	21.53	141.74	-36.52
-2300	139.45	-34.47	135.05	-1.25	143.24	-46.48	140.19	-26.45	134.74	20.75	142.73	-36.97
-2200	140.45	-34.91	136.29	-1.66	144.13	-46.93	141.26	-26.88	136.12	20.35	143.72	-37.43
-2100	141.45	-35.36	137.53	-2.07	145.03	-47.39	142.32	-27.33	137.50	19.93	144.72	-37.89
-2000	142.46	-35.81	138.77	-2.49	145.93	-47.86	143.39	-27.78	138.87	19.51	145.71	-38.35
-1900	143.47	-36.27	140.00	-2.92	146.83	-48.33	144.46	-28.24	140.23	19.08	146.71	-38.82
-1800	144.47	-36.73	141.23	-3.36	147.73	-48.81	145.53	-28.70	141.59	18.64	147.72	-39.30
-1700	145.48	-37.20	142.46	-3.81	148.64	-49.29	146.60	-29.17	142.94	18.19	148.72	-39.78
-1600	146.50	-37.67	143.69	-4.26	149.55	-49.77	147.68	-29.65	144.29	17.74	149.73	-40.26
-1500	147.52	-38.16	144.92	-4.72	150.47	-50.26	148.76	-30.13	145.63	17.27	150.75	-40.75
-1400	148.54	-38.64	146.15	-5.19	151.39	-50.76	149.84	-30.61	146.96	16.80	151.76	-41.25
-1300	149.56	-39.13	147.38	-5.66	152.31	-51.25	150.92	-31.10	148.29	16.33	152.79	-41.75
-1200	150.59	-39.63	148.60	-6.14	153.24	-51.76	152.01	-31.60	149.62	15.84	153.81	-42.25
-1100	151.62	-40.13	149.83	-6.63	154.18	-52.26	153.09	-32.10	150.93	15.35	154.84	-42.76
-1000	152.65	-40.63	151.05	-7.12	155.12	-52.77	154.19	-32.60	152.25	14.86	155.88	-43.27
-900	153.69	-41.14	152.28	-7.61	156.07	-53.29	155.28	-33.11	153.56	14.35	156.92	-43.79
-800	154.74	-41.66	153.50	-8.12	157.02	-53.80	156.39	-33.63	154.86	13.85	157.97	-44.31
-700	155.79	-42.18	154.72	-8.63	157.98	-54.32	157.49	-34.15	156.16	13.33	159.03	-44.83
-600	156.84	-42.70	155.95	-9.14	158.93	-54.85	158.60	-34.67	157.46	12.82	160.09	-45.36
-500	157.91	-43.23	157.17	-9.66	159.93	-55.37	159.72	-35.20	158.75	12.30	161.16	-45.89
-400	158.97	-43.76	158.40	-10.18	160.91	-55.90	160.84	-35.72	160.04	11.77	162.24	-46.43
-300	160.05	-44.29	159.62	-10.70	161.90	-56.44	161.96	-36.26	161.32	11.24	163.32	-46.96
-200	161.13	-44.83	160.85	-11.23	162.91	-56.97	163.10	-36.79	162.60	10.70	164.41	-47.51
-100	162.22	-45.37	162.08	-11.77	163.92	-57.51	164.23	-37.33	163.88	10.17	165.52	-48.05
0	163.31	-45.91	163.31	-12.31	164.94	-58.05	165.38	-37.88	165.16	9.63	166.63	-48.59
100	164.42	-46.46	164.54	-12.85	165.98	-58.60	166.53	-38.42	166.43	9.08	167.75	-49.14
200	165.53	-47.01	165.77	-13.39	167.03	-59.14	167.69	-38.97	167.70	8.54	168.88	-49.69
300	166.66	-47.56	167.01	-13.94	168.09	-59.69	168.86	-39.52	168.97	7.99	170.03	-50.24
400	167.79	-48.11	168.25	-14.49	169.16	-60.24	170.03	-40.07	170.23	7.44	171.18	-50.80
500	168.93	-48.67	169.49	-15.04	170.25	-60.79	171.22	-40.62	171.50	6.88	172.35	-51.35
600	170.08	-49.23	170.73	-15.59	171.36	-61.35	172.41	-41.17	172.76	6.33	173.53	-51.91
700	171.25	-49.79	171.98	-16.15	172.48	-61.90	173.62	-41.73	174.02	5.77	174.73	-52.46
800	172.43	-50.35	173.23	-16.70	173.62	-62.46	174.83	-42.29	175.28	5.22	175.93	-53.02
900	173.62	-50.91	174.48	-17.26	174.78	-63.01	176.05	-42.85	176.54	4.66	177.16	-53.58
1000	174.82	-51.47	175.74	-17.82	175.96	-63.57	177.29	-43.40	177.80	4.10	178.40	-54.14
1100	176.04	-52.04	177.06	-18.38	177.16	-64.13	178.53	-43.96	179.06	3.54	179.66	-54.70
1200	177.27	-52.60	178.27	-18.94	178.39	-64.69	179.79	-44.52	180.32	2.99	180.94	-55.26
1300	178.52	-53.17	179.54	-19.50	179.64	-65.25	181.07	-45.08	181.58	2.43	182.23	-55.82
1400	179.79	-53.73	180.81	-20.06	180.92	-65.80	182.35	-45.64	182.84	1.87	183.55	-56.37
1500	181.07	-54.30	182.10	-20.62	182.23	-66.36	183.65	-46.19	184.10	1.31	184.88	-56.93
1600	182.38	-54.86	183.38	-21.17	183.57	-66.92	184.96	-46.75	185.36	0.76	186.24	-57.49
1700	183.70	-55.43	184.68	-21.73	184.94	-67.48	186.29	-47.31	186.62	0.20	187.63	-58.04
1800	185.04	-55.99	185.98	-22.29	186.35	-68.03	187.64	-47.86	187.88	-0.34	189.03	-58.59
1900	186.40	-56.55	187.28	-22.84	187.80	-68.58	189.00	-48.41	189.15	-0.90	190.47	-59.14
2000	187.79	-57.11	188.60	-23.40	189.30	-69.14	190.38	-48.96	190.41	-1.45	191.93	-59.69
2100	189.20	-57.67	189.92	-23.95	190.83	-69.68	191.78	-49.51	191.68	-2.00	193.42	-60.23
2200	190.64	-58.23	191.25	-24.50	192.42	-70.23	193.19	-50.05	192.95	-2.54	194.94	-60.77
2300	192.10	-58.78	192.58	-25.04	194.06	-70.77	194.63	-50.59	194.23	-3.08	196.49	-61.31
2400	193.59	-59.33	193.92	-25.58	195.75	-71.31	196.08	-51.13	195.50	-3.62	198.08	-61.84
2500	195.12	-59.87	195.28	-26.12	197.51	-71.84	197.56	-51.66	196.78	-4.15	199.70	-62.36

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0483 (1.68)		0485 (2.90)		0488 (2.95)		0496 (2.91)		0497 (2.40)		0498 (1.21)	
	YEAR	R.A.	DEC.	CVN ALPHA	DEC.	R.A.	DEC.	CEN IOTA	R.A.	DEC.	R.A.	DEC.
-2500	195.96	77.60	126.86	61.20	135.55	34.42	144.41	-12.58	126.63	78.44	143.53	12.89
-2400	109.66	77.43	128.90	60.85	137.05	34.01	145.57	-13.05	130.04	78.09	144.85	12.43
-2300	113.26	77.23	130.91	60.49	138.55	33.60	146.74	-13.52	133.28	77.72	146.17	11.97
-2200	116.77	76.99	132.89	60.11	140.03	33.17	147.91	-14.00	136.36	77.32	147.48	11.49
-2100	120.16	76.72	134.83	59.72	141.51	32.73	149.07	-14.48	139.29	76.90	148.79	11.01
-2000	123.44	76.42	136.74	59.32	142.97	32.28	150.24	-14.97	142.07	76.46	150.09	10.52
-1900	126.60	76.10	138.61	58.90	144.42	31.83	151.40	-15.47	144.71	76.01	151.40	10.03
-1800	129.64	75.75	140.46	58.47	145.86	31.36	152.57	-15.97	147.23	75.54	152.69	9.53
-1700	132.56	75.38	142.27	58.03	147.30	30.89	153.74	-16.48	149.62	75.06	153.99	9.02
-1600	135.36	74.99	144.05	57.58	148.72	30.41	154.91	-16.99	151.90	74.56	155.28	8.51
-1500	138.05	74.58	145.79	57.12	150.13	29.93	156.08	-17.51	154.08	74.06	156.56	8.00
-1400	140.63	74.15	147.51	56.65	151.53	29.43	157.26	-18.03	156.17	73.55	157.85	7.48
-1300	143.11	73.71	149.20	56.17	152.93	28.93	158.43	-18.55	158.16	73.03	159.13	6.95
-1200	145.48	73.25	150.86	55.68	154.31	28.43	159.61	-19.08	160.08	72.50	160.40	6.42
-1100	147.77	72.78	152.50	55.18	155.69	27.92	160.79	-19.61	161.92	71.97	161.68	5.89
-1000	149.96	72.30	154.10	54.68	157.06	27.40	161.97	-20.15	163.69	71.43	162.95	5.35
-900	152.07	71.81	155.69	54.17	158.42	26.88	163.16	-20.69	165.40	70.88	164.23	4.81
-800	154.11	71.30	157.24	53.66	159.77	26.36	164.35	-21.23	167.05	70.34	165.50	4.26
-700	156.07	70.79	158.77	53.14	161.11	25.83	165.54	-21.78	168.65	69.78	166.76	3.72
-600	157.96	70.28	160.28	52.61	162.45	25.29	166.74	-22.33	170.19	69.23	168.03	3.17
-500	159.79	69.75	161.77	52.08	163.78	24.76	167.94	-22.88	171.69	68.67	169.30	2.61
-400	161.55	69.22	163.24	51.55	165.10	24.21	169.14	-23.43	173.15	68.12	170.56	2.06
-300	163.27	68.68	164.68	51.01	166.41	23.67	170.35	-23.99	174.57	67.56	171.83	1.50
-200	164.93	68.14	166.11	50.47	167.72	23.12	171.56	-24.54	175.95	67.00	173.09	0.94
-100	166.54	67.60	167.52	49.92	169.03	22.57	172.78	-25.10	177.30	66.43	174.35	0.39
100	169.63	66.50	170.28	48.82	170.33	22.02	174.00	-25.66	178.62	65.87	175.62	-0.17
200	171.12	65.95	171.64	48.27	171.62	21.47	175.23	-26.22	179.91	65.31	176.88	-0.74
300	172.57	65.39	172.98	47.72	172.91	20.91	176.47	-26.78	181.18	64.75	178.15	-1.30
400	173.99	64.84	174.31	47.16	174.19	20.36	177.71	-27.35	182.41	64.19	179.41	-1.86
500	175.37	64.28	175.62	46.60	175.47	19.80	178.96	-27.91	183.63	63.63	180.68	-2.42
600	176.73	63.72	176.92	46.05	176.74	19.24	180.22	-28.47	184.82	63.07	181.95	-3.04
700	178.06	63.16	178.20	45.49	178.01	18.68	181.48	-29.03	186.00	62.51	183.22	-3.54
800	179.36	62.60	179.47	44.93	179.28	18.12	182.75	-29.59	187.15	61.95	184.49	-4.10
900	180.64	62.04	179.74	44.37	180.54	17.56	184.03	-30.15	188.29	61.40	185.76	-4.66
1000	181.89	61.48	180.74	43.81	181.80	17.01	185.32	-30.71	189.41	60.84	187.04	-5.22
1100	183.13	60.92	181.99	43.26	183.06	16.45	186.61	-31.27	190.52	60.29	188.32	-5.77
1200	184.35	60.36	183.23	42.70	184.32	15.89	187.92	-31.83	191.62	59.74	189.60	-6.32
1300	185.54	59.81	184.46	42.15	185.57	15.33	189.24	-32.38	192.70	59.20	190.88	-6.87
1400	186.72	59.25	185.68	41.60	186.82	14.78	190.56	-32.94	193.77	58.65	192.17	-7.42
1500	187.89	58.70	186.89	41.04	188.07	14.23	191.90	-33.49	194.82	58.11	193.46	-7.97
1600	189.04	58.15	188.10	40.49	189.32	13.68	193.24	-34.03	195.87	57.57	194.76	-8.51
1700	190.17	57.60	189.29	40.00	190.56	13.13	194.60	-34.58	196.91	57.04	196.06	-9.05
1800	191.30	57.05	190.48	39.40	191.81	12.58	195.97	-35.12	197.94	56.50	197.36	-9.58
1900	192.41	56.50	191.66	38.86	193.05	12.04	197.35	-35.65	198.96	55.97	198.67	-10.11
2000	193.51	55.96	192.84	38.32	194.30	11.50	198.74	-36.18	199.97	55.45	199.98	-10.64
2100	194.60	55.42	194.01	37.78	195.54	10.96	200.15	-36.71	200.98	54.93	201.30	-11.16
2200	195.67	54.88	195.17	37.25	196.79	10.43	201.57	-37.23	201.98	54.41	202.62	-11.68
2300	196.74	54.35	196.33	36.72	198.03	9.89	203.00	-37.75	202.97	53.89	203.95	-12.19
2400	197.81	53.82	197.48	36.19	199.28	9.37	204.45	-38.26	203.96	53.38	205.28	-12.70
2500	198.86	53.29	198.63	35.67	200.52	8.85	205.91	-38.77	204.94	52.87	206.62	-13.20
			199.77	35.67	201.77	8.33	207.38	-39.27	205.92	52.37	207.96	-13.69

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0504 CEN EPSILON		0509 UMA NU		0513 BOO ETA		0518 CEN BETA		0520 CEN THETA		0526 BOO ALPHA	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	148.54	-29.26	146.77	73.53	150.88	43.08	152.50	-36.12	154.12	-11.52	159.67	45.73
-2400	149.63	-29.74	149.02	73.05	152.37	42.57	153.56	-36.63	155.31	-12.04	161.07	45.14
-2300	150.71	-30.23	151.17	72.56	153.85	42.06	154.62	-37.14	156.49	-12.57	162.44	44.55
-2200	151.80	-30.73	152.23	72.06	155.32	41.54	155.69	-37.65	157.67	-13.11	163.81	43.96
-2100	152.89	-31.23	153.23	71.55	156.77	41.01	156.76	-38.17	158.86	-13.65	165.16	43.36
-2000	153.99	-31.74	154.14	71.03	158.20	40.48	157.84	-38.69	160.05	-14.19	166.49	42.76
-1900	155.09	-32.25	154.99	70.51	159.63	39.94	158.92	-39.22	161.23	-14.74	167.81	42.15
-1800	156.19	-32.76	156.77	69.97	161.03	39.40	160.01	-39.75	162.42	-15.29	169.12	41.55
-1700	157.30	-33.28	162.49	69.44	162.43	38.85	161.10	-40.28	163.61	-15.84	170.41	40.94
-1600	158.41	-33.81	164.17	68.90	163.81	38.30	162.20	-40.82	164.81	-16.40	171.70	40.33
-1500	159.53	-34.33	165.78	68.35	165.18	37.75	163.31	-41.36	166.00	-16.96	172.97	39.72
-1400	160.65	-34.86	167.36	67.80	166.54	37.19	164.42	-41.90	167.20	-17.52	174.23	39.10
-1300	161.78	-35.40	168.88	67.25	167.88	36.63	165.55	-42.44	168.40	-18.09	175.48	38.49
-1200	162.91	-35.94	170.37	66.70	169.22	36.07	166.68	-42.99	169.61	-18.66	176.72	37.87
-1100	164.05	-36.48	171.82	66.14	170.55	35.50	167.82	-43.54	170.82	-19.23	177.96	37.26
-1000	165.19	-37.02	173.23	65.58	171.86	34.94	168.96	-44.09	172.03	-19.80	179.18	36.64
-900	166.35	-37.57	174.61	65.02	173.17	34.37	170.12	-44.65	173.24	-20.37	180.40	36.03
-800	167.50	-38.12	175.96	64.46	174.47	33.80	171.29	-45.21	174.46	-20.94	181.61	35.41
-700	168.67	-38.67	177.28	63.90	175.75	33.23	172.47	-45.76	175.69	-21.52	182.81	34.80
-600	169.85	-39.22	178.58	63.34	177.04	32.66	173.66	-46.32	176.92	-22.09	184.00	34.18
-500	171.03	-39.78	179.84	62.77	178.31	32.08	174.86	-46.88	178.15	-22.67	185.19	33.57
-400	172.22	-40.33	181.09	62.21	179.57	31.51	176.07	-47.44	179.39	-23.24	186.38	32.96
-300	173.42	-40.89	182.31	61.65	180.83	30.94	177.30	-48.00	180.64	-23.82	187.55	32.35
-200	174.64	-41.45	183.52	61.09	182.09	30.37	178.54	-48.57	181.89	-24.39	188.73	31.74
-100	175.86	-42.01	184.70	60.53	183.33	29.80	179.79	-49.13	183.15	-24.97	189.89	31.13
0	177.09	-42.57	185.87	59.97	184.57	29.23	181.06	-49.69	184.41	-25.54	191.06	30.52
100	178.34	-43.13	187.02	59.41	185.81	28.66	182.34	-50.25	185.69	-26.11	192.22	29.92
200	179.59	-43.69	188.16	58.85	187.04	28.09	183.64	-50.81	186.97	-26.68	193.37	29.32
300	180.86	-44.25	189.28	58.30	188.26	27.53	184.96	-51.37	188.26	-27.25	194.53	28.72
400	182.14	-44.81	190.39	57.75	189.48	26.96	186.30	-51.93	189.55	-27.82	195.68	28.13
500	183.44	-45.37	191.48	57.20	190.70	26.40	187.66	-52.49	190.86	-28.39	196.83	27.54
600	184.75	-45.93	192.57	56.65	191.91	25.84	189.03	-53.04	192.17	-28.95	197.97	26.95
700	186.07	-46.49	193.64	56.10	193.12	25.29	190.43	-53.59	193.49	-29.51	199.11	26.37
800	187.41	-47.05	194.70	55.56	194.33	24.73	191.85	-54.14	194.82	-30.06	200.26	25.79
900	188.77	-47.60	195.76	55.02	195.54	24.18	193.29	-54.69	196.17	-30.62	201.40	25.21
1000	190.14	-48.15	196.80	54.49	196.74	23.63	194.75	-55.23	197.52	-31.16	202.54	24.64
1100	191.53	-48.70	197.84	53.95	197.94	23.09	196.24	-55.77	198.88	-31.71	203.67	24.07
1200	192.94	-49.25	198.87	53.42	199.13	22.55	197.76	-56.31	200.25	-32.25	204.81	23.51
1300	194.37	-49.79	199.89	52.89	200.33	22.02	199.30	-56.84	201.64	-32.79	205.95	22.95
1400	195.82	-50.33	200.91	52.37	201.52	21.48	200.87	-57.36	203.03	-33.32	207.09	22.39
1500	197.29	-50.87	201.92	51.85	202.72	20.96	202.47	-57.88	204.44	-33.84	208.22	21.84
1600	198.78	-51.40	202.92	51.34	203.91	20.44	204.10	-58.39	205.86	-34.36	209.36	21.30
1700	200.29	-51.92	203.92	50.82	205.10	19.92	205.77	-58.90	207.30	-34.87	210.50	20.76
1800	201.83	-52.44	204.91	50.32	206.29	19.41	207.46	-59.40	208.74	-35.38	211.64	20.23
1900	203.39	-52.96	205.90	49.81	207.48	18.90	209.19	-59.89	210.20	-35.88	212.77	19.70
2000	204.97	-53.47	206.88	49.31	208.67	18.40	210.96	-60.37	211.67	-36.37	213.91	19.18
2100	206.58	-53.97	207.87	48.82	209.86	17.90	212.76	-60.85	213.16	-36.85	215.06	18.67
2200	208.22	-54.46	208.84	48.33	211.05	17.41	214.60	-61.31	214.65	-37.33	216.20	18.16
2300	209.88	-54.95	209.82	47.84	212.24	16.93	216.47	-61.76	216.17	-37.80	217.34	17.66
2400	211.57	-55.43	210.79	47.36	213.43	16.45	218.39	-62.20	216.69	-38.26	218.46	17.16
2500	213.29	-55.90	211.76	46.89	214.63	15.98	220.35	-62.64	219.24	-38.71	219.64	16.68

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0537 CEN ETA	(2.65)	053 CEN ALPHA	(0.33)	0541 LUP ALPHA	(2.89)	083500*(2.71)	800 EPSILON	0548 LIB ALPHA	(2.90)	0550 UMI BETA	(2.24)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	158.99	-18.15	162.90	-38.20	159.73	-23.48	168.57	50.53	164.67	7.62	308.33	80.45
-2400	160.17	-18.68	163.92	-38.71	160.90	-24.01	169.95	49.97	165.93	7.07	306.86	80.79
-2300	161.36	-19.22	164.94	-39.23	162.06	-24.55	171.30	49.42	167.19	6.52	305.24	81.13
-2200	162.55	-19.76	165.97	-39.74	163.24	-25.09	172.64	48.86	168.45	5.97	303.44	81.45
-2100	163.73	-20.30	167.01	-40.26	164.41	-25.63	173.97	48.30	169.71	5.41	301.47	81.75
-2000	164.93	-20.85	168.05	-40.78	165.59	-26.18	175.28	47.73	170.97	4.85	299.30	82.04
-1900	166.12	-21.39	169.10	-41.31	166.77	-26.73	176.57	47.17	172.22	4.29	296.93	82.30
-1800	167.32	-21.94	170.15	-41.83	167.96	-27.28	177.85	46.61	173.48	3.73	294.35	82.55
-1700	168.53	-22.50	171.21	-42.35	169.16	-27.83	179.12	46.04	174.73	3.16	291.57	82.77
-1600	169.73	-23.05	172.28	-42.88	170.36	-28.39	180.37	45.48	175.98	2.60	288.59	82.96
-1500	170.95	-23.61	173.35	-43.41	171.56	-28.95	181.61	44.92	177.24	2.03	285.42	83.13
-1400	172.16	-24.17	174.44	-43.94	172.77	-29.51	182.85	44.35	178.49	1.47	282.09	83.27
-1300	173.39	-24.73	175.53	-44.47	173.99	-30.07	184.07	43.79	179.74	0.90	278.61	83.37
-1200	174.61	-25.29	176.63	-45.00	175.21	-30.63	185.28	43.23	180.99	0.34	275.03	83.44
-1100	175.85	-25.85	177.74	-45.53	176.45	-31.19	186.48	42.67	182.25	-0.23	271.38	83.47
-1000	177.09	-26.42	178.86	-46.06	177.69	-31.75	187.67	42.11	183.50	-0.79	267.72	83.46
-900	178.33	-26.98	179.99	-46.59	178.93	-32.32	188.86	41.55	184.76	-1.35	264.09	83.43
-800	179.59	-27.54	181.13	-47.12	180.19	-32.88	190.03	41.00	186.02	-1.92	260.54	83.35
-700	180.84	-28.11	182.28	-47.65	181.45	-33.45	191.20	40.45	187.28	-2.48	257.10	83.24
-600	182.11	-28.67	183.45	-48.17	182.73	-34.01	192.36	39.90	188.54	-3.04	253.81	83.10
-500	183.39	-29.23	184.63	-48.70	184.01	-34.57	193.52	39.35	189.80	-3.59	250.69	82.93
-400	184.67	-29.80	185.81	-49.23	185.30	-35.13	194.67	38.80	191.07	-4.15	247.77	82.73
-300	185.96	-30.36	187.02	-49.75	186.61	-35.69	195.81	38.26	192.33	-4.70	245.06	82.51
-200	187.26	-30.92	188.23	-50.28	187.92	-36.25	196.95	37.72	193.61	-5.25	242.55	82.26
-100	188.57	-31.47	189.46	-50.80	189.25	-36.80	198.08	37.19	194.88	-5.80	240.24	81.99
0	189.89	-32.03	190.71	-51.32	190.59	-37.36	199.21	36.66	196.16	-6.34	238.14	81.71
100	191.22	-32.58	191.97	-51.84	191.93	-37.91	200.34	36.13	197.44	-6.88	236.22	81.40
200	192.56	-33.13	193.25	-52.35	193.30	-38.46	201.46	35.61	198.73	-7.41	234.49	81.08
300	193.91	-33.68	194.55	-52.87	194.67	-39.00	202.57	35.09	200.01	-7.94	232.92	80.75
400	195.27	-34.22	195.86	-53.38	196.06	-39.54	203.69	34.57	201.31	-8.47	231.52	80.41
500	196.65	-34.76	197.19	-53.88	197.46	-40.08	204.80	34.06	202.61	-8.99	230.26	80.06
600	198.03	-35.29	198.54	-54.39	198.88	-40.61	205.90	33.56	203.91	-9.51	229.13	79.70
700	199.43	-35.83	199.91	-54.88	200.31	-41.14	207.01	33.06	205.22	-10.02	228.13	79.33
800	200.84	-36.35	201.31	-55.38	201.76	-41.66	208.11	32.56	206.53	-10.52	227.24	78.95
900	202.26	-36.87	202.72	-55.87	203.22	-42.18	209.21	32.07	207.85	-11.02	226.45	78.57
1000	203.70	-37.39	204.15	-56.35	204.70	-42.69	210.31	31.59	209.17	-11.51	225.76	78.18
1100	205.15	-37.90	205.61	-56.83	206.20	-43.19	211.41	31.11	210.50	-12.00	225.16	77.79
1200	206.62	-38.40	207.10	-57.30	207.71	-43.69	212.50	30.63	211.83	-12.48	224.64	77.39
1300	208.10	-38.90	208.60	-57.77	209.25	-44.18	213.60	30.17	213.17	-12.95	224.19	77.00
1400	209.59	-39.39	210.13	-58.23	210.79	-44.67	214.69	29.71	214.52	-13.42	223.81	76.60
1500	211.10	-39.87	211.69	-58.69	212.36	-45.14	215.79	29.25	215.87	-13.88	223.49	76.19
1600	212.62	-40.35	213.28	-59.13	213.95	-45.61	216.88	28.80	217.23	-14.33	223.23	75.79
1700	214.16	-40.81	214.89	-59.57	215.55	-46.07	217.97	28.36	218.59	-14.77	223.02	75.38
1800	215.72	-41.27	216.53	-60.00	217.18	-46.52	219.06	27.92	219.96	-15.20	222.86	74.97
1900	217.29	-41.72	218.20	-60.42	218.82	-46.96	220.15	27.50	221.34	-15.63	222.75	74.56
2000	218.88	-42.16	219.90	-60.84	220.48	-47.39	221.25	27.07	222.72	-16.04	222.68	74.16
2100	220.48	-42.59	221.63	-61.24	222.16	-47.81	222.34	26.66	224.11	-16.45	222.64	73.75
2200	222.10	-43.01	223.39	-61.63	223.87	-48.21	223.43	26.25	225.51	-16.84	222.65	73.34
2300	223.74	-43.41	225.18	-62.01	225.59	-48.61	224.52	25.85	226.91	-17.23	222.68	72.93
2400	225.39	-43.81	227.00	-62.38	227.33	-48.99	225.62	25.46	228.32	-17.61	222.75	72.52
2500	227.06	-44.20	228.86	-62.74	229.10	-49.36	226.71	25.08	229.73	-17.97	222.85	72.11

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	0552 LUP BETA	(2.81)	0564 LIB BETA	(2.74)	225938*(2.96)	0578 CRB ALPHA	(2.31)	0582 SER ALPHA	(2.75)	0594 SCO DELTA	(2.54)	
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.		
-2500	163.35	-19.52	171.91	13.40	170.73	-18.60	184.88	48.17	181.73	27.73	179.73	-1.46
-2400	164.55	-20.06	173.17	12.83	171.95	-19.16	186.08	47.60	182.98	27.16	180.98	-2.03
-2300	165.74	-20.61	174.43	12.27	173.17	-19.72	187.26	47.03	184.21	26.60	182.23	-2.59
-2200	166.94	-21.16	175.69	11.71	174.40	-20.29	188.43	46.47	185.44	26.03	183.48	-3.16
-2100	168.14	-21.72	176.94	11.14	175.63	-20.85	189.59	45.91	186.67	25.47	184.73	-3.72
-2000	169.34	-22.27	178.19	10.58	176.87	-21.42	190.75	45.35	187.89	24.91	185.98	-4.29
-1900	170.55	-22.83	179.45	10.01	178.11	-21.98	191.89	44.79	189.11	24.35	187.24	-4.85
-1800	171.77	-23.39	180.70	9.45	179.36	-22.55	193.03	44.23	190.32	23.80	188.50	-5.41
-1700	172.99	-23.95	181.94	8.88	180.61	-23.11	194.16	43.68	191.53	23.24	189.76	-5.97
-1600	174.21	-24.51	183.19	8.32	181.87	-23.68	195.28	43.13	192.74	22.69	191.03	-6.52
-1500	175.44	-25.08	184.44	7.75	183.13	-24.24	196.39	42.59	193.95	22.14	192.29	-7.08
-1400	176.67	-25.64	185.68	7.19	184.40	-24.81	197.50	42.04	195.15	21.59	193.56	-7.63
-1300	177.92	-26.20	186.93	6.63	185.68	-25.37	198.61	41.50	196.35	21.05	194.84	-8.18
-1200	179.16	-26.77	188.17	6.07	186.97	-25.93	199.70	40.97	197.55	20.51	196.12	-8.72
-1100	180.42	-27.33	189.42	5.51	188.26	-26.49	200.80	40.44	198.74	19.98	197.40	-9.26
-1000	181.68	-27.90	190.67	4.96	189.56	-27.05	201.88	39.91	199.94	19.45	198.69	-9.80
-900	182.95	-28.46	191.91	4.41	190.87	-27.60	202.97	39.38	201.13	18.92	199.98	-10.33
-800	184.23	-29.02	193.16	3.86	192.19	-28.15	204.05	38.86	202.33	18.40	201.27	-10.86
-700	185.51	-29.59	194.41	3.31	193.52	-28.70	205.13	38.35	203.52	17.88	202.57	-11.38
-600	186.81	-30.15	195.66	2.76	194.85	-29.25	206.20	37.84	204.71	17.37	203.88	-11.90
-500	188.11	-30.71	196.91	2.22	196.20	-29.79	207.27	37.33	205.90	16.86	205.19	-12.42
-400	189.42	-31.26	198.16	1.69	197.55	-30.33	208.34	36.83	207.09	16.36	206.51	-12.92
-300	190.74	-31.82	199.42	1.16	198.92	-30.87	209.40	36.34	208.29	15.86	207.83	-13.42
-200	192.07	-32.37	200.68	0.63	200.30	-31.40	210.46	35.85	209.48	15.37	209.16	-13.91
-100	193.42	-32.92	201.94	0.10	201.69	-31.92	211.53	35.36	210.67	14.88	210.49	-14.40
0	194.77	-33.46	203.20	-0.41	203.08	-32.44	212.58	34.89	211.86	14.40	211.83	-14.88
100	196.13	-34.00	204.47	-0.93	204.49	-32.96	213.64	34.41	213.06	13.93	213.18	-15.35
200	197.51	-34.54	205.73	-1.44	205.92	-33.46	214.70	33.95	214.25	13.47	214.53	-15.82
300	198.90	-35.08	207.01	-1.94	207.35	-33.97	215.75	33.48	215.45	13.01	215.89	-16.28
400	200.30	-35.61	208.28	-2.44	208.80	-34.46	216.81	33.03	216.64	12.55	217.26	-16.73
500	201.71	-36.13	209.56	-2.93	210.26	-34.95	217.86	32.58	217.84	12.11	218.63	-17.17
600	203.14	-36.65	210.84	-3.41	211.73	-35.43	218.91	32.14	219.04	11.67	220.02	-17.61
700	204.58	-37.16	212.13	-3.89	213.22	-35.90	219.97	31.70	220.25	11.24	221.40	-18.03
800	206.03	-37.67	213.42	-4.36	214.71	-36.37	221.02	31.28	221.45	10.82	222.80	-18.45
900	207.50	-38.17	214.71	-4.82	216.23	-36.82	222.07	30.85	222.66	10.40	224.20	-18.85
1000	208.98	-38.66	216.01	-5.28	217.75	-37.27	223.12	30.44	223.86	10.00	225.61	-19.25
1100	210.47	-39.15	217.32	-5.73	219.29	-37.71	224.18	30.03	225.07	9.60	227.02	-19.64
1200	211.98	-39.63	218.62	-6.17	220.85	-38.14	225.23	29.63	226.28	9.21	228.45	-20.01
1300	213.51	-40.10	219.94	-6.60	222.41	-38.56	226.28	29.24	227.50	8.83	229.88	-20.38
1400	215.05	-40.56	221.25	-7.03	224.00	-38.96	227.33	28.86	228.72	8.46	231.31	-20.73
1500	216.61	-41.01	222.57	-7.44	225.59	-39.36	228.39	28.48	229.93	8.10	232.76	-21.08
1600	218.18	-41.46	223.90	-7.85	227.20	-39.75	229.44	28.11	231.16	7.74	234.21	-21.41
1700	219.77	-41.89	225.23	-8.25	228.83	-40.12	230.50	27.75	232.38	7.40	235.67	-21.73
1800	221.37	-42.32	226.57	-8.64	230.47	-40.48	231.56	27.40	233.61	7.06	237.13	-22.04
1900	222.99	-42.73	227.91	-9.01	232.12	-40.83	232.61	27.05	234.84	6.74	238.60	-22.34
2000	224.63	-43.13	229.25	-9.38	233.78	-41.17	233.67	26.71	236.07	6.43	240.08	-22.62
2100	226.29	-43.53	230.60	-9.74	235.46	-41.49	234.73	26.39	237.30	6.12	241.57	-22.89
2200	227.96	-43.91	231.96	-10.09	237.16	-41.80	235.79	26.07	238.54	5.83	243.06	-23.15
2300	229.64	-44.27	233.32	-10.43	238.86	-42.09	236.85	25.76	239.78	5.54	244.56	-23.40
2400	231.35	-44.63	234.68	-10.76	240.58	-42.38	237.92	25.45	241.02	5.27	246.06	-23.63
2500	233.07	-44.97	236.05	-11.07	242.31	-42.64	238.98	25.16	242.26	5.01	247.57	-23.85

TABLE 2.—The 5,000-year star catalog—Continued

NG. (MAG)	0597 SCG BETA	(2.90)	017074*(2.90)	DRA ETA	0616 SCG ALPHA	(1.22)	0618 HER BETA	(2.81)	0620 SCG TAU	(2.91)	0622 OPH ZETA	(2.70)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	181.49	1.03	243.74	73.03	185.28	-6.71	199.87	39.26	186.21	-8.81	191.16	8.08
-2400	182.74	0.46	243.32	73.03	186.53	-7.27	200.95	38.73	187.47	-9.37	192.39	7.53
-2300	183.99	-0.10	242.93	72.78	187.79	-7.84	202.03	38.20	188.73	-9.93	193.62	6.98
-2200	185.24	-0.67	242.56	72.52	189.05	-8.40	203.11	37.68	190.00	-10.49	194.86	6.43
-2100	186.49	-1.23	242.25	72.26	190.32	-8.96	204.18	37.16	191.27	-11.05	196.09	5.88
-2000	187.74	-1.79	241.96	71.99	191.59	-9.51	205.25	36.65	192.54	-11.60	197.33	5.34
-1900	189.00	-2.35	241.69	71.73	192.86	-10.06	206.32	36.14	193.82	-12.15	198.56	4.80
-1800	190.25	-2.91	241.45	71.46	194.13	-10.61	207.39	35.64	195.11	-12.70	199.80	4.27
-1700	191.51	-3.46	241.24	71.19	195.41	-11.16	208.45	35.14	196.39	-13.24	201.04	3.74
-1600	192.77	-4.02	241.06	70.92	196.70	-11.70	209.51	34.65	197.69	-13.78	202.28	3.22
-1500	194.04	-4.57	240.90	70.65	197.99	-12.24	210.57	34.16	198.99	-14.32	203.53	2.70
-1400	195.30	-5.11	240.76	70.37	199.28	-12.78	211.62	33.67	200.29	-14.85	204.77	2.18
-1300	196.57	-5.66	240.65	70.10	200.58	-13.31	212.68	33.20	201.60	-15.38	206.02	1.68
-1200	197.85	-6.19	240.56	69.82	201.89	-13.84	213.73	32.72	202.91	-15.90	207.27	1.17
-1100	199.12	-6.73	240.49	69.55	203.20	-14.36	214.78	32.26	204.24	-16.42	208.52	0.67
-1000	200.40	-7.26	240.45	69.27	204.52	-14.87	215.83	31.80	205.56	-16.93	209.78	0.18
-900	201.69	-7.79	240.42	69.00	205.84	-15.38	216.88	31.35	206.90	-17.44	211.04	-0.30
-800	202.98	-8.31	240.42	68.72	207.17	-15.89	217.93	30.90	208.24	-17.94	212.30	-0.78
-700	204.27	-8.82	240.43	68.44	208.51	-16.39	218.98	30.46	209.59	-18.43	213.57	-1.25
-600	205.57	-9.34	240.46	68.17	209.85	-16.88	220.03	30.02	210.95	-18.92	214.84	-1.72
-500	206.87	-9.84	240.51	67.89	211.20	-17.36	221.08	29.60	212.31	-19.40	216.11	-2.18
-400	208.18	-10.34	240.57	67.62	212.55	-17.84	222.13	29.18	213.68	-19.87	217.39	-2.63
-300	209.49	-10.83	240.66	67.34	213.92	-18.31	223.18	28.76	215.06	-20.33	218.67	-3.07
-200	210.81	-11.32	240.75	67.07	215.29	-18.78	224.22	28.36	216.45	-20.79	219.95	-3.50
-100	212.14	-11.80	240.87	66.80	216.66	-19.23	225.27	27.96	217.84	-21.24	221.24	-3.93
0	213.47	-12.27	241.00	66.53	218.05	-19.68	226.32	27.57	219.24	-21.68	222.53	-4.34
100	214.80	-12.74	241.14	66.26	219.44	-20.12	227.38	27.18	220.65	-22.11	223.83	-4.75
200	216.14	-13.19	241.29	65.99	220.84	-20.54	228.43	26.81	222.07	-22.53	225.13	-5.15
300	217.49	-13.64	241.46	65.72	222.25	-20.97	229.48	26.44	223.50	-22.94	226.44	-5.54
400	218.84	-14.08	241.65	65.46	223.67	-21.38	230.53	26.08	224.93	-23.35	227.75	-5.92
500	220.20	-14.52	241.84	65.19	225.09	-21.78	231.59	25.73	226.38	-23.74	229.06	-6.30
600	221.57	-14.94	242.05	64.93	226.52	-22.17	232.64	25.38	227.83	-24.12	230.38	-6.66
700	222.94	-15.36	242.26	64.67	227.96	-22.55	233.70	25.05	229.29	-24.49	231.70	-7.01
800	224.32	-15.76	242.49	64.41	229.41	-22.92	234.76	24.72	230.76	-24.85	233.03	-7.35
900	225.71	-16.16	242.73	64.16	230.86	-23.28	235.81	24.40	232.23	-25.20	234.36	-7.68
1000	227.10	-16.54	242.98	63.91	232.32	-23.63	236.87	24.09	233.72	-25.54	235.70	-8.00
1100	228.49	-16.92	243.24	63.65	233.79	-23.96	237.94	23.79	235.21	-25.86	237.04	-8.31
1200	229.90	-17.28	243.52	63.41	235.27	-24.29	239.00	23.50	236.71	-26.18	238.38	-8.61
1300	231.31	-17.64	243.80	63.16	236.76	-24.60	240.06	23.21	238.21	-26.48	239.73	-8.89
1400	232.73	-17.98	244.08	62.92	238.25	-24.90	241.13	22.94	239.73	-26.76	241.09	-9.17
1500	234.15	-18.32	244.38	62.68	239.75	-25.19	242.20	22.67	241.25	-27.04	242.44	-9.43
1600	235.58	-18.64	244.69	62.44	241.26	-25.46	243.26	22.42	242.78	-27.30	243.80	-9.68
1700	237.02	-18.95	245.00	62.20	242.77	-25.73	244.34	22.17	244.32	-27.55	245.17	-9.92
1800	238.46	-19.25	245.33	61.97	244.29	-25.97	245.41	21.93	245.86	-27.79	246.54	-10.15
1900	239.91	-19.53	245.66	61.74	245.82	-26.21	246.55	21.71	247.41	-28.01	247.91	-10.36
2000	241.36	-19.81	246.00	61.51	247.35	-26.43	247.68	21.49	248.97	-28.22	249.29	-10.57
2100	242.82	-20.07	246.34	61.29	248.89	-26.64	248.63	21.28	250.53	-28.41	250.67	-10.76
2200	244.28	-20.31	246.70	61.07	250.44	-26.83	249.71	21.08	252.10	-28.59	252.05	-10.93
2300	245.75	-20.55	247.06	60.85	251.99	-27.01	250.79	20.89	253.67	-28.75	253.44	-11.10
2400	247.23	-20.77	247.42	60.64	253.54	-27.18	251.87	20.72	255.25	-28.90	254.83	-11.25
2500	248.71	-20.98	247.80	60.43	255.10	-27.33	252.95	20.55	256.83	-29.04	256.22	-11.39

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	TRA ALPHA (1.88)		SCO EPSILON (2.36)		OPH ETA (2.64)		ARA BETA (2.80)		SCO UPSILON (2.80)		ARA ALPHA (2.97)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	172.77	-48.04	188.31	-15.44	197.38	0.74	185.70	-37.53	194.65	-20.99	189.64	-32.70
-2400	173.94	-48.60	189.56	-16.00	198.63	0.21	187.00	-38.09	195.96	-21.53	190.96	-33.26
-2300	175.13	-49.16	190.82	-16.56	199.88	-0.33	188.30	-38.65	197.57	-22.08	192.28	-33.82
-2200	176.33	-49.73	192.09	-17.11	201.13	-0.85	189.62	-39.21	198.29	-22.62	193.61	-34.37
-2100	177.55	-50.30	193.36	-17.67	202.39	-1.38	190.96	-39.77	199.92	-23.15	194.96	-34.92
-2000	178.78	-50.86	194.63	-18.22	203.65	-1.90	192.30	-40.32	201.26	-23.68	196.32	-35.47
-1900	180.02	-51.43	195.92	-18.77	204.91	-2.41	193.66	-40.87	202.60	-24.21	197.68	-36.01
-1800	181.28	-51.99	197.21	-19.31	206.18	-2.92	195.04	-41.42	203.96	-24.73	199.07	-36.55
-1700	182.56	-52.56	198.50	-19.85	207.45	-3.42	196.43	-41.97	205.32	-25.24	200.46	-37.08
-1600	183.86	-53.12	199.80	-20.39	208.72	-3.92	197.83	-42.51	206.69	-25.75	201.87	-37.61
-1500	185.17	-53.69	201.11	-20.92	209.99	-4.41	199.25	-43.04	208.07	-26.25	203.29	-38.13
-1400	186.51	-54.25	202.43	-21.44	211.27	-4.89	200.69	-43.57	209.46	-26.75	204.72	-38.65
-1300	187.86	-54.81	203.75	-21.96	212.56	-5.37	202.14	-44.10	210.86	-27.24	206.17	-39.16
-1200	189.24	-55.37	205.08	-22.48	213.85	-5.83	203.61	-44.62	212.27	-27.72	207.64	-39.66
-1100	190.64	-55.93	206.42	-22.99	215.14	-6.30	205.10	-45.13	213.69	-28.19	209.12	-40.16
-1000	192.06	-56.48	207.77	-23.50	216.44	-6.75	206.61	-45.64	215.12	-28.66	210.61	-40.65
-900	193.51	-57.03	209.13	-23.99	217.74	-7.20	208.13	-46.14	216.56	-29.11	212.12	-41.13
-800	194.99	-57.58	210.49	-24.48	219.05	-7.64	209.68	-46.64	218.01	-29.56	213.65	-41.61
-700	196.49	-58.12	211.87	-24.97	220.36	-8.07	211.24	-47.12	219.47	-30.00	215.19	-42.07
-600	198.02	-58.66	213.25	-25.45	221.67	-8.49	212.82	-47.60	220.94	-30.43	216.75	-42.53
-500	199.58	-59.19	214.64	-25.92	222.99	-8.90	214.43	-48.07	222.43	-30.85	218.33	-42.98
-400	201.18	-59.72	216.05	-26.38	224.32	-9.31	216.05	-48.53	223.92	-31.27	219.92	-43.42
-300	202.81	-60.24	217.46	-26.83	225.65	-9.70	217.70	-48.98	225.42	-31.67	221.53	-43.84
-200	204.47	-60.76	218.88	-27.28	226.99	-10.09	219.37	-49.42	226.94	-32.06	223.16	-44.26
-100	206.17	-61.27	220.31	-27.71	228.33	-10.47	221.06	-49.85	228.46	-32.43	224.81	-44.67
0	207.90	-61.77	221.75	-28.14	229.67	-10.83	222.77	-50.27	230.00	-32.80	226.47	-45.06
100	209.68	-62.26	223.20	-28.56	231.02	-11.19	224.51	-50.67	231.55	-33.16	228.15	-45.44
200	211.50	-62.75	224.66	-28.97	232.38	-11.53	226.26	-51.07	233.11	-33.50	229.85	-45.81
300	213.35	-63.22	226.13	-29.36	233.74	-11.87	228.04	-51.45	234.68	-33.83	231.56	-46.17
400	215.26	-63.68	227.61	-29.75	235.11	-12.19	229.85	-51.82	236.26	-34.15	233.29	-46.51
500	217.20	-64.14	229.10	-30.13	236.48	-12.50	231.68	-52.17	237.84	-34.46	235.04	-46.84
600	219.19	-64.58	230.60	-30.49	237.86	-12.80	233.52	-52.51	239.44	-34.75	236.81	-47.16
700	221.23	-65.01	232.10	-30.85	239.24	-13.09	235.38	-52.84	241.05	-35.03	238.59	-47.46
800	223.32	-65.42	233.62	-31.19	240.63	-13.37	237.27	-53.15	242.67	-35.29	240.39	-47.75
900	225.46	-65.82	235.15	-31.52	242.02	-13.64	239.18	-53.45	244.30	-35.54	242.20	-48.02
1000	227.64	-66.21	236.69	-31.84	243.41	-13.89	241.11	-53.72	245.94	-35.78	244.03	-48.27
1100	229.88	-66.58	238.24	-32.15	244.81	-14.13	243.06	-53.99	247.58	-36.00	245.87	-48.51
1200	232.17	-66.93	239.79	-32.44	246.22	-14.36	245.03	-54.23	249.23	-36.21	247.73	-48.73
1300	234.50	-67.27	241.36	-32.72	247.63	-14.58	247.02	-54.46	250.89	-36.40	249.60	-48.94
1400	236.89	-67.58	242.93	-32.99	249.04	-14.78	249.02	-54.67	252.56	-36.57	251.48	-49.12
1500	239.33	-67.88	244.51	-33.24	250.46	-14.97	251.04	-54.86	254.24	-36.73	253.37	-49.29
1600	241.81	-68.15	246.10	-33.48	251.88	-15.15	253.07	-55.03	255.92	-36.88	255.27	-49.45
1700	244.34	-68.41	247.70	-33.70	253.30	-15.31	255.12	-55.19	257.60	-37.01	257.18	-49.58
1800	246.91	-68.64	249.31	-33.92	254.73	-15.46	257.18	-55.32	259.30	-37.12	259.10	-49.70
1900	249.52	-68.84	250.92	-34.11	256.16	-15.60	259.25	-55.44	260.99	-37.22	261.03	-49.80
2000	252.17	-69.03	252.54	-34.29	257.59	-15.72	261.32	-55.53	262.69	-37.30	262.96	-49.88
2100	254.85	-69.19	254.17	-34.46	259.03	-15.83	263.61	-55.60	264.39	-37.36	264.90	-49.94
2200	257.56	-69.32	255.80	-34.61	260.47	-15.93	265.50	-55.66	266.10	-37.41	266.84	-49.98
2300	260.29	-69.43	257.43	-34.75	261.91	-16.01	267.60	-55.69	267.81	-37.44	268.78	-50.00
2400	263.05	-69.51	259.08	-34.87	263.35	-16.08	269.70	-55.71	269.52	-37.45	270.73	-50.01
2500	265.82	-69.56	260.72	-34.97	264.80	-16.14	271.79	-55.70	271.23	-37.45	272.67	-49.99

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	SC0 LAMBDA		(2.99)		(2.04)		(2.14)		(2.51)		(2.94)	
	YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.
-2500	195.29	-21.01	60.52	193.61	-26.78	213.14	25.80	196.30	-23.45	212.13	17.06	
-2400	196.59	-21.56	60.25	194.93	-27.33	214.24	25.32	197.62	-23.99	213.29	16.59	
-2300	197.91	-22.10	59.97	196.26	-27.88	215.34	24.85	198.94	-24.53	214.44	16.13	
-2200	199.24	-22.63	59.70	197.60	-28.42	216.44	24.38	200.28	-25.06	215.60	15.67	
-2100	200.57	-23.17	59.44	198.94	-28.95	217.54	23.92	201.63	-25.59	216.76	15.22	
-2000	201.91	-23.70	59.17	200.30	-29.49	218.63	23.47	202.98	-26.11	217.92	14.77	
-1900	203.25	-24.22	58.92	201.67	-30.02	219.73	23.02	204.35	-26.63	219.08	14.33	
-1800	204.61	-24.74	58.66	203.05	-30.54	220.83	22.59	205.72	-27.14	220.24	13.90	
-1700	205.98	-25.25	58.41	204.44	-31.06	221.93	22.16	207.10	-27.65	221.41	13.46	
-1600	207.35	-25.75	58.16	205.84	-31.57	223.04	21.73	208.49	-28.15	222.57	13.02	
-1500	208.73	-26.25	57.92	207.25	-32.07	224.14	21.32	209.90	-28.65	223.74	12.66	
-1400	210.13	-26.74	57.68	208.67	-32.57	225.24	20.91	211.31	-29.13	224.91	12.26	
-1300	211.53	-27.23	57.44	210.11	-33.06	226.35	20.51	212.73	-29.61	226.08	11.87	
-1200	212.94	-27.71	57.21	211.55	-33.55	227.45	20.11	214.17	-30.08	227.25	11.48	
-1100	214.36	-28.18	56.99	213.01	-34.02	228.56	19.73	215.61	-30.55	228.42	11.11	
-1000	215.80	-28.64	56.76	214.48	-34.49	229.67	19.35	217.07	-31.00	229.60	10.74	
-900	217.24	-29.09	56.53	215.97	-34.95	230.78	18.99	218.54	-31.45	230.78	10.39	
-800	218.69	-29.54	56.33	217.46	-35.40	231.89	18.63	220.01	-31.88	231.96	10.04	
-700	220.16	-29.97	56.12	218.97	-35.85	233.00	18.28	221.50	-32.31	233.14	9.70	
-600	221.63	-30.40	55.92	220.50	-36.28	234.11	17.94	223.01	-32.73	234.32	9.37	
-500	223.12	-30.82	55.72	222.03	-36.70	235.23	17.61	224.52	-33.13	235.51	9.06	
-400	224.61	-31.22	55.52	223.58	-37.11	236.35	17.28	226.04	-33.53	236.70	8.75	
-300	226.12	-31.62	55.33	225.15	-37.52	237.47	16.97	227.58	-33.92	237.89	8.45	
-200	227.64	-32.00	55.14	226.72	-37.91	238.59	16.66	229.13	-34.29	239.08	8.16	
-100	229.17	-32.38	54.96	228.31	-38.29	239.71	16.37	230.69	-34.65	240.28	7.88	
0	230.71	-32.74	54.78	229.91	-38.65	240.84	16.08	232.26	-35.00	241.48	7.61	
100	232.26	-33.09	54.61	231.53	-39.01	241.97	15.81	233.84	-35.34	242.68	7.35	
200	233.82	-33.43	54.44	233.16	-39.35	243.09	15.54	235.43	-35.67	243.88	7.11	
300	235.39	-33.75	54.28	234.80	-39.68	244.23	15.29	237.03	-35.98	245.09	6.87	
400	236.97	-34.06	54.12	236.46	-40.00	245.36	15.04	238.65	-36.28	246.29	6.64	
500	238.56	-34.36	53.97	238.12	-40.30	246.49	14.81	240.27	-36.56	247.50	6.42	
600	240.16	-34.65	53.82	239.80	-40.59	247.63	14.58	241.91	-36.83	248.71	6.22	
700	241.77	-34.92	53.68	241.49	-40.86	248.77	14.37	243.55	-37.09	249.93	6.03	
800	243.39	-35.18	53.54	243.20	-41.12	249.91	14.16	245.20	-37.33	251.14	5.85	
900	245.02	-35.43	53.41	244.91	-41.37	251.05	13.97	246.87	-37.56	252.36	5.68	
1000	246.66	-35.65	53.28	246.63	-41.60	252.20	13.79	248.54	-37.77	253.58	5.52	
1100	248.30	-35.87	53.16	248.37	-41.81	253.34	13.62	250.22	-37.97	254.80	5.37	
1200	249.95	-36.07	53.04	250.11	-42.01	254.49	13.45	251.91	-38.15	256.03	5.23	
1300	251.61	-36.25	52.93	251.87	-42.19	255.64	13.30	253.60	-38.32	257.25	5.11	
1400	253.28	-36.42	52.83	253.63	-42.36	256.79	13.16	255.30	-38.47	258.48	5.00	
1500	254.96	-36.58	52.73	255.40	-42.51	257.95	13.04	257.01	-38.61	259.71	4.89	
1600	256.64	-36.71	52.63	257.17	-42.64	259.10	12.92	258.72	-38.72	260.94	4.81	
1700	258.32	-36.84	52.54	258.95	-42.75	260.26	12.81	260.44	-38.82	262.17	4.73	
1800	260.01	-36.94	52.45	260.74	-42.85	261.41	12.72	262.17	-38.91	263.40	4.66	
1900	261.70	-37.03	52.38	262.53	-42.93	262.57	12.63	263.89	-38.98	264.63	4.61	
2000	263.40	-37.10	52.30	264.33	-43.00	263.73	12.56	265.62	-39.03	265.87	4.57	
2100	265.10	-37.16	52.23	266.13	-43.04	264.89	12.50	267.35	-39.06	267.10	4.54	
2200	266.81	-37.20	52.17	267.93	-43.07	266.06	12.45	269.09	-39.08	268.34	4.52	
2300	268.51	-37.22	52.11	269.73	-43.08	267.22	12.41	270.82	-39.08	269.58	4.51	
2400	270.22	-37.23	52.06	271.54	-43.08	268.39	12.38	272.56	-39.07	270.82	4.52	
2500	271.92	-37.22	52.01	273.34	-43.05	269.55	12.37	274.29	-39.04	272.06	4.54	

TABLE 2.—*The 5,000-year star catalog—Continued*

NO. (MAG)	0676 (2.42)		0677 (2.84)		0689 (1.95)		0692 (2.94)		0699 (0.14)		0706 (2.14)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	245.37	57.27	207.85	-17.98	206.70	-22.35	211.32	-14.40	242.00	42.67	216.66	-17.81
-2400	245.82	57.04	209.19	-18.48	208.05	-22.86	212.64	-14.88	242.80	42.41	218.02	-18.26
-2300	246.28	56.80	210.54	-18.97	209.42	-23.36	213.97	-15.36	243.60	42.15	219.39	-18.70
-2200	246.74	56.58	211.89	-19.46	210.79	-23.85	215.31	-15.83	244.40	41.91	220.77	-19.14
-2100	247.20	56.36	213.25	-19.94	212.17	-24.33	216.65	-16.30	245.21	41.67	222.15	-19.56
-2000	247.67	56.14	214.62	-20.41	213.56	-24.81	218.00	-16.75	246.01	41.44	223.54	-19.98
-1900	248.14	55.93	215.99	-20.87	214.96	-25.28	219.36	-17.20	246.82	41.22	224.93	-20.39
-1800	248.62	55.72	217.38	-21.32	216.36	-25.74	220.72	-17.63	247.63	41.01	226.34	-20.78
-1700	249.10	55.51	218.77	-21.77	217.78	-26.20	222.09	-18.06	248.44	40.80	227.75	-21.17
-1600	249.59	55.31	220.17	-22.21	219.21	-26.64	223.47	-18.48	249.25	40.60	229.17	-21.55
-1500	250.08	55.12	221.57	-22.63	220.64	-27.08	224.85	-18.89	250.07	40.41	230.59	-21.91
-1400	250.57	54.93	222.99	-23.05	222.09	-27.51	226.24	-19.29	250.88	40.23	232.03	-22.27
-1300	251.07	54.74	224.41	-23.46	223.54	-27.92	227.64	-19.68	251.70	40.05	233.47	-22.61
-1200	251.58	54.56	225.85	-23.86	225.01	-28.33	229.05	-20.06	252.51	39.88	234.92	-22.94
-1100	252.08	54.39	227.29	-24.25	226.48	-28.73	230.46	-20.43	253.33	39.72	236.37	-23.26
-1000	252.59	54.21	228.74	-24.63	227.96	-29.11	231.88	-20.78	254.15	39.57	237.84	-23.57
-900	253.10	54.05	230.19	-25.00	229.46	-29.49	233.31	-21.13	254.97	39.42	239.30	-23.86
-800	253.62	53.89	231.66	-25.35	230.96	-29.85	234.74	-21.47	255.80	39.29	240.78	-24.15
-700	254.14	53.73	233.13	-25.70	232.47	-30.20	236.18	-21.79	256.62	39.16	242.26	-24.42
-600	254.66	53.58	234.61	-26.03	234.00	-30.54	237.61	-22.10	257.45	39.04	243.75	-24.67
-500	255.19	53.43	236.10	-26.35	235.53	-30.87	239.09	-22.40	258.27	38.93	245.25	-24.92
-400	255.72	53.29	237.60	-26.66	237.07	-31.18	240.55	-22.69	259.10	38.82	246.75	-25.15
-300	256.25	53.15	239.11	-26.95	238.62	-31.49	242.01	-22.96	259.93	38.73	248.26	-25.36
-200	256.79	53.02	240.62	-27.24	240.18	-31.78	243.49	-23.23	260.76	38.64	249.77	-25.57
-100	257.33	52.90	242.14	-27.51	241.75	-32.05	244.97	-23.48	261.59	38.56	251.29	-25.76
0	257.87	52.77	243.67	-27.76	243.32	-32.31	246.45	-23.71	262.42	38.49	252.82	-25.93
100	258.41	52.66	245.20	-28.01	244.91	-32.56	247.95	-23.93	263.25	38.42	254.34	-26.09
200	258.96	52.55	246.75	-28.24	246.50	-32.80	249.44	-24.14	264.09	38.37	255.88	-26.24
300	259.51	52.44	248.29	-28.45	248.10	-33.01	250.95	-24.34	264.92	38.32	257.41	-26.37
400	260.06	52.34	249.85	-28.65	249.71	-33.22	252.45	-24.52	265.76	38.28	258.96	-26.48
500	260.61	52.25	251.41	-28.84	251.32	-33.41	253.97	-24.68	266.60	38.25	260.50	-26.58
600	261.17	52.16	252.97	-29.01	252.94	-33.59	255.48	-24.84	267.43	38.23	262.05	-26.67
700	261.73	52.08	254.54	-29.17	254.57	-33.75	257.00	-24.97	268.27	38.21	263.60	-26.74
800	262.29	52.00	256.12	-29.31	256.20	-33.89	258.53	-25.10	269.11	38.21	265.15	-26.80
900	262.85	51.92	257.70	-29.44	257.84	-34.02	260.06	-25.21	269.95	38.21	266.70	-26.84
1000	263.41	51.86	259.28	-29.55	259.48	-34.13	261.59	-25.30	270.79	38.22	268.26	-26.87
1100	263.98	51.80	260.87	-29.65	261.13	-34.23	263.12	-25.38	271.63	38.22	269.82	-26.88
1200	264.55	51.74	262.46	-29.73	262.78	-34.31	264.66	-25.44	272.48	38.27	271.37	-26.87
1300	265.12	51.69	264.05	-29.80	264.43	-34.38	266.20	-25.49	273.32	38.30	272.93	-26.85
1400	265.69	51.64	265.65	-29.85	266.09	-34.43	267.74	-25.53	274.16	38.35	274.49	-26.82
1500	266.26	51.60	267.25	-29.88	267.74	-34.46	269.28	-25.55	275.01	38.40	276.05	-26.77
1600	266.84	51.57	268.85	-29.90	269.40	-34.48	270.82	-25.55	275.85	38.46	277.60	-26.70
1700	267.41	51.54	270.45	-29.91	271.06	-34.48	272.36	-25.54	276.70	38.53	279.16	-26.62
1800	267.99	51.52	272.05	-29.90	272.72	-34.46	273.91	-25.52	277.54	38.61	280.71	-26.53
1900	268.57	51.50	273.65	-29.87	274.38	-34.43	275.45	-25.48	278.39	38.69	282.27	-26.42
2000	269.15	51.49	275.25	-29.83	276.04	-34.38	276.99	-25.42	279.23	38.78	283.82	-26.30
2100	269.73	51.48	276.85	-29.77	277.70	-34.32	278.54	-25.35	280.08	38.88	285.36	-26.16
2200	270.32	51.48	278.45	-29.70	279.36	-34.24	280.07	-25.27	280.93	38.99	286.91	-26.00
2300	270.90	51.49	280.04	-29.50	281.01	-34.15	281.61	-25.17	281.78	39.11	288.45	-25.84
2400	271.48	51.50	281.64	-29.50	282.66	-34.04	283.15	-25.05	282.62	39.24	289.99	-25.66
2500	272.07	51.52	283.23	-29.39	284.31	-33.91	284.68	-24.93	283.47	39.37	291.52	-25.46

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	187600* (2.721)		048796* (2.971)		0741 (2.80)		0745 (0.89)		0764 (2.12)		0765 (2.32)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	216.62	-21.82	261.38	41.34	243.40	10.72	242.91	8.50	214.23	-52.20	265.69	33.65
-2400	218.01	-22.27	262.14	41.26	246.56	10.47	244.11	8.25	215.90	-52.66	266.56	33.61
-2300	219.40	-22.71	262.90	41.18	245.71	10.23	245.30	8.01	217.59	-53.12	267.44	33.58
-2200	220.81	-23.14	263.66	41.12	246.87	10.00	246.50	7.78	219.31	-53.56	268.31	33.56
-2100	222.22	-23.56	264.43	41.06	248.03	9.78	247.69	7.57	221.06	-54.00	269.19	33.54
-2000	223.64	-23.98	265.19	41.01	249.19	9.58	248.89	7.36	222.83	-54.42	270.07	33.54
-1900	225.07	-24.38	265.96	40.96	250.36	9.38	250.09	7.17	224.63	-54.83	270.94	33.54
-1800	226.50	-24.78	266.72	40.93	251.52	9.20	251.30	6.98	226.46	-55.23	271.82	33.56
-1700	227.95	-25.16	267.49	40.90	252.69	9.02	252.50	6.81	228.31	-55.62	272.70	33.58
-1600	229.40	-25.53	268.25	40.88	253.86	8.86	253.71	6.65	230.20	-55.99	273.58	33.61
-1500	230.87	-25.90	269.02	40.87	255.03	8.71	254.92	6.51	232.04	-56.34	274.46	33.65
-1400	232.34	-26.25	269.79	40.86	256.20	8.57	256.13	6.37	234.04	-56.68	275.34	33.70
-1300	233.82	-26.58	270.56	40.86	257.38	8.44	257.34	6.25	236.00	-57.01	276.22	33.76
-1200	235.31	-26.91	271.33	40.87	258.55	8.32	258.56	6.13	237.99	-57.32	277.10	33.82
-1100	236.80	-27.23	272.11	40.89	259.73	8.21	259.77	6.03	240.00	-57.61	277.98	33.89
-1000	238.30	-27.53	272.88	40.92	260.91	8.12	260.99	5.95	242.04	-57.89	278.87	33.98
-900	239.82	-27.82	273.65	40.95	262.09	8.04	262.20	5.87	244.10	-58.14	279.75	34.07
-800	241.33	-28.10	274.42	40.99	263.27	7.96	263.42	5.80	246.18	-58.38	280.63	34.17
-700	242.86	-28.36	275.20	41.04	264.45	7.90	264.64	5.75	248.29	-58.60	281.52	34.28
-600	244.39	-28.61	275.97	41.09	265.64	7.85	265.86	5.71	250.41	-58.80	282.40	34.39
-500	245.94	-28.84	276.75	41.16	266.82	7.82	267.09	5.68	252.56	-58.99	283.29	34.52
-400	247.48	-29.07	277.53	41.23	268.01	7.79	268.31	5.67	254.72	-59.15	284.17	34.65
-300	249.04	-29.27	278.30	41.30	269.19	7.78	269.53	5.67	256.89	-59.29	285.06	34.79
-200	250.60	-29.47	279.08	41.39	270.38	7.78	270.76	5.67	259.08	-59.41	285.95	34.94
-100	252.16	-29.65	279.86	41.48	271.57	7.79	271.98	5.69	261.29	-59.50	286.83	35.10
0	253.73	-29.81	280.64	41.58	272.76	7.81	273.21	5.73	263.50	-59.58	287.72	35.27
100	255.31	-29.96	281.41	41.69	273.95	7.84	274.43	5.77	265.71	-59.64	288.61	35.44
200	256.89	-30.10	282.19	41.81	275.14	7.88	275.66	5.83	267.94	-59.67	289.50	35.63
300	258.48	-30.22	282.97	41.93	276.33	7.94	276.89	5.90	270.16	-59.68	290.39	35.82
400	260.06	-30.32	283.75	42.06	277.52	8.01	278.11	5.98	272.39	-59.67	291.27	36.02
500	261.66	-30.41	284.53	42.20	278.71	8.09	279.34	6.07	274.61	-59.64	292.16	36.22
600	263.25	-30.48	285.31	42.35	279.90	8.18	280.57	6.18	276.83	-59.59	293.05	36.44
700	264.85	-30.54	286.09	42.50	281.09	8.28	281.79	6.30	279.04	-59.51	293.94	36.66
800	266.45	-30.58	286.87	42.66	282.28	8.39	283.02	6.43	281.25	-59.41	294.83	36.89
900	268.05	-30.61	287.65	42.83	283.47	8.52	284.24	6.57	283.44	-59.30	295.72	37.13
1000	269.66	-30.62	288.43	43.00	284.66	8.65	285.47	6.72	285.62	-59.16	296.62	37.38
1100	271.26	-30.62	289.21	43.18	285.86	8.80	286.69	6.88	287.79	-59.00	297.51	37.63
1200	272.86	-30.60	289.99	43.37	287.05	8.96	287.92	7.06	289.94	-58.82	298.40	37.90
1300	274.47	-30.56	290.77	43.57	288.24	9.13	289.14	7.25	292.08	-58.63	299.29	38.17
1400	276.07	-30.51	291.56	43.77	289.43	9.31	290.37	7.45	294.19	-58.41	300.18	38.44
1500	277.67	-30.44	292.34	43.98	290.62	9.50	291.59	7.65	296.28	-58.17	301.08	38.73
1600	279.27	-30.36	293.12	44.20	291.81	9.70	292.81	7.88	298.36	-57.92	301.97	39.02
1700	280.87	-30.26	293.90	44.42	293.00	9.91	294.03	8.11	300.41	-57.65	302.87	39.32
1800	282.47	-30.15	294.68	44.65	294.19	10.14	295.26	8.35	302.43	-57.36	303.76	39.64
1900	284.06	-30.02	295.46	44.89	295.38	10.37	296.48	8.60	304.43	-57.06	304.66	39.94
2000	285.65	-29.88	296.24	45.13	296.56	10.61	297.70	8.87	306.41	-56.74	305.56	40.26
2100	287.24	-29.72	297.02	45.38	297.75	10.87	298.91	9.14	308.36	-56.40	306.45	40.58
2200	288.82	-29.55	297.81	45.64	298.94	11.13	300.13	9.43	310.29	-56.05	307.35	40.92
2300	290.40	-29.36	298.59	45.90	300.13	11.41	301.35	9.72	312.19	-55.69	308.25	41.26
2400	291.97	-29.16	299.37	46.17	301.31	11.69	302.57	10.03	314.07	-55.31	309.15	41.61
2500	293.54	-28.95	300.15	46.45	302.50	11.98	303.78	10.34	315.91	-54.92	310.06	41.96

TABLE 2.—The 5,000-year star catalog—Continued

NO. (MAG)	0777 (1.33) CYG ALPHA		0803 (2.60) CEP ALPHA		0815 (2.54) PES EPSILON		0819 (2.98) CAP DELTA		0829 (2.16) GRU ALPHA	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-2500	272.46	36.27	290.93	48.06	269.82	-1.53	260.14	-25.40	245.15	-54.72
-2400	273.29	36.29	291.59	48.26	271.09	-1.52	261.66	-25.50	247.14	-54.96
-2300	274.13	36.33	292.26	48.47	272.35	-1.51	263.18	-25.59	249.14	-55.18
-2200	274.96	36.38	292.92	48.69	273.62	-1.48	264.70	-25.66	251.16	-55.37
-2100	275.80	36.43	293.58	48.91	274.89	-1.44	266.23	-25.71	253.19	-55.55
-2000	276.63	36.49	294.25	49.14	276.15	-1.38	267.76	-25.75	255.24	-55.71
-1900	277.47	36.56	294.91	49.37	277.42	-1.32	269.29	-25.78	257.30	-55.85
-1800	278.31	36.64	295.57	49.61	278.68	-1.24	270.82	-25.79	259.37	-55.97
-1700	279.14	36.72	296.23	49.86	279.95	-1.15	272.35	-25.78	261.45	-56.07
-1600	279.98	36.82	296.89	50.11	281.21	-1.04	273.88	-25.76	263.54	-56.15
-1500	280.82	36.92	297.54	50.37	282.48	-0.93	275.41	-25.73	265.64	-56.21
-1400	281.66	37.03	298.20	50.63	283.74	-0.80	276.94	-25.67	267.74	-56.25
-1300	282.50	37.15	298.86	50.90	285.01	-0.66	278.47	-25.61	269.84	-56.27
-1200	283.34	37.27	299.51	51.17	286.27	-0.51	280.00	-25.53	271.95	-56.24
-1100	284.18	37.41	300.17	51.45	287.53	-0.34	281.52	-25.43	274.05	-56.24
-1000	285.02	37.55	300.82	51.74	288.79	-0.17	283.05	-25.32	276.15	-56.19
-900	285.86	37.70	301.47	52.03	290.05	0.02	284.57	-25.20	278.24	-56.13
-800	286.70	37.86	302.12	52.33	291.31	0.22	286.09	-25.06	280.33	-56.04
-700	287.54	38.02	302.77	52.63	292.57	0.43	287.61	-24.91	282.41	-55.94
-600	288.38	38.19	303.41	52.93	293.83	0.65	289.12	-24.74	284.49	-55.81
-500	289.22	38.38	304.06	53.25	295.08	0.88	290.63	-24.56	286.55	-55.66
-400	290.06	38.56	304.70	53.56	296.34	1.13	292.14	-24.36	288.60	-55.50
-300	290.90	38.76	305.35	53.89	297.59	1.38	293.64	-24.15	290.63	-55.32
-200	291.74	38.97	306.00	54.21	298.84	1.65	295.14	-23.93	292.65	-55.11
-100	292.59	39.18	306.65	54.55	300.09	1.92	296.63	-23.69	294.65	-54.89
0	293.43	39.40	307.27	54.88	301.34	2.21	298.12	-23.44	296.64	-54.66
100	294.27	39.62	307.91	55.23	302.58	2.51	299.60	-23.18	298.61	-54.40
200	295.11	39.86	308.54	55.57	303.83	2.81	301.08	-22.91	300.56	-54.13
300	295.96	40.10	309.18	55.93	305.07	3.13	302.56	-22.62	302.49	-53.84
400	296.80	40.35	309.81	56.28	306.32	3.46	304.02	-22.32	304.40	-53.54
500	297.65	40.61	310.44	56.65	307.56	3.79	305.49	-22.01	306.28	-53.22
600	298.49	40.87	311.07	57.01	308.80	4.14	306.95	-21.69	308.15	-52.88
700	299.33	41.14	311.69	57.38	310.04	4.50	308.40	-21.36	310.00	-52.53
800	300.18	41.42	312.32	57.76	311.27	4.86	309.84	-21.01	311.82	-52.17
900	301.02	41.70	312.94	58.14	312.51	5.23	311.29	-20.66	313.63	-51.80
1000	301.87	42.00	313.56	58.52	313.75	5.62	312.72	-20.29	315.41	-51.41
1100	302.72	42.29	314.18	58.91	314.98	6.01	314.15	-19.92	317.17	-51.01
1200	303.56	42.60	314.80	59.30	316.21	6.41	315.57	-19.53	318.90	-50.60
1300	304.41	42.91	315.41	59.70	317.44	6.81	316.99	-19.14	320.62	-50.18
1400	305.26	43.23	316.02	60.10	318.67	7.23	318.40	-18.73	322.32	-49.74
1500	306.11	43.56	316.63	60.50	319.90	7.65	319.81	-18.32	323.99	-49.30
1600	306.95	43.89	317.24	60.91	321.13	8.08	321.21	-17.90	325.64	-48.85
1700	307.80	44.23	317.85	61.33	322.36	8.52	322.61	-17.47	327.28	-48.39
1800	308.65	44.57	318.45	61.74	323.59	8.96	324.00	-17.03	328.89	-47.92
1900	309.51	44.92	319.05	62.16	324.82	9.42	325.38	-16.58	330.48	-47.45
2000	310.36	45.28	319.64	62.59	326.05	9.88	326.76	-16.13	332.06	-46.96
2100	311.21	45.64	320.24	63.01	327.27	10.34	328.13	-15.67	333.61	-46.47
2200	312.06	46.01	320.83	63.44	328.50	10.81	329.50	-15.20	335.15	-45.97
2300	312.92	46.39	321.42	63.88	329.73	11.29	330.87	-14.72	336.67	-45.47
2400	313.78	46.77	322.00	64.32	330.96	11.77	332.23	-14.24	338.18	-44.96
2500	314.63	47.16	322.58	64.76	332.19	12.26	333.58	-13.76	339.66	-44.45

TABLE 2.—*The 5,000-year star catalog—Continued*

NU. (MAG)	(2.91)		(2.24)		(1.29)		(2.61)		(2.57)	
	TUC ALPHA	DEC.	GRU BETA	DEC.	PSA ALPHA	DEC.	PEG BETA	DEC.	PEG ALPHA	DEC.
-2500	R.A.	228.49	R.A.	253.63	R.A.	271.45	R.A.	293.32	R.A.	290.13
-2400	DEC.	-65.55	DEC.	-58.30	DEC.	-44.42	DEC.	9.40	DEC.	-2.85
-2300	R.A.	230.65	R.A.	255.77	R.A.	273.26	R.A.	294.49	R.A.	291.40
-2200	DEC.	-66.26	DEC.	-58.58	DEC.	-44.38	DEC.	9.88	DEC.	-2.65
-2100	R.A.	232.94	R.A.	257.93	R.A.	275.07	R.A.	295.66	R.A.	292.68
-2000	DEC.	-66.59	DEC.	-58.69	DEC.	-44.32	DEC.	10.13	DEC.	-2.22
-1900	R.A.	235.23	R.A.	260.09	R.A.	276.88	R.A.	296.82	R.A.	293.95
-1800	DEC.	-67.20	DEC.	-58.78	DEC.	-44.26	DEC.	10.39	DEC.	-1.98
-1700	R.A.	237.58	R.A.	262.27	R.A.	278.69	R.A.	297.99	R.A.	295.22
-1600	DEC.	-67.47	DEC.	-58.85	DEC.	-44.17	DEC.	10.66	DEC.	-1.74
-1500	R.A.	242.40	R.A.	266.65	R.A.	282.29	R.A.	300.32	R.A.	296.49
-1400	DEC.	-67.72	DEC.	-58.92	DEC.	-43.94	DEC.	11.24	DEC.	-1.48
-1300	R.A.	244.87	R.A.	268.84	R.A.	284.08	R.A.	301.48	R.A.	299.02
-1200	DEC.	-67.95	DEC.	-58.92	DEC.	-43.81	DEC.	11.54	DEC.	-0.94
-1100	R.A.	247.39	R.A.	271.04	R.A.	285.87	R.A.	302.65	R.A.	300.79
-1000	DEC.	-68.16	DEC.	-58.90	DEC.	-43.65	DEC.	11.85	DEC.	-0.65
-900	R.A.	249.94	R.A.	273.24	R.A.	287.65	R.A.	303.81	R.A.	301.55
-800	DEC.	-68.34	DEC.	-58.86	DEC.	-43.48	DEC.	12.18	DEC.	-0.35
-700	R.A.	252.53	R.A.	275.43	R.A.	289.43	R.A.	304.97	R.A.	302.81
-600	DEC.	-68.49	DEC.	-58.80	DEC.	-43.29	DEC.	12.51	DEC.	-0.04
-500	R.A.	255.15	R.A.	277.62	R.A.	291.19	R.A.	306.13	R.A.	304.07
-400	DEC.	-68.63	DEC.	-58.72	DEC.	-43.08	DEC.	13.20	DEC.	0.28
-300	R.A.	257.80	R.A.	279.80	R.A.	292.95	R.A.	307.29	R.A.	305.32
-200	DEC.	-68.73	DEC.	-58.61	DEC.	-42.86	DEC.	13.55	DEC.	0.61
-100	R.A.	260.47	R.A.	281.97	R.A.	294.70	R.A.	308.45	R.A.	306.58
-90	DEC.	-68.81	DEC.	-58.49	DEC.	-42.63	DEC.	13.82	DEC.	0.95
-80	R.A.	263.15	R.A.	284.13	R.A.	296.44	R.A.	309.61	R.A.	307.83
-70	DEC.	-68.87	DEC.	-58.34	DEC.	-42.37	DEC.	14.29	DEC.	1.30
-60	R.A.	265.86	R.A.	286.28	R.A.	298.17	R.A.	310.77	R.A.	309.08
-50	DEC.	-68.89	DEC.	-58.17	DEC.	-42.11	DEC.	14.68	DEC.	1.66
-40	R.A.	268.57	R.A.	288.42	R.A.	299.88	R.A.	311.93	R.A.	310.33
-30	DEC.	-68.90	DEC.	-57.99	DEC.	-41.83	DEC.	15.07	DEC.	2.02
-20	R.A.	271.26	R.A.	290.53	R.A.	301.59	R.A.	313.08	R.A.	311.58
-10	DEC.	-68.87	DEC.	-57.78	DEC.	-41.53	DEC.	15.47	DEC.	2.40
0	R.A.	273.99	R.A.	292.64	R.A.	303.28	R.A.	314.24	R.A.	312.82
100	DEC.	-68.82	DEC.	-57.56	DEC.	-41.22	DEC.	15.88	DEC.	2.79
200	R.A.	276.69	R.A.	294.72	R.A.	304.96	R.A.	315.40	R.A.	314.07
300	DEC.	-68.74	DEC.	-57.31	DEC.	-40.90	DEC.	16.29	DEC.	3.18
400	R.A.	279.38	R.A.	296.78	R.A.	306.63	R.A.	316.56	R.A.	315.31
500	DEC.	-68.64	DEC.	-57.05	DEC.	-40.56	DEC.	16.72	DEC.	3.58
600	R.A.	282.05	R.A.	298.82	R.A.	308.29	R.A.	317.71	R.A.	316.55
700	DEC.	-68.51	DEC.	-56.77	DEC.	-39.94	DEC.	17.15	DEC.	3.99
800	R.A.	284.71	R.A.	300.84	R.A.	309.94	R.A.	318.87	R.A.	317.79
900	DEC.	-68.35	DEC.	-56.48	DEC.	-39.65	DEC.	17.58	DEC.	4.41
1000	R.A.	287.33	R.A.	302.83	R.A.	311.57	R.A.	320.03	R.A.	319.03
1100	DEC.	-68.17	DEC.	-56.17	DEC.	-39.48	DEC.	18.03	DEC.	4.84
1200	R.A.	289.92	R.A.	304.80	R.A.	313.19	R.A.	321.19	R.A.	320.26
1300	DEC.	-67.97	DEC.	-55.84	DEC.	-39.09	DEC.	18.49	DEC.	5.27
1400	R.A.	292.48	R.A.	306.75	R.A.	314.80	R.A.	322.35	R.A.	321.50
1500	DEC.	-67.74	DEC.	-55.50	DEC.	-38.70	DEC.	18.94	DEC.	5.72
1600	R.A.	295.01	R.A.	308.67	R.A.	316.39	R.A.	323.51	R.A.	322.73
1700	DEC.	-67.50	DEC.	-55.14	DEC.	-38.29	DEC.	19.40	DEC.	6.16
1800	R.A.	297.49	R.A.	310.57	R.A.	317.97	R.A.	324.67	R.A.	323.97
1900	DEC.	-67.23	DEC.	-54.77	DEC.	-37.88	DEC.	19.85	DEC.	6.62
2000	R.A.	299.93	R.A.	312.44	R.A.	319.54	R.A.	325.83	R.A.	325.20
2100	DEC.	-66.94	DEC.	-54.39	DEC.	-37.45	DEC.	20.35	DEC.	7.08
2200	R.A.	302.33	R.A.	314.29	R.A.	321.09	R.A.	327.00	R.A.	326.43
2300	DEC.	-66.63	DEC.	-53.99	DEC.	-37.02	DEC.	20.83	DEC.	7.55
2400	R.A.	304.68	R.A.	316.11	R.A.	322.64	R.A.	328.16	R.A.	327.66
2500	DEC.	-66.30	DEC.	-53.58	DEC.	-36.57	DEC.	21.31	DEC.	8.03
2600	R.A.	306.99	R.A.	317.91	R.A.	324.17	R.A.	329.33	R.A.	328.89
2700	DEC.	-65.96	DEC.	-53.16	DEC.	-36.12	DEC.	21.81	DEC.	8.51
2800	R.A.	309.25	R.A.	319.68	R.A.	325.69	R.A.	330.49	R.A.	330.12
2900	DEC.	-65.22	DEC.	-52.73	DEC.	-35.66	DEC.	22.31	DEC.	8.99
3000	R.A.	311.47	R.A.	321.43	R.A.	327.19	R.A.	331.66	R.A.	331.36
3100	DEC.	-64.83	DEC.	-52.28	DEC.	-35.19	DEC.	22.81	DEC.	9.49
3200	R.A.	313.64	R.A.	323.15	R.A.	328.69	R.A.	332.84	R.A.	332.59
3300	DEC.	-64.42	DEC.	-51.83	DEC.	-34.71	DEC.	23.32	DEC.	9.99
3400	R.A.	315.76	R.A.	324.86	R.A.	330.17	R.A.	334.01	R.A.	333.82
3500	DEC.	-64.00	DEC.	-51.37	DEC.	-34.24	DEC.	23.84	DEC.	10.49
3600	R.A.	317.83	R.A.	326.53	R.A.	331.64	R.A.	335.19	R.A.	335.05
3700	DEC.	-63.57	DEC.	-50.42	DEC.	-33.74	DEC.	24.35	DEC.	11.00
3800	R.A.	321.85	R.A.	328.19	R.A.	333.10	R.A.	336.37	R.A.	336.28
3900	DEC.	-63.13	DEC.	-49.94	DEC.	-33.24	DEC.	24.88	DEC.	11.51
4000	R.A.	323.80	R.A.	331.43	R.A.	335.99	R.A.	337.55	R.A.	337.51
4100	DEC.	-62.67	DEC.	-49.44	DEC.	-32.74	DEC.	25.40	DEC.	12.03
4200	R.A.	325.70	R.A.	333.02	R.A.	337.42	R.A.	338.74	R.A.	338.75
4300	DEC.	-62.21	DEC.	-48.94	DEC.	-32.23	DEC.	25.93	DEC.	12.55
4400	R.A.	327.56	R.A.	334.59	R.A.	338.83	R.A.	341.12	R.A.	339.98
4500	DEC.	-61.73	DEC.	-48.44	DEC.	-31.72	DEC.	26.46	DEC.	13.07
4600	R.A.	329.38	R.A.	336.13	R.A.	340.24	R.A.	342.32	R.A.	342.46
4700	DEC.	-61.25	DEC.	-47.93	DEC.	-30.68	DEC.	27.00	DEC.	13.60
4800	R.A.	331.17	R.A.	337.66	R.A.	341.64	R.A.	343.52	R.A.	343.70
4900	DEC.	-60.76	DEC.	-47.41	DEC.	-30.15	DEC.	27.54	DEC.	14.13
5000	R.A.	332.91	R.A.	339.17	R.A.	343.03	R.A.	344.73	R.A.	344.94
5100	DEC.	-60.26	DEC.	-46.88	DEC.	-29.62	DEC.	28.08	DEC.	14.67
5200	R.A.	334.63	R.A.	340.67	R.A.	344.41	R.A.	345.94	R.A.	346.19
5300	DEC.	-59.75	DEC.	-46.36	DEC.	-29.09	DEC.	28.63	DEC.	15.21
5400	R.A.	336.30	R.A.	342.14	R.A.	345.78	R.A.	347.16	R.A.	347.44
5500	DEC.	-59.24	DEC.	-45.83	DEC.	-28.55	DEC.	29.18	DEC.	15.75
5600	R.A.	337.95	R.A.	343.60	R.A.	347.15	R.A.	348.38	R.A.	348.69
5700	DEC.	-58.73	DEC.	-45.29	DEC.	-28.01	DEC.	29.73	DEC.	16.29
5800	R.A.	339.56	R.A.	345.04	R.A.	348.51	R.A.	349.61	R.A.	349.94
5900	DEC.	-58.20	DEC.	-44.75	DEC.	-27.47	DEC.	30.28	DEC.	16.83
6000	R.A.	341.15	R.A.	346.47	R.A.	349.86	R.A.	350.85	R.A.	351.20
6100	DEC.	-57.68	DEC.	-44.21	DEC.	-26.93	DEC.	30.83	DEC.	17.38
6200	R.A.	342.71	R.A.	347.88	R.A.	351.20	R.A.	352.09	R.A.	352.46

TABLE 3.—*The 10,000-year star catalog—Continued*

NO. (MAG)	C066 ARI BETA	(2.72)	0073 AND GAPHA	(2.29)	0074 ARI ALPHA	(2.23)	129R25*(2.01)	CET OMICRON	C107 CET ALPHA	(2.82)	0111 PER BETA	(2.20)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	227.39	-8.71	242.13	6.87	231.16	-8.11	216.77	-30.83	231.43	-32.19	251.59	-0.88
-9500	234.45	-10.75	248.48	5.50	238.22	-9.99	224.63	-33.26	239.72	-34.01	258.31	-1.75
-9000	241.53	-12.45	254.78	4.46	245.29	-11.54	232.71	-35.36	248.16	-35.43	264.97	-2.26
-8500	248.64	-13.80	261.04	3.76	252.38	-12.72	240.99	-37.09	256.71	-36.41	271.57	-2.41
-8000	255.78	-14.79	267.27	3.39	259.48	-13.53	249.46	-38.43	265.30	-36.94	278.10	-2.21
-7500	262.92	-15.40	273.45	3.35	266.57	-13.97	258.08	-39.33	273.88	-37.02	284.55	-1.68
-7000	270.05	-15.64	279.59	3.64	273.63	-14.03	266.77	-39.79	282.37	-36.66	290.92	-0.82
-6500	277.14	-15.52	285.67	4.23	280.64	-13.73	275.46	-39.80	290.70	-35.87	297.21	0.33
-6000	284.18	-15.03	291.70	5.12	287.58	-13.08	284.06	-39.36	298.82	-34.70	303.42	1.77
-5500	291.14	-14.19	297.68	6.30	294.44	-12.09	292.50	-38.51	306.69	-33.17	309.54	3.46
-5000	298.01	-13.03	303.60	7.74	301.20	-10.80	300.71	-37.28	314.29	-31.33	315.60	5.39
-4500	304.77	-11.57	309.47	9.42	307.86	-9.21	308.67	-35.69	321.63	-29.22	321.60	7.53
-4000	311.42	-9.84	315.31	11.33	314.41	-7.36	316.34	-33.80	328.72	-26.90	327.57	9.85
-3500	317.97	-7.86	321.12	13.44	320.87	-5.29	323.74	-31.66	335.58	-24.39	333.51	12.32
-3000	324.42	-5.66	326.91	15.73	327.25	-3.01	330.87	-29.30	342.24	-21.76	339.46	14.92
-2500	330.80	-3.29	332.73	18.17	333.56	-0.57	337.77	-26.78	348.75	-19.03	345.45	17.63
-2000	337.10	-0.76	338.57	20.74	339.82	2.01	344.45	-24.14	355.12	-16.24	351.51	20.40
-1500	343.38	1.88	344.48	23.41	346.07	4.69	350.97	-21.42	1.41	-13.42	357.67	23.21
-1000	349.64	4.61	350.49	26.15	352.32	7.44	357.36	-18.64	7.65	-10.63	3.97	26.03
-500	355.91	7.38	356.63	28.94	358.62	10.22	3.66	-15.86	13.86	-7.87	10.46	28.82
-C	2.24	10.18	2.96	31.74	4.98	13.01	9.69	-13.11	20.09	-5.20	17.17	31.54
NO. (MAG)	C120 PER ALPHA	(1.90)	0139 TAU ETA	(2.96)	0144 PER ZETA	(2.91)	0147 PER EPSTILON	(2.96)	C168 TAU ALPHA	(1.06)	0181 AUR IOTA	(2.90)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	257.97	6.03	252.32	-19.45	256.57	-12.80	259.94	-5.29	261.72	-29.57	270.14	-14.65
-9500	264.31	5.49	260.05	-20.26	263.93	-13.39	266.89	-5.71	270.15	-29.89	277.60	-14.50
-9000	270.57	5.28	267.75	-20.66	271.22	-13.58	273.75	-5.76	278.47	-29.75	284.92	-13.97
-8500	276.77	5.41	275.36	-20.64	278.42	-13.39	280.52	-5.45	286.63	-29.17	292.09	-13.07
-8000	282.89	5.86	282.88	-20.23	285.52	-12.82	287.19	-4.79	294.59	-28.20	299.10	-11.83
-7500	288.93	6.62	290.26	-19.44	292.49	-11.91	293.76	-3.80	302.32	-26.86	305.95	-10.28
-7000	294.90	7.68	297.50	-18.30	299.33	-10.66	300.22	-2.51	309.82	-25.19	312.64	-8.45
-6500	300.80	9.00	304.58	-16.83	306.04	-9.12	306.57	-0.94	317.07	-23.23	319.18	-6.39
-6000	306.63	10.58	311.49	-15.07	312.62	-7.31	312.89	0.88	324.09	-21.04	325.60	-4.11
-5500	312.42	12.40	318.24	-13.06	319.07	-5.26	318.99	2.93	330.91	-18.64	331.91	-1.66
-5000	318.16	14.42	324.85	-10.83	325.43	-3.00	325.09	5.18	337.54	-16.09	338.14	0.93
-4500	323.87	16.63	331.32	-8.42	331.69	-0.57	331.14	7.60	344.02	-13.42	344.32	3.63
-4000	329.59	19.01	337.70	-5.85	337.89	2.01	337.16	10.16	350.39	-10.66	350.48	6.41
-3500	335.32	21.53	344.00	-3.17	344.06	4.69	343.19	12.83	356.68	-7.86	356.66	9.23
-3000	341.11	24.16	350.25	-0.41	350.22	7.46	349.25	15.58	2.93	-5.04	2.89	12.07
-2500	346.98	26.88	356.49	2.40	356.41	10.27	355.37	18.39	9.16	-2.25	9.20	14.89
-2000	352.97	29.66	2.74	5.22	2.66	13.10	1.60	21.21	15.42	0.49	15.63	17.65
-1500	359.12	32.48	9.04	8.02	9.00	15.91	7.97	24.02	21.73	3.15	22.21	20.31
-1000	5.49	35.29	15.43	10.77	15.47	18.66	14.52	26.78	28.12	5.68	28.97	22.85
-500	12.11	38.07	21.93	13.43	22.10	21.32	21.28	29.46	34.61	8.06	35.95	25.23
-0	19.06	40.77	28.56	15.96	28.92	23.85	28.31	32.00	41.22	10.25	43.15	27.39

TABLE 3.—*The 10,000-year star catalog—Continued*

NO. (MAG)	C188 EQI BETA	(2.92)	0193 AUR ALPHA	(0.21)	0194 CRI BETA	(0.34)	0201 ORI GAMMA	(1.70)	0202 TAU BETA	(1.78)	0204 LEP BETA	(2.96)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	267.31	-52.74	275.10	-0.90	268.77	-56.27	274.88	-41.97	276.23	-19.20	273.21	-68.82
-9500	278.03	-52.67	281.79	-0.56	280.08	-56.09	284.28	-41.51	283.94	-18.74	287.71	-68.32
-9000	288.46	-52.03	288.37	0.12	291.00	-55.33	293.38	-40.58	291.47	-17.89	301.16	-67.12
-8500	298.43	-50.90	294.83	1.12	301.35	-54.05	302.12	-39.23	298.82	-16.68	313.21	-65.35
-8000	307.85	-49.32	301.17	2.42	311.03	-52.32	310.46	-37.50	305.96	-15.15	323.82	-63.15
-7500	316.69	-47.38	307.40	3.99	320.01	-50.24	318.41	-35.47	312.91	-13.33	333.16	-60.66
-7000	324.96	-45.14	313.54	5.81	328.34	-47.89	325.97	-33.18	319.68	-11.26	341.46	-57.98
-6500	332.70	-42.68	319.60	7.84	336.09	-45.33	333.18	-30.68	326.28	-8.98	348.93	-55.19
-6000	339.99	-40.05	325.60	10.07	343.34	-42.62	340.09	-28.04	332.75	-6.52	355.75	-52.33
-5500	346.89	-37.31	331.55	12.47	350.17	-39.82	346.75	-25.28	339.10	-3.92	2.09	-49.46
-5000	353.47	-34.50	337.50	15.00	356.66	-36.97	353.20	-22.46	345.37	-1.21	8.06	-46.61
-4500	359.79	-31.66	343.46	17.64	2.90	-34.11	359.49	-19.61	351.60	1.57	13.75	-43.81
-4000	5.92	-28.83	349.48	20.36	8.93	-31.28	5.67	-16.77	357.81	4.38	19.24	-41.09
-3500	11.90	-26.03	355.58	23.13	14.82	-28.49	11.77	-13.95	4.05	7.21	24.59	-38.46
-3000	17.79	-23.30	1.81	25.91	20.61	-25.78	17.84	-11.21	10.34	10.00	29.84	-35.94
-2500	23.61	-20.67	8.21	28.69	26.33	-23.18	23.90	-8.56	16.73	12.74	35.03	-33.56
-2000	29.41	-18.15	14.82	31.41	32.03	-20.71	29.98	-6.04	23.23	15.37	40.19	-31.33
-1500	35.21	-15.78	21.69	34.04	37.72	-18.40	36.12	-3.68	29.88	17.88	45.34	-29.27
-1000	41.02	-13.57	28.86	36.53	43.43	-16.26	42.32	-1.50	36.71	20.21	50.50	-27.39
-500	46.88	-11.56	36.37	38.85	49.18	-14.31	48.60	0.47	43.73	22.34	55.68	-25.72
-C	52.78	-9.77	44.24	40.94	54.97	-12.59	54.97	2.21	50.95	24.22	60.89	-24.25
NO. (MAG)	C206 URI DELTA	(2.48)	0207 LEP ALPHA	(2.69)	0209 CRI IOTA	(2.89)	0210 ORI EPSILON	(1.75)	0215 COL ALPHA	(2.75)	132444*(2.05)	CRI ZETA
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	276.92	-48.72	276.32	-66.25	278.15	-54.35	278.51	-49.63	282.96	-82.40	280.27	-50.36
-9500	287.02	-48.13	289.81	-65.60	289.00	-53.68	288.70	-48.96	309.22	-81.07	290.53	-49.60
-9000	296.72	-47.05	302.33	-64.31	299.32	-52.48	298.45	-47.79	327.57	-78.81	300.30	-48.34
-8500	305.94	-45.52	315.65	-62.49	309.00	-50.83	307.68	-46.19	340.29	-76.11	309.52	-46.65
-8000	314.63	-43.63	323.76	-60.28	318.03	-48.80	316.37	-44.22	349.73	-73.24	318.18	-44.62
-7500	322.81	-41.44	332.77	-57.78	326.41	-46.49	324.52	-41.57	357.26	-70.30	326.29	-42.31
-7000	330.52	-39.01	340.88	-55.10	334.23	-43.96	332.19	-39.49	3.63	-67.37	333.91	-39.78
-6500	337.80	-36.40	348.26	-52.30	341.54	-41.28	339.43	-36.85	9.26	-64.47	341.09	-37.10
-6000	344.72	-33.67	355.06	-49.44	348.44	-38.49	346.31	-34.09	14.41	-61.63	347.92	-34.32
-5500	351.35	-30.85	1.42	-46.56	355.01	-35.64	352.89	-31.26	19.23	-56.87	354.45	-31.48
-5000	357.73	-28.00	7.44	-43.70	1.30	-32.77	359.23	-28.40	23.82	-56.19	0.76	-28.61
-4500	3.93	-25.14	13.20	-40.88	7.39	-29.92	5.40	-25.54	28.27	-53.62	6.88	-25.76
-4000	10.00	-22.31	18.77	-38.13	13.34	-27.11	11.43	-22.72	32.63	-51.16	12.88	-22.94
-3500	15.98	-19.53	24.22	-35.48	19.18	-24.38	17.38	-19.56	36.93	-48.82	18.80	-20.21
-3000	21.91	-16.85	29.57	-32.95	24.95	-21.74	23.28	-17.30	41.19	-46.62	24.67	-17.57
-2500	27.81	-14.27	34.88	-30.55	30.70	-19.24	29.16	-14.76	45.45	-44.55	30.52	-15.05
-2000	33.73	-11.84	40.16	-28.31	36.44	-16.88	35.04	-12.36	49.72	-42.65	36.39	-12.69
-1500	39.68	-9.58	45.44	-26.23	42.20	-14.69	40.97	-10.13	54.01	-40.91	42.29	-10.51
-1000	45.67	-7.51	50.73	-24.35	47.99	-12.70	46.93	-8.11	58.32	-39.34	48.24	-8.53
-500	51.73	-5.65	56.05	-22.67	53.84	-10.93	52.96	-6.30	62.66	-37.96	54.24	-6.76
-C	57.86	-4.03	61.40	-21.22	59.74	-9.39	59.06	-4.73	67.04	-36.77	60.31	-5.25

TABLE 3.—The 10,000-year star catalog—Continued

NO. (MAG)	C220 (2.20)	CRI ALPHA (0.10)	O227 (2.07)	O58636* (2.72)	C243 (1.99)	O278 (2.74)
YEAR	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.
-10000	283.83 -58.00	286.64 -40.89	282.96 -3.33	283.21 -10.79	304.79 -64.42	67.78 -76.33
-9500	295.13 -57.02	293.82 -39.92	289.75 -2.51	290.41 -9.96	316.26 -62.44	63.38 -74.98
-9000	305.70 -55.52	302.61 -38.52	296.40 -1.37	297.44 -8.78	326.41 -60.08	70.42 -73.47
-8500	315.47 -53.59	310.99 -36.75	302.89 0.08	304.30 -7.29	335.40 -57.46	58.60 -71.87
-8000	324.44 -51.34	318.95 -34.67	309.25 1.79	310.99 -5.52	343.44 -54.68	57.67 -70.24
-7500	332.69 -48.84	326.53 -32.34	315.49 3.75	317.52 -3.49	350.75 -51.81	57.43 -68.60
-7000	340.32 -46.16	333.74 -29.82	321.63 5.92	323.92 -1.26	357.47 -48.89	57.71 -66.98
-6500	347.43 -43.37	340.65 -27.14	327.68 8.28	330.21 1.16	3.75 -45.98	58.41 -65.41
-6000	354.13 -40.52	347.31 -24.36	333.68 10.78	336.41 3.73	9.69 -43.10	59.45 -63.88
-5500	0.49 -37.64	353.75 -21.52	339.66 13.42	342.56 6.41	15.39 -40.29	60.77 -62.42
-5000	6.59 -34.78	0.04 -18.65	345.64 16.15	348.70 9.18	20.90 -37.55	62.31 -61.03
-4500	12.51 -31.96	6.22 -15.79	351.67 18.95	354.84 12.00	26.29 -34.93	64.04 -59.72
-4000	18.28 -29.21	17.32 -12.98	357.78 21.78	1.04 14.84	31.59 -32.43	65.94 -58.50
-3500	23.96 -26.55	18.39 -10.23	4.01 24.62	7.33 17.67	36.84 -30.07	67.99 -57.37
-3000	29.59 -24.01	24.46 -7.58	10.40 27.44	13.75 20.46	42.07 -27.88	70.15 -56.35
-2500	35.19 -21.62	30.56 -5.06	17.00 30.19	20.33 23.16	47.30 -25.86	72.43 -55.43
-2000	40.79 -19.39	36.70 -2.70	23.85 32.84	27.11 25.74	52.54 -24.04	74.81 -54.62
-1500	46.41 -17.34	42.92 -0.53	30.98 35.34	34.12 28.16	57.81 -22.43	77.26 -53.94
-1000	52.06 -15.50	49.23 1.43	38.44 37.66	41.38 30.38	63.11 -21.04	79.80 -53.37
-500	57.76 -13.89	55.67 3.14	46.25 39.73	48.91 32.36	68.46 -19.89	82.39 -52.93
-0	63.50 -12.51	62.10 4.60	54.42 41.52	56.71 34.05	73.84 -18.98	85.04 -52.62
NO. (MAG)	C251 (1.93)	O257 (-1.59)	O263 (2.83)	O268 (1.63)	O273 (1.98)	O278 (2.74)
YEAR	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.	R.A. DEC.
-10000	295.51 -30.25	314.09 -56.88	50.08 -74.72	338.04 -69.21	337.13 -65.84	4.10 -70.16
-9500	303.72 -28.77	323.85 -54.73	48.80 -72.63	347.12 -66.25	345.96 -62.90	9.93 -67.05
-9000	311.59 -26.94	332.69 -52.33	48.57 -70.54	354.82 -63.22	353.63 -59.89	15.15 -64.04
-8500	319.13 -24.83	340.76 -49.74	49.07 -68.49	1.59 -60.20	0.45 -56.87	19.97 -61.14
-8000	326.36 -22.49	348.18 -47.04	50.09 -66.50	7.69 -57.21	6.67 -53.88	24.52 -58.35
-7500	333.31 -19.95	355.08 -44.29	51.49 -64.58	13.32 -54.29	12.44 -50.95	28.89 -55.68
-7000	340.04 -17.28	1.56 -41.53	53.18 -62.75	18.62 -51.45	17.90 -48.11	33.14 -53.14
-6500	346.57 -14.50	7.71 -38.79	55.09 -61.01	23.68 -48.72	23.13 -45.37	37.30 -50.74
-6000	352.96 -11.66	13.62 -36.11	57.19 -59.37	28.57 -46.11	28.19 -42.74	41.41 -48.48
-5500	359.24 -8.79	19.34 -33.51	59.45 -57.84	33.34 -43.62	33.14 -40.25	45.51 -46.23
-5000	5.45 -5.92	24.93 -31.02	61.83 -56.41	38.05 -41.28	38.01 -37.91	49.59 -44.43
-4500	11.65 -3.09	30.42 -28.66	64.33 -55.11	42.71 -39.09	42.85 -35.72	53.68 -42.64
-4000	17.85 -0.33	35.86 -26.44	66.93 -53.92	47.35 -37.07	47.66 -33.70	57.79 -41.03
-3500	24.10 2.32	41.25 -24.39	69.61 -52.86	51.99 -35.22	52.48 -31.87	61.92 -39.59
-3000	30.41 4.85	46.64 -22.52	72.37 -51.94	56.64 -33.56	57.31 -30.24	66.09 -38.34
-2500	36.82 7.20	52.03 -20.85	75.20 -51.15	61.31 -32.10	62.16 -28.81	70.28 -37.29
-2000	43.35 9.37	57.43 -19.40	78.09 -50.50	66.01 -30.84	67.04 -27.59	74.51 -36.43
-1500	50.00 11.30	62.85 -18.17	81.03 -49.99	70.75 -29.80	71.95 -26.60	78.77 -35.78
-1000	56.78 12.98	68.30 -17.19	84.02 -49.63	75.51 -28.98	76.90 -25.84	83.06 -35.33
-500	63.68 14.37	73.77 -16.45	87.04 -49.42	80.31 -28.39	81.88 -25.32	87.38 -35.10
-0	70.69 15.45	79.25 -15.97	90.10 -49.36	85.13 -28.03	86.88 -25.05	91.73 -35.07

TABLE 3.—*The 10,000-year star catalog—Continued*

NO. (MAG)	C283 (2.431)		C287 (1.99)		C291 (0.48)		C295 (1.21)		C306 (2.27)		C308 (2.88)	
	YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.
-10000	347.91	-65.10	304.39	-11.18	317.84	-31.39	309.60	-13.32	18.02	-62.32	352.25	-54.26
-9500	355.58	-62.02	311.47	-9.33	325.63	-29.15	316.68	-11.28	22.81	-59.38	359.26	-51.16
-9000	2.35	-58.95	318.33	-7.23	333.04	-26.72	323.52	-9.01	27.37	-56.57	5.71	-48.09
-8500	8.46	-55.93	325.00	-4.92	340.11	-21.15	330.16	-6.56	31.76	-53.91	11.74	-45.09
-8000	14.13	-52.99	331.50	-2.43	346.89	-24.43	336.63	-3.96	36.04	-51.40	17.47	-42.19
-7500	19.46	-50.14	337.86	0.20	353.45	-18.72	342.96	-1.25	40.24	-49.04	22.96	-39.44
-7000	24.56	-47.40	344.13	2.94	359.83	-15.96	349.20	1.53	44.38	-46.84	28.29	-36.74
-6500	29.49	-44.79	350.35	5.75	6.08	-13.22	355.39	4.36	48.51	-44.81	33.50	-34.22
-6000	34.31	-42.31	356.54	8.60	12.24	-10.53	1.56	7.20	52.62	-42.95	38.64	-31.87
-5500	39.05	-39.99	2.75	11.46	18.36	-7.92	7.76	10.02	56.73	-41.26	43.74	-29.69
-5000	43.75	-37.82	9.03	14.29	28.46	-5.41	14.02	12.79	60.86	-39.76	48.82	-27.69
-4500	48.43	-35.83	15.40	17.06	30.57	-3.04	20.37	15.47	65.01	-38.45	53.90	-25.90
-4000	53.11	-34.02	21.90	19.74	36.72	-0.83	26.86	18.03	69.17	-37.33	58.99	-24.31
-3500	57.79	-32.40	28.57	22.30	42.93	1.18	33.50	20.45	73.37	-36.41	64.10	-22.95
-3000	62.50	-30.98	35.44	24.68	49.21	2.98	40.32	22.67	77.59	-35.70	69.24	-21.82
-2500	67.23	-29.78	42.52	26.86	55.57	4.55	47.34	24.67	81.84	-35.19	74.41	-20.93
-2000	72.00	-28.79	49.83	28.80	62.01	5.84	54.56	26.41	86.11	-34.89	79.61	-20.29
-1500	76.79	-28.03	57.37	30.46	68.52	6.86	61.97	27.86	90.41	-34.80	84.84	-19.91
-1000	81.62	-27.50	65.12	31.79	75.09	7.57	69.95	28.98	94.73	-34.93	90.09	-19.78
-500	86.47	-27.21	73.06	32.77	81.71	7.98	77.27	29.75	99.06	-35.27	95.36	-19.91
-0	91.35	-27.15	81.14	33.38	88.36	8.06	85.10	30.15	103.40	-35.81	100.65	-20.30

NO. (MAG)	C309 (1.92)		C315 (1.74)		C345 (2.22)		C348 (1.80)		C351 (2.25)		C353 (2.63)	
	YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.
-10000	33.97	-62.44	58.28	-58.83	29.95	-51.66	72.74	-50.19	55.79	-52.06	48.94	-51.39
-9500	37.40	-59.86	60.67	-57.20	34.65	-48.98	75.84	-49.30	59.21	-50.33	52.71	-49.36
-9000	40.85	-57.44	63.18	-55.70	39.22	-46.49	78.95	-48.59	62.64	-48.79	56.47	-47.53
-8500	44.32	-55.17	65.78	-54.34	43.71	-44.18	82.06	-48.06	66.10	-47.43	60.24	-45.89
-8000	47.80	-53.05	68.45	-53.13	48.14	-42.06	85.16	-47.69	69.57	-46.25	64.01	-44.44
-7500	51.30	-51.09	71.19	-52.06	52.52	-40.14	88.26	-47.49	73.06	-45.25	67.79	-43.19
-7000	54.82	-49.29	73.98	-51.14	56.89	-38.41	91.34	-47.45	76.56	-44.45	71.57	-42.13
-6500	58.37	-47.66	76.81	-50.38	61.25	-36.88	94.41	-47.58	80.07	-43.82	75.37	-41.27
-6000	61.95	-46.19	79.67	-49.76	65.61	-35.56	97.46	-47.87	83.59	-43.38	79.17	-40.60
-5500	65.56	-44.89	82.56	-49.29	69.97	-34.45	100.48	-48.31	87.12	-43.13	82.98	-40.13
-5000	69.19	-43.77	85.48	-48.98	74.35	-33.55	103.48	-48.90	90.66	-43.06	86.80	-39.86
-4500	72.86	-42.83	88.42	-48.81	78.75	-32.87	106.45	-49.63	94.19	-43.16	90.63	-39.78
-4000	76.56	-42.07	91.37	-48.80	83.15	-32.42	109.38	-50.51	97.73	-43.45	94.47	-39.90
-3500	80.29	-41.49	94.33	-48.94	87.58	-32.18	112.27	-51.52	101.26	-43.92	98.31	-40.20
-3000	84.05	-41.10	97.29	-49.22	92.02	-32.16	115.22	-52.67	104.79	-44.55	102.15	-40.70
-2500	87.83	-40.89	100.25	-49.65	96.47	-32.37	117.91	-53.93	108.32	-45.36	106.00	-41.39
-2000	91.63	-40.88	103.20	-50.22	100.93	-32.80	120.64	-55.32	111.83	-46.33	109.84	-42.26
-1500	95.45	-41.05	106.14	-50.94	105.39	-33.44	123.30	-56.81	115.32	-47.46	113.67	-43.30
-1000	99.28	-41.41	109.05	-51.79	109.87	-34.29	125.88	-58.41	118.81	-48.74	117.51	-44.52
-500	103.12	-41.96	111.94	-52.77	114.35	-35.35	128.36	-60.10	122.27	-50.17	121.34	-45.90
-0	106.97	-42.69	114.79	-53.89	118.85	-36.60	130.72	-61.89	125.71	-51.74	125.16	-47.44

TABLE 3.—The 10,000-year star catalog—Continued

YEAR	C354 (2.16)		0380 (1.34)		08129A*(2.61)		222321*(2.85)		0416 (2.44)		0417 (1.95)	
	R.A.	DEC.	LEC ALPHA	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	352.98	-29.73	345.57	-7.38	340.33	-0.75	45.24	-37.71	317.56	29.01	312.37	32.68
-9500	359.76	-26.62	352.26	-4.35	347.01	2.24	50.21	-35.56	323.02	31.38	317.51	34.82
-9000	6.27	-23.55	358.81	-1.32	353.57	5.28	55.12	-33.64	328.44	33.90	322.60	37.12
-8500	12.56	-20.55	5.26	1.69	0.06	8.31	59.98	-31.96	333.84	36.54	327.67	39.55
-8000	18.70	-17.65	11.66	4.63	6.54	11.32	64.81	-30.52	339.29	39.27	332.76	42.10
-7500	24.74	-14.88	18.07	7.48	13.04	14.26	69.62	-28.32	344.82	42.09	337.91	44.76
-7000	30.73	-12.26	24.51	10.21	19.62	17.11	74.41	-28.37	350.49	44.96	343.16	47.49
-6500	36.69	-9.81	31.03	12.78	26.31	19.82	79.19	-27.67	356.38	47.86	348.59	50.29
-6000	42.64	-7.56	37.65	15.17	33.15	22.36	83.97	-27.21	9.15	50.77	354.27	53.13
-5500	48.65	-5.53	44.41	17.34	40.18	24.70	88.74	-27.00	2.57	53.65	0.29	55.99
-5000	54.69	-3.73	51.30	19.25	47.40	26.80	93.52	-27.04	16.25	56.46	6.77	58.84
-4500	60.78	-2.19	58.34	20.90	54.84	28.61	98.28	-27.32	24.01	59.17	13.86	61.64
-4000	66.92	-0.92	65.51	22.23	62.47	30.11	103.05	-27.84	32.60	61.70	21.79	64.34
-3500	73.12	0.06	72.81	23.23	70.30	31.26	107.81	-28.59	42.18	63.97	30.78	66.88
-3000	79.36	0.74	80.21	23.88	78.26	32.04	112.57	-29.57	52.89	65.91	41.14	69.16
-2500	85.64	1.12	87.67	24.17	86.33	32.42	117.32	-30.76	64.76	67.39	53.12	71.07
-2000	91.94	1.18	95.15	24.09	94.43	32.40	122.09	-32.17	77.60	68.32	66.80	72.47
-1500	98.26	0.93	102.62	23.65	102.51	31.98	126.86	-33.77	91.01	68.61	81.87	73.22
-1000	104.57	0.38	110.03	22.85	110.51	31.17	131.64	-35.56	104.38	68.24	97.49	73.22
-500	110.87	-0.47	117.35	21.71	118.38	29.99	136.46	-37.52	117.14	67.25	112.57	72.47
-	117.14	-1.61	124.55	20.26	126.08	28.48	141.32	-39.64	128.90	65.73	126.28	71.08
YEAR	C422 (2.58)		0444 (2.23)		0447 (2.54)		0452 (2.88)		0457 (2.78)		0462 (1.10)	
	R.A.	DEC.	LEC BETA	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	348.94	9.31	0.48	13.36	324.45	34.27	54.23	-26.56	28.66	-4.20	67.65	-31.16
-9500	355.52	12.40	7.14	16.42	329.85	36.87	59.64	-24.80	35.21	-1.53	72.57	-30.04
-9000	2.07	15.47	13.82	19.38	335.25	39.58	64.99	-23.32	41.73	0.90	77.45	-29.19
-8500	8.64	18.50	20.58	22.23	340.69	42.38	70.30	-22.12	48.26	3.07	82.28	-28.60
-8000	15.28	21.44	27.46	24.93	346.24	45.24	75.57	-21.19	54.81	4.96	87.08	-28.27
-7500	22.04	24.26	34.50	27.43	351.95	48.15	80.82	-20.54	61.40	6.56	91.84	-28.20
-7000	28.97	26.93	41.74	29.71	357.91	51.09	86.05	-20.17	68.02	7.84	96.57	-28.37
-6500	36.10	29.41	49.18	31.72	4.22	54.01	91.26	-20.07	74.68	8.79	101.27	-28.79
-6000	43.46	31.65	56.85	33.43	10.99	56.90	96.44	-20.24	81.36	9.41	105.95	-29.45
-5500	51.08	33.63	64.73	34.80	18.37	59.71	101.61	-20.67	88.06	9.69	110.60	-30.34
-5000	58.94	35.28	72.78	35.81	26.55	62.38	106.76	-21.36	94.75	9.63	115.24	-31.44
-4500	67.03	36.59	80.96	36.42	35.74	64.85	111.89	-22.30	101.41	9.24	119.85	-32.76
-4000	75.32	37.52	89.22	36.63	46.13	67.02	117.00	-23.47	108.04	8.52	124.47	-34.27
-3500	83.74	38.04	97.47	36.43	57.89	68.79	122.10	-24.87	114.61	7.49	129.08	-35.97
-3000	92.22	38.13	105.66	35.82	70.95	70.04	127.20	-26.49	121.11	6.16	133.70	-37.85
-2500	100.69	37.81	113.71	34.84	84.98	70.64	132.31	-28.30	127.55	4.57	138.35	-39.89
-2000	109.07	37.07	121.59	33.49	99.29	70.55	137.43	-30.29	133.91	2.72	143.03	-42.08
-1500	117.29	35.95	129.26	31.83	113.11	69.76	142.58	-32.46	140.21	0.65	147.79	-44.40
-1000	125.30	34.47	136.69	29.88	125.85	68.38	147.79	-34.78	146.46	-1.61	152.64	-46.85
-500	133.07	32.68	143.91	27.69	137.26	66.52	153.08	-37.22	152.67	-4.03	157.61	-49.41
-	140.60	30.61	150.90	25.31	147.36	64.30	158.47	-39.79	158.86	-6.59	162.76	-52.05

TABLE 3.—*The 10,000-year star catalog—Continued*

NO. (MAG)	C468 CRU GAMMA	(1.61)	0471 CRU BETA	(2.84)	0474 MUS ALPHA	(2.94)	2236C3*(2.39)	138917*(2.91)	0481 CRU BETA	(1.50)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	61.37	-27.08	35.38	-5.21	74.47	-33.27	56.57	-20.83	66.07	-27.12
-9500	66.67	-25.67	41.90	-2.74	79.16	-32.50	62.23	-19.21	71.27	-25.93
-9000	71.93	-24.55	48.40	-0.54	83.80	-31.99	67.84	-17.87	76.43	-25.02
-8500	77.13	-23.70	54.90	1.39	88.40	-31.73	73.41	-16.83	81.54	-24.39
-8000	82.30	-23.14	61.41	3.01	92.95	-31.72	78.94	-15.68	86.61	-24.03
-7500	87.43	-22.85	67.94	4.31	97.47	-31.94	84.45	-15.62	91.64	-23.94
-7000	92.54	-22.83	74.48	5.29	101.95	-32.40	89.92	-15.45	96.64	-24.11
-6500	97.61	-23.08	81.04	5.94	106.40	-33.08	95.37	-15.56	101.61	-24.55
-6000	102.65	-23.59	87.61	6.25	110.82	-33.99	100.78	-15.95	106.55	-25.23
-5500	107.67	-24.36	94.16	6.22	115.22	-35.10	106.17	-16.61	111.46	-26.15
-5000	112.66	-25.36	100.68	5.86	119.59	-36.41	111.53	-17.53	116.36	-27.30
-4500	117.63	-26.60	107.17	5.17	123.95	-37.90	116.87	-18.70	121.23	-28.67
-4000	122.59	-28.05	113.61	4.18	128.31	-39.58	122.18	-20.11	126.10	-30.24
-3500	127.54	-29.71	119.99	2.90	132.67	-41.43	127.48	-21.73	130.97	-32.01
-3000	132.49	-31.57	126.31	1.34	137.05	-43.43	132.77	-23.57	135.85	-33.97
-2500	137.46	-33.61	132.56	-0.46	141.46	-45.58	138.07	-25.59	140.76	-36.08
-2000	142.46	-35.81	138.77	-2.49	145.93	-47.86	143.39	-27.78	145.71	-38.35
-1500	147.52	-38.16	144.92	-4.72	150.47	-50.26	148.76	-30.13	150.75	-40.75
-1000	152.65	-40.63	151.05	-7.12	155.12	-52.77	154.19	-32.60	155.88	-43.27
-500	157.91	-43.23	157.17	-9.66	159.93	-55.37	159.72	-35.20	161.16	-45.89
-0	163.31	-45.91	163.31	-12.31	164.94	-58.05	165.38	-37.88	166.63	-48.59

NO. (MAG)	C483 UMA EPSILON	(1.68)	0485 CVN ALPHA	(2.90)	0488 VIR EPSILON	(2.95)	0496 CEN IOTA	(2.91)	0497 UMA ZETA	(2.40)	0498 VIR ALPHA	(1.21)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	325.34	43.12	348.13	38.20	15.37	23.80	52.73	-6.74	327.90	47.05	35.58	12.04
-9500	330.31	45.75	354.30	41.25	22.43	26.75	59.08	-4.98	332.75	49.75	42.68	14.49
-9000	335.30	48.46	0.64	44.29	29.65	29.51	65.41	-3.53	337.64	52.53	49.84	16.66
-8500	340.36	51.26	7.23	47.29	37.05	32.05	71.71	-2.41	342.63	55.37	57.07	18.50
-8000	345.55	54.12	14.18	50.22	44.68	34.32	77.98	-1.61	347.80	58.27	64.38	20.01
-7500	350.96	57.03	21.59	53.03	52.55	36.29	84.23	-1.13	353.24	61.20	71.76	21.15
-7000	356.69	59.96	29.58	55.67	60.65	37.92	90.45	-0.59	359.10	64.14	79.18	21.92
-6500	2.89	62.89	38.26	58.08	68.98	39.18	96.63	-1.16	5.57	67.07	86.63	22.31
-6000	9.74	65.78	47.73	60.20	77.47	40.02	102.77	-1.65	12.94	69.95	94.07	22.32
-5500	17.55	68.60	58.04	61.94	86.07	40.44	108.87	-2.44	21.65	72.73	101.46	21.94
-5000	26.69	71.29	69.14	63.21	94.69	40.43	114.91	-3.52	32.39	75.31	108.77	21.21
-4500	37.73	73.73	80.85	63.95	103.25	39.99	120.89	-4.87	46.10	77.55	115.98	20.12
-4000	51.29	75.79	92.84	64.11	111.67	39.13	126.83	-6.47	63.71	79.22	123.07	18.72
-3500	67.77	77.26	104.73	63.67	119.89	37.89	132.72	-8.30	84.99	80.02	130.03	17.03
-3000	86.65	77.91	116.16	62.68	127.85	36.31	138.58	-10.35	107.17	79.73	136.84	15.07
-2500	105.96	77.60	126.86	61.20	135.55	34.42	144.41	-12.58	126.63	78.44	143.53	12.89
-2000	123.44	76.42	136.74	59.32	142.97	32.28	150.24	-14.97	142.07	76.46	150.09	10.52
-1500	138.05	74.58	145.79	57.12	150.13	29.93	156.08	-17.51	154.08	74.06	156.56	8.00
-1000	149.96	72.30	154.10	54.68	157.06	27.40	161.97	-20.15	163.69	71.43	162.95	5.35
-500	159.79	69.75	161.77	52.08	163.78	24.76	167.94	-22.88	171.69	68.67	169.30	2.61
-0	168.11	67.05	168.91	49.37	170.33	22.02	174.00	-25.66	178.62	65.87	175.62	-0.17

TABLE 3.—*The 10,000-year star catalog—Continued*

NO. (MAG)	C504 CEN EPSILON	(2.56)	0509 UMA NU	(1.91)	0513 BOO ETA	(2.80)	0518 CEN BETA	(0.86)	0520 CEN THETA	(2.26)	0526 BOO ALPHA	(0.24)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	66.29	-17.69	337.50	50.43	16.44	38.57	73.69	-20.72	59.40	0.88	16.19	48.86
-9500	72.04	-16.53	342.77	53.33	23.99	41.48	79.22	-19.93	66.11	2.26	24.28	51.53
-9000	77.74	-15.67	348.09	56.27	31.87	44.18	84.69	-19.45	72.77	3.30	32.91	53.97
-8500	83.40	-15.11	353.71	59.23	40.14	46.63	90.10	-19.25	79.40	3.99	42.16	56.12
-8000	89.01	-14.87	359.71	62.20	48.86	48.76	95.46	-19.35	85.99	4.33	52.07	57.90
-7500	94.57	-14.91	365.14	65.14	58.02	50.52	100.77	-19.72	92.53	4.32	62.61	59.24
-7000	100.09	-15.25	371.67	68.02	67.59	51.86	106.03	-20.36	99.01	3.97	73.63	60.06
-6500	105.57	-15.86	22.24	70.79	77.48	52.72	111.25	-21.26	105.42	3.30	84.92	60.32
-6000	111.01	-16.75	32.53	73.36	87.55	53.08	116.44	-22.41	111.75	2.32	96.19	60.01
-5500	116.42	-17.89	45.20	75.61	97.63	52.92	121.59	-23.79	118.00	1.04	107.14	59.14
-5000	121.79	-19.27	60.89	77.34	107.54	52.26	126.71	-25.39	124.17	-0.51	117.55	57.76
-4500	127.14	-20.88	79.55	78.31	117.12	51.14	131.83	-27.20	130.27	-2.31	127.29	55.94
-4000	132.48	-22.70	99.53	78.33	126.27	49.60	136.94	-29.19	136.30	-4.33	136.31	53.76
-3500	137.81	-24.72	118.24	77.40	134.95	47.70	142.08	-31.35	142.27	-6.56	144.67	51.28
-3000	143.16	-26.91	134.02	75.72	143.14	45.51	147.26	-33.67	148.21	-8.97	152.43	48.59
-2500	148.54	-29.26	146.77	73.53	150.88	43.08	152.50	-36.12	154.12	-11.52	159.67	45.73
-2000	153.99	-31.74	157.14	71.03	158.20	40.48	157.84	-38.69	160.05	-14.19	166.49	42.76
-1500	159.53	-34.33	165.78	68.35	165.18	37.75	163.31	-41.36	166.00	-16.96	172.97	39.72
-1000	165.19	-37.02	173.23	65.58	171.86	34.94	168.96	-44.09	172.03	-19.80	179.18	36.64
-500	171.03	-39.78	179.84	62.77	178.31	32.08	174.86	-46.88	178.15	-22.67	185.19	33.57
-C	177.09	-42.57	185.87	59.97	184.57	29.23	181.06	-49.69	184.41	-25.54	191.06	30.52

NO. (MAG)	C537 CEN ETA	(2.65)	053 CEN ALPHA	(0.33)	0541 LUP ALPHA	(2.89)	083500*(2.71) BOO EPSILON	0548 LIB ALPHA	(2.90)	0550 UMI BETA	(2.24)	
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	66.92	-3.02	87.28	-16.08	70.64	-6.94	17.58	52.23	56.01	21.19	295.93	52.40
-9500	73.44	-1.91	92.73	-16.05	76.95	-6.01	25.71	55.15	63.73	22.80	298.85	53.78
-9000	79.92	-1.15	98.08	-16.29	83.20	-5.42	34.49	57.83	71.49	24.01	301.64	55.26
-8500	86.34	-0.73	103.35	-16.80	89.40	-5.17	44.07	60.21	79.28	24.82	304.29	56.86
-8000	92.71	-0.66	108.53	-17.56	95.53	-5.25	54.53	62.20	87.06	25.22	306.80	58.55
-7500	99.02	-0.92	113.64	-18.56	101.60	-5.64	65.86	63.72	94.79	25.20	309.15	60.33
-7000	105.26	-1.50	118.67	-19.77	107.61	-6.35	77.90	64.67	102.45	24.79	311.33	62.19
-6500	111.44	-2.39	123.65	-21.20	113.56	-7.34	90.33	65.00	109.98	24.00	313.31	64.13
-6000	117.55	-3.57	128.57	-22.82	119.44	-8.61	102.70	64.70	117.37	22.85	315.04	66.13
-5500	123.59	-5.02	133.46	-24.61	125.27	-10.14	114.60	63.80	124.60	21.37	316.47	68.17
-5000	129.57	-6.72	138.32	-26.57	131.04	-11.90	125.72	62.38	131.66	19.61	317.51	70.26
-4500	135.50	-8.65	143.17	-28.67	136.79	-13.87	135.92	60.52	138.54	17.58	318.02	72.37
-4000	141.38	-10.78	148.03	-30.90	142.50	-16.04	145.20	58.33	145.26	15.33	317.80	74.48
-3500	147.25	-13.09	152.92	-33.24	148.22	-18.38	153.66	55.88	151.84	12.90	316.52	76.57
-3000	153.11	-15.56	157.87	-35.68	153.95	-20.87	161.40	53.26	158.30	10.32	313.65	78.58
-2500	158.99	-18.15	162.90	-38.20	159.73	-23.48	168.57	50.53	164.67	7.62	308.33	80.45
-2000	164.93	-20.85	168.05	-40.78	165.59	-26.18	175.28	47.73	170.97	4.85	299.30	82.04
-1500	170.95	-23.61	173.35	-43.41	171.56	-28.95	181.67	44.92	177.24	2.03	285.42	83.13
-1000	177.09	-26.42	178.86	-46.06	177.69	-31.75	187.61	42.11	183.50	-0.79	267.72	83.66
-500	183.39	-29.23	184.63	-48.70	184.01	-34.57	193.52	39.35	189.80	-3.59	250.69	82.93
-C	189.89	-32.03	190.71	-51.32	190.59	-37.36	199.21	36.66	196.16	-6.34	238.14	81.71

TABLE 3.—The 10,000-year star catalog—Continued

YEAR	C552 (2.81)		0564 (2.74)		225938*(2.96)		0578 (2.31)		0582 (2.75)		0594 (2.54)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	CR8 ALPHA	DEC.	SER ALPHA	DEC.	R.A.	DEC.
-10000	71.08	-1.70	58.38	30.01	76.33	2.92	28.73	60.77	55.00	46.50	74.73	22.12
-9500	77.66	-0.80	66.65	31.50	83.15	3.53	38.58	63.41	64.56	48.14	82.64	22.79
-9000	84.18	-0.26	74.99	32.56	89.90	3.78	49.58	65.66	74.39	49.29	90.49	23.03
-8500	90.64	-0.07	83.37	33.18	96.57	3.66	61.80	67.42	84.38	49.92	98.24	22.86
-8000	97.04	-0.23	91.72	33.35	103.15	3.20	75.11	68.58	94.37	50.02	105.87	22.28
-7500	103.37	-0.71	100.00	33.09	109.64	2.40	89.07	69.03	104.22	49.60	113.35	21.33
-7000	109.62	-1.51	108.13	32.42	116.04	-0.10	103.02	68.75	113.79	48.69	120.65	20.03
-6500	115.79	-2.61	116.08	31.35	122.34	-0.10	116.27	67.80	122.96	47.35	127.78	18.42
-6000	121.89	-3.99	123.81	29.92	128.55	-1.76	128.38	66.26	131.69	45.62	134.72	16.53
-5500	127.92	-5.62	131.30	28.18	134.68	-3.66	139.21	64.27	139.94	43.57	141.48	14.39
-5000	133.89	-7.50	136.56	26.16	140.74	-5.77	148.82	61.94	147.75	41.27	148.10	12.06
-4500	139.80	-9.58	145.59	23.91	146.74	-8.07	157.39	59.38	155.15	38.77	154.58	9.55
-4000	145.69	-11.85	152.41	21.47	152.72	-10.54	165.11	56.67	162.20	36.12	160.95	6.91
-3500	151.55	-14.28	159.05	18.88	158.69	-13.13	172.17	53.86	168.94	33.37	167.24	4.17
-3000	157.44	-16.85	165.53	16.17	164.69	-15.83	178.72	51.01	175.43	30.56	173.49	1.37
-2500	163.35	-19.52	171.91	13.40	170.73	-18.60	184.88	48.17	181.73	27.73	179.73	-1.46
-2000	169.34	-22.27	178.19	10.58	176.87	-21.42	196.75	45.35	187.89	24.91	185.98	-4.29
-1500	175.44	-25.08	184.44	7.75	183.13	-24.24	196.39	42.59	193.95	22.14	192.29	-7.08
-1000	181.68	-27.90	190.67	4.96	189.56	-27.05	201.88	39.91	199.94	19.45	198.69	-9.80
-500	188.11	-30.71	196.91	2.22	196.20	-29.79	207.27	37.33	205.90	16.86	205.19	-12.41
-0	194.77	-33.46	203.20	-0.41	203.08	-32.44	212.58	34.69	211.86	14.40	211.83	-14.88

YEAR	C597 (2.90)		017074*(2.90)		0616 (1.22)		0618 (2.81)		C620 (2.91)		0622 (2.70)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	HR8 BETA	DEC.	SCO TAU	DEC.	OPH ZETA	DEC.
-10000	74.95	25.15	301.60	67.43	82.68	20.31	59.29	65.72	84.60	18.89	80.47	36.00
-9500	83.05	25.80	301.50	69.00	90.49	20.56	72.36	67.05	92.31	19.04	89.39	36.35
-9000	91.10	26.02	300.82	70.53	98.19	20.38	86.10	67.68	99.92	18.77	98.19	36.21
-8500	99.04	25.81	299.48	72.00	105.75	19.81	99.91	67.58	107.38	18.11	106.82	35.62
-8000	106.85	25.19	297.36	73.37	113.16	18.86	113.14	66.77	114.68	17.08	115.21	34.60
-7500	114.48	24.19	294.35	74.61	120.39	17.57	125.34	65.36	121.80	15.72	123.32	33.19
-7000	121.92	22.84	290.36	75.69	127.44	15.96	136.32	63.48	128.76	14.06	131.13	31.46
-6500	129.17	21.17	285.37	76.55	134.31	14.08	146.11	61.23	135.54	12.13	138.63	29.43
-6000	136.21	19.22	279.50	77.14	141.02	11.96	154.84	58.72	142.17	9.96	145.86	27.16
-5500	143.06	17.04	273.04	77.43	147.57	9.63	162.72	56.04	148.65	7.60	152.82	24.69
-5000	149.73	14.65	266.42	77.39	154.00	7.13	169.90	53.26	155.02	5.07	159.55	22.08
-4500	156.26	12.11	260.13	77.04	160.33	4.49	176.54	50.43	161.31	2.42	166.09	19.35
-4000	162.67	9.44	254.57	76.41	166.59	1.76	182.77	47.58	167.54	-0.33	172.49	16.55
-3500	168.99	6.88	249.97	75.54	172.81	-1.04	188.68	44.75	173.74	-3.14	178.77	13.72
-3000	175.25	3.87	246.38	74.48	179.03	-3.88	194.36	41.97	179.96	-5.97	184.98	10.88
-2500	181.49	1.03	243.74	73.28	185.28	-6.71	199.87	39.26	186.21	-8.81	191.16	8.08
-2000	187.74	-1.79	241.96	71.99	191.59	-9.51	205.25	36.65	192.54	-11.60	197.33	5.34
-1500	194.04	-4.57	240.90	70.65	197.99	-12.24	210.57	34.16	198.99	-14.32	203.53	2.70
-1000	200.40	-7.26	240.45	69.27	204.52	-14.87	215.80	31.80	205.56	-16.93	209.78	0.18
-500	206.87	-9.84	240.51	67.89	211.20	-17.36	221.08	29.60	212.31	-19.40	216.11	-2.18
-0	213.47	-12.27	241.00	66.53	218.05	-19.68	226.32	27.57	219.24	-21.68	222.53	-4.34

TABLE 3.—The 10,000-year star catalog—Continued

NO. (MAG)	C625 (1.88)		C628 (2.36)		160332*(2.64)		0645 (2.80)		0649 (2.80)		0651 (2.97)	
	TRA ALPHA	DEC.	R.A.	DEC.	R.A.	DEC.	ARA BETA	R.A.	DEC.	ARA ALPHA	R.A.	DEC.
-10000	94.06	-20.86	90.82	14.52	91.09	32.06	97.11	-7.04	97.52	11.24	98.03	-1.21
-9500	99.52	-21.17	98.18	13.30	99.69	31.84	103.37	-7.54	104.77	10.69	104.59	-1.77
-9000	104.89	-21.76	105.40	13.69	108.08	31.81	109.51	-8.35	111.85	9.78	111.03	-2.65
-8500	110.18	-22.62	112.47	12.73	116.24	30.10	115.54	-9.46	118.77	8.54	117.34	-3.85
-8000	115.40	-23.73	119.37	11.44	124.13	28.66	121.47	-10.84	125.53	6.99	123.53	-5.33
-7000	120.56	-25.09	126.10	9.86	131.74	26.89	127.31	-12.48	132.13	5.16	129.62	-7.06
-6500	125.67	-26.66	132.69	8.00	139.07	24.84	133.08	-14.34	138.59	3.10	135.62	-9.03
-6000	130.75	-28.44	139.12	5.91	146.14	22.56	138.79	-16.42	144.94	0.83	141.54	-11.20
-5500	135.80	-30.41	145.43	3.62	152.99	20.09	144.47	-18.67	151.16	-1.62	147.41	-13.55
-5000	140.85	-32.55	151.64	1.16	159.63	17.47	150.13	-21.09	153.23	-4.21	153.25	-16.05
-4500	145.92	-34.85	157.76	-1.44	166.11	14.74	155.80	-23.64	163.46	-6.91	159.10	-18.67
-4000	151.05	-37.29	163.84	-4.14	172.47	11.94	161.53	-26.30	169.57	-9.69	164.98	-21.40
-3500	156.25	-39.84	169.90	-6.93	178.73	9.11	167.34	-29.05	175.71	-12.52	170.94	-24.19
-3000	161.57	-42.50	175.98	-9.76	184.95	6.28	173.27	-31.86	181.91	-15.37	177.00	-27.03
-2500	167.06	-45.24	182.10	-12.61	191.16	3.48	179.37	-34.69	188.21	-18.20	183.22	-29.88
-2000	172.77	-48.04	188.31	-15.44	197.38	0.74	185.70	-37.53	194.65	-20.99	189.64	-32.70
-1500	178.78	-50.86	194.63	-18.22	203.65	-1.90	192.30	-40.32	201.26	-23.68	196.32	-35.47
-1000	185.17	-53.69	201.11	-20.92	209.99	-4.41	199.25	-43.04	208.07	-26.25	203.29	-38.13
-500	192.06	-56.48	207.77	-23.50	216.44	-6.75	206.61	-45.64	215.12	-28.66	210.61	-40.65
-C	207.90	-61.77	221.75	-28.14	229.67	-10.83	222.77	-50.27	230.00	-32.80	226.47	-45.06
YEAR												
-10000	98.09	11.43	283.75	79.25	98.79	5.44	96.90	61.74	99.89	9.49	101.67	52.44
-9500	105.34	10.85	273.71	79.67	105.71	4.84	109.19	61.07	107.03	8.83	112.17	51.62
-9000	112.43	9.91	263.50	79.53	112.49	3.89	120.73	59.79	114.00	7.80	122.12	50.30
-8500	119.35	8.64	254.41	78.88	119.13	2.63	131.34	58.02	120.82	6.46	131.47	48.55
-8000	126.11	7.06	247.17	77.84	125.62	1.07	141.01	55.87	127.47	4.82	140.20	46.46
-7500	132.72	5.22	241.86	76.51	131.98	-0.75	149.80	53.42	133.98	2.92	148.35	44.11
-7000	139.18	3.13	238.23	75.01	138.23	-2.80	157.83	50.77	140.35	0.79	155.97	41.56
-6500	145.52	0.84	235.92	73.39	144.38	-5.05	165.22	47.98	146.61	-1.53	163.14	38.86
-6000	151.76	-1.62	234.65	71.72	150.46	-7.48	172.11	45.11	152.79	-4.02	169.93	36.07
-5500	157.92	-4.22	234.16	70.02	156.49	-10.05	178.58	42.21	158.91	-6.64	176.42	33.24
-5000	164.05	-6.93	234.29	68.33	162.51	-12.73	184.75	39.30	165.00	-9.37	182.68	30.39
-4500	170.17	-9.72	234.90	66.66	168.55	-15.49	190.68	36.43	171.10	-12.17	188.75	27.56
-4000	176.32	-12.56	235.89	65.04	174.64	-18.32	196.44	33.62	177.24	-15.01	194.69	24.79
-3500	182.53	-15.41	237.19	63.66	180.82	-21.16	202.07	30.89	183.46	-17.86	200.54	22.10
-3000	188.84	-18.24	238.76	61.95	187.13	-23.99	207.63	28.28	189.80	-20.68	206.35	19.52
-2500	195.29	-21.01	240.54	60.52	193.61	-26.78	213.14	25.80	196.30	-23.45	212.13	17.06
-2000	201.91	-23.70	242.51	59.17	200.30	-29.49	218.63	23.47	202.98	-26.11	217.92	14.77
-1500	208.73	-26.25	244.64	57.92	207.25	-32.07	224.14	21.32	209.90	-28.65	223.74	12.66
-1000	215.80	-28.64	246.91	56.76	214.48	-34.49	229.67	19.35	217.07	-31.00	229.60	10.74
-500	223.12	-30.82	249.30	55.72	222.03	-36.70	235.23	17.61	224.52	-33.13	235.51	9.06
-C	230.71	-32.74	251.80	54.78	229.91	-38.65	240.84	16.08	232.26	-35.00	241.48	7.61
YEAR												
-10000	98.09	11.43	283.75	79.25	98.79	5.44	96.90	61.74	99.89	9.49	101.67	52.44
-9500	105.34	10.85	273.71	79.67	105.71	4.84	109.19	61.07	107.03	8.83	112.17	51.62
-9000	112.43	9.91	263.50	79.53	112.49	3.89	120.73	59.79	114.00	7.80	122.12	50.30
-8500	119.35	8.64	254.41	78.88	119.13	2.63	131.34	58.02	120.82	6.46	131.47	48.55
-8000	126.11	7.06	247.17	77.84	125.62	1.07	141.01	55.87	127.47	4.82	140.20	46.46
-7500	132.72	5.22	241.86	76.51	131.98	-0.75	149.80	53.42	133.98	2.92	148.35	44.11
-7000	139.18	3.13	238.23	75.01	138.23	-2.80	157.83	50.77	140.35	0.79	155.97	41.56
-6500	145.52	0.84	235.92	73.39	144.38	-5.05	165.22	47.98	146.61	-1.53	163.14	38.86
-6000	151.76	-1.62	234.65	71.72	150.46	-7.48	172.11	45.11	152.79	-4.02	169.93	36.07
-5500	157.92	-4.22	234.16	70.02	156.49	-10.05	178.58	42.21	158.91	-6.64	176.42	33.24
-5000	164.05	-6.93	234.29	68.33	162.51	-12.73	184.75	39.30	165.00	-9.37	182.68	30.39
-4500	170.17	-9.72	234.90	66.66	168.55	-15.49	190.68	36.43	171.10	-12.17	188.75	27.56
-4000	176.32	-12.56	235.89	65.04	174.64	-18.32	196.44	33.62	177.24	-15.01	194.69	24.79
-3500	182.53	-15.41	237.19	63.66	180.82	-21.16	202.07	30.89	183.46	-17.86	200.54	22.10
-3000	188.84	-18.24	238.76	61.95	187.13	-23.99	207.63	28.28	189.80	-20.68	206.35	19.52
-2500	195.29	-21.01	240.54	60.52	193.61	-26.78	213.14	25.80	196.30	-23.45	212.13	17.06
-2000	201.91	-23.70	242.51	59.17	200.30	-29.49	218.63	23.47	202.98	-26.11	217.92	14.77
-1500	208.73	-26.25	244.64	57.92	207.25	-32.07	224.14	21.32	209.90	-28.65	223.74	12.66
-1000	215.80	-28.64	246.91	56.76	214.48	-34.49	229.67	19.35	217.07	-31.00	229.60	10.74
-500	223.12	-30.82	249.30	55.72	222.03	-36.70	235.23	17.61	224.52	-33.13	235.51	9.06
-C	230.71	-32.74	251.80	54.78	229.91	-38.65	240.84	16.08	232.26	-35.00	241.48	7.61
YEAR												
-10000	98.09	11.43	283.75	79.25	98.79	5.44	96.90	61.74	99.89	9.49	101.67	52.44
-9500	105.34	10.85	273.71	79.67	105.71	4.84	109.19	61.07	107.03	8.83	112.17	51.62
-9000	112.43	9.91	263.50	79.53	112.49	3.89	120.73	59.79	114.00	7.80	122.12	50.30
-8500	119.35	8.64	254.41	78.88	119.13	2.63	131.34	58.02	120.82	6.46	131.47	48.55
-8000	126.11	7.06	247.17	77.84	125.62	1.07	141.01	55.87	127.47	4.82	140.20	46.46
-7500	132.72	5.22	241.86	76.51	131.98	-0.75	149.80	53.42	133.98	2.92	148.35	44.11
-7000	139.18	3.13	238.23	75.01	138.23	-2.80	157.83	50.77	140.35	0.79	155.97	41.56
-6500	145.52	0.84	235.92	73.39	144.38	-5.05	165.22	47.98	146.61	-1.53	163.14	38.86
-6000	151.76	-1.62	234.65	71.72	150.46	-7.48	172.11	45.11	152.79	-4.02	169.93	36.07
-5500	157.92	-4.22	234.16	70.02	156.49	-10.05	178.58	42.21	158.91	-6.64	176.42	33.24
-5000	164.05	-6.93	234.29	68.33	162.51	-12.73	184.75	39.30	165.00	-9.37	182.68	30.39
-4500	170.17	-9.72	234.90	66.66	168.55	-15.49	190.68	36.43	171.10	-12.17	188.75	27.56
-4000	176.32	-12.56	235.89	65.04	174.64	-18.32	196.44	33.62	177.24	-15.01	194.69	24.79
-3500	182.53	-15.41	237.19	63.66	180.82	-21.16	202.07	30.89	183.46	-17.86	200.54	22.10
-3000	188.84	-18.24	238.76	61.95	187.13	-23.99	207.63	28.28	189.80	-20.68	206.35	19.52
-2500	195.29	-21.01	240.54	60.52	193.61	-26.78	213.14	25.80	196.30	-23.45	212.13	17.06
-2000	201.91	-23.70	242.51	59.17	200.30	-29.49	218.63	23.47	202.98	-26.11	217.92	14.77
-1500	208.73	-26.25	244.64	57.92	207.25	-32.07	224.14	21.32	209.90	-28.65	223.74	12.66
-1000	215.80	-28.64	246.91	56.76	214.48	-34.49	229.67	19.35	217.07	-31.00	229.60	10.74
-500	223.12	-30.82	249.30	55.72	222.03	-36.70	235.23	17.61	224.52	-33.13	235.51	9.06
-C	230.71	-32.74	251.80	54.78	229.91	-38.65	240.84	16.08	232.26	-35.00	241.48	7.61
YEAR												
-10000	98.09	11.43	283.75	79.25	98.79	5.44	96.90	61.74	99.89	9.49	101.67	52.44
-9500	105.34	10.85	273.71	79.67	105.71	4.84	109.19	61				

TABLE 3.—The 10,000-year star catalog—Continued

NO. (MAG)	0676 (2.42)		0687 (2.84)		0689 (1.95)		0692 (2.94)		0699 (0.14)		0706 (2.14)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	261.64	79.44	108.68	18.00	108.94	13.68	111.46	22.56	174.48	78.51	117.39	19.95
-9500	252.56	78.68	116.25	16.87	116.26	12.52	119.24	21.26	182.03	75.38	124.98	18.38
-9000	245.57	77.52	123.36	15.38	123.36	11.03	126.76	19.62	188.04	72.30	132.30	16.50
-8500	240.62	76.09	130.70	13.60	130.27	9.25	134.01	17.68	193.22	69.30	139.37	14.36
-8000	237.34	74.50	137.60	11.55	136.99	7.21	141.02	15.48	197.92	66.40	146.21	12.00
-7500	235.37	72.81	144.30	9.27	143.54	4.95	147.81	13.08	202.30	63.59	152.85	9.47
-7000	234.37	71.09	150.84	6.81	149.94	2.50	154.40	10.51	206.48	60.90	159.34	6.79
-6500	234.12	69.35	157.25	4.20	156.24	-0.09	160.85	7.81	210.54	58.32	165.70	4.02
-6000	234.43	67.64	163.55	1.47	162.45	-2.81	167.18	5.01	214.51	55.86	171.97	1.17
-5500	235.19	65.95	169.79	-1.33	168.62	-5.61	173.42	2.16	218.43	53.53	178.20	-1.70
-5000	236.30	64.32	176.00	-4.18	174.77	-8.46	179.63	-0.73	222.33	51.33	184.43	-4.58
-4500	237.71	62.75	182.21	-7.05	180.96	-11.33	185.84	-3.61	226.23	49.28	190.68	-7.42
-4000	239.35	61.25	188.47	-9.90	187.21	-14.19	192.07	-6.45	230.13	47.38	197.00	-10.20
-3500	241.19	59.83	194.81	-12.69	193.55	-17.00	198.38	-9.21	234.06	45.64	203.42	-12.88
-3000	243.21	58.50	201.26	-15.40	200.04	-19.73	204.78	-11.88	238.01	44.07	209.96	-15.43
-2500	245.37	57.27	207.85	-17.98	206.70	-22.35	211.32	-14.40	242.00	42.67	216.66	-17.81
-2000	247.67	56.14	214.62	-20.41	213.56	-24.81	218.00	-16.75	246.01	41.44	223.54	-19.98
-1500	250.08	55.12	221.57	-22.63	220.64	-27.08	224.85	-18.89	250.07	40.41	230.59	-21.91
-1000	252.99	54.21	228.74	-24.63	227.96	-29.11	231.88	-20.78	254.15	39.57	237.84	-23.57
-500	255.19	53.43	236.10	-26.35	235.53	-30.87	239.09	-22.40	258.27	38.93	245.25	-24.92
-0	257.87	52.77	243.67	-27.76	243.32	-32.31	246.45	-23.71	262.42	38.49	252.82	-25.93

NO. (MAG)	187600*(2.72)		048796*(2.97)		0741 (2.80)		0745 (0.89)		0764 (2.12)		0765 (2.32)	
	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	118.04	15.86	207.98	66.76	150.53	48.07	147.42	45.96	121.24	-14.24	200.34	59.05
-9500	125.41	14.27	211.39	64.01	158.67	45.28	155.70	43.24	127.17	-15.95	205.18	56.15
-9000	132.54	12.39	214.81	61.40	166.17	42.37	163.38	40.38	133.00	-17.90	209.80	53.39
-8500	139.44	10.26	218.24	58.92	173.17	39.40	170.55	37.44	138.72	-20.04	214.28	50.79
-8000	146.14	7.91	221.68	56.59	179.77	36.41	177.33	34.47	144.39	-22.36	218.65	48.35
-7500	152.68	5.38	225.14	54.40	186.05	33.45	183.80	31.50	150.02	-24.83	222.96	46.08
-7000	159.07	2.72	228.62	52.35	192.10	30.54	190.02	28.57	155.64	-27.43	227.22	43.97
-6500	165.37	-0.04	232.13	50.46	197.98	27.72	196.07	25.72	161.31	-30.14	231.45	42.04
-6000	171.60	-2.87	235.66	48.73	203.73	25.00	202.00	22.97	167.05	-32.93	235.68	40.30
-5500	177.81	-5.74	239.23	47.16	209.41	22.41	207.85	20.35	172.91	-35.77	239.91	38.74
-5000	184.03	-8.61	242.83	45.75	215.05	19.97	213.66	17.87	178.96	-38.65	244.15	37.38
-4500	190.31	-11.45	246.47	44.51	220.67	17.70	219.46	15.57	185.24	-41.51	248.42	36.22
-4000	196.67	-14.22	250.15	43.45	226.30	15.62	225.27	13.46	191.83	-44.35	252.70	35.26
-3500	203.16	-16.90	253.86	42.56	231.96	13.76	231.11	11.56	198.80	-47.10	257.01	34.51
-3000	209.80	-19.44	257.61	41.86	237.66	12.11	236.99	9.90	206.24	-49.74	261.34	33.97
-2000	213.62	-21.82	261.38	41.34	243.40	10.72	242.91	8.50	214.23	-52.20	265.69	33.65
-1500	230.87	-25.90	269.02	40.87	249.19	9.58	248.89	7.36	222.83	-54.42	270.07	33.54
-1000	238.30	-27.53	272.88	40.92	255.03	8.71	254.92	6.51	232.10	-56.34	274.46	33.68
-500	245.94	-28.84	276.75	41.16	260.91	8.12	260.99	5.95	242.04	-57.89	278.87	33.95
-0	253.73	-29.81	280.64	41.58	266.82	7.82	267.09	5.68	252.56	-58.99	283.29	34.52
					272.76	7.81	273.21	5.73	263.50	-59.58	287.72	35.27

TABLE 3.—*The 10,000-year star catalog*—Continued

NO. (MAG)	C777 CVS ALPHA	(1.33)	0780 CYG EPSILON	(2.64)	0803 CEP ALPHA	(2.60)	0815 PEG EPSILON	(2.54)	0819 CAP DELTA	(2.98)	0829 GRU ALPHA	(2.16)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	211.05	56.76	190.51	52.89	240.91	52.19	176.95	27.58	158.28	9.79	140.19	-16.33
-9500	215.30	54.11	196.43	49.81	244.13	50.67	183.62	24.46	165.08	6.79	146.23	-18.81
-9000	219.46	51.63	202.01	46.87	247.39	49.33	190.05	21.39	171.70	3.74	152.18	-21.45
-8500	223.55	49.32	207.34	44.07	250.67	48.17	196.30	18.43	178.18	0.67	158.09	-24.20
-8000	227.61	47.18	212.51	41.43	253.98	47.19	202.43	15.58	184.59	-2.38	164.01	-27.04
-7500	231.65	45.23	217.54	38.96	257.31	46.39	208.47	12.89	190.97	-5.37	169.97	-29.94
-7000	235.67	43.45	222.50	36.68	260.65	45.77	214.48	10.36	197.36	-8.28	176.02	-32.88
-6500	239.69	41.86	227.40	34.58	264.01	45.33	220.48	8.22	203.80	-11.08	182.24	-35.82
-6000	243.73	40.47	232.27	32.68	267.38	45.06	226.49	5.50	210.34	-13.73	188.67	-38.73
-5500	247.77	39.26	237.13	30.99	270.75	44.98	232.54	4.01	216.99	-16.19	195.38	-41.58
-5000	251.84	38.25	241.99	29.52	274.12	45.07	236.63	2.37	223.80	-18.45	202.45	-44.33
-4500	255.92	37.44	246.86	28.28	277.50	45.33	244.78	1.00	230.76	-20.45	209.94	-46.93
-4000	260.03	36.84	251.75	27.27	280.87	45.77	250.98	-0.09	237.88	-22.18	217.91	-49.33
-3500	264.15	36.44	256.66	26.49	284.23	46.37	257.22	-0.88	245.17	-23.59	226.43	-51.47
-3000	268.30	36.25	261.59	25.97	287.59	47.13	263.51	-1.36	252.60	-24.68	235.52	-53.29
-2500	272.46	36.27	266.54	25.69	290.93	48.06	269.82	-1.53	260.14	-25.40	245.15	-54.72
-2000	276.63	36.49	271.50	25.66	294.25	49.14	276.15	-1.38	267.76	-25.75	255.24	-55.71
-1500	280.82	36.92	276.48	25.88	297.54	50.37	282.48	-0.53	275.41	-25.73	265.64	-56.21
-1000	285.02	37.55	281.46	26.34	300.82	51.74	288.79	-0.17	283.05	-25.32	276.15	-56.19
-500	289.22	38.38	286.46	27.05	304.06	53.25	295.08	0.88	290.63	-24.56	286.55	-55.66
-C	293.43	39.40	291.46	28.00	307.27	54.88	301.34	2.21	298.12	-23.44	296.64	-54.66

NO. (MAG)	C841 TUC ALPHA	(2.91)	0856 GRU BETA	(2.24)	0867 PSA ALPHA	(1.29)	0870 PEG RETA	(2.61)	0871 PEG ALPHA	(2.57)
YEAR	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.	R.A.	DEC.
-10000	130.61	-26.91	144.00	-20.99	159.77	-11.33	205.00	24.28	195.11	16.21
-9500	136.01	-29.00	149.93	-23.59	166.20	-14.35	211.09	21.49	201.51	13.22
-9000	141.35	-31.27	155.82	-26.31	172.59	-17.41	217.06	18.90	207.81	10.39
-8500	146.65	-33.68	161.70	-29.13	178.98	-20.47	222.96	16.53	214.05	7.75
-8000	151.95	-36.22	167.62	-32.02	185.43	-23.52	228.82	14.40	220.26	5.32
-7500	157.28	-38.87	173.64	-34.95	191.99	-26.50	234.66	12.53	226.67	3.12
-7000	162.70	-41.61	179.80	-37.89	198.70	-29.39	240.49	10.91	232.70	1.18
-6500	168.25	-44.41	186.19	-40.82	205.63	-32.16	246.33	9.57	238.96	-0.50
-6000	173.99	-47.27	192.86	-43.70	212.82	-34.75	252.19	8.52	245.27	-1.89
-5500	180.02	-50.14	199.90	-46.49	220.30	-37.13	258.06	7.76	251.62	-2.98
-5000	186.40	-53.00	207.39	-49.14	228.11	-39.24	263.94	7.29	258.01	-3.76
-4500	193.27	-55.82	215.41	-51.61	236.26	-41.06	269.82	7.13	264.43	-4.22
-4000	200.75	-58.54	223.03	-53.82	244.72	-42.52	275.71	7.26	270.86	-4.35
-3500	209.00	-61.12	233.29	-55.72	253.46	-43.59	281.60	7.69	277.30	-4.17
-3000	218.20	-63.48	243.19	-57.24	262.40	-44.23	287.47	8.41	283.73	-3.66
-2500	228.49	-65.55	253.63	-58.30	271.45	-44.42	293.32	9.40	290.13	-2.85
-2000	239.96	-67.20	264.46	-58.85	280.49	-44.17	299.16	10.66	296.49	-1.74
-1500	252.53	-68.34	275.43	-58.86	289.43	-43.48	304.97	12.18	302.81	-0.35
-1000	265.86	-68.87	286.28	-58.34	298.17	-42.37	310.77	13.92	309.08	1.30
-500	279.38	-68.74	296.78	-57.31	306.63	-40.90	316.56	15.88	315.31	3.18
-C	292.48	-67.97	306.75	-55.84	314.80	-39.09	322.35	18.03	321.50	5.27

