

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

Table with columns for date, alpha, delta, delta, r, beta, V, psi, 45, -26 for two groups of objects: 348073 2003 WN22 and 3800 Karayusuf (continuation). Includes sub-sections for 3255 Tholen and 162473 2000 LA16, and 3800 Karayusuf. Each row lists orbital parameters and position data for specific dates.









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20/21	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°	20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°
<b>171671 2000 PF<sub>32</sub></b>										<b>1865 Cerberus</b>									
12 27	22 0.10	-18 4.0	2.046	1.613	28.1	20.9	51 E	24*	38*	1 1	21 27.83	-6 6.0	2.129	1.558	25.4	20.5	43 E	31*	22*
1 1	22 14.02	-16 46.0	2.086	1.623	27.3	21.0	49 E	25*	36*	1 11	21 52.02	-4 49.6	2.214	1.572	23.0	20.5	39 E	29*	18*
1 6	22 27.70	-15 25.4	2.127	1.634	26.4	21.0	48 E	25*	34*	1 21	22 15.67	-3 24.9	2.289	1.581	20.7	20.5	35 E	26*	14*
<b>474611 2004 SB<sub>56</sub></b>										<b>37568 1989 TP</b>									
12 27	22 2.91	+11 2.6	0.801	0.954	67.5	21.0	64 E	52*	25*	12 27	22 3.51	+0 42.7	1.923	1.641	30.7	19.4	59 E	43*	31*
1 1	22 18.34	+11 44.2	0.790	0.935	68.9	21.0	63 E	52*	24*	1 6	22 29.97	+1 27.6	2.007	1.649	29.2	19.5	55 E	41*	27*
1 6	22 34.06	+12 21.1	0.776	0.916	70.5	20.9	61 E	52*	22*	1 16	22 56.23	+2 23.5	2.090	1.657	27.5	19.5	51 E	40*	24*
<b>1865 Cerberus</b>										<b>482228 2011 BH<sub>10</sub></b>									
12 27	22 2.69	-4 36.4	1.906	1.582	31.0	20.4	56 E	37*	33*	12 27	22 3.82	-0 29.6	1.075	1.002	56.4	20.1	58 E	41*	32*
1 6	22 24.66	-3 36.2	1.991	1.575	29.1	20.5	51 E	36*	29*	1 1	22 22.07	+1 47.9	1.061	0.996	57.0	20.1	58 E	43*	30*
1 16	22 46.69	-2 25.4	2.064	1.561	27.2	20.5	47 E	34*	24*	1 6	22 40.87	+4 8.6	1.048	0.994	57.5	20.1	58 E	45*	28*
<b>1865 Cerberus</b>										<b>482228 2011 BH<sub>10</sub></b>									
12 27	22 2.69	-4 36.4	1.906	1.582	31.0	20.4	56 E	37*	33*	1 11	23 0.28	+6 31.1	1.037	0.994	57.9	20.1	59 E	47*	27*
1 6	22 24.66	-3 36.2	1.991	1.575	29.1	20.5	51 E	36*	29*	1 16	23 20.35	+8 54.3	1.026	0.997	58.2	20.0	59 E	48*	26*
1 16	22 46.69	-2 25.4	2.064	1.561	27.2	20.5	47 E	34*	24*	1 21	23 41.11	+11 16.4	1.018	1.003	58.3	20.0	60 E	50*	25*
<b>1865 Cerberus</b>										<b>482228 2011 BH<sub>10</sub></b>									
12 27	22 2.69	-4 36.4	1.906	1.582	31.0	20.4	56 E	37*	33*	1 26	0 2.59	+13 35.6	1.012	1.011	58.3	20.0	61 E	51*	24*
1 6	22 24.66	-3 36.2	1.991	1.575	29.1	20.5	51 E	36*	29*	1 31	0 24.80	+15 49.8	1.008	1.022	58.1	20.1	62 E	52*	23*
1 16	22 46.69	-2 25.4	2.064	1.561	27.2	20.5	47 E	34*	24*	2 5	0 47.71	+17 56.9	1.008	1.035	57.7	20.1	63 E	54*	23*







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20/22		$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$	$-26^\circ$	20/21		$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$	$-26^\circ$
<b>167068</b> 2003 QY <sub>109</sub> (continuation)											<b>313477</b> 2002 TA <sub>180</sub> (continuation)										
h m											h m										
10 13	10 20.56	+10 2.8	2.630	2.070	20.4	20.2	46 W	36*	23*	36*	5 6	3 0.31	+25 0.8	3.084	2.093	4.2	20.5	9 E	2*	—	
10 23	10 37.49	+7 58.8	2.582	2.112	21.6	20.2	52 W	40*	27*	40*	5 16	3 22.67	+26 59.6	3.133	2.137	3.9	20.6	8 W	1*	—	
11 2	10 53.19	+5 57.5	2.525	2.155	22.8	20.3	57 W	43*	31*	43*	5 26	3 45.05	+28 45.9	3.174	2.182	4.5	20.7	10 W	4*	—	
11 12	11 7.57	+4 0.3	2.460	2.198	23.7	20.3	63 W	45*	36*	45*	6 5	4 7.40	+30 19.6	3.206	2.227	5.7	20.8	13 W	6*	—	
11 22	11 20.54	+2 8.7	2.387	2.241	24.4	20.3	70 W	46*	42*	46*	6 15	4 29.65	+31 41.3	3.229	2.273	7.2	21.0	16 W	9*	2*	
12 2	11 31.95	+0 23.9	2.307	2.284	24.8	20.3	76 W	45*	48*	45*	6 25	4 51.70	+32 51.3	3.243	2.318	8.9	21.1	21 W	13*	5*	
12 12	11 41.62	-1 12.5	2.221	2.327	24.9	20.2	84 W	44	55*	44	7 5	5 13.45	+33 50.3	3.246	2.364	10.5	21.2	25 W	17*	8*	
12 22	11 49.32	-2 39.0	2.133	2.371	24.5	20.2	91 W	42	61*	42	7 15	5 34.79	+34 39.3	3.238	2.410	12.1	21.3	30 W	22*	10*	
1 1	11 54.79	-3 53.9	2.043	2.414	23.7	20.1	100 W	41	67*	41	7 25	5 55.58	+35 19.3	3.220	2.455	13.6	21.4	35 W	27*	12*	
1 11	11 57.77	-4 55.3	1.955	2.457	22.3	20.0	109 W	40	69	40	8 4	6 15.72	+35 51.7	3.191	2.500	15.1	21.4	40 W	32*	13*	
1 21	11 58.02	-5 41.1	1.873	2.499	20.2	19.9	119 W	39	70	39											
<b>380665</b> 2005 EF <sub>224</sub>											<b>219481</b> 2001 DF <sub>15</sub>										
12 27	22 6.90	-17 1.8	1.973	1.580	29.6	19.9	52 E	26*	39*	26*	12 27	22 7.17	-9 0.8	3.112	2.676	17.6	21.2	55 E	33*	36*	
1 6	22 28.17	-13 4.2	2.003	1.538	28.6	19.8	48 E	25*	33*	25*	1 6	22 19.90	-7 13.4	3.253	2.706	15.8	21.3	49 E	32*	29*	
1 16	22 50.04	-8 57.1	2.028	1.498	27.5	19.7	45 E	29*	28*	29*	1 16	22 32.89	-5 24.3	3.383	2.735	14.0	21.3	42 E	30*	22*	
1 26	23 12.55	-4 41.5	2.049	1.462	26.4	19.7	41 E	29*	23*	29*	1 26	22 46.04	-3 33.6	3.501	2.763	12.0	21.4	36 E	26*	16*	
2 5	23 35.79	+0 18.8	2.067	1.429	25.3	19.6	38 E	29*	18*	29*	2 5	22 59.28	-1 41.5	3.605	2.790	10.0	21.4	30 E	22*	11*	
2 15	23 59.91	+4 9.2	2.082	1.402	24.2	19.6	36 E	28*	14*	28*	2 15	23 12.58	+0 11.7	3.695	2.816	8.0	21.4	23 E	17*	6*	
2 25	0 25.09	+8 39.8	2.095	1.379	23.2	19.5	33 E	26*	11*	26*	2 25	23 25.87	+2 5.9	3.770	2.842	6.0	21.3	17 E	11*	1*	
3 7	0 51.55	+13 9.5	2.108	1.362	22.3	19.5	31 E	25*	8*	25*	3 7	23 39.12	+4 0.7	3.830	2.866	4.1	21.3	12 E	6*	—	
3 17	1 19.57	+17 34.1	2.121	1.351	21.5	19.4	30 E	24*	6*	24*	3 17	23 52.30	+5 55.8	3.874	2.890	2.6	21.2	8 E	—	—	
3 27	1 49.40	+21 48.3	2.136	1.346	20.7	19.4	29 E	23*	4*	23*	3 27	0 5.37	+7 50.9	3.901	2.913	2.4	21.2	7 W	1*	—	
4 1	2 5.06	+23 49.5	2.144	1.346	20.4	19.4	28 E	22*	3*	22*	4 6	0 18.30	+9 45.7	3.912	2.935	3.6	21.3	11 W	4*	2*	
4 6	2 21.26	+25 45.8	2.153	1.348	20.1	19.4	28 E	22*	3*	22*	4 16	0 31.06	+11 40.0	3.907	2.956	5.4	21.5	16 W	6*	8*	
4 11	2 38.02	+27 36.3	2.164	1.351	19.8	19.4	27 E	21*	2*	21*	<b>310111</b> 2008 JO										
4 16	2 55.34	+29 19.9	2.175	1.356	19.4	19.4	27 E	21*	2*	21*	12 27	22 7.27	-6 46.7	1.1213	1.053	50.9	20.8	56 E	36*	35*	
4 21	3 13.22	+30 56.0	2.188	1.363	19.1	19.4	26 E	20*	1*	20*	1 6	22 32.86	-4 49.0	1.159	0.962	54.3	20.6	53 E	36*	31*	
4 26	3 31.62	+32 23.4	2.202	1.371	18.8	19.5	26 E	20*	1*	20*	1 16	23 0.92	-2 35.8	1.086	0.875	59.1	20.4	50 E	36*	27*	
5 1	3 50.52	+33 41.5	2.217	1.380	18.5	19.5	26 E	20*	1*	20*	1 26	23 31.49	-0 12.6	0.992	0.796	65.8	20.2	47 E	35*	25*	
5 6	4 9.86	+34 49.4	2.234	1.391	18.1	19.5	25 E	19*	1*	19*	1 31	23 47.68	+0 59.8	0.938	0.762	70.0	20.1	47 E	35*	24*	
5 11	4 29.58	+35 46.6	2.253	1.403	17.7	19.5	25 E	19*	1*	19*	2 5	0 4.43	+2 10.2	0.880	0.733	74.7	20.1	46 E	35*	23*	
5 16	4 49.57	+36 32.7	2.272	1.417	17.3	19.6	25 E	19*	1*	19*	2 10	0 21.68	+3 16.3	0.818	0.710	80.1	20.0	45 E	34*	23*	
5 21	5 9.72	+37 7.2	2.294	1.432	16.8	19.6	24 E	18*	1*	18*	2 15	0 39.37	+4 15.6	0.754	0.694	86.0	20.0	44 E	34*	23*	
5 26	5 29.93	+37 30.2	2.316	1.447	16.3	19.6	24 E	18*	1*	18*	2 20	0 57.41	+5 4.9	0.687	0.686	92.1	20.0	44 E	33*	23*	
5 31	5 50.06	+37 41.7	2.341	1.464	15.8	19.6	23 E	17*	1*	17*	2 25	1 15.79	+5 41.5	0.620	0.687	98.3	20.1	43 E	32*	23*	
6 5	6 10.02	+37 42.0	2.366	1.482	15.3	19.7	23 E	16*	1*	16*	3 2	1 34.60	+6 2.7	0.554	0.696	104.3	20.2	43 E	32*	24*	
6 10	6 29.67	+37 31.7	2.393	1.501	14.7	19.7	22 E	16*	1*	16*	3 7	1 54.11	+6 6.2	0.490	0.713	109.7	20.3	43 E	31*	25*	
6 15	6 48.94	+37 11.3	2.421	1.521	14.1	19.7	21 E	15*	1*	15*	3 12	2 14.88	+5 50.1	0.429	0.738	114.2	20.3	43 E	29*	26*	
6 20	7 7.73	+36 41.5	2.449	1.541	13.5	19.8	21 E	14*	1*	14*	3 17	2 37.78	+5 11.8	0.372	0.768	117.3	20.3	43 E	28*	29*	
6 25	7 25.97	+36 3.3	2.479	1.562	12.8	19.8	20 E	14*	1*	14*	3 22	3 4.20	+4 7.3	0.319	0.803	118.7	20.2	45 E	28*	32*	
6 30	7 43.63	+35 17.4	2.509	1.584	12.1	19.8	19 E	13*	1*	13*	3 27	3 36.15	+2 30.6	0.272	0.841	117.8	19.9	48 E	27*	36*	
7 5	8 0.67	+34 24.8	2.539	1.606	11.4	19.9	18 E	12*	1*	12*	4 1	4 16.41	+0 13.8	0.232	0.883	113.8	19.4	54 E	28*	43*	
7 10	8 17.09	+33 26.2	2.570	1.629	10.7	19.9	17 E	11*	—	11*	4 6	5 8.08	-2 48.0	0.201	0.926	106.2	18.7	63 E	29*	52*	
7 15	8 32.89	+32 22.6	2.601	1.652	10.0	19.9	16 E	10*	—	10*	4 8	5 32.36	-4 11.6	0.191	0.944	102.0	18.4	67 E	30*	56*	
7 20	8 48.07	+31 14.8	2.632	1.675	9.3	19.9	16 E	9*	—	9*	4 10	5 58.59	-5 38.6	0.185	0.962	97.3	18.1	72 E	30*	61*	
7 25	9 2.65	+30 3.3	2.663	1.699	8.7	20.0	15 E	9*	—	9*	4 12	6 26.42	-7 5.7	0.180	0.980	92.1	17.9	78 E	31*	66*	
7 30	9 16.66	+28 49.0	2.693	1.723	8.0	20.0	14 E	8*	—	8*	4 14	6 55.28	-8 28.9	0.179	0.998	86.6	17.7	83 E	31*	70*	
8 4	9 30.13	+27 32.4	2.722	1.748	7.4	20.0	13 E	7*	—	7*	4 16	7 24.45	-9 44.4	0.180	1.016	81.0	17.5	89 E	32*	73*	
8 14	9 55.56	+24 54.2	2.778	1.797	6.5	20.1	12 E	5*	—	5*	4 18	7 53.14	-10 49.1	0.183	1.034	75.5	17.4	94 E	32*	75	
8 24	10 19.18	+22 12.4	2.828	1.847	6.1	20.2	11 E	3*	—	3*	4 20	8 20.64	-11 41.7	0.189	1.052	70.4	17.4	99 E	32*	76	
9 3	10 41.22	+19 29.8	2.872	1.896	6.3	20.3	12 W	4*	—	4*	4 22	8 46.42	-12 22.0	0.198	1.071	65.6	17.3	104 E	32*	76	
9 13	11 1.90	+16 48.2	2.907	1.946	7.2	20.4	14 W	7*	—	7*	4 24	9 10.15	-12 51.2	0.208	1.089	61.4	17.4	108 E	32*	77	
9 23	11 21.38	+14 9.5	2.934	1.996	8.4	20.5	17 W	11*	—	11*	4 26	9 31.71	-13 11.2	0.221	1.107	57.6	17.4	112 E	32*	77	
10 3	11 39.80	+11 34.6	2.949	2.045	10.0	20.6	21 W	15*	—	15*	4 28	9 51.16	-13 23.8	0.235	1.125	54.4	17.5	115 E	32*	77	
10 13	11 57.28	+9 4.5	2.954	2.093	11.7	20.8	25 W	19*	3*	19*	4 30	10 8.61	-13 30.9	0.250	1.143	51.6	17.6	117 E	31	78	
10 23	12 13.87	+6 39.9	2.946	2.141	13.4	20.9	30 W	23*	7*	23*	5 2	10 24.26	-13 34.0	0.267	1.161	49.3	17.7	119			

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20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$	$-26^\circ$	20/21	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$	$-26^\circ$										
<b>22385 Fujimoriboshi</b> (continuation)										<b>23187 2000 PN<sub>9</sub></b> (continuation)																			
2 5	23 1.07	0 0.6	3.651	2.827	9.7	20.4	29 E	20*	12*	3 26	5 21.76	+22 53.9	0.361	0.975	83.0	16.6	76 E	60*	37*	3 27	5 30.59	+25 23.1	0.367	0.983	81.6	16.6	77 E	62*	36*
2 15	23 15.50	0 3 7.5	3.697	2.809	7.7	20.3	22 E	15*	8*	3 29	5 48.28	+29 59.1	0.382	1.000	78.7	16.7	79 E	67*	32*	3 31	6 5.92	+34 2.9	0.401	1.018	75.9	16.7	81 E	71*	29*
2 25	23 30.22	0 2 10.2	3.728	2.790	5.6	20.2	16 E	9*	4*	4 2	6 23.39	+37 34.4	0.423	1.035	73.3	16.8	83 E	74*	26*	4 4	6 40.57	+40 35.1	0.447	1.053	70.8	16.8	84 E	77*	23*
3 7	23 45.16	0 1 9.8	3.743	2.771	3.5	20.1	10 E	3*	—	4 6	6 57.34	+43 7.6	0.473	1.071	68.6	16.9	85 E	79*	21*	4 8	7 13.63	+45 15.1	0.501	1.089	66.5	17.0	86 E	80*	19*
3 17	0 0.32	0 0 7.4	3.742	2.750	1.3	19.9	4 E	—	—	4 10	7 29.36	+47 0.7	0.530	1.108	64.6	17.1	87 E	81*	17	4 12	7 44.47	+48 27.5	0.561	1.126	62.8	17.2	87 E	81*	16
3 27	0 15.66	+0 56.0	3.725	2.728	0.9	19.9	2 W	—	—	4 14	7 58.94	+49 38.2	0.592	1.144	61.1	17.3	88 E	81*	14	4 16	8 12.76	+50 35.3	0.624	1.163	59.6	17.4	88 E	81*	13
4 6	0 31.15	+1 59.2	3.692	2.706	3.1	20.0	8 W	—	2*	4 18	8 25.91	+51 20.7	0.656	1.181	58.2	17.5	88 E	81*	12	4 20	8 38.42	+51 56.3	0.688	1.200	56.8	17.6	88 E	81*	13
4 16	0 46.79	+3 1.3	3.645	2.683	5.2	20.1	14 W	—	8*	4 22	8 50.30	+52 23.4	0.721	1.218	55.6	17.7	88 E	81*	12	4 24	9 1.58	+52 43.5	0.755	1.236	54.4	17.8	88 E	81*	11
4 26	1 2.57	+4 1.2	3.583	2.658	7.4	20.1	20 W	—	14*	4 26	9 12.28	+52 57.5	0.788	1.255	53.2	17.9	88 E	80*	11	4 28	9 22.44	+53 6.2	0.821	1.273	52.2	18.0	88 E	80*	11
5 6	1 18.46	+4 57.7	3.507	2.634	9.5	20.2	26 W	1*	20*	4 30	9 32.10	+53 10.5	0.855	1.292	51.2	18.1	87 E	80*	11	5 2	9 41.29	+53 11.0	0.888	1.310	50.2	18.2	87 E	80*	11
5 16	1 34.47	+5 49.9	3.419	2.608	11.6	20.2	31 W	3*	25*	5 4	9 50.04	+53 8.0	0.922	1.328	49.3	18.3	87 E	80*	11	5 6	9 58.40	+53 2.2	0.956	1.347	48.4	18.4	87 E	80*	11
5 26	1 50.56	+6 36.4	3.319	2.581	13.6	20.1	37 W	6*	31*	5 8	10 6.38	+52 53.8	0.989	1.365	47.6	18.4	86 E	79*	11	5 10	10 14.02	+52 43.1	1.022	1.383	46.7	18.5	86 E	79*	11
6 5	2 6.71	+7 16.2	3.208	2.554	15.6	20.1	42 W	10*	36*	5 12	10 28.39	+52 30.5	1.056	1.401	46.0	18.6	85 E	79*	11	5 16	10 35.17	+52 0.2	1.122	1.436	44.5	18.7	85 E	78*	12
6 15	2 22.89	+7 48.0	3.088	2.526	17.4	20.1	48 W	13*	40*	5 21	10 51.08	+51 14.8	1.204	1.481	42.8	18.9	83 E	77*	13	5 26	11 5.73	+50 22.9	1.285	1.524	41.2	19.1	82 E	76*	14
6 25	2 39.04	+8 10.5	2.960	2.497	19.2	20.0	54 W	18*	44*	5 31	11 19.36	+49 26.0	1.365	1.567	39.7	19.2	81 E	74*	15	6 5	11 32.14	+48 25.2	1.443	1.609	38.3	19.4	80 E	73*	16
7 5	2 55.11	+8 22.4	2.824	2.467	20.8	19.9	59 W	23*	48*	6 10	11 44.25	+47 21.2	1.521	1.650	37.1	19.5	78 E	71*	17	6 15	11 55.79	+46 14.8	1.597	1.691	35.8	19.6	77 E	69*	18
7 15	3 11.00	+8 22.1	2.683	2.437	22.2	19.8	65 W	29*	53*	6 20	12 6.87	+45 6.6	1.673	1.731	34.7	19.7	76 E	67*	19	6 25	12 17.55	+43 57.0	1.746	1.770	33.6	19.9	74 E	65*	20
7 25	3 26.60	+8 8.3	2.538	2.406	23.5	19.7	71 W	34*	58*	6 30	12 27.90	+42 46.3	1.819	1.809	32.5	20.0	73 E	63*	21	7 5	12 37.98	+41 34.8	1.890	1.846	31.5	20.1	72 E	61*	22*
8 4	3 41.79	+7 39.2	2.390	2.375	24.6	19.6	77 W	40*	55*	7 10	12 47.83	+40 22.8	1.961	1.883	30.6	20.2	70 E	59*	24*	7 15	12 57.50	+39 10.6	2.030	1.919	29.7	20.2	69 E	58*	25*
8 14	3 56.39	+6 53.3	2.241	2.343	25.4	19.5	83 W	44*	57*	7 20	13 7.00	+37 58.4	2.097	1.955	28.8	20.3	68 E	56*	25*	7 25	13 16.38	+36 46.5	2.164	1.990	27.9	20.4	66 E	55*	26*
8 24	4 10.19	+5 49.0	2.093	2.311	25.9	19.3	89 W	47*	58*	7 30	13 25.64	+35 35.0	2.229	2.023	27.1	20.5	65 E	53*	27*	8 4	13 34.81	+34 24.1	2.292	2.057	26.3	20.6	64 E	52*	27*
9 3	4 22.95	+4 24.6	1.947	2.278	26.2	19.1	96 W	48*	60	8 8	13 43.90	+33 13.9	2.355	2.089	25.5	20.6	62 E	51*	27*	8 9	13 52.95	+32 4.7	2.416	2.121	24.7	20.7	61 E	50*	27*
9 13	4 34.34	+2 38.9	1.806	2.245	26.0	18.9	102 W	48*	61	8 19	14 1.94	+30 56.7	2.476	2.152	24.0	20.8	60 E	49*	27*	8 24	14 10.89	+29 50.0	2.534	2.182	23.3	20.8	58 E	48*	27*
9 23	4 44.03	+0 31.2	1.672	2.211	25.4	18.7	109 W	46	63	8 29	14 19.81	+28 44.7	2.591	2.212	22.5	20.9	57 E	47*	26*	8 14	14 28.72	+27 40.9	2.647	2.241	21.9	20.9	56 E	46*	25*
10 3	4 51.62	+1 58.2	1.547	2.177	24.4	18.5	116 W	43	66	9 3	14 37.61	+26 38.8	2.701	2.269	21.2	21.0	54 E	45*	24*	9 8	14 46.49	+25 38.6	2.754	2.297	20.5	21.0	53 E	44*	23*
10 13	4 56.66	-4 47.1	1.433	2.144	23.1	18.2	123 W	40	69	9 13	14 55.37	+24 40.5	2.806	2.324	19.9	21.1	52 E	44*	22*	9 18	15 6.34	+23 44.5	2.855	2.350	19.3	21.1	51 E	43*	20*
10 18	4 58.10	-6 17.5	1.382	2.127	22.3	18.1	126 W	39	70	9 28	15 13.11	+22 50.7	2.903	2.376	18.7	21.2	49 E	42*	19*	9 23	15 21.98	+21 59.2	2.950	2.401	18.1	21.2	48 E	41*	17*
10 23	4 58.76	-7 50.5	1.334	2.110	21.4	18.0	129 W	37	72	10 3	15 30.85	+21 10.3	2.995	2.425	17.5	21.2	47 E	40*	15*	10 8	15 39.73	+20 24.0	3.037	2.449	17.0	21.3	46 E	40*	13*
10 28	4 58.61	-9 25.1	1.291	2.093	20.6	17.9	132 W	36	73	10 13	15 48.61	+19 40.4	3.079	2.472	16.5	21.3	45 E	39*	10*	10 18	15 57.48	+18 59.6	3.118	2.495	16.0	21.3	44 E	38*	8*
11 2	4 57.62	-10 59.7	1.252	2.076	19.8	17.8	135 W	34	75	10 23	16 6.34	+18 21.6	3.155	2.517	15.5	21.4	43 E	37*	6*	10 28	16 3.44	+17 46.7	3.190	2.538	15.1	21.4	42 E	36*	3*
11 7	4 55.80	-12 32.5	1.218	2.059	19.0	17.7	137 W	32	77	11 2	16 15.20	+17 46.7	3.223	2.559	14.7	21.4	41 E	34*	—	11 12	16 32.87	+16 46.1	3.254	2.579	14.3	21.4	40 E	33*	—
11 12	4 53.19	-14 1.4	1.188	2.042	18.5	17.6	139 W	31	78	11 7	16 24.04	+17 14.8	3.263	2.589	14.0	21.5	40 E	32*	—	11 17	16 41.67	+16 20.6	3.283	2.598	14.0	21.5	40 E	32*	—
11 17	4 49.85	-15 24.4	1.164	2.026	18.2	17.5	140 W	30	79	11 27	16 50.44	+15 58.4	3.310	2.617	13.7	21.5	39 E	30*	—	11 22	16 59.18	+15 39.4	3.334	2.635	13.5	21.5	39 E	29*	—
11 22	4 45.89	-16 39.4	1.144	2.009	18.1	17.4	141 W	28	81	12 27	17 7.00	+14 46.3	3.360	2.647	13.1	21.5	38 E	28*	—	12 7	17 13.11	+13 34.8	3.394	2.676	12.6	21.5	37 E	27*	—
11 27	4 41.43	-17 44.4	1.130	1.992	18.4	17.4	140 W	27	82	12 17	17 21.98	+13 24.1	3.430	2.683	12.1	21.5	37 E	27*	—	12 17	17 21.98	+13 24.1	3.430	2.683	12.1	21.5	37 E	27*	—
12 2	4 36.63	-18 37.6	1.120	1.976	18.9	17.4	139 W	26	83	12 7	17 36.41	+12 11.3	3.492	2.711	11.2	21.5	36 E	25*	—	12 27	17 40.89	+11 14.8	3.534	2.732	10.3	21.5	35 E	24*	—
12 7	4 31.70	-19 17.7	1.115	1.960	19.7	17.4	138 E	25	83	12 15	17 50.85	+10 56.8	3.567	2.748	10.3	21.5	35 E	24*	—	12 23	18 4.44	+9 45.4	3.597	2.769	9.4	21.5	34 E	23*	—
12 12	4 26.85	-19 43.8	1.114	1.944	20.8	17.4	136 E	26	84	12 5	18 3.44	+9 33.9	3.629	2.780	9.4	21.5	34 E	23*	—	12 12	18 17.55	+8 22.8	3.660	2.799	8.5	21.5	33 E	22*	

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°	20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°
124200 2001 OM <sub>81</sub> (continuation)										247087 2000 SC <sub>145</sub>									
5 6	3 46.06	+14 19.7	2.563	1.598	8.3	18.8	13 E	1*	7*	12 27	22 9.31	-9 51.2	2.061	1.707	28.3	21.3	55 E	33*	37*
5 16	4 15.30	+15 50.8	2.591	1.610	6.9	18.8	11 E	—	5*	1 6	22 34.40	-7 36.5	2.156	1.730	26.5	21.4	52 E	33*	32*
5 26	4 44.65	+17 3.6	2.620	1.626	5.5	18.8	9 E	—	3*	1 16	22 58.98	-5 16.6	2.251	1.755	24.7	21.4	48 E	33*	28*
6 5	5 13.95	+17 57.2	2.649	1.646	4.3	18.8	7 E	—	1*	1 26	23 23.07	-2 53.6	2.347	1.782	22.8	21.5	44 E	32*	24*
6 15	5 43.02	+18 31.2	2.679	1.670	3.2	18.8	5 E	—	—	2 5	23 46.71	-0 29.8	2.441	1.811	20.8	21.6	41 E	30*	21*
6 25	6 11.67	+18 45.8	2.707	1.696	2.8	18.8	5 W	—	—	170880 2004 PH <sub>85</sub>									
7 5	6 39.74	+18 42.0	2.734	1.725	3.3	18.9	6 W	—	—	12 27	22 9.40	-13 25.7	2.005	1.637	29.1	20.7	54 E	29*	39*
7 15	7 7.09	+18 21.1	2.759	1.757	4.5	19.0	8 W	—	—	1 6	22 35.73	-11 10.5	2.082	1.647	27.6	20.7	51 E	30*	34*
7 25	7 33.59	+17 44.8	2.780	1.791	5.9	19.2	10 W	—	—	1 16	23 1.69	-8 46.4	2.159	1.660	25.9	20.8	47 E	30*	30*
8 4	7 59.16	+16 55.1	2.797	1.827	7.5	19.3	14 W	—	—	1 26	23 27.26	-6 16.4	2.236	1.676	24.1	20.8	44 E	29*	27*
8 14	8 23.76	+15 54.1	2.809	1.864	9.2	19.4	17 W	7*	8*	2 5	23 52.47	-3 43.3	2.313	1.693	22.3	20.8	41 E	28*	24*
8 24	8 47.34	+14 43.8	2.814	1.903	10.8	19.5	21 W	11*	10*	2 15	0 17.35	-1 9.4	2.390	1.713	20.5	20.9	37 E	26*	21*
9 3	9 9.90	+13 26.5	2.812	1.942	12.5	19.6	25 W	15*	13*	2 25	0 41.95	+1 22.8	2.465	1.735	18.6	20.9	34 E	24*	18*
9 13	9 31.45	+12 4.0	2.803	1.983	14.2	19.7	29 W	19*	15*	3 7	1 6.32	+3 51.0	2.540	1.759	16.7	20.9	31 E	21*	16*
9 23	9 51.98	+10 38.4	2.784	2.024	15.9	19.8	33 W	24*	17*	3 17	1 30.52	+6 13.4	2.612	1.784	14.7	21.0	27 E	18*	14*
10 3	10 11.51	+9 11.7	2.757	2.066	17.4	19.9	38 W	28*	20*	3 27	1 54.57	+8 28.1	2.681	1.811	12.7	21.0	24 E	14*	12*
10 13	10 30.03	+7 45.5	2.720	2.108	18.9	20.0	43 W	33*	23*	4 6	2 18.51	+10 33.7	2.747	1.839	10.7	21.0	20 E	11*	10*
10 23	10 47.52	+6 21.7	2.673	2.150	20.3	20.0	49 W	37*	26*	4 16	2 42.36	+12 29.0	2.809	1.867	8.7	21.0	16 E	7*	7*
11 2	11 3.96	+5 2.1	2.617	2.192	21.6	20.0	54 W	41*	30*	4 26	3 6.12	+14 12.8	2.865	1.897	6.7	21.0	13 E	3*	5*
11 12	11 19.26	+3 48.3	2.551	2.234	22.7	20.1	60 W	44*	34*	5 6	3 29.78	+15 44.4	2.917	1.927	4.8	21.0	9 E	—	2*
11 22	11 33.34	+2 42.3	2.476	2.276	23.5	20.1	67 W	46*	39*	5 16	3 53.31	+17 3.3	2.962	1.958	2.9	20.9	6 E	—	—
12 2	11 46.08	+1 45.7	2.394	2.317	24.1	20.0	74 W	47*	45*	5 26	4 16.66	+18 9.0	3.000	1.989	1.6	20.9	3 E	—	—
12 12	11 57.29	+1 0.6	2.305	2.359	24.3	20.0	81 W	46	51*	6 5	4 39.78	+19 1.4	3.031	2.021	2.2	21.0	4 W	—	—
12 22	12 6.77	+0 29.0	2.211	2.399	24.2	20.0	89 W	45	56*	6 15	5 2.61	+19 40.6	3.054	2.052	3.9	21.1	8 W	—	2*
1 1	12 14.29	+0 12.7	2.115	2.440	23.6	19.9	97 W	45	61*	6 25	5 25.07	+20 6.9	3.067	2.084	5.8	21.3	12 W	—	6*
1 11	12 19.55	+0 14.0	2.020	2.479	22.4	19.8	106 W	45	64*	7 5	5 47.10	+20 20.8	3.072	2.115	7.7	21.4	16 W	2*	9*
1 21	12 22.31	+0 34.3	1.930	2.518	20.6	19.7	116 W	46	63										
422665 1999 TT <sub>39</sub>										24029 1999 RT <sub>198</sub>									
12 27	22 8.87	-20 5.4	2.055	1.645	28.1	21.2	52 E	23*	41*	12 27	22 9.55	-2 57.0	2.486	2.138	23.0	18.4	58 E	39*	34*
1 6	22 34.42	-16 57.9	2.115	1.642	26.8	21.2	49 E	24*	36*	1 6	22 27.51	-2 31.0	2.552	2.102	21.8	18.4	52 E	37*	29*
1 16	22 59.65	-13 41.8	2.175	1.642	25.3	21.2	45 E	25*	32*	1 16	22 46.31	-1 52.5	2.611	2.065	20.3	18.4	47 E	35*	24*
1 26	23 24.55	-10 19.8	2.236	1.645	23.7	21.2	42 E	26*	28*	1 26	23 5.85	-1 2.9	2.660	2.028	18.7	18.3	41 E	31*	20*
2 5	23 49.16	-6 54.9	2.298	1.652	22.0	21.3	39 E	25*	24*	2 5	23 26.06	-0 4.0	2.701	1.992	17.0	18.3	36 E	27*	16*
2 15	0 13.56	+3 29.8	2.360	1.661	20.3	21.3	36 E	24*	21*	2 15	23 46.92	+1 2.7	2.732	1.956	15.2	18.2	31 E	23*	13*
2 25	0 37.81	+0 6.9	2.422	1.674	18.5	21.3	33 E	22*	18*	2 25	0 8.39	+2 15.3	2.755	1.921	13.3	18.1	27 E	19*	10*
3 7	1 1.98	+3 11.1	2.483	1.689	16.7	21.3	29 E	20*	15*	3 7	0 30.49	+3 32.0	2.769	1.886	11.4	18.0	22 E	15*	8*
3 17	1 26.14	+6 22.1	2.544	1.708	14.8	21.3	26 E	17*	13*	3 17	0 53.23	+4 51.0	2.775	1.853	9.5	17.9	18 E	10*	6*
3 27	1 50.36	+9 24.1	2.604	1.728	12.9	21.3	23 E	14*	10*	3 27	1 16.63	+6 10.3	2.773	1.820	7.6	17.8	14 E	6*	4*
4 6	2 14.69	+12 15.3	2.662	1.751	11.0	21.3	19 E	11*	8*	4 6	1 40.71	+7 27.8	2.764	1.789	5.7	17.6	10 E	2*	3*
4 16	2 39.16	+14 54.3	2.718	1.776	9.0	21.3	16 E	8*	6*	4 16	2 5.51	+8 41.5	2.749	1.759	4.2	17.5	7 E	—	1*
4 26	3 3.78	+17 19.7	2.771	1.803	7.1	21.3	13 E	5*	3*	4 26	2 31.04	+9 49.1	2.730	1.731	3.2	17.4	6 E	—	—
5 6	3 28.56	+19 30.4	2.820	1.831	5.1	21.3	9 E	2*	—	5 6	2 57.30	+10 48.5	2.706	1.705	3.4	17.4	6 E	—	—
5 16	3 53.46	+21 25.9	2.864	1.861	3.2	21.3	6 E	—	—	5 16	3 24.27	+11 37.6	2.678	1.681	4.5	17.4	8 W	—	—
5 26	4 18.44	+23 5.5	2.904	1.892	1.4	21.2	3 E	—	—	5 26	3 51.91	+12 14.1	2.649	1.660	6.0	17.4	10 W	—	2*
6 5	4 43.41	+24 29.1	2.937	1.925	1.4	21.3	3 W	—	—	6 5	4 20.13	+12 36.4	2.618	1.642	7.6	17.4	12 W	—	5*
6 15	5 8.29	+25 36.8	2.965	1.958	3.2	21.4	6 W	—	—	6 15	4 48.83	+12 42.7	2.587	1.627	9.2	17.4	15 W	—	8*
344112 1999 VD <sub>4</sub>										432036 2008 WR <sub>61</sub>									
12 27	22 8.93	-15 57.3	2.284	1.870	24.9	21.0	53 E	27*	40*	12 27	22 9.65	+2 27.4	1.948	1.700	30.3	19.9	61 E	45*	31*
1 6	22 29.83	-13 37.8	2.330	1.836	23.7	21.0	49 E	27*	34*	1 6	22 36.20	+4 6.0	2.043	1.726	28.7	20.0	57 E	44*	27*
1 16	22 51.38	-11 7.9	2.372	1.803	22.4	20.9	44 E	27*	29*	1 16	23 2.42	+5 49.5	2.141	1.754	27.0	20.1	54 E	43*	23*
1 26	23 13.51	-8 28.8	2.408	1.773	21.0	20.9	40 E	26*	25*	1 26	23 28.26	+7 35.8	2.242	1.786	25.2	20.2	51 E	42*	20*
2 5	23 36.16	-5 42.0	2.440	1.745	19.5	20.8	36 E	24*	21*	2 5	23 53.69	+9 22.6	2.345	1.820	23.3	20.3	47 E	39*	17*
2 15	23 59.35	-2 49.1	2.468	1.720	18.0	20.8	33 E	22*	17*	2 15	0 18.72	+11 8.1	2.448	1.855	21.4	20.3	43 E	36*	15*
2 25	0 23.06	+0 7.9	2.494	1.699	16.5	20.7	29 E	20*	15*	2 25	0 43.36	+12 50.5	2.552	1.893	19.3	20.4	39 E	33*	13*
3 7	0 47.33	+3 6.7	2.517	1.681	14.9	20.7	26 E	17*	12*	3 7	1 7.61	+14 28.1	2.654	1.932	17.3	20.5	35 E	29*	11*
3 17	1 12.20	+6 4.8	2.539	1.666	13.3	20.6	23 E	14*	10*	3 17	1 31.52	+15 59.8	2.754	1.972	15.2	20.5	31 E	25*	9*
3 27	1 37.69	+8 59.5	2.560	1.655	11.7	20.5	20 E	12*	8*	3 27	1 55.08	+17 24.2	2.849	2.013	13.0	20.6	27 E	21*	7*
4 6	2 3.85	+11 47.2	2.581	1.649	10.1	20.5	17 E	9*	6*	4 6	2 18.30	+18 40.5	2.940	2.055	10.9	20.6	23 E	16*	6*
4 16	2 30.70	+14 27.2	2.601	1.646	8.5	20.4	14 E	6*	4*										
4 26	2 58.21	+16 54.6	2.622	1.647	6.9	20.4	11 E	4*	2*										
5 6	3 26.36	+19 7.2	2.643	1.653	5.3	20.3	9 E	1*	—										
5 16	3 55.07	+21 2.8	2.664	1.662	3.7	20.3	6 E	—	—										
5 26	4 24.21	+22 39.2	2.685	1.675	2.1	20.2	3 E	—	—										
6 5	4 53.60	+23 55.2	2.706	1.692	0.9	20.1	1 E	—	—										
6 15	5 23.06	+24 49.9	2.727	1.713	1.6	20.3	3 W	—	—										
6 25	5 52.35	+25 23.2	2.746	1.736	3.2	20.4	5 W	—	—										
7 5	6 21.25	+25 35.7	2.763	1.763	4.8	20.6	8 W	1*	—										
7 15	6 49.56	+25 28.5	2.777	1.793	6.5	20.7	12 W	4*	2*										
7 25	7 17.07	+25 3.4	2.788	1.824	8.2	20.8	15 W	7*	4*										
8 4	7 43.64	+24 22.5	2.794	1.858	9.9	20.9	18 W	11*	6*										
8 14	8 9.18	+23 28.0	2.795	1.894	11.5														

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°	20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°		
<b>432036 2008 WR<sub>61</sub></b>										<b>74779 1999 RF<sub>241</sub></b>											
<i>(continuation)</i>										<i>(continuation)</i>											
4	16	2 41.21	+19 48.0	3.025	2.097	8.7	20.6	18 E	12*	4*	9	3	5 18.40	+12 33.6	1.808	1.926	31.1	18.5	81 W	52*	50*
4	26	3 3.76	+20 45.9	3.102	2.140	6.6	20.6	14 E	8*	1*	9	13	5 36.25	+13 50.9	1.673	1.892	32.0	18.4	86 W	56*	49*
5	6	3 25.95	+21 34.0	3.172	2.183	4.4	20.6	10 E	3*	—	9	23	5 53.63	+15 13.4	1.540	1.859	32.7	18.2	91 W	60*	48*
5	16	3 47.75	+22 11.9	3.232	2.227	2.3	20.5	5 E	—	—	10	3	6 10.37	+16 45.8	1.409	1.827	32.9	17.9	97 W	62	47*
5	26	4 9.12	+22 39.5	3.282	2.270	0.7	20.5	2 W	—	—	10	13	6 26.21	+18 33.4	1.283	1.797	32.7	17.7	103 W	64	45
6	5	4 30.00	+22 56.9	3.322	2.313	2.2	20.7	5 W	—	—	10	18	6 33.70	+19 35.1	1.221	1.783	32.4	17.6	107 W	65	44
6	15	4 50.36	+23 4.2	3.350	2.356	4.2	20.9	10 W	—	3*	10	23	6 40.84	+20 43.5	1.162	1.769	31.9	17.4	110 W	66	43
6	25	5 10.11	+23 1.7	3.367	2.398	6.2	21.0	15 W	3*	7*	10	28	6 47.59	+21 59.5	1.104	1.755	31.3	17.3	113 W	67	42
7	5	5 29.21	+22 49.8	3.371	2.441	8.2	21.1	20 W	7*	11*	11	2	6 53.88	+23 24.4	1.049	1.742	30.5	17.1	117 W	68	41
7	15	5 47.59	+22 29.0	3.363	2.483	10.1	21.3	25 W	11*	15*	11	7	6 59.61	+24 59.2	0.996	1.729	29.4	17.0	121 W	70	39
7	25	6 5.17	+21 59.8	3.342	2.524	11.9	21.4	31 W	17*	19*	11	12	7 4.73	+26 44.9	0.947	1.718	28.2	16.8	125 W	72	37
8	4	6 21.89	+21 23.0	3.308	2.565	13.6	21.4	37 W	22*	22*	11	17	7 9.13	+28 42.4	0.900	1.706	26.7	16.6	129 W	74	35
8	14	6 37.66	+20 39.1	3.262	2.605	15.2	21.5	42 W	28*	26*	11	22	7 12.73	+30 52.2	0.858	1.695	25.1	16.5	133 W	76	33
12	27	22 10.10	-23 24.8	2.502	2.043	22.2	21.4	52 E	20*	42*	12	27	7 15.39	+33 14.1	0.820	1.685	23.3	16.3	138 W	78	31
1	6	22 26.34	-19 58.7	2.554	2.002	20.7	21.4	46 E	21*	35*	12	7	7 16.99	+35 47.2	0.787	1.676	21.4	16.1	142 W	81	28
1	16	22 43.06	-16 29.0	2.598	1.962	19.1	21.3	41 E	21*	29*	12	12	7 17.40	+38 29.8	0.759	1.667	19.5	16.0	146 W	83	26
1	26	23 0.21	-12 55.5	2.634	1.923	17.4	21.2	36 E	20*	23*	12	17	7 16.51	+41 18.9	0.736	1.659	17.9	15.9	149 W	86	23
2	5	23 17.76	-9 18.0	2.663	1.885	15.5	21.2	31 E	19*	18*	12	22	7 14.27	+44 10.3	0.720	1.652	16.6	15.8	151 W	89	20
2	15	23 35.74	-5 36.8	2.684	1.849	13.6	21.1	26 E	16*	13*	12	27	7 10.65	+46 59.3	0.709	1.646	16.0	15.7	153 W	88	17
2	25	23 54.17	+17 51.8	2.698	1.815	11.6	21.0	22 E	13*	9*	12	7	5 7.1	+49 40.7	0.704	1.640	16.2	15.7	152 W	85	14
3	7	0 13.13	+1 56.3	2.704	1.782	9.6	20.8	17 E	10*	5*	1	6	6 59.61	+52 9.4	0.705	1.635	17.1	15.7	151 W	83	12
3	17	0 32.72	+5 47.1	2.704	1.752	7.7	20.7	14 E	7*	1*	1	6	6 52.70	+54 21.1	0.711	1.631	18.6	15.8	148 E	81	10
3	27	0 53.05	+9 39.8	2.697	1.725	6.0	20.6	10 E	4*	—	1	11	6 45.46	+56 13.1	0.723	1.628	20.4	15.9	145 E	79	8
4	6	1 14.27	+13 33.1	2.686	1.701	4.7	20.5	8 E	2*	—	1	13	6 42.61	+56 52.1	0.729	1.627	21.2	15.9	143 E	78	7
4	16	1 36.56	+17 25.5	2.670	1.679	4.4	20.4	7 E	—	—	1	15	6 39.82	+57 27.7	0.735	1.626	22.0	15.9	142 E	78	7
4	26	2 0.13	+21 15.0	2.650	1.662	5.1	20.4	8 W	2*	—	1	17	6 37.16	+57 59.9	0.742	1.626	22.7	16.0	140 E	77	6
5	6	2 25.20	+24 58.9	2.629	1.648	6.4	20.5	11 W	5*	—	1	19	6 34.64	+58 28.9	0.750	1.625	23.5	16.0	139 E	77	6
5	16	2 52.02	+28 33.9	2.607	1.637	8.0	20.5	13 W	7*	—	1	21	6 32.30	+58 54.7	0.758	1.624	24.3	16.1	137 E	76	5
5	26	3 20.80	+31 56.0	2.584	1.631	9.6	20.6	16 W	9*	—	12	27	22 10.57	-9 27.9	1.843	1.526	32.2	20.5	56 E	33*	37*
6	5	3 51.71	+35 0.2	2.563	1.629	11.2	20.6	18 W	12*	—	1	6	22 38.65	-6 47.5	1.908	1.535	30.8	20.6	53 E	34*	33*
6	15	4 24.82	+37 41.7	2.543	1.631	12.6	20.6	21 W	14*	—	1	16	23 6.46	-3 59.9	1.977	1.548	29.3	20.6	50 E	35*	29*
6	25	5 0.01	+39 54.8	2.526	1.637	13.9	20.7	23 W	17*	—	1	26	23 33.99	-1 8.4	2.049	1.565	27.7	20.7	48 E	35*	26*
7	5	5 36.94	+41 35.0	2.512	1.648	15.1	20.7	25 W	19*	—	2	5	0 1.21	+1 43.5	2.123	1.585	26.0	20.7	45 E	34*	23*
7	15	6 15.01	+42 38.8	2.500	1.662	16.2	20.8	27 W	21*	—	2	15	0 28.18	+4 33.0	2.201	1.610	24.3	20.8	42 E	32*	20*
7	25	6 53.41	+43 4.8	2.491	1.679	17.2	20.8	29 W	23*	—	2	25	0 54.92	+7 17.0	2.281	1.637	22.4	20.8	39 E	30*	18*
8	4	7 31.28	+42 54.1	2.484	1.700	18.0	20.9	31 W	25*	—	3	7	1 21.45	+9 53.0	2.362	1.668	20.6	20.9	36 E	28*	16*
8	14	8 7.80	+42 10.2	2.478	1.725	18.9	20.9	33 W	27*	—	3	17	1 47.82	+12 19.0	2.445	1.700	18.6	20.9	33 E	25*	14*
8	24	8 42.37	+40 58.2	2.472	1.752	19.6	21.0	36 W	29*	—	3	27	2 14.04	+14 33.1	2.527	1.735	16.7	21.0	30 E	22*	13*
9	3	9 14.63	+39 24.0	2.465	1.782	20.4	21.0	38 W	31*	—	4	6	2 40.11	+16 33.9	2.608	1.772	14.7	21.0	27 E	19*	11*
9	13	9 44.47	+37 34.0	2.456	1.814	21.2	21.1	41 W	33*	—	4	16	3 6.03	+18 20.5	2.688	1.810	12.7	21.1	23 E	15*	9*
9	23	10 11.87	+35 33.9	2.443	1.849	21.9	21.1	43 W	36*	—	4	26	3 31.75	+19 52.1	2.765	1.850	10.6	21.1	20 E	12*	8*
10	3	10 36.97	+33 28.8	2.425	1.885	22.7	21.2	47 W	40*	2*	5	6	3 57.23	+21 8.2	2.838	1.890	8.6	21.1	16 E	8*	6*
10	13	10 59.92	+31 23.3	2.401	1.923	23.5	21.2	50 W	44*	4*	5	16	4 22.42	+22 8.9	2.906	1.931	6.5	21.1	12 E	4*	3*
10	23	11 20.84	+29 20.8	2.370	1.962	24.3	21.3	54 W	48*	6*	5	26	4 47.24	+22 54.2	2.969	1.973	4.4	21.1	9 E	1*	1*
11	2	11 39.87	+27 24.4	2.331	2.002	25.0	21.3	59 W	53*	10*	6	5	5 11.61	+23 24.6	3.024	2.015	2.3	21.1	5 E	—	—
11	12	11 57.06	+25 36.7	2.283	2.043	25.7	21.3	63 W	57*	14*	6	15	5 35.46	+23 40.7	3.073	2.057	0.3	21.0	1 E	—	—
11	22	12 12.40	+23 59.7	2.227	2.085	26.2	21.3	69 W	62*	18*	6	25	5 58.70	+23 43.4	3.112	2.099	1.8	21.2	4 W	—	—
12	2	12 25.86	+22 35.0	2.163	2.127	26.6	21.3	75 W	65*	23*	7	5	6 21.27	+23 33.7	3.143	2.141	3.8	21.4	8 W	—	1*
12	12	12 37.28	+21 24.3	2.091	2.169	26.6	21.3	81 W	66*	29*	12	27	22 10.80	-33 7.8	0.803	0.778	76.9	19.3	50 E	10*	44*
12	22	12 46.48	+20 28.5	2.014	2.212	26.4	21.2	88 W	65*	34*	1	1	22 26.36	-34 5.3	0.761	0.753	81.0	19.2	49 E	9*	43*
1	1	12 53.19	+19 48.2	1.933	2.254	25.7	21.2	96 W	65	40*	1	6	22 41.47	-35 3.4	0.714	0.732	85.7	19.2	48 E	8*	42*
1	11	12 57.05	+19 23.6	1.851	2.297	24.5	21.1	104 W	64	43*	1	11	22 55.78	-36 2.6	0.664	0.716	90.8	19.2	47 E	6*	41*
1	21	12 57.70	+19 13.3	1.771	2.340	22.8	21.0	113 W	64	45	1	16	23 8.84	-37 2.8	0.610	0.707	96.4	19.2	46 E	4*	40*
12	27	22 10.16	-32 36.3	3.270	2.748	16.0	20.1	50 E	11*	44*	1	21	23 20.11	-38 3.4	0.554	0.704	102.4	19.3	44 E	2*	38*
1	6	22 24.75	-30 41.4	3.336	2.723	14.6	20.1	44 E	11*	38*	1	26	23 28.94	-39 2.6	0.496	0.707	108.6	19.4	43 E	—	36*
1	16	22 39.83	-28 43.7	3.391	2.697	13.2	20.1	39 E	10*	32*	1	28	23 31.62	-39 25.3	0.473	0.710	111.1	19.5	42 E	—	36*
1	26	22 55.31	-26 43.6	3.434	2.670	11.8	20.0	34 E	8*	27*	1	30	23 33.75	-39 47.0	0.449	0.714	113.7	19.5	42 E	—	35*
2	5	23 11.08	-24 41.4	3.464	2.642	10.3	20.0	29 E	5*	22*	2	1	23 35.27	-40 7.3	0.426	0.720	116.3	19.6	41 E	—	34*
2	15	23 27.10	-22 37.4	3.482	2.613	8.9	19.9	24 E	2*	18*	2	3	23 36.11	-40 25.8	0.403	0.726	118.8	19.7	40 E	—	33*
2	25	23 43.32	-20 32.2	3.487	2.583	7.7	19.8	21 E	—	14*	2	5	23 36.2								



EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

Table with columns for date (20/21, 20/22), right ascension (α2000), declination (δ2000), distance (Δ), radius (r), phase angle (β), magnitude (V), position angle (ψ), and coordinates (45°, -26°). It contains three main sections: 333889 1998 SV4 (continuation), 483498 2002 UL3 (continuation), and 118162 1951 SX. Each section lists multiple rows of data for different dates and times, with some rows indicating specific astronomical events or observations.

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

2021	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°-26°	20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°-26°	
<b>503960 2004 QF<sub>1</sub> (continuation)</b>									<b>503960 2004 QF<sub>1</sub> (continuation)</b>									
3 22	2 26.28	+ 2 37.7	0.321	0.758	130.3	21.0	35 E	20*	9 4	18 20.69	-34 13.1	0.589	1.349	43.7	19.5	113 E	11 82	
3 27	2 36.76	- 4 19.1	0.299	0.769	133.3	21.2	34 E	12*	9 6	18 23.38	-33 13.2	0.604	1.351	44.1	19.6	111 E	12 83	
4 1	2 44.85	-11 59.2	0.284	0.783	133.2	21.1	35 E	4*	9 8	18 26.17	-32 15.6	0.620	1.352	44.4	19.6	110 E	13 84	
4 6	2 50.49	-19 49.4	0.277	0.800	129.9	20.7	38 E	—	30*	9 10	18 29.03	-31 20.2	0.635	1.353	44.8	19.7	109 E	14 85
4 11	2 53.85	-27 16.1	0.277	0.819	124.4	20.3	42 E	—	29*	9 12	18 31.98	-30 27.0	0.651	1.354	45.1	19.7	108 E	15 86
4 16	2 55.20	-33 55.3	0.282	0.841	117.9	19.9	48 E	—	28*	9 14	18 34.99	-29 35.6	0.667	1.355	45.4	19.8	106 E	15 86
4 21	2 54.90	-39 36.7	0.290	0.863	111.2	19.5	53 E	—	27*	9 16	18 38.07	-28 46.1	0.683	1.356	45.7	19.9	105 E	16 87
4 26	2 53.37	-44 21.3	0.299	0.887	104.8	19.3	58 E	—	25*	9 18	18 41.21	-27 58.3	0.699	1.356	45.9	19.9	104 E	17 88
4 28	2 52.52	-46 0.7	0.303	0.897	102.4	19.2	60 E	—	24*	9 20	18 44.41	-27 12.1	0.715	1.357	46.2	20.0	103 E	18 89
4 30	2 51.57	-47 32.8	0.307	0.907	100.1	19.2	62 E	—	23*	9 22	18 47.65	-26 27.4	0.731	1.357	46.4	20.0	102 E	19 90
5 2	2 50.54	-48 58.3	0.311	0.917	97.9	19.1	64 E	—	22*	9 24	18 50.95	-25 44.0	0.747	1.357	46.6	20.1	101 E	19 90
5 4	2 49.46	-50 17.8	0.315	0.927	95.7	19.1	66 E	—	21*	9 26	18 54.30	-25 1.9	0.764	1.356	46.8	20.1	99 E	20 89
5 6	2 48.35	-51 32.2	0.318	0.937	93.7	19.0	68 W	—	21*	9 28	18 57.69	-24 21.0	0.780	1.356	47.0	20.2	98 E	21 88
5 8	2 47.22	-52 42.1	0.322	0.947	91.7	19.0	70 W	—	23*	9 30	19 1.13	-23 41.1	0.796	1.355	47.2	20.2	97 E	21 88
5 10	2 46.06	-53 48.2	0.325	0.958	89.7	18.9	71 W	—	25*	10 2	19 4.61	-23 2.2	0.812	1.354	47.3	20.3	96 E	22 87*
5 12	2 44.89	-54 51.2	0.328	0.968	87.9	18.9	73 W	—	26*	10 4	19 8.13	-22 24.3	0.828	1.353	47.4	20.3	95 E	23 86*
5 14	2 43.70	-55 51.5	0.330	0.978	86.1	18.9	75 W	—	28*	10 6	19 11.69	-21 47.1	0.844	1.352	47.5	20.4	94 E	23 85*
5 16	2 42.49	-56 49.7	0.333	0.988	84.4	18.8	77 W	—	29*	10 8	19 15.29	-21 10.8	0.860	1.351	47.6	20.4	93 E	24 84*
5 21	2 39.30	-59 9.4	0.337	1.013	80.2	18.8	81 W	—	33*	10 10	19 18.93	-20 35.1	0.876	1.349	47.7	20.5	92 E	24 83*
5 26	2 35.66	-61 25.9	0.340	1.038	76.3	18.7	85 W	—	36*	10 12	19 22.60	-20 0.0	0.892	1.348	47.8	20.5	91 E	25 81*
5 31	2 31.20	-63 44.8	0.341	1.063	72.5	18.6	89 W	—	38*	10 14	19 26.31	-19 25.5	0.908	1.346	47.8	20.5	90 E	26 80*
6 5	2 25.25	-66 11.2	0.340	1.086	68.9	18.6	93 W	—	40*	10 16	19 30.06	-18 51.5	0.923	1.344	47.9	20.6	89 E	26 79*
6 7	2 22.20	-67 12.8	0.340	1.096	67.4	18.5	95 W	—	40*	10 18	19 33.83	-18 17.9	0.939	1.341	47.9	20.6	88 E	27 77*
6 9	2 18.60	-68 16.3	0.339	1.105	66.0	18.5	96 W	—	41*	10 20	19 37.63	-17 44.7	0.954	1.339	48.0	20.6	87 E	27 76*
6 11	2 14.32	-69 21.9	0.338	1.114	64.5	18.5	98 W	—	41*	10 22	19 41.46	-17 11.9	0.969	1.336	48.0	20.7	86 E	28 75*
6 13	2 9.17	-70 29.5	0.337	1.123	63.0	18.4	100 W	—	41*	10 24	19 45.32	-16 39.3	0.983	1.333	48.0	20.7	85 E	28 73*
6 15	2 2.90	-71 39.0	0.336	1.132	61.6	18.4	102 W	—	41*	10 26	19 49.21	-16 7.0	0.998	1.330	48.0	20.7	84 E	29 72*
6 16	1 59.26	-72 14.4	0.335	1.136	60.8	18.4	102 W	—	41*	10 28	19 53.12	-15 35.0	1.012	1.327	48.0	20.7	83 E	29 71*
6 17	1 55.21	-72 50.1	0.335	1.140	60.1	18.4	103 W	—	41*	10 30	19 57.07	-15 3.1	1.027	1.324	48.0	20.8	82 E	30 69*
6 18	1 50.72	-73 26.1	0.334	1.145	59.4	18.3	104 W	—	41*	11 1	20 0.04	-14 31.3	1.040	1.320	48.0	20.8	81 E	30 68*
6 19	1 45.70	-74 2.3	0.334	1.149	58.6	18.3	105 W	—	40*	11 3	20 5.04	-13 59.6	1.054	1.316	47.9	20.8	80 E	31 67*
6 20	1 40.10	-74 38.7	0.333	1.153	57.9	18.3	106 W	—	40*	11 5	20 9.07	-13 28.0	1.067	1.312	47.9	20.8	79 E	32 65*
6 21	1 33.83	-75 15.0	0.333	1.157	57.2	18.3	107 W	—	40*	11 7	20 13.12	-12 56.4	1.080	1.308	47.9	20.9	78 E	32 64*
6 22	1 26.80	-75 51.1	0.332	1.161	56.4	18.3	108 W	—	39*	11 9	20 17.20	-12 24.8	1.093	1.304	47.8	20.9	77 E	33 63*
6 23	1 18.89	-76 26.9	0.332	1.166	55.7	18.3	109 W	—	39*	11 11	20 21.31	-11 53.2	1.106	1.299	47.8	20.9	76 E	33 61*
6 24	1 10.01	-77 2.1	0.331	1.170	55.0	18.2	110 W	—	39*	11 13	20 25.45	-11 21.5	1.118	1.294	47.8	20.9	76 E	34 60*
6 25	1 0.00	-77 36.4	0.331	1.174	54.2	18.2	110 W	—	38*	11 15	20 29.61	-10 49.8	1.130	1.290	47.7	20.9	75 E	34 58*
6 26	0 48.74	-78 9.5	0.330	1.178	53.5	18.2	111 W	—	38*	11 17	20 33.79	-10 17.9	1.141	1.285	47.7	20.9	74 E	35 57*
6 27	0 36.06	-78 41.0	0.330	1.182	52.8	18.2	112 W	—	37*	11 19	20 38.00	-9 45.9	1.152	1.279	47.6	20.9	73 E	35 56*
6 28	0 21.84	-79 10.4	0.330	1.185	52.1	18.2	113 W	—	37*	11 21	20 42.24	-9 13.8	1.163	1.274	47.6	20.9	72 E	36 54*
6 29	0 5.95	-79 37.2	0.330	1.189	51.4	18.2	114 W	—	36*	11 23	20 46.50	-8 41.5	1.173	1.268	47.5	21.0	71 E	36 53*
6 30	23 48.33	-80 0.8	0.329	1.193	50.6	18.2	115 W	—	36*	11 25	20 50.79	-8 9.1	1.183	1.263	47.5	21.0	70 E	37 52*
7 1	23 28.98	-80 20.4	0.329	1.197	49.9	18.1	116 W	—	36*	11 27	20 55.10	-7 36.4	1.193	1.257	47.4	21.0	70 E	37 50*
7 2	23 8.02	-80 35.4	0.329	1.201	49.2	18.1	117 W	—	35*	11 29	20 59.45	-7 3.5	1.202	1.250	47.4	21.0	69 E	38 49*
7 3	22 45.73	-80 45.1	0.329	1.204	48.5	18.1	117 W	—	35*	12 1	21 3.82	-6 30.4	1.211	1.244	47.3	21.0	68 E	38 47*
7 4	22 22.50	-80 49.0	0.329	1.208	47.8	18.1	118 W	—	35*	12 3	21 8.23	-5 57.1	1.219	1.238	47.3	21.0	67 E	39 46*
7 5	21 58.86	-80 46.5	0.330	1.212	47.2	18.1	119 W	—	35*	12 5	21 12.66	-5 23.5	1.227	1.231	47.3	21.0	67 E	39 45*
7 6	21 35.39	-80 37.6	0.330	1.215	46.5	18.1	120 W	—	35*	12 7	21 17.13	-4 49.6	1.235	1.224	47.2	21.0	66 E	39 43*
7 7	21 12.66	-80 22.3	0.330	1.219	45.9	18.1	121 W	—	35*	12 9	21 21.62	-4 15.5	1.242	1.217	47.2	21.0	65 E	40 42*
7 8	20 51.13	-80 0.9	0.331	1.222	45.2	18.1	121 W	—	36*	12 11	21 26.15	-3 41.0	1.248	1.210	47.2	21.0	64 E	40 41*
7 9	20 31.14	-79 33.7	0.331	1.226	44.6	18.1	122 W	—	36*	12 13	21 30.72	-3 6.2	1.255	1.203	47.2	21.0	64 E	41 40*
7 10	20 12.87	-79 1.4	0.332	1.229	44.0	18.0	123 W	—	36*	12 15	21 35.31	-2 31.2	1.260	1.195	47.2	21.0	63 E	41 38*
7 12	19 41.63	-77 43.6	0.334	1.236	42.8	18.0	124 W	—	38*	12 17	21 39.94	-1 55.8	1.265	1.188	47.2	21.0	62 E	41 37*
7 14	19 16.95	-76 12.0	0.336	1.242	41.8	18.0	125 E	—	40*	12 19	21 44.61	-1 20.1	1.270	1.180	47.2	21.0	62 E	42 36*
7 16	18 57.72	-74 30.2	0.339	1.249	40.8	18.0	127 E	—	41*	12 21	21 49.31	-0 44.2	1.274	1.172	47.2	21.0	61 E	42 35*
7 18	18 42.82	-72 41.4	0.343	1.255	40.0	18.0	128 E	—	43*	12 23	21 54.05	-0 7.8	1.278	1.164	47.2	20.9	60 E	42 33*
7 20	18 31.28	-70 47.7	0.347	1.261	39.2	18.1	128 E	—	45*	12 25	21 58.84	+ 0 28.8	1.281	1.155	47.3	20.9	60 E	43 32*
7 22	18 22.34	-68 51.0	0.351	1.267	38.6	18.1	129 E	—	47*	12 27	22 3.66	+ 1 5.7	1.284	1.147	47.3	20.9	59 E	43 31*
7 24	18 15.43	-66 52.7	0.356	1.272	38.1	18.1	129 E	—	49*	12 29	22 8.54	+ 1 43.0	1.286	1.139	47.4	20.9	58 E	43 30*
7 26	18 10.12	-64 53.8	0.362	1.278	37.7	18.1	130 E	—	51*	12 31	22 13.45	+ 2 20.5	1.288	1.130	47.4	20.9	58 E	43 29*
7 28	18 6.08	-62 55.3	0.369	1.283	37.4	18.2	130 E	—	53*	1 2	22 18.42	+ 2 58.4	1.289	1.121	47.5	20.9	57 E	44 28*
7 30	18 3.06	-60 57.9	0.376	1.288	37.3	18.2	130 E	—	55*	1 4	22 23.44	+ 3 36.7	1.290	1.112	47.6	20.9	57 E	44 27*
8 1	18 0.90	-59 2.2	0.383	1.293	37.3	18.3	129 E	—	57*	1 6	22 28.52	+ 4 15.2	1.290	1.103	47.8	20.9	56 E	44 26*
8 3	17 59.43	-57 8.7	0.392	1.298	37.4	18.3	129 E	—	59*	1 8	22 33.65	+ 4 54.0	1.					

EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$ - $26^\circ$	20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	$45^\circ$ - $26^\circ$
<b>55825 1995 SD<sub>4</sub></b>									<b>4197 Morpheus</b>								
<i>(continuation)</i>									<i>(continuation)</i>								
4 6	2 26.16	+13 52.1	2.664	1.782	12.5	20.1	23 E	14* 10*	8 4	13 32.90	-23 21.2	1.394	1.558	39.7	18.2	79 E	9* 73*
4 16	2 51.35	+15 37.7	2.721	1.803	10.5	20.1	19 E	11* 8*	8 9	13 48.37	-24 34.1	1.488	1.616	37.8	18.3	78 E	8* 71*
4 26	3 16.58	+17 11.0	2.775	1.826	8.5	20.1	16 E	7* 6*	8 14	14 3.02	-25 37.7	1.585	1.673	36.1	18.5	77 E	7* 70*
5 6	3 41.82	+18 31.0	2.824	1.850	6.6	20.1	12 E	3* 4*	8 19	14 16.94	-26 33.5	1.683	1.729	34.5	18.6	75 E	7* 68*
5 16	4 7.03	+19 36.9	2.868	1.874	4.6	20.1	9 E	— 1*	8 24	14 30.26	-27 22.8	1.782	1.783	32.9	18.8	74 E	7* 66*
5 26	4 32.11	+20 28.2	2.907	1.900	2.7	20.0	5 E	—	8 29	14 43.06	-28 6.4	1.882	1.837	31.5	18.9	72 E	6* 64*
6 5	4 56.99	+21 4.7	2.939	1.926	1.0	19.9	2 E	—	9 3	14 55.41	-28 45.2	1.983	1.889	30.1	19.1	70 E	6* 62*
6 15	5 21.59	+21 26.4	2.965	1.952	1.7	20.0	3 W	—	9 8	15 7.38	-29 19.9	2.084	1.941	28.7	19.2	68 E	6* 60*
6 25	5 45.80	+21 33.8	2.984	1.979	3.6	20.2	7 W	— 1*	9 13	15 19.02	-29 50.9	2.184	1.991	27.4	19.3	66 E	5* 58*
7 5	6 9.54	+21 27.3	2.995	2.006	5.5	20.3	11 W	— 4*	9 18	15 30.37	-30 18.7	2.285	2.040	26.1	19.4	63 E	5* 56*
7 15	6 32.71	+21 7.7	2.998	2.033	7.4	20.5	15 W	3* 7*	9 23	15 41.46	-30 43.5	2.384	2.089	24.8	19.5	61 E	5* 54*
7 25	6 55.25	+20 36.0	2.992	2.060	9.3	20.6	19 W	7* 10*	10 31	16 3.00	-31 25.2	2.581	2.182	22.3	19.7	56 E	4* 49*
8 4	7 17.07	+19 53.3	2.978	2.087	11.2	20.7	24 W	12* 13*	10 31	16 23.82	-31 57.8	2.771	2.273	19.8	19.9	51 E	4* 44*
8 14	7 38.13	+19 0.8	2.953	2.114	13.0	20.7	28 W	17* 16*	10 13	16 44.04	-32 22.2	2.953	2.360	17.4	20.0	45 E	3* 39*
8 24	7 58.37	+17 59.8	2.920	2.141	14.8	20.8	33 W	22* 18*	11 2	17 3.72	-32 39.2	3.125	2.443	15.0	20.1	40 E	2* 33*
9 3	8 17.74	+16 51.6	2.876	2.168	16.5	20.9	38 W	27* 21*	11 12	17 22.92	-32 49.6	3.285	2.524	12.6	20.2	34 E	1* 28*
9 13	8 36.19	+15 37.6	2.823	2.194	18.2	20.9	43 W	32* 24*	11 22	17 41.64	-32 53.8	3.431	2.601	10.3	20.3	28 E	— 22*
9 23	8 53.68	+14 19.4	2.760	2.220	19.7	20.9	48 W	37* 27*	12 2	17 59.87	-32 52.3	3.563	2.676	8.0	20.4	22 E	— 16*
10 3	9 10.15	+12 58.3	2.687	2.245	21.1	20.9	54 W	41* 30*	12 12	18 17.61	-32 45.8	3.677	2.748	5.9	20.4	17 E	— 11*
10 13	9 25.52	+11 35.9	2.605	2.270	22.3	20.9	60 W	46* 33*	12 22	18 34.81	-32 34.8	3.773	2.818	4.1	20.4	12 E	— 5*
10 23	9 39.69	+10 14.0	2.515	2.294	23.3	20.9	66 W	49* 37*	1 1	18 51.44	-32 20.0	3.851	2.885	3.2	20.4	9 E	—
11 2	9 52.55	+8 54.0	2.418	2.317	24.1	20.9	72 W	52* 41*	1 11	19 7.45	-32 2.1	3.908	2.950	3.7	20.6	11 W	— 3*
11 12	10 3.94	+7 38.0	2.314	2.340	24.6	20.8	79 W	52* 46*	1 21	19 22.80	-31 42.0	3.946	3.012	5.2	20.7	16 W	— 9*
11 22	10 13.65	+6 28.1	2.205	2.362	24.7	20.7	87 W	51 50*	<b>205457 2001 QY<sub>12</sub></b>								
12 2	10 21.46	+5 26.4	2.094	2.384	24.4	20.6	95 W	50 55*	12 27	22 17.77	-7 36.9	1.952	1.659	30.2	20.7	58 E	36* 38*
12 12	10 27.08	+4 35.4	1.983	2.404	23.5	20.5	103 W	50 59*	1 6	22 42.12	-5 1.0	2.031	1.667	28.7	20.7	55 E	36* 33*
12 22	10 30.22	+3 57.9	1.875	2.424	22.1	20.4	112 W	49 60	1 16	23 6.44	-2 20.3	2.110	1.676	27.2	20.8	51 E	36* 28*
1 1	10 30.60	+3 36.3	1.775	2.444	19.9	20.2	122 W	49 60	1 26	23 30.72	+0 23.1	2.188	1.688	25.5	20.8	48 E	36* 24*
1 11	10 28.04	+3 33.4	1.686	2.462	17.1	20.0	133 W	49 60	2 5	23 54.97	+3 7.0	2.267	1.703	23.8	20.8	44 E	34* 21*
1 21	10 22.57	+3 50.1	1.614	2.480	13.4	19.8	144 W	49 60	2 15	0 19.22	+5 49.3	2.344	1.719	22.0	20.9	41 E	32* 18*
<b>4197 Morpheus</b>									2 25	0 43.51	+8 28.0	2.420	1.737	20.1	20.9	37 E	29* 15*
12 27	22 17.22	-12 58.2	2.390	2.015	23.9	19.4	56 E	30* 40*	3 7	1 7.86	+11 1.1	2.495	1.757	18.2	21.0	34 E	26* 13*
1 6	22 29.34	-11 14.2	2.404	1.914	22.9	19.3	49 E	29* 33*	3 17	1 32.32	+13 26.8	2.567	1.779	16.3	21.0	30 E	23* 11*
1 16	22 43.07	-9 18.7	2.400	1.809	21.8	19.1	43 E	28* 26*	3 27	1 56.92	+15 43.5	2.637	1.802	14.4	21.0	27 E	20* 9*
1 26	22 58.38	-7 10.7	2.378	1.700	20.4	18.9	37 E	25* 21*	4 6	2 21.64	+17 49.6	2.704	1.826	12.4	21.0	23 E	16* 7*
2 5	23 15.30	+4 49.1	2.337	1.586	19.1	18.7	32 E	22* 16*	4 16	2 46.52	+19 43.9	2.766	1.851	10.4	21.0	20 E	13* 5*
2 15	23 33.97	+2 12.3	2.278	1.467	17.8	18.4	27 E	19* 12*	4 26	3 11.50	+21 25.3	2.825	1.878	8.5	21.0	16 E	9* 3*
2 25	23 54.63	+0 41.3	2.200	1.343	16.6	18.1	23 E	15* 8*	5 6	3 36.55	+22 52.8	2.878	1.905	6.5	21.0	12 E	6* 1*
3 7	0 17.71	+3 53.7	2.105	1.214	15.7	17.8	19 E	13* 5*	5 16	4 1.63	+24 6.0	2.925	1.932	4.6	21.0	9 E	2*
3 17	0 43.86	+7 27.0	1.994	1.080	15.5	17.4	17 E	10* 3*	5 26	4 26.63	+25 4.3	2.967	1.960	2.8	20.9	5 E	—
3 27	1 14.06	+11 21.9	1.866	0.943	16.4	17.0	15 E	9* 1*	6 5	4 51.48	+25 47.6	3.001	1.989	1.7	20.9	3 W	—
4 1	1 31.13	+13 27.1	1.797	0.874	17.5	16.8	15 E	9* 1*	6 15	5 16.07	+26 16.3	3.028	2.017	2.5	21.0	5 W	—
4 6	1 49.81	+15 36.5	1.725	0.806	19.3	16.6	15 E	9* 1*	6 25	5 40.30	+26 30.5	3.046	2.046	4.2	21.1	8 W	1*
4 11	2 10.41	+17 48.6	1.649	0.739	22.0	16.4	16 E	10* 1*	7 5	6 4.06	+26 31.1	3.056	2.075	6.0	21.3	12 W	4* 3*
4 16	2 33.24	+20 0.6	1.568	0.676	25.7	16.2	17 E	11* 2*	7 15	6 27.26	+26 18.8	3.057	2.104	7.9	21.4	17 W	8* 6*
4 21	2 58.62	+22 7.8	1.484	0.618	30.9	16.0	18 E	12* 3*	<b>251428 2008 BD<sub>16</sub></b>								
4 26	3 26.79	+24 3.6	1.396	0.571	37.7	15.9	20 E	14* 4*	12 27	22 17.92	-12 29.4	2.001	1.672	29.3	21.2	56 E	31* 40*
4 28	3 38.86	+24 44.6	1.359	0.556	40.9	15.9	21 E	14* 5*	1 6	22 42.12	-10 18.5	2.056	1.655	28.2	21.2	53 E	31* 35*
4 30	3 51.38	+25 21.7	1.322	0.543	44.3	15.9	22 E	15* 6*	1 16	23 6.74	-7 56.7	2.110	1.640	26.9	21.2	49 E	31* 31*
5 2	4 4.33	+25 54.0	1.284	0.533	47.9	15.9	23 E	16* 7*	1 26	23 31.69	-5 26.0	2.161	1.629	25.5	21.2	45 E	31* 27*
5 4	4 17.68	+26 20.8	1.246	0.526	51.7	15.9	24 E	17* 8*	2 5	23 56.93	-2 49.0	2.210	1.620	24.1	21.2	42 E	30* 24*
5 6	4 31.41	+26 41.5	1.208	0.522	55.5	15.9	25 E	17* 9*	2 15	0 22.47	+0 8.2	2.259	1.615	22.6	21.2	39 E	28* 21*
5 8	4 45.46	+26 55.4	1.170	0.522	59.4	16.0	26 E	18* 10*	2 25	0 48.31	+2 33.6	2.307	1.613	21.1	21.2	36 E	26* 19*
5 10	4 59.81	+27 1.9	1.132	0.525	63.1	16.0	28 E	19* 12*	3 7	1 14.44	+5 13.4	2.355	1.614	19.5	21.2	33 E	23* 17*
5 12	5 14.39	+27 0.6	1.095	0.531	66.7	16.1	29 E	19* 13*	3 17	1 44.91	+7 48.6	2.402	1.619	17.9	21.2	30 E	21* 15*
5 14	5 29.19	+26 51.2	1.059	0.541	70.0	16.1	30 E	20* 14*	3 27	2 7.71	+10 16.4	2.449	1.626	16.3	21.2	27 E	18* 14*
5 16	5 44.16	+26 33.3	1.024	0.553	73.0	16.2	32 E	21* 16*	4 6	2 34.83	+12 34.0	2.496	1.637	14.6	21.2	24 E	15* 12*
5 18	5 59.27	+26 6.8	0.990	0.568	75.6	16.3	33 E	21* 18*	4 16	3 2.25	+14 39.3	2.543	1.651	12.9	21.2	22 E	12* 10*
5 20	6 14.50	+25 31.5	0.958	0.585	77.8	16.4	34 E	22* 19*	4 26	3 29.92	+16 30.0	2.589	1.668	11.1	21.2	19 E	9* 9*
5 22	6 29.82	+24 47.5	0.928	0.604	79.6	16.4	36 E	22* 21*	5 6	3 57.76	+18 4.4	2.635	1.687	9.4	21.2	16 E	6* 7*
5 24	6 45.22	+23 54.7	0.900	0.625	81.0	16.5	38 E	22* 23*	5 16	4 25.69	+19 21.5	2.679	1.709	7.6	21.1	13 E	3* 5*
5 26	7 0.68	+22 53.2	0.875	0.647	82.0	16.5	39 E	22* 25*	5 26	4 53.55	+20 20.4	2.721	1.733	5.8	21.1	10 E	— 3*
5 31	7 39.37	+19 43.2	0.821	0.708	82.7	16.6	44 E	23* 31*	6 5	5 21.23	+21 0.8	2.761	1.758	4.0	21.1	7 E	— 1*
6 5	8 17.77	+15 47.1	0.785	0.773	81.2	16.7	49 E	23* 37*	6 15	5 48.59	+21 22.9	2.798	1.786	2.3	21.1	4 E	—
6 10	8 55.27	+11 17.0	0.766	0.841	78.2	16.7	54 E	22* 43*	6 25	6 15.47	+21 27.3	2.831	1.815	1.1	21.0	2 E	—
6 15	9 31.27	+6 29.6	0.765	0.910	74.1	16.7	60 E	21* 49*	7 5	6 41.76	+21 15.1	2.859	1.846	2.0	21.2	4 W	—
6 17	9 45.12	+4 33.9	0.770	0.938	72.3	16.7	62 E	20* 51*	7 15	7 7.35	+20 47.7	2.882	1.877	3.8	21.3	7 W	— 1*
6 19	9 58.62	+2 39.4	0.777	0.965	70.4	16.7	64 E	20* 54*</									





EPHEMERIDES OF NEAS AND SOME UNUSUAL MINOR PLANETS

20/22	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°	20/21	$\alpha_{2000}$	$\delta_{2000}$	$\Delta$	$r$	$\beta$	$V$	$\psi$	45°	-26°
<b>99913 1997 CZ<sub>5</sub></b>										<b>431714 2008 ED<sub>131</sub></b>									
<i>(continuation)</i>										<i>(continuation)</i>									
10 3	11 44.37	-15 9.4	2.769	1.835	9.2	17.6	17 W	—	10*	2 15	0 20.52	-1 57.3	2.298	1.635	21.8	20.9	38 E	26*	22*
<b>475981 2007 PR<sub>18</sub></b>										<b>250308 2003 QT<sub>67</sub></b>									
<i>(continuation)</i>										<i>(continuation)</i>									
12 27	22 19.55	-14 6.0	1.978	1.649	29.7	21.3	56 E	29*	41*	12 27	22 20.74	-10 48.6	2.009	1.700	29.3	21.4	58 E	33*	40*
<b>78587 2002 SZ<sub>12</sub></b>										<b>253444 2003 RA<sub>6</sub></b>									
<i>(continuation)</i>										<i>(continuation)</i>									
1 6	22 45.99	-12 0.5	2.043	1.648	28.4	21.3	53 E	30*	37*	1 6	22 45.82	-8 37.6	2.100	1.718	27.6	21.5	54 E	33*	35*
<b>431714 2008 ED<sub>131</sub></b>										<b>40271 1999 JT</b>									
<i>(continuation)</i>										<i>(continuation)</i>									
1 16	23 12.40	-9 43.5	2.109	1.651	27.0	21.3	50 E	30*	33*	12 27	22 21.58	-30 25.4	2.062	1.666	28.1	18.6	53 E	13*	46*



