

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
243	°	°		0.00						
7400.5	293.0733	-0.2962	5.14815	732905	+2.01757	-4.33462	-1.90889	-4.1778	+8.9757	+3.9527
7410.5	293.9214	.3150	.14454	734448	2.08599	4.30305	1.89701	4.3286	8.9291	3.9364
7420.5	294.7707	.3338	.14094	735990	2.15396	4.27054	1.88473	4.4790	8.8802	3.9191
7430.5	295.6212	.3525	.13736	737533	2.22145	4.23711	1.87203	4.6290	8.8292	3.9009
7440.5	296.4729	-0.3712	5.13378	739074	+2.28846	-4.20274	-1.85893	-4.7786	+8.7759	+3.8817
7450.5	297.3258	.3898	.13022	740614	2.35497	4.16746	1.84542	4.9277	8.7203	3.8615
7460.5	298.1799	.4083	.12668	742152	2.42097	4.13126	1.83150	5.0763	8.6625	3.8403
7470.5	299.0352	.4268	.12314	743688	2.48643	4.09415	1.81718	5.2244	8.6025	3.8182
7480.5	299.8916	-0.4452	5.11963	745222	+2.55134	-4.05615	-1.80247	-5.3718	+8.5402	+3.7951
7490.5	300.7492	.4636	.11613	746753	2.61569	4.01725	1.78735	5.5187	8.4757	3.7710
7500.5	301.6080	.4818	.11264	748280	2.67947	3.97745	1.77184	5.6648	8.4089	3.7459
7510.5	302.4680	.5000	.10918	749804	2.74264	3.93678	1.75593	5.8101	8.3399	3.7199
7520.5	303.3291	-0.5181	5.10573	751324	+2.80521	-3.89524	-1.73964	-5.9547	+8.2686	+3.6928
7530.5	304.1914	.5361	.10230	752840	2.86716	3.85282	1.72296	6.0985	8.1950	3.6648
7540.5	305.0549	.5540	.09889	754350	2.92847	3.80955	1.70589	6.2414	8.1193	3.6358
7550.5	305.9195	.5718	.09550	755856	2.98912	3.76543	1.68845	6.3834	8.0412	3.6058
7560.5	306.7853	-0.5895	5.09214	757356	+3.04910	-3.72047	-1.67062	-6.5244	+7.9610	+3.5748
7570.5	307.6522	.6071	.08880	758849	3.10840	3.67467	1.65243	6.6644	7.8785	3.5428
7580.5	308.5202	.6245	.08548	760336	3.16700	3.62804	1.63386	6.8034	7.7938	3.5099
7590.5	309.3894	.6419	.08218	761816	3.22489	3.58060	1.61492	6.9412	7.7068	3.4759
7600.5	310.2597	-0.6591	5.07891	763289	+3.28205	-3.53235	-1.59562	-7.0779	+7.6177	+3.4410
7610.5	311.1312	.6762	.07566	764754	3.33846	3.48330	1.57595	7.2134	7.5263	3.4051
7620.5	312.0037	.6931	.07245	766211	3.39413	3.43346	1.55593	7.3476	7.4328	3.3683
7630.5	312.8774	.7099	.06925	767659	3.44902	3.38285	1.53556	7.4805	7.3370	3.3305
7640.5	313.7522	-0.7266	5.06609	769098	+3.50312	-3.33146	-1.51484	-7.6121	+7.2391	+3.2917
7650.5	314.6280	.7431	.06296	770527	3.55643	3.27932	1.49377	7.7423	7.1391	3.2519
7660.5	315.5050	.7595	.05985	771947	3.60893	3.22643	1.47236	7.8711	7.0369	3.2112
7670.5	316.3830	.7757	.05677	773356	3.66060	3.17280	1.45062	7.9984	6.9325	3.1696
7680.5	317.2621	-0.7917	5.05373	774754	+3.71144	-3.11844	-1.42854	-8.1241	+6.8261	+3.1270
7690.5	318.1422	.8076	.05072	776141	3.76142	3.06337	1.40614	8.2482	6.7175	3.0835
7700.5	319.0234	.8233	.04774	777517	3.81054	3.00760	1.38341	8.3708	6.6069	3.0390
7710.5	319.9057	.8388	.04479	778880	3.85878	2.95113	1.36037	8.4916	6.4942	2.9936
7720.5	320.7889	-0.8541	5.04188	780230	+3.90613	-2.89398	-1.33701	-8.6107	+6.3795	+2.9473
7730.5	321.6732	.8693	.03900	781568	3.95257	2.83616	1.31334	8.7280	6.2628	2.9001
7740.5	322.5585	.8843	.03616	782893	3.99811	2.77769	1.28937	8.8435	6.1441	2.8520
7750.5	323.4448	.8990	.03335	784203	4.04271	2.71857	1.26510	8.9572	6.0234	2.8030
7760.5	324.3321	-0.9136	5.03058	785499	+4.08638	-2.65882	-1.24053	-9.0689	+5.9007	+2.7531
7770.5	325.2204	.9280	.02785	786780	4.12909	2.59846	1.21568	9.1786	5.7761	2.7023
7780.5	326.1096	.9422	.02516	788046	4.17085	2.53749	1.19054	9.2864	5.6497	2.6507
7790.5	326.9998	.9561	.02250	789297	4.21163	2.47592	1.16513	9.3920	5.5214	2.5983
7800.5	327.8909	-0.9698	5.01989	790531	+4.25142	-2.41378	-1.13944	-9.4956	+5.3912	+2.5450
7810.5	328.7830	.9833	.01731	791749	4.29022	2.35107	1.11349	9.5970	5.2592	2.4908
7820.5	329.6759	.9966	.01477	792950	4.32802	2.28781	1.08727	9.6963	5.1255	2.4359
7830.5	330.5698	1.0097	.01228	794134	4.36479	2.22402	1.06080	9.7932	4.9900	2.3801
7840.5	331.4646	-1.0225	5.00983	795301	+4.40054	-2.15970	-1.03408	-9.8880	+4.8528	+2.3236
7850.5	332.3602	.0351	.00742	796448	4.43526	2.09487	1.00712	9.9803	4.7139	2.2663
7860.5	333.2567	.0475	.00506	797578	4.46893	2.02955	0.97992	10.0704	4.5734	2.2082
7870.5	334.1540	.0596	.00274	798688	4.50154	1.96375	0.95249	10.1580	4.4313	2.1493
7880.5	335.0522	-1.0714	5.00046	799779	+4.53308	-1.89748	-0.92483	-10.2431	+4.2876	+2.0898

SATURN

67

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.00						
7400.5	293.3631	-0.0070	10.02818	0.99160	+3.97674	-8.44541	-3.66400	- 4.5110	+ 9.6834	+4.2598
7410.5	293.6659	.0202	.02705	0.99193	4.02488	8.42415	3.65729	4.6659	9.6352	4.2430
7420.5	293.9687	.0333	.02590	0.99227	4.07289	8.40264	3.65047	4.8205	9.5848	4.2252
7430.5	294.2716	.0465	.02474	0.99261	4.12079	8.38088	3.64355	4.9747	9.5322	4.2065
7440.5	294.5745	-0.0596	10.02357	0.99296	+4.16856	-8.35887	-3.63651	- 5.1284	+ 9.4773	+4.1868
7450.5	294.8776	.0728	.02237	0.99332	4.21621	8.33662	3.62937	5.2817	9.4201	4.1662
7460.5	295.1807	.0859	.02117	0.99368	4.26374	8.31412	3.62212	5.4344	9.3607	4.1445
7470.5	295.4838	.0991	.01994	0.99404	4.31114	8.29137	3.61476	5.5865	9.2990	4.1219
7480.5	295.7871	-0.1123	10.01870	0.99441	+4.35841	-8.26838	-3.60729	- 5.7381	+ 9.2350	+4.0982
7490.5	296.0904	.1254	.01745	0.99478	4.40555	8.24514	3.59972	5.8890	9.1688	4.0736
7500.5	296.3938	.1386	.01617	0.99516	4.45256	8.22166	3.59204	6.0392	9.1003	4.0480
7510.5	296.6973	.1518	.01489	0.99555	4.49944	8.19793	3.58426	6.1887	9.0296	4.0214
7520.5	297.0009	-0.1649	10.01358	0.99594	+4.54619	-8.17396	-3.57637	- 6.3374	+ 8.9565	+3.9938
7530.5	297.3045	.1781	.01226	0.99633	4.59280	8.14975	3.56837	6.4852	8.8812	3.9652
7540.5	297.6082	.1913	.01093	0.99673	4.63927	8.12529	3.56026	6.6322	8.8037	3.9356
7550.5	297.9120	.2044	.00958	0.99713	4.68561	8.10060	3.55205	6.7782	8.7238	3.9051
7560.5	298.2159	-0.2176	10.00821	0.99754	+4.73181	-8.07566	-3.54374	- 6.9233	+ 8.6418	+3.8735
7570.5	298.5199	.2307	.00683	0.99795	4.77786	8.05048	3.53532	7.0673	8.5574	3.8410
7580.5	298.8240	.2439	.00543	0.99837	4.82378	8.02506	3.52679	7.2103	8.4708	3.8074
7590.5	299.1281	.2570	.00402	0.99879	4.86955	7.99941	3.51816	7.3522	8.3820	3.7729
7600.5	299.4323	-0.2702	10.00259	0.99922	+4.91517	-7.97351	-3.50942	- 7.4929	+ 8.2910	+3.7374
7610.5	299.7367	.2833	10.00115	0.99966	4.96065	7.94738	3.50058	7.6324	8.1977	3.7009
7620.5	300.0411	.2964	.999969	1.00009	5.00598	7.92101	3.49164	7.7707	8.1022	3.6634
7630.5	300.3456	.3096	.99822	1.00054	5.05117	7.89441	3.48259	7.9076	8.0045	3.6249
7640.5	300.6501	-0.3227	.999673	1.00098	+5.09620	-7.86757	-3.47344	- 8.0432	+ 7.9047	+3.5855
7650.5	300.9548	.3358	.99523	1.00143	5.14108	7.84049	3.46418	8.1774	7.8026	3.5451
7660.5	301.2596	.3489	.99371	1.00189	5.18580	7.81318	3.45482	8.3102	7.6984	3.5037
7670.5	301.5645	.3620	.99217	1.00235	5.23037	7.78564	3.44536	8.4414	7.5920	3.4614
7680.5	301.8694	-0.3751	.999062	1.00282	+5.27479	-7.75786	-3.43579	- 8.5711	+ 7.4835	+3.4182
7690.5	302.1745	.3882	.98906	1.00329	5.31904	7.72986	3.42612	8.6992	7.3729	3.3740
7700.5	302.4796	.4013	.98748	1.00377	5.36314	7.70162	3.41635	8.8257	7.2602	3.3288
7710.5	302.7849	.4144	.98588	1.00425	5.40708	7.67315	3.40648	8.9505	7.1454	3.2827
7720.5	303.0902	-0.4275	.998427	1.00473	+5.45085	-7.64445	-3.39650	- 9.0735	+ 7.0286	+3.2357
7730.5	303.3957	.4406	.98265	1.00522	5.49447	7.61553	3.38643	9.1948	6.9097	3.1878
7740.5	303.7012	.4536	.98101	1.00572	5.53791	7.58637	3.37625	9.3142	6.7888	3.1389
7750.5	304.0069	.4667	.97936	1.00622	5.58120	7.55699	3.36597	9.4318	6.6659	3.0892
7760.5	304.3126	-0.4797	.997769	1.00672	+5.62431	-7.52738	-3.35559	- 9.5474	+ 6.5411	+3.0386
7770.5	304.6185	.4927	.97601	1.00723	5.66726	7.49755	3.34511	9.6610	6.4143	2.9871
7780.5	304.9245	.5058	.97431	1.00775	5.71003	7.46749	3.33453	9.7726	6.2856	2.9347
7790.5	305.2305	.5188	.97260	1.00827	5.75264	7.43720	3.32385	9.8822	6.1551	2.8815
7800.5	305.5367	-0.5318	.997088	1.00879	+5.79507	-7.40670	-3.31307	- 9.9896	+ 6.0226	+2.8274
7810.5	305.8430	.5448	.96914	1.00932	5.83732	7.37597	3.30218	10.0949	5.8884	2.7725
7820.5	306.1494	.5578	.96738	1.00985	5.87940	7.34502	3.29120	10.1980	5.7523	2.7167
7830.5	306.4559	.5707	.96561	1.01039	5.92131	7.31385	3.28013	10.2988	5.6145	2.6602
7840.5	306.7625	-0.5837	.996383	1.01093	+5.96303	-7.28246	-3.26895	-10.3974	+ 5.4750	+2.6028
7850.5	307.0692	.5966	.96204	1.01148	6.00458	7.25084	3.25767	10.4936	5.3337	2.5447
7860.5	307.3760	.6096	.96023	1.01203	6.04595	7.21902	3.24630	10.5874	5.1908	2.4858
7870.5	307.6830	.6225	.95840	1.01258	6.08713	7.18697	3.23483	10.6789	5.0463	2.4262
7880.5	307.9900	-0.6354	.995656	1.01315	+6.12813	-7.15471	-3.22326	-10.7678	+ 4.9002	+2.3658

JUPITER

Julian Date	Heliocentric		Radius Vector <i>r</i>	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude <i>l</i>	Latitude <i>b</i>			<i>x</i>	<i>y</i>	<i>z</i>	<i>X</i>	<i>Y</i>	<i>Z</i>
243	°	°		0.00						
7880.5	335.0522	-1.0714	5.00046	799779	+4.53308	-1.89748	-0.92483	-10.2431	+4.2876	+2.0898
7890.5	335.9511	0.0830	4.99823	800851	4.56356	1.83076	0.89695	10.3258	4.1424	2.0295
7900.5	336.8509	0.0944	4.99604	801902	4.59295	1.76362	0.86886	10.4060	3.9957	1.9685
7910.5	337.7515	0.1054	4.99391	802933	4.62125	1.69605	0.84057	10.4835	3.8476	1.9069
7920.5	338.6528	-1.1163	4.99181	803943	+4.64845	-1.62808	-0.81207	-10.5585	+3.6980	+1.8446
7930.5	339.5549	0.1268	4.98977	804932	4.67454	1.55972	0.78339	10.6308	3.5471	1.7816
7940.5	340.4577	0.1371	4.98777	805899	4.69952	1.49099	0.75451	10.7005	3.3949	1.7180
7950.5	341.3612	0.1471	4.98582	806844	4.72338	1.42190	0.72546	10.7674	3.2414	1.6538
7960.5	342.2655	-1.1568	4.98393	807766	+4.74611	-1.35248	-0.69623	-10.8316	+3.0866	+1.5889
7970.5	343.1704	0.1663	4.98208	808666	4.76770	1.28273	0.66683	10.8930	2.9307	1.5236
7980.5	344.0760	0.1754	4.98028	809543	4.78816	1.21267	0.63728	10.9516	2.7737	1.4576
7990.5	344.9822	0.1843	4.97853	810397	4.80746	1.14233	0.60757	11.0073	2.6155	1.3911
8000.5	345.8891	-1.1929	4.97683	811226	+4.82561	-1.07170	-0.57772	-11.0602	+2.4563	+1.3241
8010.5	346.7966	0.2012	4.97518	812032	4.84260	1.00083	0.54773	11.1102	2.2962	1.2566
8020.5	347.7047	0.2092	4.97359	812814	4.85843	0.92971	0.51760	11.1572	2.1350	1.1887
8030.5	348.6133	0.2169	4.97204	813570	4.87308	0.85836	0.48736	11.2013	1.9730	1.1202
8040.5	349.5225	-1.2243	4.97056	814302	+4.88656	-0.78682	-0.45699	-11.2424	+1.8102	+1.0514
8050.5	350.4323	0.2314	4.96912	815009	4.89887	0.71508	0.42652	11.2805	1.6466	0.9821
8060.5	351.3426	0.2381	4.96774	815689	4.90999	0.64317	0.39594	11.3155	1.4822	0.9125
8070.5	352.2534	0.2446	4.96641	816345	4.91992	0.57110	0.36526	11.3475	1.3172	0.8425
8080.5	353.1646	-1.2508	4.96513	816974	+4.92866	-0.49889	-0.33450	-11.3764	+1.1516	+0.7721
8090.5	354.0763	0.2566	4.96391	817577	4.93622	0.42657	0.30366	11.4023	0.9853	0.7014
8100.5	354.9885	0.2622	4.96274	818153	4.94257	0.35414	0.27274	11.4250	0.8186	0.6305
8110.5	355.9011	0.2674	4.96163	818703	4.94773	0.28163	0.24176	11.4446	0.6514	0.5592
8120.5	356.8141	-1.2723	4.96058	819225	+4.95169	-0.20904	-0.21072	-11.4611	+0.4839	+0.4877
8130.5	357.7274	0.2769	4.95958	819720	4.95445	0.13641	0.17962	11.4744	0.3159	0.4160
8140.5	358.6411	0.2811	4.95864	820188	4.95600	-0.06374	0.14849	11.4846	+0.1477	0.3441
8150.5	359.5552	0.2851	4.95775	820628	4.95635	+0.00894	0.11732	11.4915	-0.0207	0.2720
8160.5	0.4696	-1.2887	4.95692	821041	+4.95550	+0.08162	-0.08612	-11.4953	-0.1893	+0.1998
8170.5	1.3842	0.2919	4.95615	821425	4.95344	0.15428	0.05489	11.4959	0.3580	0.1274
8180.5	2.2992	0.2949	4.95543	821782	4.95017	0.22690	-0.02366	11.4933	0.5268	+0.0549
8190.5	3.2144	0.2975	4.95477	822110	4.94571	0.29946	+0.00758	11.4875	0.6956	-0.0176
8200.5	4.1298	-1.2998	4.95417	822409	+4.94003	+0.37196	+0.03882	-11.4785	-0.8643	-0.0902
8210.5	5.0455	0.3018	4.95362	822680	4.93315	0.44436	0.07005	11.4663	1.0328	0.1628
8220.5	5.9613	0.3034	4.95314	822923	4.92508	0.51665	0.10126	11.4509	1.2012	0.2354
8230.5	6.8774	0.3047	4.95271	823137	4.91580	0.58882	0.13245	11.4323	1.3694	0.3080
8240.5	7.7935	-1.3056	4.95234	823322	+4.90532	+0.66085	+0.16360	-11.4105	-1.5372	-0.3806
8250.5	8.7098	0.3063	4.95202	823478	4.89364	0.73271	0.19472	11.3855	1.7047	0.4530
8260.5	9.6262	0.3066	4.95177	823605	4.88078	0.80439	0.22579	11.3574	1.8718	0.5254
8270.5	10.5427	0.3065	4.95157	823703	4.86672	0.87588	0.25680	11.3260	2.0384	0.5976
8280.5	11.4592	-1.3061	4.95143	823772	+4.85147	+0.94716	+0.28775	-11.2915	-2.2044	-0.6697
8290.5	12.3758	0.3054	4.95135	823813	4.83504	1.01820	0.31863	11.2538	2.3699	0.7416
8300.5	13.2924	0.3044	4.95133	823824	4.81743	1.08900	0.34943	11.2129	2.5347	0.8133
8310.5	14.2090	0.3030	4.95137	823806	4.79865	1.15952	0.38015	11.1690	2.6988	0.8848
8320.5	15.1255	-1.3013	4.95146	823758	+4.77869	+1.22977	+0.41077	-11.1219	-2.8622	-0.9560
8330.5	16.0420	0.2993	4.95161	823682	4.75757	1.29972	0.44129	11.0717	3.0247	1.0270
8340.5	16.9585	0.2969	4.95183	823577	4.73529	1.36935	0.47171	11.0184	3.1863	1.0976
8350.5	17.8748	0.2942	4.95209	823443	4.71185	1.43864	0.50201	10.9621	3.3470	1.1679
8360.5	18.7911	-1.2911	4.95242	823280	+4.68726	+1.50758	+0.53219	-10.9027	-3.5067	-1.2379

SATURN

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.00						
7880.5	307.9900	-0.6354	9.95656	101315	+6.12813	-7.15471	-3.22326	-10.7678	+ 4.9002	+2.3658
7890.5	308.2972	.6483	.95471	101371	6.16894	7.12223	3.21159	10.8543	4.7525	2.3046
7900.5	308.6045	.6612	.95285	101428	6.20957	7.08953	3.19983	10.9382	4.6034	2.2428
7910.5	308.9119	.6740	.95097	101486	6.25001	7.05663	3.18797	11.0196	4.4528	2.1803
7920.5	309.2194	-0.6869	9.94907	101544	+6.29026	-7.02351	-3.17601	-11.0983	+ 4.3007	+2.1171
7930.5	309.5270	.6997	.94717	101602	6.33032	6.99017	3.16396	11.1744	4.1473	2.0532
7940.5	309.8348	.7125	.94525	101661	6.37019	6.95663	3.15181	11.2478	3.9925	1.9888
7950.5	310.1426	.7253	.94332	101720	6.40987	6.92288	3.13957	11.3184	3.8365	1.9236
7960.5	310.4506	-0.7381	9.94137	101780	+6.44935	-6.88891	-3.12723	-11.3863	+ 3.6792	+1.8579
7970.5	310.7587	.7509	.93941	101840	6.48864	6.85474	3.11480	11.4514	3.5207	1.7916
7980.5	311.0670	.7637	.93744	101901	6.52773	6.82036	3.10227	11.5137	3.3610	1.7248
7990.5	311.3753	.7764	.93545	101962	6.56662	6.78577	3.08965	11.5732	3.2002	1.6573
8000.5	311.6838	-0.7891	9.93345	102023	+6.60531	-6.75098	-3.07694	-11.6297	+ 3.0384	+1.5894
8010.5	311.9924	.8018	.93144	102086	6.64380	6.71599	3.06413	11.6833	2.8755	1.5210
8020.5	312.3011	.8145	.92941	102148	6.68209	6.68079	3.05123	11.7340	2.7118	1.4521
8030.5	312.6100	.8272	.92737	102211	6.72018	6.64538	3.03824	11.7817	2.5470	1.3827
8040.5	312.9190	-0.8398	9.92532	102274	+6.75806	-6.60978	-3.02515	-11.8265	+ 2.3815	+1.3128
8050.5	313.2281	.8525	.92326	102338	6.79573	6.57397	3.01197	11.8682	2.2151	1.2426
8060.5	313.5373	.8651	.92118	102402	6.83320	6.53797	2.99870	11.9068	2.0480	1.1720
8070.5	313.8467	.8777	.91909	102467	6.87046	6.50176	2.98534	11.9424	1.8802	1.1010
8080.5	314.1562	-0.8902	9.91699	102532	+6.90751	-6.46536	-2.97189	-11.9750	+ 1.7118	+1.0296
8090.5	314.4658	.9028	.91488	102598	6.94435	6.42876	2.95835	12.0044	1.5427	0.9579
8100.5	314.7756	.9153	.91275	102664	6.98098	6.39196	2.94472	12.0307	1.3732	0.8859
8110.5	315.0855	.9278	.91061	102730	7.01739	6.35497	2.93100	12.0538	1.2031	0.8137
8120.5	315.3955	-0.9403	9.90846	102797	+7.05359	-6.31779	-2.91718	-12.0738	+ 1.0327	+0.7411
8130.5	315.7057	.9528	.90630	102865	7.08957	6.28041	2.90328	12.0907	0.8619	0.6684
8140.5	316.0160	.9652	.90412	102933	7.12534	6.24285	2.88930	12.1044	0.6908	0.5954
8150.5	316.3264	.9776	.90193	103001	7.16088	6.20509	2.87522	12.1148	0.5194	0.5223
8160.5	316.6370	-0.9900	9.89973	103069	+7.19621	-6.16714	-2.86105	-12.1221	+ 0.3478	+0.4490
8170.5	316.9477	1.0024	.89752	103139	7.23132	6.12900	2.84680	12.1262	0.1762	0.3755
8180.5	317.2586	.0147	.89530	103208	7.26620	6.09068	2.83246	12.1271	+ 0.0044	0.3020
8190.5	317.5696	.0270	.89306	103278	7.30086	6.05217	2.81803	12.1247	- 0.1674	0.2283
8200.5	317.8807	-1.0393	9.89081	103349	+7.33530	-6.01347	-2.80352	-12.1192	- 0.3391	+0.1547
8210.5	318.1920	.0516	.88855	103419	7.36951	5.97459	2.78892	12.1104	0.5107	0.0809
8220.5	318.5034	.0639	.88628	103491	7.40350	5.93552	2.77424	12.0984	0.6821	+0.0072
8230.5	318.8149	.0761	.88400	103562	7.43725	5.89628	2.75947	12.0832	0.8534	-0.0665
8240.5	319.1266	-1.0883	9.88171	103634	+7.47078	-5.85685	-2.74462	-12.0648	- 1.0243	-0.1402
8250.5	319.4384	.1004	.87940	103707	7.50407	5.81724	2.72968	12.0432	1.1949	0.2138
8260.5	319.7504	.1126	.87709	103780	7.53714	5.77746	2.71465	12.0184	1.3651	0.2873
8270.5	320.0626	.1247	.87476	103853	7.56997	5.73749	2.69955	11.9904	1.5348	0.3607
8280.5	320.3748	-1.1368	9.87242	103927	+7.60257	-5.69735	-2.68436	-11.9592	- 1.7041	-0.4340
8290.5	320.6873	.1488	.87007	104002	7.63493	5.65704	2.66909	11.9248	1.8727	0.5070
8300.5	320.9998	.1609	.86771	104076	7.66706	5.61655	2.65373	11.8873	2.0407	0.5799
8310.5	321.3126	.1729	.86534	104151	7.69895	5.57588	2.63830	11.8466	2.2081	0.6526
8320.5	321.6254	-1.1848	9.86296	104227	+7.73060	-5.53505	-2.62278	-11.8028	- 2.3746	-0.7250
8330.5	321.9384	.1968	.86056	104303	7.76201	5.49404	2.60718	11.7559	2.5404	0.7972
8340.5	322.2516	.2087	.85816	104379	7.79318	5.45287	2.59150	11.7059	2.7053	0.8690
8350.5	322.5649	.2206	.85574	104456	7.82410	5.41152	2.57574	11.6528	2.8693	0.9406
8360.5	322.8784	-1.2324	9.85332	104533	+7.85479	-5.37001	-2.55991	-11.5966	- 3.0323	-1.0118

JUPITER

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude a	Latitude b			x	y	z	X	Y	Z
243	°	°		0.00						
8360.5	18.7911	-1.2911	4.95242	823280	+4.68726	+1.50758	+0.53219	-10.9027	-3.5067	-1.2379
8370.5	19.7072	.2878	.95281	823087	4.66153	1.57616	0.56224	10.8404	3.6654	1.3075
8380.5	20.6231	.2841	.95325	822867	4.63467	1.64435	0.59215	10.7750	3.8229	1.3767
8390.5	21.5389	.2801	.95375	822618	4.60667	1.71214	0.62191	10.7067	3.9793	1.4454
8400.5	22.4545	-1.2757	4.95431	822340	+4.57755	+1.77952	+0.65153	-10.6354	-4.1345	-1.5138
8410.5	23.3698	.2710	.95492	822033	4.54732	1.84646	0.68099	10.5612	4.2884	1.5816
8420.5	24.2849	.2660	.95560	821698	4.51598	1.91295	0.71028	10.4842	4.4410	1.6490
8430.5	25.1998	.2607	.95633	821335	4.48354	1.97897	0.73939	10.4042	4.5923	1.7158
8440.5	26.1143	-1.2551	4.95711	820944	+4.45001	+2.04452	+0.76833	-10.3215	-4.7421	-1.7821
8450.5	27.0286	.2491	.95796	820525	4.41540	2.10956	0.79708	10.2360	4.8905	1.8478
8460.5	27.9425	.2429	.95886	820079	4.37971	2.17410	0.82564	10.1478	5.0374	1.9130
8470.5	28.8561	.2363	.95981	819605	4.34296	2.23810	0.85400	10.0568	5.1827	1.9776
8480.5	29.7693	-1.2294	4.96082	819103	+4.30516	+2.30156	+0.88215	-9.9632	-5.3264	-2.0415
8490.5	30.6822	.2222	.96189	818575	4.26631	2.36447	0.91008	9.8669	5.4684	2.1048
8500.5	31.5946	.2147	.96301	818020	4.22643	2.42680	0.93780	9.7680	5.6088	2.1674
8510.5	32.5066	.2068	.96419	817437	4.18552	2.48854	0.96528	9.6666	5.7474	2.2294
8520.5	33.4181	-1.1987	4.96542	816829	+4.14360	+2.54968	+0.99254	-9.5627	-5.8842	-2.2906
8530.5	34.3292	.1903	.96671	816194	4.10068	2.61020	1.01955	9.4562	6.0192	2.3511
8540.5	35.2398	.1816	.96805	815534	4.05677	2.67009	1.04632	9.3474	6.1523	2.4109
8550.5	36.1499	.1726	.96945	814847	4.01187	2.72934	1.07283	9.2362	6.2835	2.4699
8560.5	37.0594	-1.1633	4.97089	814136	+3.96601	+2.78793	+1.09909	-9.1226	-6.4128	-2.5281
8570.5	37.9684	.1537	.97239	813399	3.91919	2.84584	1.12508	9.0068	6.5401	2.5856
8580.5	38.8769	.1439	.97395	812637	3.87143	2.90307	1.15080	8.8887	6.6654	2.6422
8590.5	39.7847	.1337	.97555	811852	3.82273	2.95961	1.17624	8.7684	6.7886	2.6980
8600.5	40.6920	-1.1233	4.97721	811041	+3.77312	+3.01543	+1.20140	-8.6460	-6.9097	-2.7530
8610.5	41.5986	.1126	.97892	810207	3.72260	3.07052	1.22627	8.5214	7.0287	2.8071
8620.5	42.5046	.1016	.98067	809349	3.67119	3.12488	1.25085	8.3948	7.1456	2.8603
8630.5	43.4100	.0904	.98248	808469	3.61889	3.17849	1.27513	8.2662	7.2603	2.9126
8640.5	44.3146	-1.0789	4.98434	807565	+3.56573	+3.23134	+1.29910	-8.1357	-7.3727	-2.9641
8650.5	45.2186	.0671	.98625	806639	3.51172	3.28341	1.32276	8.0033	7.4830	3.0146
8660.5	46.1219	.0551	.98820	805690	3.45687	3.33470	1.34610	7.8690	7.5909	3.0642
8670.5	47.0245	.0428	.99021	804720	3.40119	3.38520	1.36913	7.7329	7.6966	3.1128
8680.5	47.9263	-1.0303	4.99226	803728	+3.34470	+3.43488	+1.39182	-7.5951	-7.7999	-3.1606
8690.5	48.8273	.0175	.99436	802716	3.28742	3.48375	1.41419	7.4557	7.9009	3.2073
8700.5	49.7276	1.0045	.99650	801683	3.22935	3.53180	1.43622	7.3145	7.9996	3.2531
8710.5	50.6271	0.9913	4.99869	800629	3.17052	3.57900	1.45791	7.1718	8.0958	3.2978
8720.5	51.5258	-0.9778	5.00093	799555	+3.11093	+3.62535	+1.47925	-7.0276	-8.1897	-3.3416
8730.5	52.4237	.9641	.00321	798462	3.05061	3.67085	1.50024	6.8819	8.2811	3.3844
8740.5	53.3207	.9502	.00553	797350	2.98957	3.71548	1.52088	6.7348	8.3701	3.4262
8750.5	54.2169	.9361	.00790	796219	2.92782	3.75923	1.54116	6.5864	8.4567	3.4670
8760.5	55.1122	-0.9217	5.01031	795070	+2.86538	+3.80209	+1.56107	-6.4366	-8.5408	-3.5067
8770.5	56.0067	.9071	.01277	793902	2.80227	3.84406	1.58062	6.2856	8.6224	3.5454
8780.5	56.9003	.8924	.01526	792718	2.73849	3.88512	1.59979	6.1334	8.7015	3.5830
8790.5	57.7929	.8774	.01780	791516	2.67408	3.92528	1.61859	5.9800	8.7781	3.6197
8800.5	58.6847	-0.8622	5.02038	790298	+2.60903	+3.96451	+1.63701	-5.8256	-8.8522	-3.6552
8810.5	59.5755	.8468	.02299	789064	2.54338	4.00281	1.65505	5.6701	8.9237	3.6897
8820.5	60.4654	.8313	.02565	787813	2.47713	4.04018	1.67270	5.5137	8.9928	3.7232
8830.5	61.3543	.8155	.02835	786547	2.41031	4.07660	1.68996	5.3563	9.0593	3.7555
8840.5	62.2422	-0.7996	5.03108	785267	+2.34292	+4.11208	+1.70683	-5.1981	-9.1232	-3.7868

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
243	°	°		0.00						
8360.5	322.8784	-1.2324	9.85332	104533	+7.85479	-5.37001	-2.55991	-11.5966	-3.0323	-1.0118
8370.5	323.1920	.2442	.85088	104611	7.88523	5.32833	2.54399	11.5375	3.1943	1.0826
8380.5	323.5058	.2560	.84843	104688	7.91542	5.28649	2.52799	11.4753	3.3552	1.1530
8390.5	323.8198	.2678	.84598	104767	7.94537	5.24448	2.51192	11.4101	3.5150	1.2230
8400.5	324.1339	-1.2795	9.84351	104846	+7.97507	-5.20231	-2.49576	-11.3420	-3.6736	-1.2926
8410.5	324.4481	.2912	.84103	104925	8.00452	5.15998	2.47953	11.2710	3.8309	1.3617
8420.5	324.7625	.3029	.83855	105005	8.03373	5.11749	2.46323	11.1970	3.9869	1.4304
8430.5	325.0771	.3145	.83605	105085	8.06268	5.07484	2.44684	11.1202	4.1416	1.4985
8440.5	325.3918	-1.3261	9.83354	105165	+8.09138	-5.03203	-2.43038	-11.0406	-4.2949	-1.5661
8450.5	325.7067	.3376	.83102	105246	8.11982	4.98907	2.41385	10.9582	4.4468	1.6332
8460.5	326.0217	.3491	.82850	105327	8.14801	4.94595	2.39724	10.8730	4.5971	1.6996
8470.5	326.3369	.3606	.82596	105409	8.17595	4.90268	2.38055	10.7851	4.7459	1.7655
8480.5	326.6523	-1.3721	9.82341	105491	+8.20363	-4.85925	-2.36379	-10.6945	-4.8932	-1.8308
8490.5	326.9678	.3835	.82086	105573	8.23105	4.81568	2.34696	10.6012	5.0388	1.8954
8500.5	327.2835	.3949	.81829	105656	8.25822	4.77195	2.33005	10.5054	5.1827	1.9594
8510.5	327.5993	.4062	.81571	105739	8.28512	4.72807	2.31307	10.4069	5.3249	2.0227
8520.5	327.9154	-1.4175	9.81313	105822	+8.31177	-4.68405	-2.29602	-10.3060	-5.4653	-2.0853
8530.5	328.2315	.4288	.81054	105906	8.33815	4.63988	2.27890	10.2025	5.6039	2.1471
8540.5	328.5479	.4400	.80793	105991	8.36427	4.59556	2.26170	10.0966	5.7407	2.2083
8550.5	328.8644	.4512	.80532	106075	8.39013	4.55110	2.24443	9.9883	5.8756	2.2687
8560.5	329.1811	-1.4624	9.80270	106161	+8.41572	-4.50650	-2.22710	-9.8776	-6.0085	-2.3283
8570.5	329.4979	.4735	.80007	106246	8.44105	4.46176	2.20969	9.7647	6.1395	2.3872
8580.5	329.8149	.4846	.79743	106332	8.46611	4.41687	2.19222	9.6494	6.2685	2.4452
8590.5	330.1321	.4956	.79478	106418	8.49091	4.37185	2.17467	9.5320	6.3954	2.5024
8600.5	330.4495	-1.5066	9.79213	106505	+8.51543	-4.32669	-2.15706	-9.4124	-6.5203	-2.5588
8610.5	330.7670	.5176	.78946	106592	8.53969	4.28140	2.13938	9.2907	6.6431	2.6144
8620.5	331.0847	.5285	.78679	106679	8.56367	4.23597	2.12163	9.1669	6.7637	2.6690
8630.5	331.4025	.5394	.78410	106767	8.58738	4.19040	2.10382	9.0411	6.8822	2.7228
8640.5	331.7206	-1.5502	9.78141	106855	+8.61083	-4.14471	-2.08594	-8.9133	-6.9985	-2.7757
8650.5	332.0388	.5610	.77871	106944	8.63399	4.09888	2.06799	8.7836	7.1125	2.8277
8660.5	332.3572	.5717	.77601	107032	8.65689	4.05293	2.04998	8.6520	7.2243	2.8788
8670.5	332.6757	.5825	.77329	107122	8.67951	4.00684	2.03190	8.5187	7.3339	2.9289
8680.5	332.9945	-1.5931	9.77057	107211	+8.70185	-3.96063	-2.01376	-8.3835	-7.4411	-2.9781
8690.5	333.3134	.6037	.76784	107301	8.72391	3.91430	1.99556	8.2467	7.5460	3.0263
8700.5	333.6325	.6143	.76510	107392	8.74570	3.86784	1.97729	8.1083	7.6486	3.0736
8710.5	333.9517	.6249	.76235	107482	8.76721	3.82126	1.95896	7.9682	7.7488	3.1199
8720.5	334.2712	-1.6353	9.75960	107573	+8.78844	-3.77456	-1.94057	-7.8266	-7.8466	-3.1652
8730.5	334.5908	.6458	.75683	107665	8.80938	3.72774	1.92211	7.6835	7.9420	3.2095
8740.5	334.9106	.6562	.75406	107756	8.83005	3.68080	1.90360	7.5389	8.0350	3.2529
8750.5	335.2306	.6665	.75129	107849	8.85043	3.63374	1.88502	7.3930	8.1255	3.2952
8760.5	335.5507	-1.6768	9.74850	107941	+8.87053	-3.58657	-1.86639	-7.2458	-8.2136	-3.3364
8770.5	335.8711	.6871	.74571	108034	8.89035	3.53929	1.84769	7.0972	8.2992	3.3767
8780.5	336.1916	.6973	.74291	108127	8.90988	3.49189	1.82894	6.9475	8.3824	3.4159
8790.5	336.5123	.7075	.74010	108220	8.92913	3.44438	1.81013	6.7966	8.4631	3.4541
8800.5	336.8332	-1.7176	9.73729	108314	+8.94808	-3.39676	-1.79126	-6.6446	-8.5412	-3.4913
8810.5	337.1542	.7277	.73447	108409	8.96676	3.34904	1.77233	6.4916	8.6169	3.5273
8820.5	337.4755	.7377	.73164	108503	8.98514	3.30120	1.75335	6.3376	8.6901	3.5624
8830.5	337.7969	.7477	.72881	108598	9.00323	3.25326	1.73431	6.1826	8.7607	3.5964
8840.5	338.1186	-1.7576	9.72597	108693	+9.02103	-3.20522	-1.71521	-6.0267	-8.8288	-3.6293

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.00						
8840.5	62.2422	-0.7996	5.03108	785267	+2.34292	+4.11208	+1.70683	- 5.1981	- 9.1232	-3.7868
8850.5	63.1292	.7835	.03385	783972	2.27498	4.14660	1.72330	5.0390	9.1846	3.8171
8860.5	64.0152	.7673	.03665	782663	2.20652	4.18016	1.73937	4.8792	9.2435	3.8462
8870.5	64.9002	.7508	.03949	781340	2.13755	4.21274	1.75503	4.7187	9.2998	3.8743
8880.5	65.7842	-0.7343	5.04237	780004	+2.06808	+4.24436	+1.77029	- 4.5576	- 9.3536	-3.9013
8890.5	66.6671	.7175	.04528	778655	1.99814	4.27499	1.78514	4.3958	9.4048	3.9272
8900.5	67.5491	.7006	.04822	777294	1.92773	4.30463	1.79958	4.2335	9.4535	3.9521
8910.5	68.4299	.6836	.05120	775922	1.85688	4.33329	1.81361	4.0707	9.4996	3.9759
8920.5	69.3098	-0.6664	5.05420	774537	+1.78560	+4.36095	+1.82722	- 3.9075	- 9.5432	-3.9985
8930.5	70.1886	.6491	.05724	773142	1.71392	4.38760	1.84040	3.7439	9.5842	4.0201
8940.5	71.0663	.6316	.06031	771736	1.64184	4.41326	1.85317	3.5799	9.6227	4.0407
8950.5	71.9429	.6141	.06341	770320	1.56938	4.43790	1.86552	3.4156	9.6587	4.0601
8960.5	72.8185	-0.5964	5.06654	768895	+1.49657	+4.46154	+1.87743	- 3.2511	- 9.6922	-4.0785
8970.5	73.6930	.5786	.06969	767460	1.42342	4.48415	1.88892	3.0864	9.7231	4.0958
8980.5	74.5663	.5606	.07287	766016	1.34994	4.50575	1.89999	2.9216	9.7516	4.1120
8990.5	75.4386	.5426	.07609	764564	1.27616	4.52632	1.91062	2.7567	9.7775	4.1272
9000.5	76.3098	-0.5245	5.07932	763104	+1.20209	+4.54587	+1.92081	- 2.5917	- 9.8010	-4.1413
9010.5	77.1798	.5062	.08258	761636	1.12774	4.56439	1.93058	2.4268	9.8220	4.1544
9020.5	78.0487	.4879	.08587	760161	1.05314	4.58189	1.93990	2.2618	9.8405	4.1663
9030.5	78.9165	.4695	.08917	758680	0.97831	4.59835	1.94879	2.0970	9.8567	4.1773
9040.5	79.7831	-0.4510	5.09250	757192	+0.90325	+4.61377	+1.95725	- 1.9323	- 9.8703	-4.1872
9050.5	80.6486	.4324	.09586	755698	0.82799	4.62817	1.96526	1.7679	9.8816	4.1960
9060.5	81.5130	.4138	.09923	754199	0.75255	4.64152	1.97284	1.6036	9.8904	4.2038
9070.5	82.3762	.3950	.10262	752696	0.67694	4.65384	1.97997	1.4396	9.8969	4.2106
9080.5	83.2383	-0.3762	5.10604	751187	+0.60118	+4.66512	+1.98666	- 1.2759	- 9.9010	-4.2164
9090.5	84.0992	.3574	.10947	749674	0.52528	4.67537	1.99291	1.1126	9.9028	4.2211
9100.5	84.9589	.3385	.11292	748157	0.44927	4.68458	1.99872	0.9497	9.9022	4.2249
9110.5	85.8175	.3196	.11639	746637	0.37315	4.69274	2.00408	0.7872	9.8993	4.2276
9120.5	86.6749	-0.3006	5.11987	745114	+0.29696	+4.69987	+2.00900	- 0.6252	- 9.8941	-4.2293
9130.5	87.5311	.2815	.12337	743588	0.22070	4.70597	2.01348	0.4637	9.8867	4.2301
9140.5	88.3862	.2624	.12689	742060	0.14439	4.71102	2.01752	0.3027	9.8770	4.2299
9150.5	89.2400	.2433	.13041	740531	+0.06805	4.71504	2.02111	- 0.1424	9.8650	4.2287
9160.5	90.0928	-0.2242	5.13395	739000	-0.00831	+4.71803	+2.02425	+ 0.0174	- 9.8509	-4.2265
9170.5	90.9443	.2050	.13751	737467	0.08467	4.71998	2.02696	0.1764	9.8345	4.2234
9180.5	91.7946	.1859	.14107	735934	0.16100	4.72091	2.02922	0.3348	9.8160	4.2193
9190.5	92.6438	.1667	.14465	734401	0.23730	4.72080	2.03104	0.4924	9.7953	4.2143
9200.5	93.4918	-0.1475	5.14823	732868	-0.31355	+4.71967	+2.03242	+ 0.6492	- 9.7725	-4.2083
9210.5	94.3386	.1283	.15183	731335	0.38973	4.71751	2.03336	0.8053	9.7476	4.2014
9220.5	95.1842	.1091	.15543	729802	0.46583	4.71433	2.03385	0.9605	9.7206	4.1937
9230.5	96.0286	.0899	.15904	728271	0.54183	4.71013	2.03391	1.1149	9.6916	4.1850
9240.5	96.8718	-0.0707	5.16266	726742	-0.61771	+4.70492	+2.03353	+ 1.2683	- 9.6605	-4.1754
9250.5	97.7139	.0515	.16628	725214	0.69345	4.69869	2.03271	1.4209	9.6275	4.1650
9260.5	98.5548	.0323	.16991	723688	0.76905	4.69145	2.03145	1.5725	9.5924	4.1536
9270.5	99.3945	- 0.132	.17354	722165	0.84448	4.68321	2.02976	1.7231	9.5554	4.1414
9280.5	100.2330	+0.0060	5.17718	720644	-0.91974	+4.67397	+2.02763	+ 1.8726	- 9.5165	-4.1284
9290.5	101.0704	.0251	.18082	719127	0.99479	4.66373	2.02507	2.0212	9.4756	4.1145
9300.5	101.9066	.0441	.18446	717613	1.06964	4.65249	2.02208	2.1687	9.4329	4.0998
9310.5	102.7416	.0632	.18810	716102	1.14425	4.64027	2.01866	2.3151	9.3883	4.0842
9320.5	103.5754	+0.0821	5.19174	714596	-1.21863	+4.62706	+2.01481	+ 2.4604	- 9.3419	-4.0678

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.00						
8840.5	338.1186	-1.7576	9.72597	108693	+9.02103	-3.20522	-1.71521	-6.0267	-8.8288	-3.6293
8850.5	338.4404	.7675	.72312	108789	9.03855	3.15708	1.69606	5.8700	8.8944	3.6611
8860.5	338.7624	.7773	.72027	108885	9.05577	3.10883	1.67686	5.7125	8.9574	3.6919
8870.5	339.0845	.7871	.71741	108981	9.07269	3.06048	1.65760	5.5543	9.0180	3.7217
8880.5	339.4069	-1.7968	9.71454	109077	+9.08933	-3.01204	-1.63829	-5.3954	-9.0759	-3.7503
8890.5	339.7295	.8064	.71167	109174	9.10567	2.96350	1.61893	5.2359	9.1314	3.7779
8900.5	340.0522	.8161	.70879	109271	9.12171	2.91487	1.59951	5.0758	9.1843	3.8044
8910.5	340.3752	.8256	.70590	109369	9.13746	2.86614	1.58005	4.9153	9.2347	3.8298
8920.5	340.6983	-1.8351	9.70301	109466	+9.15292	-2.81732	-1.56053	-4.7542	-9.2825	-3.8542
8930.5	341.0216	.8446	.70011	109565	9.16807	2.76841	1.54096	4.5927	9.3279	3.8775
8940.5	341.3451	.8540	.69721	109663	9.18293	2.71941	1.52134	4.4309	9.3707	3.8997
8950.5	341.6688	.8634	.69430	109762	9.19749	2.67032	1.50168	4.2688	9.4110	3.9208
8960.5	341.9927	-1.8727	9.69139	109861	+9.21175	-2.62115	-1.48196	-4.1064	-9.4488	-3.9409
8970.5	342.3168	.8819	.68847	109960	9.22571	2.57189	1.46220	3.9437	9.4841	3.9599
8980.5	342.6411	.8911	.68554	110060	9.23937	2.52255	1.44239	3.7810	9.5169	3.9779
8990.5	342.9655	.9003	.68261	110160	9.25273	2.47313	1.42253	3.6180	9.5473	3.9948
9000.5	343.2902	-1.9093	9.67968	110260	+9.26579	-2.42362	-1.40263	-3.4551	-9.5752	-4.0106
9010.5	343.6150	.9184	.67673	110361	9.27854	2.37404	1.38268	3.2921	9.6006	4.0254
9020.5	343.9401	.9273	.67379	110461	9.29099	2.32439	1.36269	3.1291	9.6236	4.0391
9030.5	344.2653	.9362	.67084	110563	9.30313	2.27465	1.34265	2.9663	9.6441	4.0518
9040.5	344.5908	-1.9451	9.66788	110664	+9.31498	-2.22485	-1.32257	-2.8035	-9.6623	-4.0635
9050.5	344.9164	.9539	.66492	110766	9.32651	2.17497	1.30244	2.6409	9.6780	4.0741
9060.5	345.2423	.9626	.66195	110868	9.33774	2.12502	1.28228	2.4785	9.6913	4.0837
9070.5	345.5683	.9713	.65898	110970	9.34866	2.07501	1.26207	2.3163	9.7023	4.0923
9080.5	345.8945	-1.9800	9.65601	111073	+9.35928	-2.02492	-1.24182	-2.1544	-9.7110	-4.0998
9090.5	346.2210	.9885	.65303	111176	9.36958	1.97477	1.22153	1.9929	9.7173	4.1064
9100.5	346.5476	.9970	.65005	111279	9.37958	1.92456	1.20120	1.8317	9.7212	4.1119
9110.5	346.8744	2.0055	.64706	111382	9.38927	1.87428	1.18083	1.6709	9.7229	4.1165
9120.5	347.2015	-2.0139	9.64407	111486	+9.39865	-1.82395	-1.16043	-1.5106	-9.7223	-4.1200
9130.5	347.5287	.0222	.64107	111590	9.40772	1.77355	1.13998	1.3508	9.7194	4.1226
9140.5	347.8561	.0304	.63807	111694	9.41648	1.72309	1.11950	1.1915	9.7143	4.1242
9150.5	348.1838	.0386	.63507	111798	9.42493	1.67258	1.09898	1.0328	9.7070	4.1248
9160.5	348.5116	-2.0468	9.63206	111903	+9.43306	-1.62202	-1.07842	-0.8747	-9.6975	-4.1245
9170.5	348.8397	.0549	.62905	112008	9.44088	1.57140	1.05783	0.7172	9.6858	4.1232
9180.5	349.1679	.0629	.62603	112114	9.44839	1.52073	1.03721	0.5604	9.6719	4.1210
9190.5	349.4964	.0708	.62302	112219	9.45559	1.47001	1.01655	0.4043	9.6559	4.1179
9200.5	349.8250	-2.0787	9.61999	112325	+9.46247	-1.41925	-0.99586	-0.2490	-9.6378	-4.1138
9210.5	350.1539	.0866	.61697	112431	9.46903	1.36843	0.97513	-0.0944	9.6176	4.1088
9220.5	350.4829	.0943	.61394	112537	9.47529	1.31758	0.95437	+0.0594	9.5953	4.1029
9230.5	350.8122	.1020	.61091	112644	9.48122	1.26668	0.93359	0.2123	9.5710	4.0961
9240.5	351.1417	-2.1097	9.60788	112750	+9.48684	-1.21573	-0.91277	+0.3644	-9.5447	-4.0884
9250.5	351.4713	.1172	.60484	112857	9.49214	1.16475	0.89192	0.5156	9.5164	4.0799
9260.5	351.8012	.1247	.60180	112965	9.49713	1.11373	0.87104	0.6658	9.4861	4.0705
9270.5	352.1313	.1322	.59876	113072	9.50180	1.06268	0.85013	0.8151	9.4539	4.0602
9280.5	352.4616	-2.1396	9.59571	113180	+9.50615	-1.01159	-0.82919	+0.9634	-9.4197	-4.0491
9290.5	352.7921	.1469	.59266	113288	9.51018	0.96046	0.80823	1.1107	9.3837	4.0371
9300.5	353.1228	.1541	.58961	113396	9.51389	0.90931	0.78724	1.2570	9.3458	4.0243
9310.5	353.4538	.1613	.58656	113504	9.51728	0.85812	0.76622	1.4022	9.3060	4.0107
9320.5	353.7849	-2.1684	9.58351	113613	+9.52036	-0.80691	-0.74518	+1.5463	-9.2644	-3.9963

JUPITER

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude l	Latitude b			x	y	z	X	Y	Z
243	°	°		0.00						
9320.5	103.5754	+0.0821	5.19174	714596	-1.21863	+4.62706	+2.01481	+ 2.4604	- 9.3419	-4.0678
9330.5	104.4081	.1011	.19538	713094	1.29275	4.61287	2.01054	2.6045	9.2937	4.0507
9340.5	105.2396	.1200	.19903	711597	1.36659	4.59771	2.00584	2.7475	9.2437	4.0327
9350.5	106.0699	.1388	.20267	710105	1.44014	4.58158	2.00072	2.8893	9.1919	4.0140
9360.5	106.8991	+0.1576	5.20630	708617	-1.51340	+4.56448	+1.99517	+ 3.0299	- 9.1385	-3.9945
9370.5	107.7271	.1764	.20994	707136	1.58633	4.54643	1.98921	3.1693	9.0833	3.9742
9380.5	108.5540	.1950	.21357	705660	1.65893	4.52743	1.98283	3.3075	9.0264	3.9532
9390.5	109.3797	.2136	.21719	704190	1.73119	4.50747	1.97604	3.4443	8.9679	3.9315
9400.5	110.2043	+0.2322	5.22081	702727	-1.80309	+4.48658	+1.96883	+ 3.5799	- 8.9078	-3.9090
9410.5	111.0277	.2506	.22442	701270	1.87461	4.46476	1.96122	3.7142	8.8461	3.8858
9420.5	111.8500	.2690	.22803	699820	1.94574	4.44200	1.95320	3.8472	8.7828	3.8619
9430.5	112.6712	.2873	.23163	698377	2.01646	4.41833	1.94477	3.9788	8.7180	3.8373
9440.5	113.4913	+0.3055	5.23522	696942	-2.08677	+4.39374	+1.93594	+ 4.1090	- 8.6517	-3.8120
9450.5	114.3102	.3236	.23880	695514	2.15665	4.36825	1.92671	4.2380	8.5839	3.7861
9460.5	115.1280	.3417	.24237	694094	2.22609	4.34186	1.91709	4.3655	8.5146	3.7595
9470.5	115.9447	.3596	.24593	692682	2.29507	4.31457	1.90706	4.4916	8.4438	3.7322
9480.5	116.7603	+0.3775	5.24947	691278	-2.36357	+4.28640	+1.89665	+ 4.6163	- 8.3717	-3.7043
9490.5	117.5748	.3952	.25301	689883	2.43160	4.25735	1.88585	4.7395	8.2982	3.6758
9500.5	118.3883	.4129	.25653	688497	2.49912	4.22743	1.87467	4.8614	8.2233	3.6467
9510.5	119.2006	.4304	.26004	687120	2.56614	4.19664	1.86310	4.9818	8.1471	3.6169
9520.5	120.0119	+0.4478	5.26354	685752	-2.63263	+4.16501	+1.85115	+ 5.1007	- 8.0696	-3.5866
9530.5	120.8221	.4651	.26702	684393	2.69859	4.13253	1.83883	5.2181	7.9908	3.5556
9540.5	121.6312	.4823	.27048	683044	2.76401	4.09921	1.82614	5.3341	7.9108	3.5241
9550.5	122.4393	.4994	.27393	681705	2.82886	4.06506	1.81307	5.4485	7.8295	3.4921
9560.5	123.2463	+0.5164	5.27737	680375	-2.89314	+4.03009	+1.79964	+ 5.5614	- 7.7470	-3.4594
9570.5	124.0523	.5332	.28078	679056	2.95684	3.99431	1.78585	5.6729	7.6633	3.4263
9580.5	124.8572	.5499	.28418	677747	3.01995	3.95772	1.77169	5.7828	7.5785	3.3926
9590.5	125.6612	.5665	.28756	676449	3.08245	3.92034	1.75719	5.8911	7.4925	3.3583
9600.5	126.4641	+0.5829	5.29091	675162	-3.14433	+3.88217	+1.74233	+ 5.9980	- 7.4055	-3.3236
9610.5	127.2660	.5992	.29425	673885	3.20558	3.84323	1.72712	6.1033	7.3173	3.2883
9620.5	128.0669	.6154	.29757	672620	3.26619	3.80352	1.71156	6.2070	7.2281	3.2526
9630.5	128.8668	.6315	.30087	671366	3.32615	3.76306	1.69567	6.3092	7.1379	3.2164
9640.5	129.6657	+0.6473	5.30414	670124	-3.38545	+3.72184	+1.67944	+ 6.4098	- 7.0466	-3.1797
9650.5	130.4636	.6631	.30739	668893	3.44408	3.67989	1.66287	6.5088	6.9544	3.1426
9660.5	131.2606	.6787	.31062	667673	3.50203	3.63721	1.64598	6.6062	6.8612	3.1050
9670.5	132.0566	.6941	.31383	666466	3.55928	3.59380	1.62876	6.7021	6.7671	3.0669
9680.5	132.8517	+0.7094	5.31701	665270	-3.61583	+3.54969	+1.61121	+ 6.7964	- 6.6720	-3.0285
9690.5	133.6458	.7246	.32017	664087	3.67167	3.50488	1.59336	6.8890	6.5761	2.9896
9700.5	134.4390	.7395	.32330	662916	3.72679	3.45938	1.57518	6.9801	6.4793	2.9503
9710.5	135.2312	.7544	.32640	661758	3.78117	3.41320	1.55670	7.0696	6.3816	2.9105
9720.5	136.0226	+0.7690	5.32948	660612	-3.83482	+3.36635	+1.53791	+ 7.1575	- 6.2831	-2.8704
9730.5	136.8130	.7835	.33253	659478	3.88771	3.31884	1.51883	7.2438	6.1838	2.8299
9740.5	137.6026	.7979	.33555	658358	3.93985	3.27069	1.49944	7.3284	6.0837	2.7891
9750.5	138.3912	.8120	.33855	657251	3.99121	3.22189	1.47976	7.4115	5.9829	2.7479
9760.5	139.1790	+0.8260	5.34151	656157	-4.04180	+3.17247	+1.45980	+ 7.4929	- 5.8813	-2.7063
9770.5	139.9660	.8399	.34445	655075	4.09160	3.12244	1.43955	7.5728	5.7790	2.6643
9780.5	140.7520	.8535	.34736	654007	4.14061	3.07179	1.41902	7.6510	5.6760	2.6221
9790.5	141.5373	.8670	.35023	652953	4.18882	3.02055	1.39822	7.7276	5.5723	2.5794
9800.5	142.3217	+0.8803	5.35308	651912	-4.23622	+2.96873	+1.37715	+ 7.8026	- 5.4680	-2.5365

SATURN

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.00						
9320.5	353.7849	-2.1684	9.58351	113613	+9.52036	-0.80691	-0.74518	+ 1.5463	- 9.2644	-3.9963
9330.5	354.1162	-1.754	5.8045	113722	9.52311	0.75567	0.72412	1.6893	9.2211	3.9811
9340.5	354.4478	-1.824	5.7739	113830	9.52554	0.70441	0.70303	1.8312	9.1759	3.9651
9350.5	354.7795	-1.893	5.7433	113940	9.52766	0.65312	0.68191	1.9719	9.1290	3.9483
9360.5	355.1115	-2.1961	9.57127	114049	+9.52945	-0.60181	-0.66078	+ 2.1115	- 9.0805	-3.9308
9370.5	355.4437	-2.029	5.6820	114159	9.53092	0.55049	0.63962	2.2498	9.0302	3.9125
9380.5	355.7761	-2.096	5.6514	114269	9.53206	0.49914	0.61844	2.3870	8.9782	3.8935
9390.5	356.1087	-2.162	5.6207	114379	9.53289	0.44778	0.59724	2.5229	8.9247	3.8737
9400.5	356.4415	-2.2227	9.55900	114489	+9.53339	-0.39640	-0.57602	+ 2.6575	- 8.8695	-3.8533
9410.5	356.7745	-2.292	5.5593	114599	9.53357	0.34502	0.55478	2.7909	8.8127	3.8321
9420.5	357.1077	-2.356	5.5286	114710	9.53343	0.29362	0.53352	2.9230	8.7544	3.8102
9430.5	357.4412	-2.420	5.4979	114820	9.53296	0.24221	0.51225	3.0538	8.6945	3.7876
9440.5	357.7748	-2.2482	9.54671	114931	+9.53217	-0.19079	-0.49096	+ 3.1832	- 8.6331	-3.7644
9450.5	358.1087	-2.544	5.4364	115042	9.53106	0.13937	0.46965	3.3113	8.5703	3.7404
9460.5	358.4428	-2.605	5.4056	115154	9.52962	0.08795	0.44832	3.4381	8.5060	3.7159
9470.5	358.7771	-2.666	5.3749	115265	9.52786	-0.03652	0.42699	3.5635	8.4403	3.6906
9480.5	359.1116	-2.2726	9.53441	115377	+9.52577	+0.01491	-0.40563	+ 3.6875	- 8.3732	-3.6648
9490.5	359.4463	-2.785	5.3134	115489	9.52335	0.06633	0.38427	3.8101	8.3047	3.6383
9500.5	359.7812	-2.843	5.2826	115601	9.52062	0.11776	0.36289	3.9313	8.2348	3.6112
9510.5	0.1164	-2.901	5.2518	115713	9.51755	0.16917	0.34149	4.0511	8.1637	3.5835
9520.5	0.4518	-2.2957	9.52210	115825	+9.51416	+0.22059	-0.32009	+ 4.1694	- 8.0912	-3.5552
9530.5	0.7873	-3.013	5.1902	115937	9.51045	0.27199	0.29868	4.2863	8.0175	3.5264
9540.5	1.1231	-3.069	5.1595	116050	9.50641	0.32338	0.27725	4.4018	7.9425	3.4969
9550.5	1.4591	-3.123	5.1287	116163	9.50204	0.37477	0.25582	4.5157	7.8663	3.4669
9560.5	1.7954	-2.3177	9.50979	116275	+9.49734	+0.42613	-0.23438	+ 4.6282	- 7.7888	-3.4364
9570.5	2.1318	-3.230	5.0671	116388	9.49232	0.47749	0.21293	4.7392	7.7103	3.4053
9580.5	2.4685	-3.282	5.0364	116501	9.48698	0.52882	0.19147	4.8488	7.6305	3.3737
9590.5	2.8053	-3.334	5.0056	116615	9.48130	0.58014	0.17001	4.9568	7.5497	3.3416
9600.5	3.1424	-2.3384	9.49748	116728	+9.47530	+0.63143	-0.14854	+ 5.0633	- 7.4678	-3.3089
9610.5	3.4797	-3.434	4.9441	116841	9.46898	0.68271	0.12707	5.1683	7.3847	3.2758
9620.5	3.8172	-3.483	4.9133	116955	9.46232	0.73396	0.10559	5.2718	7.3007	3.2422
9630.5	4.1550	-3.532	4.8826	117069	9.45534	0.78518	0.08411	5.3737	7.2156	3.2081
9640.5	4.4929	-2.3579	9.48519	117182	+9.44803	+0.83638	-0.06263	+ 5.4741	- 7.1295	-3.1735
9650.5	4.8311	-3.626	4.8212	117296	9.44040	0.88754	0.04115	5.5730	7.0424	3.1385
9660.5	5.1695	-3.672	4.7905	117410	9.43243	0.93867	-0.01966	5.6703	6.9544	3.1030
9670.5	5.5081	-3.717	4.7598	117525	9.42414	0.98978	+0.00183	5.7661	6.8654	3.0671
9680.5	5.8469	-2.3762	9.47291	117639	+9.41553	+1.04084	+0.02331	+ 5.8603	- 6.7755	-3.0308
9690.5	6.1859	-3.805	4.6984	117753	9.40658	1.09187	0.04480	5.9530	6.6847	2.9940
9700.5	6.5252	-3.848	4.6678	117867	9.39731	1.14286	0.06628	6.0441	6.5931	2.9569
9710.5	6.8647	-3.890	4.6372	117982	9.38771	1.19381	0.08776	6.1336	6.5006	2.9193
9720.5	7.2043	-2.3931	9.46066	118096	+9.37778	+1.24472	+0.10924	+ 6.2216	- 6.4073	-2.8813
9730.5	7.5442	-3.971	4.5760	118211	9.36753	1.29558	0.13071	6.3080	6.3132	2.8430
9740.5	7.8844	-4.011	4.5454	118326	9.35695	1.34640	0.15218	6.3928	6.2184	2.8043
9750.5	8.2247	-4.049	4.5149	118440	9.34604	1.39717	0.17364	6.4760	6.1227	2.7652
9760.5	8.5653	-2.4087	9.44844	118555	+9.33480	+1.44789	+0.19510	+ 6.5577	- 6.0264	-2.7258
9770.5	8.9060	-4.124	4.4539	118670	9.32324	1.49855	0.21654	6.6378	5.9293	2.6860
9780.5	9.2470	-4.161	4.4234	118785	9.31135	1.54917	0.23799	6.7163	5.8315	2.6459
9790.5	9.5882	-4.196	4.3930	118900	9.29913	1.59973	0.25942	6.7932	5.7331	2.6055
9800.5	9.9297	-2.4230	9.43626	119015	+9.28659	+1.65023	+0.28084	+ 6.8685	- 5.6340	-2.5648

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243/4	°	°		0.00						
9800.5	142.3217	+0.8803	5.35308	651912	-4.23622	+2.96873	+1.37715	+ 7.8026	- 5.4680	-2.5365
9810.5	143.1053	.8934	.35589	650885	4.28280	2.91634	1.35581	7.8759	5.3630	2.4933
9820.5	143.8880	.9064	.35868	649872	4.32855	2.86338	1.33421	7.9477	5.2575	2.4497
9830.5	144.6700	.9191	.36143	648872	4.37347	2.80987	1.31235	8.0178	5.1513	2.4059
9840.5	145.4512	+0.9317	5.36414	647886	-4.41756	+2.75582	+1.29024	+ 8.0863	- 5.0445	-2.3618
9850.5	146.2315	.9441	.36683	646914	4.46079	2.70124	1.26788	8.1532	4.9372	2.3174
9860.5	147.0112	.9563	.36948	645957	4.50317	2.64614	1.24528	8.2185	4.8293	2.2727
9870.5	147.7900	.9683	.37210	645013	4.54468	2.59054	1.22244	8.2821	4.7209	2.2278
9880.5	148.5681	+0.9801	5.37468	644084	-4.58533	+2.53444	+1.19937	+ 8.3442	- 4.6121	-2.1826
9890.5	149.3455	0.9918	.37723	643169	4.62511	2.47786	1.17607	8.4046	4.5027	2.1371
9900.5	150.1222	1.0032	.37974	642269	4.66400	2.42081	1.15254	8.4634	4.3929	2.0914
9910.5	150.8981	.0145	.38221	641384	4.70200	2.36330	1.12880	8.5206	4.2826	2.0455
9920.5	151.6734	+1.0255	5.38465	640512	-4.73912	+2.30534	+1.10484	+ 8.5762	- 4.1719	-1.9994
9930.5	152.4479	.0364	.38705	639656	4.77533	2.24694	1.08067	8.6302	4.0608	1.9530
9940.5	153.2218	.0470	.38942	638814	4.81064	2.18811	1.05630	8.6825	3.9492	1.9065
9950.5	153.9950	.0575	.39175	637987	4.84504	2.12887	1.03173	8.7333	3.8373	1.8597
9960.5	154.7675	+1.0677	5.39404	637175	-4.87852	+2.06923	+1.00696	+ 8.7825	- 3.7251	-1.8128
9970.5	155.5394	.0778	.39629	636378	4.91108	2.00920	0.98200	8.8300	3.6125	1.7656
9980.5	156.3107	.0876	.39850	635596	4.94272	1.94879	0.95686	8.8760	3.4996	1.7183
9990.5	157.0813	.0972	.40067	634828	4.97342	1.88801	0.93153	8.9203	3.3863	1.6708
0000.5	157.8514	+1.1067	5.40281	634076	-5.00320	+1.82688	+0.90603	+ 8.9631	- 3.2728	-1.6231
0010.5	158.6208	.1159	.40490	633339	5.03203	1.76540	0.88037	9.0043	3.1590	1.5753
0020.5	159.3897	.1249	.40696	632618	5.05991	1.70359	0.85453	9.0439	3.0449	1.5274
0030.5	160.1579	.1337	.40897	631911	5.08685	1.64147	0.82854	9.0819	2.9306	1.4792
0040.5	160.9257	+1.1423	5.41095	631220	-5.11284	+1.57903	+0.80239	+ 9.1183	- 2.8161	-1.4310
0050.5	161.6928	.1507	.41288	630545	5.13787	1.51630	0.77609	9.1531	2.7013	1.3826
0060.5	162.4595	.1589	.41477	629884	5.16195	1.45329	0.74965	9.1864	2.5863	1.3341
0070.5	163.2256	.1669	.41662	629239	5.18505	1.39001	0.72306	9.2180	2.4712	1.2855
0080.5	163.9912	+1.1746	5.41842	628610	-5.20720	+1.32646	+0.69634	+ 9.2481	- 2.3558	-1.2367
0090.5	164.7563	.1822	.42019	627996	5.22837	1.26267	0.66949	9.2767	2.2404	1.1879
0100.5	165.5209	.1895	.42191	627398	5.24857	1.19865	0.64252	9.3037	2.1247	1.1389
0110.5	166.2850	.1966	.42359	626816	5.26780	1.13440	0.61543	9.3291	2.0090	1.0899
0120.5	167.0487	+1.2035	5.42523	626249	-5.28604	+1.06995	+0.58822	+ 9.3529	- 1.8931	-1.0408
0130.5	167.8119	.2101	.42682	625698	5.30331	1.00529	0.56091	9.3752	1.7772	0.9916
0140.5	168.5747	.2166	.42837	625162	5.31960	0.94045	0.53349	9.3959	1.6611	0.9423
0150.5	169.3370	.2228	.42987	624643	5.33490	0.87543	0.50597	9.4151	1.5450	0.8930
0160.5	170.0990	+1.2289	5.43133	624139	-5.34921	+0.81025	+0.47836	+ 9.4328	- 1.4288	-0.8435
0170.5	170.8605	.2346	.43275	623651	5.36253	0.74492	0.45066	9.4489	1.3126	0.7941
0180.5	171.6217	.2402	.43412	623179	5.37486	0.67946	0.42287	9.4634	1.1963	0.7446
0190.5	172.3825	.2456	.43545	622722	5.38621	0.61386	0.39501	9.4765	1.0800	0.6950
0200.5	173.1429	+1.2507	5.43673	622282	-5.39655	+0.54816	+0.36708	+ 9.4880	- 0.9638	-0.6454
0210.5	173.9030	.2556	.43797	621858	5.40591	0.48235	0.33907	9.4979	0.8475	0.5957
0220.5	174.6627	.2603	.43916	621449	5.41426	0.41646	0.31101	9.5064	0.7312	0.5461
0230.5	175.4221	.2648	.44030	621057	5.42162	0.35049	0.28289	9.5133	0.6150	0.4964
0240.5	176.1813	+1.2690	5.44140	620680	-5.42799	+0.28445	+0.25471	+ 9.5187	- 0.4988	-0.4467
0250.5	176.9401	.2730	.44246	620320	5.43335	0.21836	0.22649	9.5225	0.3827	0.3970
0260.5	177.6986	.2768	.44346	619975	5.43772	0.15223	0.19823	9.5249	0.2667	0.3472
0270.5	178.4568	.2804	.44442	619647	5.44109	0.08608	0.16993	9.5258	0.1507	0.2975
0280.5	179.2148	+1.2837	5.44534	619335	-5.44346	+0.01990	+0.14160	+ 9.5251	- 0.0348	-0.2478

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243/4	°	°		0.00						
9800.5	9.9297	-2.4230	9.43626	119015	+9.28659	+1.65023	+0.28084	+ 6.8685	- 5.6340	-2.5648
9810.5	10.2713	.4264	.43322	119130	9.27372	1.70068	0.30225	6.9423	5.5343	2.5237
9820.5	10.6132	.4297	.43018	119245	9.26053	1.75106	0.32366	7.0145	5.4339	2.4824
9830.5	10.9553	.4329	.42715	119360	9.24700	1.80138	0.34505	7.0851	5.3330	2.4407
9840.5	11.2976	-2.4360	9.42412	119475	+9.23316	+1.85164	+0.36643	+ 7.1541	- 5.2315	-2.3988
9850.5	11.6401	.4391	.42109	119590	9.21898	1.90183	0.38779	7.2215	5.1294	2.3566
9860.5	11.9828	.4420	.41807	119706	9.20448	1.95196	0.40914	7.2873	5.0268	2.3141
9870.5	12.3258	.4449	.41505	119821	9.18966	2.00201	0.43048	7.3516	4.9237	2.2713
9880.5	12.6689	-2.4476	9.41203	119936	+9.17451	+2.05200	+0.45180	+ 7.4143	- 4.8200	-2.2283
9890.5	13.0123	.4503	.40902	120051	9.15903	2.10190	0.47310	7.4754	4.7159	2.1851
9900.5	13.3559	.4529	.40601	120167	9.14323	2.15174	0.49439	7.5349	4.6114	2.1416
9910.5	13.6997	.4555	.40301	120282	9.12711	2.20150	0.51566	7.5929	4.5064	2.0979
9920.5	14.0438	-2.4579	9.40001	120397	+9.11066	+2.25118	+0.53691	+ 7.6492	- 4.4009	-2.0540
9930.5	14.3880	.4602	.39701	120512	9.09389	2.30077	0.55814	7.7040	4.2951	2.0099
9940.5	14.7325	.4625	.39402	120627	9.07679	2.35029	0.57935	7.7572	4.1888	1.9655
9950.5	15.0772	.4646	.39103	120743	9.05937	2.39972	0.60055	7.8089	4.0822	1.9210
9960.5	15.4221	-2.4667	9.38805	120858	+9.04163	+2.44907	+0.62171	+ 7.8590	- 3.9752	-1.8763
9970.5	15.7672	.4687	.38507	120973	9.02356	2.49832	0.64286	7.9075	3.8679	1.8313
9980.5	16.1126	.4706	.38210	121088	9.00517	2.54749	0.66398	7.9545	3.7602	1.7862
9990.5	16.4581	.4724	.37913	121203	8.98646	2.59657	0.68508	7.9999	3.6523	1.7410
0000.5	16.8039	-2.4742	9.37616	121318	+8.96743	+2.64555	+0.70616	+ 8.0437	- 3.5440	-1.6955
0010.5	17.1499	.4758	.37320	121433	8.94808	2.69443	0.72721	8.0860	3.4355	1.6500
0020.5	17.4961	.4773	.37025	121548	8.92840	2.74322	0.74823	8.1268	3.3267	1.6042
0030.5	17.8425	.4788	.36730	121663	8.90841	2.79191	0.76923	8.1659	3.2177	1.5583
0040.5	18.1891	-2.4802	9.36435	121777	+8.88810	+2.84050	+0.79020	+ 8.2036	- 3.1084	-1.5123
0050.5	18.5360	.4814	.36142	121892	8.86746	2.88899	0.81114	8.2397	2.9989	1.4662
0060.5	18.8830	.4826	.35848	122007	8.84651	2.93737	0.83205	8.2742	2.8892	1.4199
0070.5	19.2303	.4837	.35556	122121	8.82524	2.98565	0.85293	8.3073	2.7793	1.3735
0080.5	19.5778	-2.4847	9.35263	122236	+8.80365	+3.03382	+0.87377	+ 8.3387	- 2.6692	-1.3270
0090.5	19.9255	.4857	.34972	122350	8.78174	3.08188	0.89459	8.3687	2.5590	1.2804
0100.5	20.2734	.4865	.34681	122465	8.75952	3.12982	0.91538	8.3971	2.4486	1.2337
0110.5	20.6216	.4872	.34390	122579	8.73697	3.17765	0.93613	8.4240	2.3382	1.1869
0120.5	20.9699	-2.4879	9.34101	122693	+8.71412	+3.22537	+0.95684	+ 8.4494	- 2.2275	-1.1400
0130.5	21.3185	.4884	.33811	122807	8.69094	3.27297	0.97753	8.4733	2.1168	1.0930
0140.5	21.6672	.4889	.33523	122921	8.66745	3.32045	0.99817	8.4956	2.0060	1.0460
0150.5	22.0162	.4892	.33235	123035	8.64365	3.36781	1.01878	8.5164	1.8951	0.9989
0160.5	22.3654	-2.4895	9.32948	123148	+8.61953	+3.41505	+1.03936	+ 8.5358	- 1.7842	-0.9517
0170.5	22.7148	.4897	.32661	123262	8.59510	3.46216	1.05989	8.5536	1.6732	0.9045
0180.5	23.0645	.4898	.32375	123375	8.57036	3.50915	1.08039	8.5699	1.5622	0.8572
0190.5	23.4143	.4898	.32090	123488	8.54530	3.55600	1.10085	8.5847	1.4511	0.8099
0200.5	23.7643	-2.4897	9.31806	123602	+8.51994	+3.60273	+1.12126	+ 8.5980	- 1.3401	-0.7625
0210.5	24.1146	.4895	.31522	123715	8.49426	3.64932	1.14164	8.6099	1.2290	0.7151
0220.5	24.4651	.4892	.31239	123827	8.46827	3.69579	1.16197	8.6202	1.1180	0.6677
0230.5	24.8157	.4888	.30957	123940	8.44197	3.74211	1.18226	8.6291	1.0069	0.6202
0240.5	25.1666	-2.4884	9.30675	124053	+8.41537	+3.78830	+1.20251	+ 8.6364	- 0.8960	-0.5727
0250.5	25.5177	.4878	.30394	124165	8.38845	3.83435	1.22271	8.6424	0.7850	0.5253
0260.5	25.8690	.4871	.30114	124277	8.36123	3.88026	1.24287	8.6468	0.6742	0.4778
0270.5	26.2205	.4864	.29835	124389	8.33370	3.92602	1.26298	8.6497	0.5634	0.4303
0280.5	26.5722	-2.4855	9.29557	124501	+8.30586	+3.97164	+1.28305	+ 8.6512	- 0.4527	-0.3828

JUPITER

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude l	Latitude b			x	y	z	X	Y	Z
244	°	°		0.00						
0280.5	179.2148	+1.2837	5.44534	619335	-5.44346	+0.01990	+0.14160	+ 9.5251	- 0.0348	-0.2478
0290.5	179.9726	.2868	.44621	619038	5.44483	-0.04627	0.11325	9.5229	+ 0.0809	0.1981
0300.5	180.7301	.2897	.44703	618758	5.44521	0.11244	0.08487	9.5193	0.1966	0.1484
0310.5	181.4874	.2924	.44780	618495	5.44458	0.17859	0.05648	9.5141	0.3121	0.0987.
0320.5	182.2445	+1.2948	5.44853	618247	-5.44296	-0.24470	+0.02807	+ 9.5075	+ 0.4274	-0.0490
0330.5	183.0014	.2970	.44921	618015	5.44034	0.31077	-0.00034	9.4994	0.5426	+0.0006
0340.5	183.7581	.2990	.44985	617800	5.43673	0.37678	0.02874	9.4897	0.6577	0.0502
0350.5	184.5146	.3007	.45043	617601	5.43212	0.44273	0.05715	9.4786	0.7725	0.0997
0360.5	185.2710	+1.3023	5.45097	617418	-5.42652	-0.50859	-0.08554	+ 9.4661	+ 0.8872	+0.1492
0370.5	186.0273	.3036	.45146	617251	5.41992	0.57436	0.11391	9.4520	1.0017	0.1987
0380.5	186.7834	.3046	.45190	617100	5.41234	0.64003	0.14227	9.4365	1.1159	0.2481
0390.5	187.5394	.3055	.45230	616966	5.40376	0.70557	0.17060	9.4195	1.2299	0.2974
0400.5	188.2953	+1.3061	5.45265	616848	-5.39420	-0.77099	-0.19890	+ 9.4010	+ 1.3437	+0.3466
0410.5	189.0511	.3065	.45295	616746	5.38365	0.83627	0.22716	9.3811	1.4572	0.3958
0420.5	189.8068	.3067	.45320	616660	5.37212	0.90140	0.25538	9.3597	1.5705	0.4449
0430.5	190.5625	.3066	.45341	616590	5.35961	0.96636	0.28356	9.3368	1.6835	0.4940
0440.5	191.3181	+1.3063	5.45356	616537	-5.34612	-1.03114	-0.31168	+ 9.3125	+ 1.7962	+0.5429
0450.5	192.0737	.3058	.45367	616500	5.33165	1.09574	0.33974	9.2867	1.9086	0.5918
0460.5	192.8293	.3050	.45373	616479	5.31621	1.16013	0.36775	9.2595	2.0207	0.6405
0470.5	193.5848	.3041	.45375	616475	5.29980	1.22432	0.39568	9.2309	2.1325	0.6892
0480.5	194.3404	+1.3029	5.45371	616486	-5.28242	-1.28828	-0.42355	+ 9.2008	+ 2.2439	+0.7377
0490.5	195.0959	.3014	.45363	616514	5.26407	1.35200	0.45134	9.1693	2.3550	0.7862
0500.5	195.8515	.2998	.45350	616559	5.24477	1.41548	0.47904	9.1363	2.4658	0.8345
0510.5	196.6072	.2979	.45332	616619	5.22450	1.47870	0.50666	9.1019	2.5761	0.8827
0520.5	197.3629	+1.2958	5.45310	616695	-5.20329	-1.54165	-0.53418	+ 9.0660	+ 2.6861	+0.9307
0530.5	198.1186	.2935	.45282	616788	5.18112	1.60432	0.56161	9.0288	2.7957	0.9787
0540.5	198.8745	.2909	.45250	616898	5.15801	1.66670	0.58893	8.9901	2.9050	1.0265
0550.5	199.6304	.2882	.45213	617023	5.13395	1.72877	0.61615	8.9500	3.0138	1.0741
0560.5	200.3865	+1.2851	5.45171	617165	-5.10896	-1.79052	-0.64325	+ 8.9085	+ 3.1221	+1.1216
0570.5	201.1426	.2819	.45125	617323	5.08303	1.85195	0.67024	8.8655	3.2301	1.1690
0580.5	201.8989	.2785	.45074	617496	5.05617	1.91304	0.69710	8.8212	3.3376	1.2162
0590.5	202.6554	.2748	.45018	617687	5.02839	1.97378	0.72384	8.7754	3.4446	1.2632
0600.5	203.4120	+1.2709	5.44957	617893	-4.99968	-2.03416	-0.75044	+ 8.7282	+ 3.5511	+1.3101
0610.5	204.1688	.2668	.44892	618115	4.97007	2.09417	0.77691	8.6796	3.6572	1.3568
0620.5	204.9258	.2624	.44822	618354	4.93954	2.15379	0.80323	8.6296	3.7628	1.4033
0630.5	205.6829	.2579	.44747	618609	4.90811	2.21302	0.82941	8.5783	3.8679	1.4496
0640.5	206.4403	+1.2531	5.44667	618880	-4.87578	-2.27184	-0.85544	+ 8.5255	+ 3.9724	+1.4958
0650.5	207.1979	.2481	.44583	619167	4.84255	2.33025	0.88131	8.4713	4.0764	1.5417
0660.5	207.9557	.2429	.44494	619470	4.80844	2.38823	0.90701	8.4158	4.1799	1.5875
0670.5	208.7138	.2374	.44401	619789	4.77344	2.44577	0.93255	8.3588	4.2828	1.6330
0680.5	209.4722	+1.2318	5.44303	620124	-4.73757	-2.50286	-0.95792	+ 8.3005	+ 4.3852	+1.6783
0690.5	210.2308	.2259	.44200	620476	4.70083	2.55949	0.98312	8.2408	4.4869	1.7235
0700.5	210.9897	.2198	.44093	620843	4.66323	2.61565	1.00813	8.1797	4.5881	1.7684
0710.5	211.7490	.2135	.43981	621227	4.62476	2.67134	1.03296	8.1172	4.6887	1.8130
0720.5	212.5085	+1.2069	5.43864	621626	-4.58545	-2.72653	-1.05759	+ 8.0534	+ 4.7886	+1.8575
0730.5	213.2684	.2002	.43743	622041	4.54529	2.78121	1.08204	7.9882	4.8879	1.9017
0740.5	214.0286	.1932	.43617	622473	4.50430	2.83539	1.10628	7.9217	4.9866	1.9456
0750.5	214.7891	.1861	.43487	622920	4.46247	2.88904	1.13032	7.8537	5.0846	1.9893
0760.5	215.5501	+1.1787	5.43353	623383	-4.41982	-2.94216	-1.15415	+ 7.7845	+ 5.1819	+2.0328

SATURN

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
0280.5	26.5722	-2.4855	9.29557	124501	+8.30586	+3.97164	+1.28305	+ 8.6512	- 0.4527	-0.3828
0290.5	26.9242	-4.846	9.29279	124613	8.27772	4.01712	1.30307	8.6512	0.3421	0.3353
0300.5	27.2763	-4.836	9.29002	124724	8.24928	4.06244	1.32304	8.6498	0.2316	0.2878
0310.5	27.6286	-4.824	9.28726	124835	8.22053	4.10762	1.34296	8.6469	0.1213	0.2404
0320.5	27.9812	-2.4812	9.28451	124946	+8.19148	+4.15265	+1.36283	+ 8.6426	- 0.0110	-0.1929
0330.5	28.3339	-4.799	9.28177	125057	8.16213	4.19752	1.38266	8.6368	+ 0.0990	0.1455
0340.5	28.6869	-4.785	9.27903	125168	8.13247	4.24223	1.40243	8.6295	0.2089	0.0982
0350.5	29.0400	-4.770	9.27630	125278	8.10252	4.28679	1.42215	8.6208	0.3187	0.0508
0360.5	29.3934	-2.4754	9.27359	125388	+8.07226	+4.33119	+1.44181	+ 8.6107	+ 0.4282	-0.0036
0370.5	29.7470	-4.737	9.27088	125498	8.04171	4.37543	1.46142	8.5991	0.5376	+0.0437
0380.5	30.1007	-4.719	9.26818	125608	8.01086	4.41950	1.48098	8.5861	0.6468	0.0909
0390.5	30.4547	-4.700	9.26549	125717	7.97971	4.46342	1.50048	8.5717	0.7557	0.1380
0400.5	30.8089	-2.4680	9.26281	125827	+7.94826	+4.50716	+1.51993	+ 8.5558	+ 0.8644	+0.1850
0410.5	31.1633	-4.660	9.26013	125936	7.91652	4.55074	1.53932	8.5385	0.9729	0.2320
0420.5	31.5179	-4.638	9.25747	126044	7.88449	4.59415	1.55866	8.5198	1.0811	0.2789
0430.5	31.8726	-4.615	9.25482	126153	7.85216	4.63739	1.57793	8.4997	1.1891	0.3258
0440.5	32.2276	-2.4591	9.25217	126261	+7.81954	+4.68045	+1.59715	+ 8.4782	+ 1.2968	+0.3725
0450.5	32.5828	-4.567	9.24954	126369	7.78663	4.72334	1.61630	8.4552	1.4042	0.4192
0460.5	32.9382	-4.541	9.24691	126477	7.75343	4.76605	1.63540	8.4308	1.5113	0.4657
0470.5	33.2937	-4.515	9.24430	126584	7.71993	4.80859	1.65443	8.4051	1.6181	0.5122
0480.5	33.6495	-2.4487	9.24169	126691	+7.68615	+4.85094	+1.67341	+ 8.3779	+ 1.7245	+0.5586
0490.5	34.0055	-4.459	9.23910	126798	7.65209	4.89312	1.69232	8.3493	1.8307	0.6048
0500.5	34.3617	-4.429	9.23651	126904	7.61773	4.93510	1.71116	8.3193	1.9365	0.6510
0510.5	34.7180	-4.399	9.23394	127010	7.58309	4.97691	1.72995	8.2880	2.0419	0.6970
0520.5	35.0746	-2.4368	9.23138	127116	+7.54817	+5.01853	+1.74866	+ 8.2552	+ 2.1470	+0.7429
0530.5	35.4313	-4.335	9.22882	127222	7.51297	5.05996	1.76732	8.2211	2.2517	0.7887
0540.5	35.7883	-4.302	9.22628	127327	7.47748	5.10119	1.78590	8.1855	2.3561	0.8343
0550.5	36.1454	-4.268	9.22375	127432	7.44171	5.14224	1.80442	8.1486	2.4600	0.8798
0560.5	36.5027	-2.4233	9.22123	127536	+7.40566	+5.18309	+1.82287	+ 8.1103	+ 2.5635	+0.9252
0570.5	36.8603	-4.197	9.21872	127641	7.36933	5.22375	1.84125	8.0706	2.6666	0.9704
0580.5	37.2180	-4.159	9.21622	127744	7.33272	5.26421	1.85956	8.0296	2.7693	1.0154
0590.5	37.5759	-4.121	9.21373	127848	7.29584	5.30447	1.87781	7.9871	2.8715	1.0603
0600.5	37.9340	-2.4082	9.21126	127951	+7.25868	+5.34453	+1.89598	+ 7.9433	+ 2.9733	+1.1051
0610.5	38.2922	-4.042	9.20879	128054	7.22125	5.38439	1.91408	7.8982	3.0745	1.1497
0620.5	38.6507	-4.001	9.20634	128156	7.18355	5.42405	1.93210	7.8517	3.1754	1.1940
0630.5	39.0094	-3.959	9.20389	128258	7.14557	5.46350	1.95006	7.8038	3.2757	1.2383
0640.5	39.3682	-2.3917	9.20146	128360	+7.10732	+5.50274	+1.96794	+ 7.7545	+ 3.3755	+1.2823
0650.5	39.7272	-3.873	9.19904	128461	7.06880	5.54177	1.98574	7.7039	3.4748	1.3261
0660.5	40.0865	-3.828	9.19664	128562	7.03002	5.58060	2.00347	7.6520	3.5736	1.3698
0670.5	40.4458	-3.782	9.19424	128663	6.99097	5.61921	2.02112	7.5987	3.6718	1.4132
0680.5	40.8054	-2.3735	9.19186	128763	+6.95165	+5.65760	+2.03870	+ 7.5441	+ 3.7695	+1.4565
0690.5	41.1652	-3.688	9.18949	128862	6.91207	5.69579	2.05620	7.4881	3.8667	1.4995
0700.5	41.5251	-3.639	9.18713	128962	6.87223	5.73375	2.07362	7.4307	3.9632	1.5424
0710.5	41.8853	-3.590	9.18478	129061	6.83212	5.77150	2.09096	7.3721	4.0592	1.5850
0720.5	42.2456	-2.3539	9.18245	129159	+6.79176	+5.80903	+2.10822	+ 7.3121	+ 4.1545	+1.6273
0730.5	42.6061	-3.487	9.18013	129257	6.75113	5.84633	2.12541	7.2508	4.2493	1.6695
0740.5	42.9667	-3.435	9.17782	129355	6.71025	5.88341	2.14251	7.1881	4.3434	1.7114
0750.5	43.3276	-3.382	9.17552	129452	6.66911	5.92027	2.15953	7.1242	4.4369	1.7531
0760.5	43.6886	-2.3327	9.17324	129549	+6.62772	+5.95690	+2.17646	+ 7.0589	+ 4.5298	+1.7945

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
0760.5	215.5501	+1.1787	5.43353	623383	-4.41982	-2.94216	-1.15415	+ 7.7845	+ 5.1819	+ 2.0328
0770.5	216.3114	.1711	.43214	623862	4.37636	2.99474	1.17777	7.7138	5.2786	2.0760
0780.5	217.0731	.1633	.43070	624357	4.33208	3.04676	1.20117	7.6419	5.3745	2.1189
0790.5	217.8352	.1553	.42922	624867	4.28701	3.09822	1.22435	7.5685	5.4698	2.1615
0800.5	218.5977	+1.1470	5.42770	625393	-4.24114	-3.14911	-1.24730	+ 7.4939	+ 5.5643	+ 2.2039
0810.5	219.3607	.1386	.42613	625935	4.19449	3.19941	1.27002	7.4178	5.6581	2.2460
0820.5	220.1241	.1300	.42452	626493	4.14706	3.24912	1.29250	7.3405	5.7511	2.2878
0830.5	220.8879	.1211	.42287	627066	4.09886	3.29823	1.31475	7.2618	5.8434	2.3293
0840.5	221.6522	+1.1121	5.42117	627655	-4.04989	-3.34672	-1.33675	+ 7.1818	+ 5.9349	+ 2.3705
0850.5	222.4170	.1028	.41943	628260	4.00018	3.39459	1.35850	7.1005	6.0255	2.4114
0860.5	223.1823	.0933	.41765	628880	3.94972	3.44183	1.38000	7.0178	6.1154	2.4520
0870.5	223.9481	.0837	.41582	629516	3.89852	3.48843	1.40125	6.9339	6.2045	2.4922
0880.5	224.7144	+1.0738	5.41396	630167	-3.84660	-3.53438	-1.42223	+ 6.8486	+ 6.2927	+ 2.5322
0890.5	225.4813	.0638	.41205	630834	3.79396	3.57967	1.44294	6.7620	6.3801	2.5718
0900.5	226.2487	.0535	.41010	631516	3.74061	3.62429	1.46339	6.6742	6.4666	2.6110
0910.5	227.0166	.0431	.40811	632213	3.68657	3.66823	1.48356	6.5850	6.5522	2.6500
0920.5	227.7851	+1.0324	5.40608	632925	-3.63183	-3.71149	-1.50346	+ 6.4945	+ 6.6370	+ 2.6885
0930.5	228.5542	.0216	.40401	633653	3.57641	3.75405	1.52307	6.4028	6.7208	2.7267
0940.5	229.3239	1.0105	.40190	634396	3.52032	3.79591	1.54240	6.3097	6.8037	2.7646
0950.5	230.0941	0.9993	.39975	635154	3.46357	3.83705	1.56143	6.2154	6.8857	2.8020
0960.5	230.8650	+0.9879	5.39756	635927	-3.40616	-3.87747	-1.58018	+ 6.1199	+ 6.9667	+ 2.8391
0970.5	231.6365	.9763	.39533	636715	3.34812	3.91716	1.59862	6.0230	7.0467	2.8758
0980.5	232.4087	.9645	.39307	637518	3.28944	3.95611	1.61677	5.9249	7.1257	2.9121
0990.5	233.1815	.9525	.39076	638336	3.23014	3.99432	1.63461	5.8256	7.2038	2.9480
1000.5	233.9549	+0.9404	5.38842	639168	-3.17024	-4.03177	-1.65214	+ 5.7250	+ 7.2808	+ 2.9835
1010.5	234.7291	.9280	.38604	640016	3.10973	4.06845	1.66936	5.6232	7.3568	3.0186
1020.5	235.5039	.9155	.38363	640878	3.04863	4.10437	1.68626	5.5201	7.4317	3.0533
1030.5	236.2794	.9028	.38117	641755	2.98695	4.13950	1.70284	5.4159	7.5056	3.0875
1040.5	237.0556	+0.8899	5.37869	642646	-2.92471	-4.17385	-1.71909	+ 5.3104	+ 7.5784	+ 3.1213
1050.5	237.8326	.8768	.37616	643551	2.86191	4.20741	1.73502	5.2037	7.6501	3.1547
1060.5	238.6102	.8636	.37360	644472	2.79856	4.24016	1.75062	5.0957	7.7207	3.1876
1070.5	239.3886	.8502	.37101	645406	2.73468	4.27210	1.76589	4.9866	7.7901	3.2201
1080.5	240.1678	+0.8366	5.36838	646354	-2.67028	-4.30323	-1.78082	+ 4.8764	+ 7.8584	+ 3.2521
1090.5	240.9477	.8229	.36572	647317	2.60536	4.33353	1.79540	4.7649	7.9255	3.2836
1100.5	241.7284	.8090	.36302	648294	2.53995	4.36301	1.80965	4.6523	7.9915	3.3146
1110.5	242.5099	.7949	.36029	649284	2.47405	4.39164	1.82354	4.5385	8.0562	3.3452
1120.5	243.2922	+0.7807	5.35753	650289	-2.40767	-4.41943	-1.83709	+ 4.4236	+ 8.1197	+ 3.3752
1130.5	244.0752	.7663	.35474	651307	2.34083	4.44637	1.85028	4.3075	8.1820	3.4048
1140.5	244.8591	.7518	.35191	652338	2.27354	4.47245	1.86311	4.1903	8.2430	3.4338
1150.5	245.6439	.7370	.34906	653384	2.20581	4.49767	1.87558	4.0720	8.3028	3.4624
1160.5	246.4294	+0.7222	5.34617	654443	-2.13765	-4.52201	-1.88769	+ 3.9525	+ 8.3613	+ 3.4904
1170.5	247.2158	.7072	.34325	655515	2.06907	4.54548	1.89944	3.8320	8.4185	3.5179
1180.5	248.0031	.6920	.34031	656600	2.00010	4.56807	1.91082	3.7104	8.4743	3.5448
1190.5	248.7912	.6767	.33733	657699	1.93074	4.58977	1.92182	3.5877	8.5288	3.5712
1200.5	249.5803	+0.6612	5.33433	658810	-1.86100	-4.61058	-1.93245	+ 3.4640	+ 8.5819	+ 3.5970
1210.5	250.3702	.6456	.33130	659934	1.79089	4.63048	1.94270	3.3392	8.6337	3.6222
1220.5	251.1610	.6299	.32824	661071	1.72044	4.64948	1.95258	3.2133	8.6840	3.6469
1230.5	251.9527	.6140	.32516	662221	1.64965	4.66757	1.96207	3.0865	8.7330	3.6710
1240.5	252.7453	+0.5980	5.32205	663383	-1.57854	-4.68475	-1.97117	+ 2.9586	+ 8.7805	+ 3.6945

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
0760.5	43.6886	-2.3327	9.17324	129549	+6.62772	+5.95690	+2.17646	+7.0589	+4.5298	+1.7945
0770.5	44.0498	.3272	.17097	129645	6.58607	5.99330	2.19331	6.9923	4.6219	1.8357
0780.5	44.4111	.3216	.16871	129741	6.54417	6.02948	2.21008	6.9243	4.7134	1.8766
0790.5	44.7727	.3158	.16646	129836	6.50202	6.06542	2.22677	6.8551	4.8043	1.9172
0800.5	45.1344	-2.3100	9.16423	129931	+6.45962	+6.10113	+2.24337	+6.7846	+4.8944	+1.9576
0810.5	45.4963	.3041	.16201	130025	6.41697	6.13660	2.25988	6.7127	4.9838	1.9977
0820.5	45.8583	.2981	.15981	130119	6.37408	6.17184	2.27630	6.6396	5.0724	2.0375
0830.5	46.2206	.2920	.15762	130212	6.33094	6.20685	2.29264	6.5652	5.1604	2.0770
0840.5	46.5829	-2.2858	9.15544	130305	+6.28756	+6.24161	+2.30889	+6.4894	+5.2475	+2.1163
0850.5	46.9455	.2795	.15328	130398	6.24394	6.27613	2.32505	6.4124	5.3339	2.1552
0860.5	47.3082	.2731	.15113	130490	6.20008	6.31041	2.34113	6.3341	5.4196	2.1938
0870.5	47.6711	.2666	.14899	130581	6.15597	6.34445	2.35711	6.2546	5.5044	2.2321
0880.5	48.0342	-2.2601	9.14687	130672	+6.11163	+6.37825	+2.37300	+6.1737	+5.5884	+2.2701
0890.5	48.3974	.2534	.14476	130763	6.06706	6.41179	2.38880	6.0916	5.6716	2.3078
0900.5	48.7608	.2466	.14267	130852	6.02225	6.44509	2.40450	6.0082	5.7539	2.3452
0910.5	49.1244	.2398	.14059	130942	5.97721	6.47814	2.42012	5.9236	5.8354	2.3822
0920.5	49.4881	-2.2328	9.13852	131031	+5.93193	+6.51095	+2.43564	+5.8377	+5.9160	+2.4188
0930.5	49.8520	.2258	.13647	131119	5.88643	6.54349	2.45107	5.7505	5.9957	2.4551
0940.5	50.2160	.2186	.13443	131207	5.84070	6.57579	2.46640	5.6621	6.0746	2.4911
0950.5	50.5802	.2114	.13241	131294	5.79474	6.60783	2.48163	5.5725	6.1525	2.5267
0960.5	50.9445	-2.2041	9.13040	131380	+5.74856	+6.63961	+2.49677	+5.4816	+6.2295	+2.5619
0970.5	51.3090	.1967	.12841	131466	5.70215	6.67114	2.51181	5.3895	6.3055	2.5968
0980.5	51.6737	.1892	.12643	131552	5.65553	6.70241	2.52676	5.2962	6.3806	2.6312
0990.5	52.0385	.1816	.12447	131637	5.60868	6.73341	2.54161	5.2017	6.4547	2.6653
1000.5	52.4035	-2.1739	9.12252	131721	+5.56162	+6.76416	+2.55635	+5.1059	+6.5279	+2.6990
1010.5	52.7686	.1661	.12059	131805	5.51434	6.79464	2.57100	5.0090	6.6000	2.7323
1020.5	53.1339	.1582	.11867	131888	5.46684	6.82486	2.58555	4.9108	6.6711	2.7651
1030.5	53.4993	.1503	.11677	131971	5.41913	6.85481	2.60000	4.8115	6.7411	2.7976
1040.5	53.8649	-2.1422	9.11488	132053	+5.37121	+6.88450	+2.61435	+4.7110	+6.8101	+2.8296
1050.5	54.2306	.1341	.11301	132134	5.32309	6.91391	2.62859	4.6093	6.8781	2.8612
1060.5	54.5964	.1258	.11115	132215	5.27475	6.94306	2.64274	4.5064	6.9449	2.8923
1070.5	54.9624	.1175	.10931	132295	5.22621	6.97193	2.65677	4.4024	7.0107	2.9231
1080.5	55.3286	-2.1091	9.10749	132375	+5.17746	+7.00054	+2.67071	+4.2972	+7.0753	+2.9533
1090.5	55.6949	.1006	.10568	132453	5.12851	7.02887	2.68454	4.1909	7.1388	2.9831
1100.5	56.0613	.0920	.10388	132532	5.07936	7.05692	2.69827	4.0834	7.2011	3.0124
1110.5	56.4279	.0833	.10211	132609	5.03001	7.08470	2.71189	3.9748	7.2623	3.0413
1120.5	56.7946	-2.0745	9.10035	132686	+4.98047	+7.11220	+2.72540	+3.8651	+7.3222	+3.0696
1130.5	57.1614	.0657	.09860	132763	4.93073	7.13943	2.73881	3.7543	7.3810	3.0975
1140.5	57.5284	.0567	.09687	132838	4.88079	7.16637	2.75211	3.6424	7.4386	3.1249
1150.5	57.8956	.0477	.09516	132914	4.83067	7.19303	2.76530	3.5294	7.4949	3.1518
1160.5	58.2628	-2.0386	9.09346	132988	+4.78035	+7.21941	+2.77839	+3.4153	+7.5499	+3.1781
1170.5	58.6302	.0293	.09178	133062	4.72985	7.24551	2.79136	3.3002	7.6037	3.2040
1180.5	58.9977	.0200	.09012	133135	4.67916	7.27132	2.80423	3.1840	7.6562	3.2293
1190.5	59.3654	.0107	.08847	133207	4.62828	7.29684	2.81698	3.0667	7.7074	3.2540
1200.5	59.7332	-2.0012	9.08684	133279	+4.57723	+7.32208	+2.82963	+2.9484	+7.7572	+3.2783
1210.5	60.1011	.9916	.08523	133350	4.52599	7.34703	2.84216	2.8291	7.8057	3.3019
1220.5	60.4691	.9820	.08363	133420	4.47458	7.37169	2.85458	2.7088	7.8529	3.3251
1230.5	60.8373	.9723	.08205	133490	4.42299	7.39606	2.86689	2.5875	7.8987	3.3476
1240.5	61.2055	-1.9624	9.08049	133559	+4.37122	+7.42014	+2.87909	+2.4653	+7.9430	+3.3696

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
1240.5	252.7453	+0.5980	5.32205	663383	-1.57854	-4.68475	-1.97117	+ 2.9586	+ 8.7805	+ 3.6945
1250.5	253.5389	.5819	.31891	664558	1.50712	4.70100	1.97989	2.8298	8.8266	3.7174
1260.5	254.3333	.5656	.31575	665744	1.43540	4.71633	1.98822	2.6999	8.8712	3.7397
1270.5	255.1288	.5492	.31256	666943	1.36339	4.73073	1.99616	2.5691	8.9143	3.7614
1280.5	255.9252	+0.5326	5.30935	668153	-1.29112	-4.74419	-2.00370	+ 2.4373	+ 8.9559	+ 3.7825
1290.5	256.7225	.5160	.30612	669376	1.21859	4.75672	2.01085	2.3046	8.9959	3.8029
1300.5	257.5208	.4992	.30286	670610	1.14582	4.76830	2.01760	2.1710	9.0345	3.8227
1310.5	258.3201	.4823	.29958	671856	1.07283	4.77894	2.02394	2.0365	9.0714	3.8419
1320.5	259.1204	+0.4653	5.29628	673112	-0.99962	-4.78862	-2.02989	+ 1.9010	+ 9.1068	+ 3.8604
1330.5	259.9217	.4482	.29296	674380	0.92621	4.79735	2.03543	1.7647	9.1406	3.8782
1340.5	260.7240	.4309	.28962	675659	0.85261	4.80512	2.04056	1.6276	9.1728	3.8953
1350.5	261.5273	.4136	.28626	676948	0.77885	4.81193	2.04528	1.4896	9.2033	3.9118
1360.5	262.3316	+0.3962	5.28288	678249	-0.70493	-4.81778	-2.04960	+ 1.3508	+ 9.2322	+ 3.9276
1370.5	263.1370	.3786	.27948	679559	0.63086	4.82266	2.05350	1.2112	9.2594	3.9427
1380.5	263.9434	.3610	.27606	680880	0.55667	4.82656	2.05699	1.0709	9.2849	3.9571
1390.5	264.7508	.3432	.27263	682211	0.48237	4.82950	2.06006	0.9298	9.3087	3.9707
1400.5	265.5593	+0.3254	5.26918	683552	-0.40797	-4.83146	-2.06272	+ 0.7879	+ 9.3308	+ 3.9837
1410.5	266.3688	.3075	.26571	684903	0.33349	4.83244	2.06496	0.6453	9.3511	3.9959
1420.5	267.1794	.2895	.26223	686262	0.25894	4.83243	2.06679	0.5021	9.3697	4.0073
1430.5	267.9911	.2714	.25874	687632	0.18434	4.83145	2.06819	0.3581	9.3865	4.0180
1440.5	268.8039	+0.2533	5.25523	689010	-0.10970	-4.82948	-2.06917	+ 0.2136	+ 9.4015	+ 4.0280
1450.5	269.6177	.2350	.25171	690397	-0.03504	4.82653	2.06973	+ 0.0683	9.4146	4.0372
1460.5	270.4327	.2167	.24817	691792	+0.03963	4.82259	2.06986	- 0.0775	9.4260	4.0456
1470.5	271.2487	.1983	.24463	693197	0.11429	4.81767	2.06957	0.2238	9.4354	4.0533
1480.5	272.0659	+0.1799	5.24107	694609	+0.18893	-4.81175	-2.06886	- 0.3708	+ 9.4431	+ 4.0601
1490.5	272.8841	.1614	.23750	696029	0.26353	4.80484	2.06772	0.5182	9.4488	4.0662
1500.5	273.7035	.1428	.23393	697457	0.33807	4.79695	2.06615	0.6662	9.4526	4.0715
1510.5	274.5240	.1242	.23034	698892	0.41255	4.78806	2.06416	0.8146	9.4545	4.0759
1520.5	275.3456	+0.1056	5.22675	700335	+0.48694	-4.77818	-2.06174	- 0.9635	+ 9.4545	+ 4.0795
1530.5	276.1683	.0868	.22315	701784	0.56122	4.76731	2.05889	1.1128	9.4525	4.0823
1540.5	276.9922	.0681	.21954	703240	0.63540	4.75545	2.05562	1.2625	9.4485	4.0843
1550.5	277.8172	.0493	.21593	704703	0.70943	4.74260	2.05192	1.4125	9.4426	4.0854
1560.5	278.6434	+0.0305	5.21231	706171	+0.78332	-4.72876	-2.04778	- 1.5629	+ 9.4347	+ 4.0857
1570.5	279.4707	+ .0116	.20868	707646	0.85705	4.71393	2.04322	1.7135	9.4247	4.0851
1580.5	280.2991	- .0073	.20506	709126	0.93060	4.69811	2.03824	1.8645	9.4127	4.0836
1590.5	281.1288	.0262	.20143	710611	1.00395	4.68130	2.03282	2.0156	9.3987	4.0813
1600.5	281.9595	-0.0452	5.19780	712102	+1.07709	-4.66351	-2.02697	- 2.1670	+ 9.3826	+ 4.0781
1610.5	282.7915	.0641	.19416	713597	1.15000	4.64474	2.02070	2.3186	9.3645	4.0740
1620.5	283.6246	.0831	.19053	715097	1.22267	4.62498	2.01400	2.4703	9.3442	4.0691
1630.5	284.4588	.1021	.18690	716601	1.29508	4.60425	2.00688	2.6221	9.3219	4.0632
1640.5	285.2943	-0.1211	5.18326	718108	+1.36722	-4.58254	-1.99933	- 2.7739	+ 9.2975	+ 4.0564
1650.5	286.1309	.1400	.17963	719619	1.43907	4.55985	1.99135	2.9259	9.2709	4.0487
1660.5	286.9687	.1590	.17601	721134	1.51060	4.53619	1.98295	3.0778	9.2422	4.0401
1670.5	287.8076	.1780	.17238	722651	1.58182	4.51156	1.97412	3.2297	9.2114	4.0306
1680.5	288.6478	-0.1970	5.16876	724171	+1.65270	-4.48597	-1.96488	- 3.3815	+ 9.1784	+ 4.0202
1690.5	289.4891	.2159	.16514	725693	1.72322	4.45941	1.95521	3.5332	9.1432	4.0088
1700.5	290.3316	.2348	.16153	727217	1.79337	4.43190	1.94512	3.6847	9.1059	3.9965
1710.5	291.1753	.2537	.15793	728743	1.86314	4.40343	1.93461	3.8361	9.0664	3.9833
1720.5	292.0201	-0.2726	5.15433	730269	+1.93250	-4.37401	-1.92369	- 3.9872	+ 9.0247	+ 3.9691

SATURN

83

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
1240.5	61.2055	-1.9624	9.08049	133559	+4.37122	+7.42014	+2.87909	+ 2.4653	+ 7.9430	+3.3696
1250.5	61.5740	·9525	·07894	133627	4.31928	7.44393	2.89117	2.3420	7.9860	3.3909
1260.5	61.9425	·9426	·07741	133695	4.26718	7.46742	2.90314	2.2178	8.0275	3.4117
1270.5	62.3111	·9325	·07590	133762	4.21490	7.49062	2.91499	2.0926	8.0675	3.4319
1280.5	62.6799	-1.9223	9.07440	133828	+4.16245	+7.51352	+2.92673	+ 1.9666	+ 8.1061	+3.4515
1290.5	63.0488	·9121	·07293	133893	4.10985	7.53613	2.93835	1.8396	8.1432	3.4705
1300.5	63.4178	·9018	·07147	133958	4.05708	7.55844	2.94986	1.7117	8.1788	3.4888
1310.5	63.7869	·8914	·07002	134022	4.00414	7.58045	2.96125	1.5829	8.2129	3.5065
1320.5	64.1562	-1.8809	9.06860	134085	+3.95105	+7.60215	+2.97252	+ 1.4533	+ 8.2454	+3.5235
1330.5	64.5255	·8704	·06719	134147	3.89781	7.62356	2.98368	1.3229	8.2764	3.5400
1340.5	64.8950	·8597	·06580	134209	3.84440	7.64467	2.99472	1.1916	8.3057	3.5557
1350.5	65.2645	·8490	·06443	134270	3.79085	7.66547	3.00563	1.0595	8.3335	3.5708
1360.5	65.6342	-1.8382	9.06307	134330	+3.73714	+7.68597	+3.01643	+ 0.9266	+ 8.3597	+3.5852
1370.5	66.0040	·8273	·06174	134390	3.68329	7.70617	3.02711	0.7929	8.3842	3.5989
1380.5	66.3739	·8163	·06042	134448	3.62929	7.72605	3.03767	0.6585	8.4071	3.6119
1390.5	66.7439	·8053	·05912	134506	3.57515	7.74564	3.04811	0.5234	8.4283	3.6243
1400.5	67.1140	-1.7942	9.05783	134564	+3.52086	+7.76491	+3.05843	+ 0.3875	+ 8.4478	+3.6359
1410.5	67.4842	·7830	·05657	134620	3.46643	7.78388	3.06863	0.2510	8.4656	3.6468
1420.5	67.8544	·7717	·05532	134676	3.41187	7.80253	3.07870	+ 0.1138	8.4817	3.6569
1430.5	68.2248	·7604	·05409	134730	3.35717	7.82088	3.08866	- 0.0241	8.4960	3.6664
1440.5	68.5953	-1.7489	9.05288	134784	+3.30233	+7.83892	+3.09849	- 0.1626	+ 8.5086	+3.6751
1450.5	68.9659	·7374	·05169	134838	3.24737	7.85664	3.10819	0.3017	8.5194	3.6830
1460.5	69.3366	·7258	·05051	134890	3.19227	7.87405	3.11778	0.4414	8.5284	3.6902
1470.5	69.7074	·7142	·04936	134942	3.13705	7.89115	3.12723	0.5816	8.5356	3.6967
1480.5	70.0783	-1.7025	9.04822	134993	+3.08170	+7.90793	+3.13657	- 0.7223	+ 8.5409	+3.7023
1490.5	70.4492	·6906	·04710	135043	3.02622	7.92440	3.14578	0.8636	8.5444	3.7072
1500.5	70.8203	·6788	·04600	135092	2.97063	7.94055	3.15486	1.0053	8.5461	3.7113
1510.5	71.1914	·6668	·04492	135141	2.91492	7.95639	3.16382	1.1475	8.5459	3.7146
1520.5	71.5626	-1.6548	9.04386	135188	+2.85909	+7.97190	+3.17265	- 1.2901	+ 8.5437	+3.7171
1530.5	71.9339	·6427	·04281	135235	2.80315	7.98710	3.18136	1.4331	8.5397	3.7187
1540.5	72.3053	·6305	·04179	135281	2.74709	8.00198	3.18993	1.5765	8.5337	3.7196
1550.5	72.6768	·6183	·04078	135326	2.69093	8.01654	3.19838	1.7202	8.5258	3.7196
1560.5	73.0483	-1.6060	9.039 9	135371	+2.63465	+8.03078	+3.20671	- 1.8643	+ 8.5159	+3.7188
1570.5	73.4200	·5936	·03882	135414	2.57827	8.04470	3.21490	2.0086	8.5041	3.7172
1580.5	73.7917	·5811	·03788	135457	2.52179	8.05830	3.22297	2.1531	8.4903	3.7147
1590.5	74.1634	·5686	·03694	135499	2.46520	8.07158	3.23091	2.2979	8.4745	3.7114
1600.5	74.5353	-1.5560	9.03603	135540	+2.40852	+8.08453	+3.23872	- 2.4429	+ 8.4566	+3.7071
1610.5	74.9072	·5434	·03514	135580	2.35174	8.09716	3.24639	2.5880	8.4367	3.7021
1620.5	75.2792	·5306	·03427	135619	2.29487	8.10946	3.25394	2.7333	8.4148	3.6961
1630.5	75.6513	·5178	·03341	135658	2.23790	8.12144	3.26136	2.8786	8.3909	3.6893
1640.5	76.0234	-1.5050	9.03258	135695	+2.18084	+8.13310	+3.26865	- 3.0240	+ 8.3648	+3.6816
1650.5	76.3956	·4920	·03176	135732	2.12370	8.14443	3.27581	3.1695	8.3367	3.6730
1660.5	76.7679	·4790	·03097	135768	2.06646	8.15543	3.28283	3.3149	8.3065	3.6635
1670.5	77.1402	·4660	·03019	135803	2.00915	8.16611	3.28973	3.4602	8.2742	3.6531
1680.5	77.5126	-1.4529	9.02943	135837	+1.95176	+8.17646	+3.29649	- 3.6055	+ 8.2398	+3.6418
1690.5	77.8851	·4397	·02869	135871	1.89428	8.18648	3.30312	3.7507	8.2033	3.6295
1700.5	78.2576	·4264	·02797	135903	1.83673	8.19617	3.30962	3.8957	8.1646	3.6164
1710.5	78.6302	·4131	·02727	135935	1.77911	8.20553	3.31598	4.0405	8.1238	3.6023
1720.5	79.0028	-1.3998	9.02659	135965	+1.72141	+8.21456	+3.32221	- 4.1850	+ 8.0808	+3.5873

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
244	°	°		0.00						
1720.5	292.0201	-0.2726	5.15433	730269	+1.93250	-4.37401	-1.92369	- 3.9872	+ 9.0247	+ 3.9691
1730.5	292.8662	.2915	.15074	731797	2.00145	4.34365	1.91235	4.1381	8.9808	3.9539
1740.5	293.7134	.3103	.14716	733325	2.06996	4.31234	1.90059	4.2887	8.9347	3.9378
1750.5	294.5618	.3290	.14359	734853	2.13802	4.28010	1.88842	4.4390	8.8864	3.9208
1760.5	295.4114	-0.3477	5.14003	736382	+2.20562	-4.24692	-1.87584	- 4.5888	+ 8.8358	+ 3.9027
1770.5	296.2621	.3664	.13648	737909	2.27274	4.21282	1.86285	4.7383	8.7831	3.8837
1780.5	297.1141	.3850	.13294	739436	2.33935	4.17780	1.84946	4.8873	8.7281	3.8638
1790.5	297.9672	.4036	.12942	740961	2.40546	4.14187	1.83566	5.0357	8.6708	3.8429
1800.5	298.8215	-0.4220	5.12591	742485	+2.47104	-4.10502	-1.82145	- 5.1837	+ 8.6114	+ 3.8210
1810.5	299.6769	.4405	.12241	744007	2.53608	4.06727	1.80685	5.3310	8.5497	3.7981
1820.5	300.5336	.4588	.11893	745526	2.60055	4.02863	1.79185	5.4777	8.4857	3.7743
1830.5	301.3914	.4771	.11546	747042	2.66445	3.98910	1.77645	5.6237	8.4195	3.7494
1840.5	302.2503	-0.4953	5.11202	748555	+2.72777	-3.94868	-1.76066	- 5.7690	+ 8.3511	+ 3.7236
1850.5	303.1104	.5133	.10858	750065	2.79047	3.90739	1.74448	5.9135	8.2805	3.6969
1860.5	303.9717	.5314	.10517	751570	2.85256	3.86523	1.72791	6.0572	8.2076	3.6691
1870.5	304.8341	.5493	.10178	753071	2.91401	3.82221	1.71095	6.2001	8.1324	3.6404
1880.5	305.6977	-0.5671	5.09840	754567	+2.97482	-3.77833	-1.69362	- 6.3420	+ 8.0550	+ 3.6106
1890.5	306.5625	.5848	.09505	756058	3.03496	3.73362	1.67590	6.4830	7.9754	3.5799
1900.5	307.4283	.6024	.09172	757544	3.09441	3.68806	1.65781	6.6230	7.8936	3.5482
1910.5	308.2953	.6198	.08841	759023	3.15318	3.64168	1.63935	6.7620	7.8096	3.5156
1920.5	309.1635	-0.6372	5.08512	760495	+3.21123	-3.59448	-1.62052	- 6.8998	+ 7.7233	+ 3.4819
1930.5	310.0327	.6544	.08186	761961	3.26856	3.54648	1.60133	7.0365	7.6348	3.4473
1940.5	310.9031	.6715	.07862	763420	3.32516	3.49767	1.58177	7.1721	7.5442	3.4118
1950.5	311.7746	.6885	.07541	764870	3.38100	3.44807	1.56186	7.3064	7.4513	3.3752
1960.5	312.6472	-0.7053	5.07222	766313	+3.43608	-3.39769	-1.54159	- 7.4394	+ 7.3563	+ 3.3377
1970.5	313.5209	.7220	.06906	767747	3.49037	3.34653	1.52098	7.5711	7.2591	3.2992
1980.5	314.3957	.7386	.06593	769172	3.54387	3.29462	1.50001	7.7014	7.1598	3.2598
1990.5	315.2715	.7550	.06282	770587	3.59657	3.24196	1.47871	7.8303	7.0583	3.2194
2000.5	316.1485	-0.7712	5.05975	771993	+3.64844	-3.18855	-1.45707	- 7.9577	+ 6.9547	+ 3.1781
2010.5	317.0265	.7873	.05671	773388	3.69948	3.13442	1.43509	8.0837	6.8489	3.1358
2020.5	317.9056	.8032	.05369	774772	3.74968	3.07957	1.41279	8.2080	6.7411	3.0926
2030.5	318.7857	.8189	.05071	776145	3.79901	3.02401	1.39016	8.3307	6.6313	3.0484
2040.5	319.6668	-0.8345	5.04776	777507	+3.84747	-2.96776	-1.36721	- 8.4518	+ 6.5193	+ 3.0034
2050.5	320.5490	.8498	.04484	778856	3.89504	2.91082	1.34395	8.5711	6.4053	2.9574
2060.5	321.4322	.8650	.04196	780194	3.94171	2.85322	1.32037	8.6887	6.2894	2.9105
2070.5	322.3165	.8800	.03911	781518	3.98748	2.79495	1.29650	8.8045	6.1714	2.8627
2080.5	323.2017	-0.8949	5.03630	782828	+4.03232	-2.73604	-1.27232	- 8.9185	+ 6.0514	+ 2.8141
2090.5	324.0879	.9095	.03352	784125	4.07622	2.67649	1.24785	9.0305	5.9295	2.7645
2100.5	324.9751	.9239	.03078	785407	4.11918	2.61632	1.22308	9.1406	5.8057	2.7141
2110.5	325.8632	.9381	.02807	786675	4.16118	2.55554	1.19804	9.2487	5.6800	2.6628
2120.5	326.7524	-0.9521	5.02541	787928	+4.20221	-2.49417	-1.17271	- 9.3548	+ 5.5524	+ 2.6106
2130.5	327.6424	.9659	.02278	789165	4.24226	2.43221	1.14711	9.4588	5.4230	2.5577
2140.5	328.5334	.9794	.02019	790387	4.28132	2.36969	1.12124	9.5606	5.2918	2.5039
2150.5	329.4253	0.9928	.01764	791592	4.31937	2.30661	1.09511	9.6603	5.1588	2.4492
2160.5	330.3181	-1.0059	5.01513	792780	+4.35642	-2.24299	-1.06872	- 9.7578	+ 5.0240	+ 2.3938
2170.5	331.2118	.0188	.01267	793951	4.39244	2.17885	1.04209	9.8530	4.8875	2.3376
2180.5	332.1064	.0314	.01024	795104	4.42742	2.11419	1.01520	9.9459	4.7494	2.2806
2190.5	333.0019	.0438	.00786	796239	4.46137	2.04903	0.98808	10.0365	4.6096	2.2228
2200.5	333.8982	-1.0560	5.00552	797356	+4.49426	-1.98339	-0.96073	-10.1247	+ 4.4682	+ 2.1643

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
1720.5	79.0028	-1.3998	9.02659	135965	+1.72141	+8.21456	+3.32221	- 4.1850	+ 8.0808	+3.5873
1730.5	79.3755	.3863	.02593	135995	1.66364	8.22327	3.32831	4.3293	8.0357	3.5714
1740.5	79.7482	.3728	.02529	136024	1.60581	8.23164	3.33428	4.4733	7.9884	3.5545
1750.5	80.1210	.3593	.02467	136052	1.54791	8.23968	3.34011	4.6169	7.9390	3.5367
1760.5	80.4938	-1.3457	9.02407	136079	+1.48995	+8.24740	+3.34580	- 4.7602	+ 7.8874	+3.5180
1770.5	80.8667	.3320	.02349	136106	1.43192	8.25478	3.35136	4.9030	7.8336	3.4983
1780.5	81.2397	.3183	.02293	136131	1.37384	8.26182	3.35679	5.0453	7.7776	3.4776
1790.5	81.6126	.3045	.02239	136156	1.31571	8.26854	3.36208	5.1871	7.7194	3.4560
1800.5	81.9857	-1.2906	9.02186	136179	+1.25752	+8.27492	+3.36724	- 5.3284	+ 7.6591	+3.4335
1810.5	82.3587	.2767	.02136	136202	1.19928	8.28097	3.37226	5.4690	7.5965	3.4100
1820.5	82.7318	.2628	.02088	136224	1.14099	8.28669	3.37715	5.6090	7.5318	3.3855
1830.5	83.1050	.2487	.02042	136245	1.08265	8.29208	3.38190	5.7484	7.4648	3.3601
1840.5	83.4782	-1.2347	9.01997	136265	+1.02427	+8.29713	+3.38651	- 5.8869	+ 7.3957	+3.3337
1850.5	83.8514	.2205	.01955	136284	0.96585	8.30184	3.39099	6.0248	7.3243	3.3063
1860.5	84.2246	.2064	.01915	136302	0.90739	8.30623	3.39533	6.1617	7.2508	3.2780
1870.5	84.5979	.1921	.01877	136320	0.84889	8.31027	3.39954	6.2979	7.1751	3.2487
1880.5	84.9712	-1.1779	9.01840	136336	+0.79035	+8.31399	+3.40361	- 6.4331	+ 7.0971	+3.2185
1890.5	85.3446	.1635	.01806	136352	0.73179	8.31737	3.40754	6.5673	7.0170	3.1873
1900.5	85.7179	.1492	.01774	136366	0.67319	8.32041	3.41133	6.7006	6.9348	3.1551
1910.5	86.0913	.1347	.01743	136380	0.61456	8.32312	3.41499	6.8328	6.8503	3.1220
1920.5	86.4648	-1.1202	9.01715	136393	+0.55591	+8.32549	+3.41851	- 6.9639	+ 6.7637	+3.0879
1930.5	86.8382	.1057	.01689	136405	0.49724	8.32753	3.42189	7.0939	6.6749	3.0529
1940.5	87.2117	.0911	.01665	136416	0.43855	8.32923	3.42513	7.2226	6.5840	3.0169
1950.5	87.5852	.0765	.01642	136426	0.37984	8.33060	3.42824	7.3502	6.4909	2.9800
1960.5	87.9587	-1.0618	9.01622	136435	+0.32111	+8.33163	+3.43120	- 7.4764	+ 6.3957	+2.9421
1970.5	88.3322	.0471	.01604	136443	0.26237	8.33232	3.43403	7.6014	6.2983	2.9033
1980.5	88.7057	.0324	.01588	136451	0.20361	8.33268	3.43672	7.7249	6.1989	2.8635
1990.5	89.0793	.0176	.01574	136457	0.14485	8.33270	3.43927	7.8470	6.0974	2.8228
2000.5	89.4528	-1.0027	9.01561	136463	+0.08608	+8.33239	+3.44169	- 7.9677	+ 5.9938	+2.7812
2010.5	89.8264	.09878	.01551	136467	+0.02731	8.33174	3.44396	8.0868	5.8881	2.7386
2020.5	90.2000	.9729	.01543	136471	-0.03147	8.33075	3.44610	8.2044	5.7804	2.6951
2030.5	90.5736	.9579	.01537	136474	0.09024	8.32943	3.44809	8.3203	5.6706	2.6508
2040.5	90.9472	-0.9429	9.01533	136476	-0.14901	+8.32777	+3.44995	- 8.4346	+ 5.5589	+2.6055
2050.5	91.3208	.9278	.01531	136477	0.20778	8.32578	3.45167	8.5472	5.4451	2.5593
2060.5	91.6944	.9127	.01531	136477	0.26654	8.32345	3.45325	8.6580	5.3294	2.5122
2070.5	92.0680	.8976	.01533	136476	0.32529	8.32079	3.45469	8.7670	5.2117	2.4643
2080.5	92.4416	-0.8824	9.01537	136474	-0.38402	+8.31778	+3.45599	- 8.8742	+ 5.0921	+2.4155
2090.5	92.8152	.8672	.01543	136471	0.44274	8.31445	3.45715	8.9795	4.9706	2.3658
2100.5	93.1888	.8519	.01551	136468	0.50145	8.31078	3.45817	9.0828	4.8473	2.3152
2110.5	93.5624	.8366	.01561	136463	0.56013	8.30677	3.45905	9.1841	4.7220	2.2639
2120.5	93.9360	-0.8213	9.01573	136457	-0.61880	+8.30243	+3.45980	- 9.2834	+ 4.5950	+2.2117
2130.5	94.3096	.8060	.01587	136451	0.67744	8.29775	3.46040	9.3806	4.4662	2.1586
2140.5	94.6832	.7906	.01603	136444	0.73605	8.29274	3.46086	9.4758	4.3356	2.1048
2150.5	95.0567	.7751	.01622	136435	0.79463	8.28739	3.46119	9.5687	4.2032	2.0502
2160.5	95.4303	-0.7597	9.01642	136426	-0.85319	+8.28171	+3.46137	- 9.6594	+ 4.0692	+1.9947
2170.5	95.8038	.7442	.01664	136416	0.91171	8.27570	3.46142	9.7479	3.9335	1.9385
2180.5	96.1773	.7287	.01688	136405	0.97019	8.26935	3.46132	9.8341	3.7962	1.8816
2190.5	96.5508	.7131	.01714	136393	1.02863	8.26267	3.46109	9.9179	3.6572	1.8239
2200.5	96.9243	-0.6976	9.01743	136381	-1.08704	+8.25565	+3.46071	- 9.9994	+ 3.5167	+1.7655

JUPITER

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude l	Latitude b			x	y	z	X	Y	Z
244	°	°		0.00						
2200.5	333.8982	-1.0560	5.00552	797356	+4.49426	-1.98339	-0.96073	-10.1247	+ 4.4682	+2.1643
2210.5	334.7953	·0679	·00323	798454	4.52609	1.91729	0.93314	10.2104	4.3252	2.1051
2220.5	335.6933	·0796	5.00097	799533	4.55685	1.85073	0.90534	10.2937	4.1807	2.0451
2230.5	336.5920	·0910	4.99877	800592	4.58653	1.78373	0.87732	10.3745	4.0347	1.9845
2240.5	337.4916	-1.1021	4.99661	801631	+4.61513	-1.71630	-0.84910	-10.4527	+ 3.8872	+1.9231
2250.5	338.3919	·1130	·99449	802650	4.64263	1.64848	0.82067	10.5283	3.7383	1.8611
2260.5	339.2930	·1236	·99242	803648	4.66902	1.58025	0.79205	10.6013	3.5881	1.7984
2270.5	340.1949	·1340	·99040	804624	4.69430	1.51166	0.76324	10.6717	3.4365	1.7351
2280.5	341.0974	-1.1441	4.98843	805580	+4.71847	-1.44270	-0.73425	-10.7394	+ 3.2836	+1.6712
2290.5	342.0007	·1539	·98651	806513	4.74151	1.37340	0.70508	10.8043	3.1295	1.6066
2300.5	342.9047	·1634	·98463	807424	4.76341	1.30377	0.67574	10.8665	2.9742	1.5415
2310.5	343.8093	·1726	·98280	808313	4.78418	1.23383	0.64625	10.9259	2.8178	1.4759
2320.5	344.7147	-1.1816	4.98103	809178	+4.80380	-1.16359	-0.61659	-10.9824	+ 2.6602	+1.4097
2330.5	345.6206	·1903	·97930	810020	4.82227	1.09307	0.58679	11.0361	2.5016	1.3429
2340.5	346.5272	·1986	·97762	810839	4.83958	1.02229	0.55685	11.0869	2.3420	1.2757
2350.5	347.4344	·2067	·97600	811633	4.85573	0.95127	0.52678	11.1348	2.1814	1.2080
2360.5	348.3421	-1.2145	4.97442	812404	+4.87071	-0.88002	-0.49658	-11.1798	+ 2.0199	+1.1398
2370.5	349.2505	·2220	·97290	813150	4.88453	0.80856	0.46626	11.2218	1.8576	1.0712
2380.5	350.1594	·2292	·97143	813871	4.89716	0.73690	0.43582	11.2608	1.6945	1.0022
2390.5	351.0688	·2360	·97002	814567	4.90861	0.66506	0.40529	11.2968	1.5306	0.9327
2400.5	351.9787	-1.2426	4.96865	815237	+4.91888	-0.59306	-0.37465	-11.3297	+ 1.3660	+0.8629
2410.5	352.8892	·2489	·96734	815883	4.92797	0.52092	0.34393	11.3596	1.2008	0.7928
2420.5	353.8001	·2548	·96609	816502	4.93586	0.44866	0.31312	11.3865	1.0350	0.7223
2430.5	354.7114	·2604	·96489	817094	4.94255	0.37629	0.28223	11.4102	0.8687	0.6516
2440.5	355.6232	-1.2657	4.96374	817661	+4.94806	-0.30382	-0.25128	-11.4308	+ 0.7019	+0.5805
2450.5	356.5354	·2707	·96265	818201	4.95236	0.23128	0.22026	11.4483	0.5347	0.5092
2460.5	357.4480	·2754	·96161	818714	4.95546	0.15869	0.18920	11.4627	0.3671	0.4376
2470.5	358.3610	·2798	·96063	819200	4.95736	0.08605	0.15808	11.4739	0.1992	0.3659
2480.5	359.2743	-1.2838	4.95970	819658	+4.95806	-0.01340	-0.12693	-11.4819	+ 0.0310	+0.2940
2490.5	0.1880	·2875	·95883	820090	4.95756	+0.05926	0.09575	11.4868	- 0.1373	0.2219
2500.5	1.1020	·2909	·95802	820493	4.95585	0.13190	0.06454	11.4885	0.3058	0.1496
2510.5	2.0162	·2939	·95726	820869	4.95293	0.20451	0.03332	11.4870	0.4743	0.0773
2520.5	2.9308	-1.2967	4.95656	821217	+4.94881	+0.27707	-0.00209	-11.4823	- 0.6429	+0.0049
2530.5	3.8456	·2991	·95592	821537	4.94349	0.34956	+0.02914	11.4744	0.8114	-0.0676
2540.5	4.7606	·3011	·95533	821828	4.93697	0.42197	0.06036	11.4633	0.9798	0.1402
2550.5	5.6758	·3028	·95481	822092	4.92924	0.49428	0.09157	11.4491	1.1480	0.2127
2560.5	6.5912	-1.3042	4.95433	822327	+4.92031	+0.56646	+0.12275	-11.4316	- 1.3161	-0.2852
2570.5	7.5068	·3053	·95392	822533	4.91019	0.63851	0.15391	11.4109	1.4838	0.3577
2580.5	8.4225	·3060	·95356	822711	4.89887	0.71040	0.18503	11.3871	1.6513	0.4301
2590.5	9.3383	·3064	·95326	822860	4.88635	0.78212	0.21610	11.3600	1.8183	0.5024
2600.5	10.2542	-1.3065	4.95302	822980	+4.87264	+0.85364	+0.24712	-11.3298	- 1.9849	-0.5746
2610.5	11.1702	·3062	·95284	823071	4.85775	0.92496	0.27808	11.2964	2.1510	0.6467
2620.5	12.0863	·3056	·95271	823133	4.84167	0.99606	0.30897	11.2599	2.3165	0.7186
2630.5	13.0024	·3047	·95265	823167	4.82441	1.06691	0.33979	11.2202	2.4813	0.7903
2640.5	13.9185	-1.3034	4.95264	823172	+4.80598	+1.13750	+0.37052	-11.1774	- 2.6455	-0.8617
2650.5	14.8346	·3018	·95269	823148	4.78637	1.20781	0.40117	11.1315	2.8090	0.9330
2660.5	15.7507	·2999	·95279	823095	4.76560	1.27783	0.43171	11.0825	2.9716	1.0040
2670.5	16.6667	·2976	·95296	823013	4.74366	1.34754	0.46215	11.0304	3.1334	1.0746
2680.5	17.5827	-1.2950	4.95318	822902	+4.72057	+1.41692	+0.49248	-10.9752	- 3.2943	-1.1450

SATURN

87

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude l	Latitude b			x	y	z	X	Y	Z
244	°	°		0.00						
22005	96.9243	-0.6976	9.01743	136381	-1.08704	+8.25565	+3.46071	-9.9994	+3.5167	+1.7655
22105	97.2977	.6819	.01773	136367	1.14540	8.24830	3.46020	10.0784	3.3747	1.7063
22205	97.6712	.6663	.01805	136352	1.20372	8.24062	3.45955	10.1550	3.2311	1.6465
22305	98.0446	.6506	.01840	136337	1.26198	8.23261	3.45876	10.2291	3.0862	1.5860
22405	98.4180	-0.6350	9.01876	136320	-1.32020	+8.22426	+3.45782	-10.3006	+2.9398	+1.5248
22505	98.7913	.6192	.01914	136303	1.37837	8.21559	3.45675	10.3695	2.7920	1.4629
22605	99.1646	.6035	.01954	136284	1.43648	8.20658	3.45554	10.4359	2.6429	1.4004
22705	99.5379	.5877	.01997	136265	1.49454	8.19724	3.45419	10.4996	2.4925	1.3373
22805	99.9112	-0.5720	9.02041	136245	-1.55253	+8.18757	+3.45270	-10.5606	+2.3409	+1.2736
22905	100.2844	.5561	.02088	136224	1.61047	8.17757	3.45107	10.6189	2.1881	1.2094
23005	100.6576	.5403	.02136	136202	1.66833	8.16724	3.44931	10.6745	2.0341	1.1445
23105	101.0308	.5245	.02186	136180	1.72614	8.15658	3.44740	10.7272	1.8791	1.0791
23205	101.4039	-0.5086	9.02239	136156	-1.78387	+8.14560	+3.44535	-10.7772	+1.7229	+1.0132
23305	101.7770	.4927	.02293	136131	1.84154	8.13428	3.44317	10.8243	1.5658	0.9468
23405	102.1500	.4768	.02349	136106	1.89913	8.12264	3.44085	10.8685	1.4077	0.8799
23505	102.5230	.4608	.02408	136079	1.95664	8.11067	3.43839	10.9098	1.2487	0.8126
23605	102.8960	-0.4449	9.02468	136052	-2.01408	+8.09837	+3.43579	-10.9482	+1.0888	+0.7448
23705	103.2689	.4289	.02530	136024	2.07144	8.08575	3.43305	10.9837	0.9281	0.6766
23805	103.6417	.4129	.02594	135995	2.12871	8.07280	3.43017	11.0161	0.7667	0.6079
23905	104.0145	.3969	.02661	135965	2.18590	8.05953	3.42716	11.0456	0.6045	0.5390
24005	104.3873	-0.3809	9.02729	135934	-2.24301	+8.04593	+3.42401	-11.0721	+0.4417	+0.4696
24105	104.7600	.3649	.02799	135902	2.30002	8.03201	3.42072	11.0955	0.2783	0.3999
24205	105.1326	.3489	.02871	135870	2.35694	8.01777	3.41729	11.1158	+0.1144	0.3300
24305	105.5052	.3328	.02946	135836	2.41377	8.00320	3.41372	11.1331	-0.0500	0.2597
24405	105.8778	-0.3167	9.03022	135802	-2.47050	+7.98831	+3.41002	-11.1473	-0.2149	+0.1892
24505	106.2503	.3007	.03100	135767	2.52714	7.97310	3.40618	11.1584	0.3801	0.1184
24605	106.6227	.2846	.03180	135731	2.58367	7.95757	3.40221	11.1663	0.5457	+0.0474
24705	106.9950	.2685	.03262	135694	2.64010	7.94172	3.39809	11.1711	0.7115	-0.0238
24805	107.3673	-0.2524	9.03346	135656	-2.69643	+7.92556	+3.39384	-11.1728	-0.8776	-0.0951
24905	107.7396	.2363	.03432	135617	2.75265	7.90907	3.38946	11.1713	1.0437	0.1666
25005	108.1117	.2202	.03519	135577	2.80876	7.89226	3.38494	11.1667	1.2100	0.2382
25105	108.4838	.2040	.03609	135537	2.86476	7.87514	3.38028	11.1588	1.3763	0.3099
25205	108.8558	-0.1879	9.03701	135496	-2.92064	+7.85770	+3.37549	-11.1479	-1.5426	-0.3817
25305	109.2278	.1718	.03795	135454	2.97641	7.83995	3.37056	11.1337	1.7088	0.4535
25405	109.5997	.1556	.03890	135411	3.03206	7.82188	3.36549	11.1164	1.8749	0.5253
25505	109.9715	.1395	.03988	135367	3.08759	7.80350	3.36029	11.0959	2.0407	0.5971
25605	110.3432	-0.1233	9.04087	135322	-3.14299	+7.78480	+3.35496	-11.0721	-2.2063	-0.6689
25705	110.7149	.1072	.04189	135277	3.19827	7.76580	3.34949	11.0453	2.3716	0.7406
25805	111.0865	.0910	.04292	135231	3.25343	7.74648	3.34389	11.0153	2.5365	0.8122
25905	111.4580	.0749	.04397	135183	3.30845	7.72685	3.33815	10.9821	2.7010	0.8838
26005	111.8294	-0.0588	9.04504	135135	-3.36334	+7.70691	+3.33228	-10.9457	-2.8650	-0.9552
26105	112.2007	.0426	.04613	135086	3.41810	7.68667	3.32628	10.9062	3.0284	1.0264
26205	112.5720	.0265	.04724	135037	3.47273	7.66611	3.32014	10.8636	3.1913	1.0974
26305	112.9432	-0.0103	.04836	134986	3.52721	7.64525	3.31388	10.8179	3.3535	1.1683
26405	113.3142	+0.0058	9.04951	134935	-3.58156	+7.62409	+3.30747	-10.7690	-3.5149	-1.2389
26505	113.6852	.0219	.05068	134883	3.63576	7.60261	3.30094	10.7171	3.6756	1.3092
26605	114.0561	.0381	.05186	134830	3.68982	7.58084	3.29427	10.6620	3.8354	1.3793
26705	114.4270	.0542	.05306	134776	3.74374	7.55876	3.28748	10.6040	3.9943	1.4491
26805	114.7977	+0.0703	9.05428	134722	-3.79750	+7.53638	+3.28055	-10.5428	-4.1523	-1.5185

JUPITER

Julian Date	Heliocentric		Radius Vector <i>r</i>	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude <i>l</i>	Latitude <i>b</i>			<i>x</i>	<i>y</i>	<i>z</i>	<i>X</i>	<i>Y</i>	<i>Z</i>
244	°	°		0.00						
2680.5	17.5827	-1.2950	4.95318	822902	+4.72057	+1.41692	+0.49248	-10.9752	-3.2943	-1.1450
2690.5	18.4985	.2921	.95346	822763	4.69633	1.48595	0.52269	10.9170	3.4542	1.2150
2700.5	19.4143	.2888	.95379	822595	4.67094	1.55462	0.55277	10.8557	3.6131	1.2847
2710.5	20.3299	.2853	.95419	822398	4.64441	1.62291	0.58271	10.7915	3.7709	1.3540
2720.5	21.2453	-1.2813	4.95464	822173	+4.61676	+1.69081	+0.61252	-10.7243	-3.9276	-1.4228
2730.5	22.1605	.2771	.95515	821919	4.58798	1.75830	0.64217	10.6542	4.0831	1.4913
2740.5	23.0756	.2725	.95572	821637	4.55808	1.82535	0.67167	10.5811	4.2374	1.5592
2750.5	23.9904	.2677	.95634	821327	4.52707	1.89197	0.70101	10.5052	4.3903	1.6267
2760.5	24.9050	-1.2624	4.95702	820988	+4.49496	+1.95812	+0.73017	-10.4263	-4.5420	-1.6937
2770.5	25.8193	.2569	.95776	820622	4.46176	2.02380	0.75916	10.3447	4.6922	1.7601
2780.5	26.7334	.2511	.95856	820227	4.42748	2.08898	0.78796	10.2603	4.8410	1.8260
2790.5	27.6471	.2449	.95941	819806	4.39212	2.15366	0.81657	10.1731	4.9884	1.8914
2800.5	28.5605	-1.2384	4.96031	819356	+4.35569	+2.21781	+0.84498	-10.0832	-5.1341	-1.9561
2810.5	29.4735	.2316	.96128	818880	4.31820	2.28143	0.87319	9.9906	5.2783	2.0202
2820.5	30.3862	.2245	.96229	818376	4.27967	2.34449	0.90119	9.8954	5.4209	2.0837
2830.5	31.2985	.2171	.96337	817845	4.24010	2.40698	0.92896	9.7975	5.5618	2.1465
2840.5	32.2104	-1.2094	4.96449	817288	+4.19950	+2.46889	+0.95651	-9.6971	-5.7009	-2.2087
2850.5	33.1218	.2014	.96568	816704	4.15789	2.53021	0.98384	9.5942	5.8384	2.2702
2860.5	34.0328	.1931	.96691	816095	4.11527	2.59091	1.01092	9.4887	5.9740	2.3309
2870.5	34.9434	.1845	.96820	815459	4.07166	2.65098	1.03776	9.3809	6.1077	2.3909
2880.5	35.8534	-1.1756	4.96955	814797	+4.02706	+2.71042	+1.06434	-9.2706	-6.2396	-2.4502
2890.5	36.7629	.1664	.97095	814110	3.98149	2.76920	1.09067	9.1579	6.3695	2.5087
2900.5	37.6719	.1569	.97240	813398	3.93496	2.82731	1.11674	9.0430	6.4975	2.5664
2910.5	38.5804	.1471	.97390	812661	3.88748	2.88474	1.14254	8.9258	6.6235	2.6233
2920.5	39.4883	-1.1371	4.97545	811899	+3.83907	+2.94148	+1.16806	-8.8064	-6.7474	-2.6794
2930.5	40.3956	.1267	.97706	811114	3.78973	2.99751	1.19331	8.6848	6.8693	2.7347
2940.5	41.3023	.1161	.97872	810304	3.73949	3.05282	1.21826	8.5611	6.9890	2.7891
2950.5	42.2084	.1052	.98042	809470	3.68834	3.10739	1.24293	8.4353	7.1067	2.8426
2960.5	43.1139	-1.0941	4.98218	808614	+3.63631	+3.16122	+1.26729	-8.3075	-7.2221	-2.8953
2970.5	44.0187	.0827	.98399	807734	3.58341	3.21430	1.29135	8.1778	7.3354	2.9470
2980.5	44.9228	.0710	.98585	806832	3.52966	3.26660	1.31511	8.0461	7.4464	2.9979
2990.5	45.8262	.0591	.98776	805907	3.47506	3.31813	1.33854	7.9125	7.5552	3.0478
3000.5	46.7290	-1.0469	4.98971	804960	+3.41963	+3.36886	+1.36166	-7.7772	-7.6617	-3.0968
3010.5	47.6310	.0345	.99171	803992	3.36338	3.41879	1.38446	7.6401	7.7659	3.1449
3020.5	48.5322	.0218	.99376	803002	3.30634	3.46791	1.40692	7.5012	7.8678	3.1920
3030.5	49.4327	1.0089	.99586	801992	3.24850	3.51620	1.42905	7.3608	7.9673	3.2381
3040.5	50.3325	-0.9957	4.99800	800961	+3.18990	+3.56365	+1.45084	-7.2187	-8.0645	-3.2832
3050.5	51.2314	.9823	5.00019	799910	3.13054	3.61026	1.47229	7.0750	8.1592	3.3274
3060.5	52.1296	.9687	.00242	798839	3.07043	3.65601	1.49339	6.9299	8.2516	3.3706
3070.5	53.0269	.9548	.00470	797750	3.00960	3.70090	1.51413	6.7834	8.3415	3.4127
3080.5	53.9234	-0.9408	5.00702	796641	+2.94806	+3.74492	+1.53452	-6.6354	-8.4290	-3.4539
3090.5	54.8191	.9265	.00938	795514	2.88583	3.78805	1.55454	6.4862	8.5140	3.4940
3100.5	55.7139	.9120	.01179	794368	2.82291	3.83029	1.57420	6.3356	8.5965	3.5331
3110.5	56.6078	.8973	.01424	793205	2.75933	3.87162	1.59349	6.1838	8.6766	3.5711
3120.5	57.5009	-0.8824	5.01673	792025	+2.69510	+3.91205	+1.61240	-6.0309	-8.7541	-3.6081
3130.5	58.3930	.8673	.01926	790827	2.63024	3.95156	1.63094	5.8769	8.8292	3.6441
3140.5	59.2842	.8519	.02183	789613	2.56476	3.99014	1.64909	5.7218	8.9017	3.6790
3150.5	60.1745	.8365	.02444	788384	2.49869	4.02780	1.66686	5.5657	8.9717	3.7128
3160.5	61.0639	-0.8208	5.02709	787138	+2.43203	+4.06451	+1.68423	-5.4086	-9.0392	-3.7456

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
2680.5	114.7977	+0.0703	9.05428	134722	-3.79750	+7.53638	+3.28055	-10.5428	-4.1523	-1.5185
2690.5	115.1683	.0864	.05552	134667	3.85112	7.51370	3.27349	10.4787	4.3093	1.5876
2700.5	115.5388	.1025	.05678	134610	3.90458	7.49072	3.26630	10.4116	4.4652	1.6563
2710.5	115.9093	.1186	.05806	134554	3.95789	7.46743	3.25897	10.3415	4.6200	1.7245
2720.5	116.2796	+0.1347	9.05935	134496	-4.01104	+7.44386	+3.25152	-10.2684	-4.7737	-1.7924
2730.5	116.6499	.1508	.06066	134437	4.06403	7.41998	3.24394	10.1925	4.9261	1.8598
2740.5	117.0200	.1668	.06199	134378	4.11686	7.39581	3.23623	10.1136	5.0772	1.9267
2750.5	117.3900	.1829	.06334	134318	4.16953	7.37134	3.22839	10.0319	5.2271	1.9932
2760.5	117.7600	+0.1989	9.06471	134257	-4.22203	+7.34658	+3.22043	-9.9473	-5.3755	-2.0591
2770.5	118.1298	.2149	.06610	134196	4.27437	7.32153	3.21233	9.8600	5.5225	2.1244
2780.5	118.4995	.2309	.06750	134134	4.32653	7.29619	3.20411	9.7699	5.6681	2.1892
2790.5	118.8691	.2469	.06892	134071	4.37853	7.27055	3.19576	9.6770	5.8121	2.2534
2800.5	119.2386	+0.2629	9.07036	134007	-4.43035	+7.24463	+3.18728	-9.5815	-5.9546	-2.3170
2810.5	119.6080	.2789	.07182	133942	4.48200	7.21842	3.17867	9.4833	6.0954	2.3800
2820.5	119.9773	.2948	.07329	133877	4.53347	7.19192	3.16994	9.3825	6.2346	2.4423
2830.5	120.3465	.3108	.07479	133811	4.58476	7.16514	3.16109	9.2791	6.3720	2.5040
2840.5	120.7155	+0.3267	9.07630	133744	-4.63587	+7.13807	+3.15210	-9.1731	-6.5077	-2.5650
2850.5	121.0844	.3426	.07782	133676	4.68680	7.11072	3.14300	9.0647	6.6416	2.6252
2860.5	121.4533	.3585	.07937	133608	4.73755	7.08309	3.13376	8.9538	6.7737	2.6847
2870.5	121.8220	.3743	.08093	133539	4.78810	7.05517	3.12441	8.8405	6.9039	2.7435
2880.5	122.1905	+0.3901	9.08251	133470	-4.83847	+7.02698	+3.11493	-8.7248	-7.0322	-2.8015
2890.5	122.5590	.4060	.08411	133399	4.88865	6.99851	3.10532	8.6068	7.1585	2.8588
2900.5	122.9273	.4218	.08572	133328	4.93864	6.96976	3.09560	8.4866	7.2828	2.9152
2910.5	123.2955	.4375	.08736	133256	4.98843	6.94073	3.08575	8.3640	7.4051	2.9708
2920.5	123.6636	+0.4533	9.08900	133184	-5.03803	+6.91143	+3.07578	-8.2394	-7.5253	-3.0256
2930.5	124.0316	.4690	.09067	133111	5.08742	6.88186	3.06568	8.1125	7.6434	3.0795
2940.5	124.3994	.4847	.09235	133037	5.13662	6.85202	3.05547	7.9836	7.7594	3.1326
2950.5	124.7671	.5003	.09405	132962	5.18562	6.82190	3.04514	7.8526	7.8732	3.1848
2960.5	125.1347	+0.5160	9.09577	132887	-5.23441	+6.79152	+3.03468	-7.7197	-7.9848	-3.2360
2970.5	125.5021	.5316	.09750	132811	5.28300	6.76086	3.02411	7.5848	8.0942	3.2864
2980.5	125.8695	.5472	.09925	132734	5.33138	6.72994	3.01341	7.4481	8.2013	3.3359
2990.5	126.2366	.5628	.10102	132657	5.37955	6.69876	3.00260	7.3095	8.3062	3.3844
3000.5	126.6037	+0.5783	9.10280	132579	-5.42751	+6.66731	+2.99167	-7.1691	-8.4087	-3.4320
3010.5	126.9706	.5938	.10460	132501	5.47526	6.63560	2.98062	7.0270	8.5089	3.4786
3020.5	127.3373	.6093	.10641	132421	5.52279	6.60363	2.96946	6.8832	8.6068	3.5243
3030.5	127.7040	.6247	.10825	132341	5.57011	6.57140	2.95818	6.7378	8.7023	3.5689
3040.5	128.0705	+0.6401	9.11009	132261	-5.61721	+6.53891	+2.94678	-6.5908	-8.7953	-3.6126
3050.5	128.4368	.6555	.11196	132180	5.66409	6.50616	2.93526	6.4424	8.8860	3.6553
3060.5	128.8030	.6708	.11384	132098	5.71075	6.47316	2.92363	6.2924	8.9742	3.6969
3070.5	129.1691	.6861	.11573	132016	5.75718	6.43990	2.91189	6.1411	9.0599	3.7376
3080.5	129.5350	+0.7014	9.11764	131933	-5.80339	+6.40639	+2.90003	-5.9884	-9.1432	-3.7772
3090.5	129.9008	.7166	.11957	131849	5.84938	6.37263	2.88806	5.8344	9.2240	3.8158
3100.5	130.2664	.7318	.12151	131765	5.89514	6.33862	2.87597	5.6792	9.3023	3.8533
3110.5	130.6319	.7470	.12347	131680	5.94066	6.30436	2.86378	5.5228	9.3781	3.8898
3120.5	130.9972	+0.7621	9.12544	131595	-5.98596	+6.26986	+2.85147	-5.3652	-9.4514	-3.9252
3130.5	131.3624	.7772	.12743	131509	6.03102	6.23511	2.83905	5.2066	9.5221	3.9596
3140.5	131.7274	.7923	.12944	131422	6.07585	6.20011	2.82651	5.0470	9.5903	3.9929
3150.5	132.0923	.8073	.13146	131335	6.12045	6.16488	2.81387	4.8864	9.6559	4.0251
3160.5	132.4570	+0.8223	9.13349	131247	-6.16480	+6.12940	+2.80112	-4.7249	-9.7190	-4.0563

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
3160.5	61.0639	-0.8208	5.02709	787138	+2.43203	+4.06451	+1.68423	-5.4086	-9.0392	-3.7456
3170.5	61.9523	.8049	.02977	785878	2.36480	4.10027	1.70122	5.2507	9.1041	3.7773
3180.5	62.8398	.7889	.03250	784602	2.29702	4.13508	1.71781	5.0919	9.1665	3.8080
3190.5	63.7262	.7727	.03526	783313	2.22871	4.16892	1.73400	4.9324	9.2263	3.8375
3200.5	64.6117	-0.7563	5.03805	782010	+2.15988	+4.20180	+1.74979	-4.7721	-9.2836	-3.8660
3210.5	65.4962	.7398	.04088	780692	2.09055	4.23371	1.76517	4.6112	9.3384	3.8935
3220.5	66.3797	.7231	.04375	779362	2.02074	4.26464	1.78014	4.4496	9.3905	3.9198
3230.5	67.2622	.7062	.04665	778020	1.95046	4.29458	1.79471	4.2874	9.4402	3.9451
3240.5	68.1436	-0.6892	5.04958	776665	+1.87973	+4.32353	+1.80886	-4.1248	-9.4873	-3.9692
3250.5	69.0240	.6721	.05255	775299	1.80857	4.35149	1.82259	3.9616	9.5318	3.9923
3260.5	69.9034	.6548	.05554	773921	1.73699	4.37845	1.83591	3.7981	9.5738	4.0144
3270.5	70.7817	.6374	.05857	772532	1.66501	4.40441	1.84880	3.6342	9.6133	4.0353
3280.5	71.6590	-0.6199	5.06163	771133	+1.59266	+4.42935	+1.86127	-3.4699	-9.6503	-4.0552
3290.5	72.5352	.6022	.06471	769725	1.51994	4.45329	1.87332	3.3055	9.6847	4.0740
3300.5	73.4103	.5844	.06783	768306	1.44687	4.47621	1.88494	3.1408	9.7166	4.0917
3310.5	74.2843	.5665	.07097	766879	1.37348	4.49811	1.89613	2.9759	9.7460	4.1083
3320.5	75.1572	-0.5485	5.07414	765442	+1.29977	+4.51899	+1.90688	-2.8109	-9.7729	-4.1239
3330.5	76.0291	.5304	.07734	763997	1.22577	4.53885	1.91721	2.6459	9.7973	4.1384
3340.5	76.8998	.5122	.08056	762545	1.15149	4.55768	1.92710	2.4808	9.8193	4.1518
3350.5	77.7694	.4939	.08381	761085	1.07695	4.57548	1.93656	2.3158	9.8387	4.1642
3360.5	78.6379	-0.4755	5.08708	759618	+1.00216	+4.59224	+1.94558	-2.1508	-9.8557	-4.1756
3370.5	79.5053	.4570	.09037	758145	0.92716	4.60798	1.95417	1.9860	9.8703	4.1858
3380.5	80.3715	.4385	.09369	756665	0.85194	4.62268	1.96231	1.8213	9.8825	4.1951
3390.5	81.2366	.4198	.09702	755180	0.77653	4.63634	1.97002	1.6568	9.8922	4.2033
3400.5	82.1006	-0.4011	5.10038	753689	+0.70095	+4.64897	+1.97728	-1.4926	-9.8996	-4.2105
3410.5	82.9634	.3824	.10376	752194	0.62521	4.66056	1.98410	1.3287	9.9046	4.2166
3420.5	83.8251	.3635	.10716	750694	0.54934	4.67111	1.99048	1.1651	9.9072	4.2217
3430.5	84.6856	.3446	.11057	749189	0.47334	4.68062	1.99642	1.0019	9.9075	4.2258
3440.5	85.5450	-0.3257	5.11401	747681	+0.39723	+4.68909	+2.00192	-0.8391	-9.9055	-4.2289
3450.5	86.4032	.3067	.11746	746170	0.32104	4.69653	2.00697	0.6768	9.9011	4.2310
3460.5	87.2602	.2877	.12092	744656	0.24477	4.70292	2.01158	0.5150	9.8945	4.2322
3470.5	88.1161	.2686	.12440	743139	0.16846	4.70828	2.01574	0.3537	9.8856	4.2323
3480.5	88.9708	-0.2495	5.12790	741620	+0.09210	+4.71260	+2.01946	-0.1930	-9.8744	-4.2314
3490.5	89.8244	.2303	.13141	740099	+0.01573	4.71589	2.02274	-0.0329	9.8610	4.2296
3500.5	90.6768	.2112	.13493	738578	-0.06065	4.71815	2.02557	+0.1266	9.8455	4.2268
3510.5	91.5280	.1920	.13847	737054	0.13702	4.71937	2.02796	0.2853	9.8277	4.2231
3520.5	92.3780	-0.1728	5.14201	735531	-0.21335	+4.71956	+2.02991	+0.4434	-9.8078	-4.2184
3530.5	93.2269	.1536	.14557	734006	0.28964	4.71872	2.03142	0.6007	9.7857	4.2128
3540.5	94.0746	.1344	.14914	732482	0.36587	4.71686	2.03248	0.7572	9.7616	4.2062
3550.5	94.9211	.1152	.15271	730959	0.44201	4.71397	2.03310	0.9129	9.7353	4.1988
3560.5	95.7664	-0.0959	5.15629	729436	-0.51807	+4.71006	+2.03329	+1.0677	-9.7070	-4.1904
3570.5	96.6106	.0767	.15988	727915	0.59401	4.70514	2.03303	1.2216	9.6766	4.1811
3580.5	97.4535	.0575	.16348	726394	0.66982	4.69920	2.03233	1.3747	9.6442	4.1710
3590.5	98.2953	.0384	.16708	724876	0.74548	4.69225	2.03120	1.5268	9.6098	4.1599
3600.5	99.1360	-0.0192	5.17069	723360	-0.82099	+4.68429	+2.02963	+1.6779	-9.5734	-4.1480
3610.5	99.9754	.0000	.17430	721846	0.89632	4.67533	2.02763	1.8280	9.5351	4.1353
3620.5	100.8137	+0.0191	.17792	720335	0.97146	4.66537	2.02519	1.9771	9.4949	4.1216
3630.5	101.6509	.0382	.18154	718827	1.04640	4.65441	2.02232	2.1252	9.4528	4.1072
3640.5	102.4868	+0.0572	5.18516	717323	-1.12111	+4.64247	+2.01903	+2.2721	-9.4088	-4.0919

SATURN

91

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°	9.13349	0.00						
3160.5	132.4570	+0.8223	9.13349	131247	-6.16480	+6.12940	+2.80112	- 4.7249	- 9.7190	-4.0563
3170.5	132.8215	.8372	.13554	131159	6.20892	6.09369	2.78826	4.5625	9.7795	4.0864
3180.5	133.1859	.8521	.13760	131070	6.25279	6.05773	2.77529	4.3994	9.8375	4.1154
3190.5	133.5502	.8670	.13968	130981	6.29643	6.02154	2.76221	4.2354	9.8928	4.1433
3200.5	133.9143	+0.8818	9.14178	130891	-6.33982	+5.98512	+2.74902	- 4.0708	- 9.9456	-4.1701
3210.5	134.2782	.8966	.14388	130800	6.38296	5.94846	2.73573	3.9056	9.9959	4.1959
3220.5	134.6420	.9113	.14601	130709	6.42585	5.91158	2.72233	3.7398	10.0435	4.2205
3230.5	135.0056	.9260	.14814	130617	6.46850	5.87446	2.70883	3.5734	10.0886	4.2441
3240.5	135.3691	+0.9406	9.15030	130525	-6.51090	+5.83711	+2.69522	- 3.4066	-10.1311	-4.2665
3250.5	135.7323	.9552	.15246	130433	6.55305	5.79954	2.68150	3.2393	10.1711	4.2879
3260.5	136.0955	.9698	.15464	130339	6.59494	5.76174	2.66768	3.0717	10.2085	4.3082
3270.5	136.4584	.9843	.15684	130246	6.63658	5.72372	2.65376	2.9037	10.2433	4.3274
3280.5	136.8212	+0.9987	9.15904	130152	-6.67796	+5.68548	+2.63974	- 2.7354	-10.2756	-4.3455
3290.5	137.1838	1.0132	.16127	130057	6.71909	5.64702	2.62561	2.5670	10.3053	4.3625
3300.5	137.5463	.0275	.16350	129962	6.75995	5.60834	2.61138	2.3983	10.3325	4.3785
3310.5	137.9086	.0418	.16575	129866	6.80056	5.56944	2.59705	2.2296	10.3572	4.3933
3320.5	138.2707	+1.0561	9.16801	129770	-6.84090	+5.53033	+2.58262	- 2.0607	-10.3794	-4.4071
3330.5	138.6326	.0703	.17029	129673	6.88099	5.49100	2.56810	1.8918	10.3990	4.4198
3340.5	138.9944	.0845	.17258	129576	6.92080	5.45147	2.55347	1.7230	10.4162	4.4314
3350.5	139.3560	.0986	.17488	129479	6.96036	5.41172	2.53874	1.5542	10.4309	4.4420
3360.5	139.7174	+1.1127	9.17720	129381	-6.99964	+5.37176	+2.52392	- 1.3855	-10.4431	-4.4515
3370.5	140.0787	.1267	.17953	129282	7.03866	5.33160	2.50900	1.2170	10.4528	4.4600
3380.5	140.4397	.1407	.18187	129183	7.07741	5.29123	2.49398	1.0487	10.4601	4.4674
3390.5	140.8006	.1546	.18423	129084	7.11588	5.25066	2.47886	0.8806	10.4650	4.4737
3400.5	141.1614	+1.1685	9.18659	128984	-7.15409	+5.20989	+2.46366	- 0.7128	-10.4675	-4.4790
3410.5	141.5219	.1823	.18897	128884	7.19202	5.16891	2.44835	0.5454	10.4676	4.4833
3420.5	141.8823	.1960	.19137	128783	7.22968	5.12774	2.43295	0.3783	10.4653	4.4865
3430.5	142.2424	.2097	.19377	128682	7.26706	5.08637	2.41746	0.2116	10.4606	4.4887
3440.5	142.6024	+1.2234	9.19619	128581	-7.30416	+5.04481	+2.40188	- 0.0455	-10.4536	-4.4899
3450.5	142.9622	.2369	.19862	128479	7.34098	5.00306	2.38621	+ 0.1202	10.4443	4.4901
3460.5	143.3219	.2505	.20106	128377	7.37753	4.96111	2.37044	0.2854	10.4327	4.4893
3470.5	143.6813	.2640	.20352	128274	7.41379	4.91897	2.35458	0.4500	10.4188	4.4875
3480.5	144.0406	+1.2774	9.20598	128171	-7.44978	+4.87665	+2.33864	+ 0.6139	-10.4026	-4.4847
3490.5	144.3997	.2907	.20846	128068	7.48548	4.83414	2.32260	0.7772	10.3842	4.4810
3500.5	144.7586	.3040	.21095	127964	7.52089	4.79145	2.30648	0.9399	10.3636	4.4762
3510.5	145.1173	.3173	.21345	127860	7.55602	4.74857	2.29027	1.1018	10.3408	4.4705
3520.5	145.4758	+1.3305	9.21596	127755	-7.59086	+4.70551	+2.27397	+ 1.2629	-10.3158	-4.4639
3530.5	145.8341	.3436	.21849	127650	7.62542	4.66228	2.25758	1.4232	10.2887	4.4563
3540.5	146.1923	.3567	.22102	127545	7.65969	4.61886	2.24111	1.5828	10.2594	4.4478
3550.5	146.5502	.3697	.22357	127439	7.69366	4.57527	2.22456	1.7414	10.2280	4.4383
3560.5	146.9080	+1.3826	9.22613	127333	-7.72735	+4.53151	+2.20792	+ 1.8992	-10.1946	-4.4280
3570.5	147.2655	.3955	.22869	127227	7.76074	4.48758	2.19119	2.0560	10.1591	4.4167
3580.5	147.6229	.4084	.23127	127120	7.79385	4.44347	2.17438	2.2119	10.1215	4.4046
3590.5	147.9801	.4211	.23386	127014	7.82665	4.39920	2.15749	2.3668	10.0820	4.3915
3600.5	148.3371	+1.4338	9.23646	126906	-7.85917	+4.35476	+2.14052	+ 2.5208	-10.0405	-4.3776
3610.5	148.6939	.4465	.23908	126799	7.89138	4.31016	2.12347	2.6736	9.9970	4.3628
3620.5	149.0505	.4590	.24170	126691	7.92330	4.26539	2.10634	2.8254	9.9516	4.3472
3630.5	149.4069	.4716	.24433	126583	7.95492	4.22047	2.08913	2.9761	9.9042	4.3307
3640.5	149.7631	+1.4840	9.24697	126474	-7.98625	+4.17538	+2.07184	+ 3.1257	- 9.8550	-4.3134

JUPITER

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only			
	Longitude l	Latitude b			x	y	z	X	Y	Z	
244	°	°		0.00							
3640.5	102.4868	+0.0572	5.18516	717323	-1.12111	+4.64247	+2.01903	+ 2.2721	- 9.4088	-4.0919	
3650.5	103.3216	.0762	.18878	715822	1.19558	4.62953	2.01530	2.4180	9.3629	4.0758	
3660.5	104.1552	.0952	.19240	714326	1.26980	4.61562	2.01114	2.5627	9.3153	4.0589	
3670.5	104.9877	.1141	.19602	712834	1.34375	4.60072	2.00656	2.7063	9.2658	4.0412	
3680.5	105.8190	+0.1330	5.19964	711346	-1.41742	+4.58486	+2.00155	+ 2.8487	- 9.2146	-4.0227	
3690.5	106.6492	.1518	.20325	709863	1.49078	4.56803	1.99613	2.9899	9.1616	4.0034	
3700.5	107.4782	.1706	.20687	708386	1.56384	4.55024	1.99028	3.1299	9.1070	3.9834	
3710.5	108.3061	.1893	.21048	706914	1.63657	4.53149	1.98402	3.2687	9.0506	3.9626	
3720.5	109.1328	+0.2079	5.21409	705448	-1.70895	+4.51180	+1.97734	+ 3.4062	- 8.9926	-3.9411	
3730.5	109.9584	.2265	.21769	703988	1.78098	4.49116	1.97025	3.5424	8.9329	3.9188	
3740.5	110.7828	.2450	.22129	702534	1.85263	4.46959	1.96274	3.6773	8.8716	3.8958	
3750.5	111.6061	.2634	.22488	701086	1.92390	4.44709	1.95483	3.8109	8.8088	3.8721	
3760.5	112.4283	+0.2817	5.22846	699646	-1.99478	+4.42366	+1.94651	+ 3.9431	- 8.7444	-3.8477	
3770.5	113.2494	.3000	.23204	698213	2.06523	4.39932	1.93779	4.0740	8.6784	3.8226	
3780.5	114.0693	.3182	.23560	696787	2.13526	4.37406	1.92867	4.2036	8.6110	3.7969	
3790.5	114.8882	.3363	.23916	695368	2.20485	4.34791	1.91915	4.3318	8.5421	3.7704	
3800.5	115.7059	+0.3542	5.24271	693958	-2.27399	+4.32085	+1.90923	+ 4.4585	- 8.4717	-3.7434	
3810.5	116.5225	.3721	.24625	692555	2.34266	4.29291	1.89892	4.5839	8.3999	3.7156	
3820.5	117.3381	.3899	.24977	691161	2.41085	4.26409	1.88823	4.7078	8.3267	3.6873	
3830.5	118.1525	.4076	.25328	689775	2.47854	4.23440	1.87714	4.8303	8.2522	3.6583	
3840.5	118.9659	+0.4252	5.25678	688398	-2.54573	+4.20384	+1.86568	+ 4.9513	- 8.1763	-3.6287	
3850.5	119.7782	.4427	.26027	687030	2.61240	4.17242	1.85383	5.0709	8.0990	3.5984	
3860.5	120.5894	.4600	.26375	685671	2.67854	4.14016	1.84160	5.1890	8.0205	3.5676	
3870.5	121.3996	.4773	.26720	684321	2.74414	4.10705	1.82900	5.3056	7.9407	3.5363	
3880.5	122.2087	+0.4944	5.27065	682981	-2.80918	+4.07311	+1.81603	+ 5.4207	- 7.8597	-3.5043	
3890.5	123.0168	.5114	.27407	681651	2.87365	4.03835	1.80270	5.5343	7.7774	3.4718	
3900.5	123.8238	.5283	.27748	680330	2.93754	4.00277	1.78899	5.6464	7.6940	3.4387	
3910.5	124.6298	.5451	.28088	679020	3.00084	3.96639	1.77493	5.7570	7.6093	3.4051	
3920.5	125.4348	+0.5617	5.28425	677720	-3.06353	+3.92921	+1.76051	+ 5.8660	- 7.5236	-3.3710	
3930.5	126.2387	.5782	.28761	676430	3.12561	3.89123	1.74574	5.9735	7.4367	3.3364	
3940.5	127.0417	.5946	.29094	675151	3.18707	3.85248	1.73062	6.0794	7.3487	3.3012	
3950.5	127.8436	.6108	.29426	673883	3.24788	3.81296	1.71515	6.1838	7.2597	3.2656	
3960.5	128.6445	+0.6269	5.29756	672626	-3.30805	+3.77268	+1.69934	+ 6.2866	- 7.1696	-3.2294	
3970.5	129.4445	.6428	.30083	671380	3.36756	3.73164	1.68319	6.3878	7.0784	3.1928	
3980.5	130.2435	.6586	.30408	670146	3.42641	3.68987	1.66671	6.4875	6.9863	3.1557	
3990.5	131.0415	.6743	.30731	668923	3.48457	3.64736	1.64989	6.5856	6.8932	3.1182	
4000.5	131.8385	+0.6898	5.31052	667711	-3.54204	+3.60413	+1.63275	+ 6.6821	- 6.7992	-3.0802	
4010.5	132.6346	.7051	.31371	666512	3.59881	3.56018	1.61529	6.7770	6.7042	3.0418	
4020.5	133.4298	.7203	.31687	665324	3.65487	3.51553	1.59750	6.8703	6.6084	3.0029	
4030.5	134.2240	.7354	.32000	664148	3.71021	3.47019	1.57940	6.9620	6.5116	2.9637	
4040.5	135.0173	+0.7503	5.32311	662985	-3.76482	+3.42417	+1.56099	+ 7.0521	- 6.4140	-2.9240	
4050.5	135.8097	.7650	.32620	661834	3.81869	3.37747	1.54228	7.1406	6.3155	2.8839	
4060.5	136.6011	.7795	.32925	660695	3.87181	3.33012	1.52326	7.2274	6.2163	2.8434	
4070.5	137.3917	.7939	.33228	659569	3.92418	3.28211	1.50394	7.3127	6.1162	2.8026	
4080.5	138.1814	+0.8082	5.33529	658456	-3.97578	+3.23345	+1.48433	+ 7.3964	- 6.0154	-2.7614	
4090.5	138.9702	.8222	.33826	657355	4.02660	3.18417	1.46443	7.4784	5.9138	2.7198	
4100.5	139.7582	.8361	.34121	656268	4.07664	3.13427	1.44425	7.5588	5.8115	2.6779	
4110.5	140.5453	.8498	.34413	655193	4.12589	3.08376	1.42378	7.6376	5.7085	2.6356	
4120.5	141.3315	+0.8634	5.34702	654132	-4.17434	+3.03265	+1.40304	+ 7.7148	- 5.6048	-2.5930	

SATURN

93

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
244	°	°		0.00						
3640.5	149.7631	+1.4840	9.24697	126474	-7.98625	+4.17538	+2.07184	+ 3.1257	- 9.8550	-4.3134
3650.5	150.1191	.4964	.24962	126365	8.01727	4.13014	2.05447	3.2741	9.8040	4.2952
3660.5	150.4749	.5087	.25228	126256	8.04799	4.08474	2.03703	3.4214	9.7511	4.2762
3670.5	150.8305	.5210	.25495	126147	8.07841	4.03919	2.01951	3.5675	9.6964	4.2565
3680.5	151.1860	+1.5332	9.25764	126038	-8.10853	+3.99348	+2.00191	+ 3.7124	- 9.6399	-4.2359
3690.5	151.5412	.5453	.26033	125928	8.13834	3.94763	1.98424	3.8560	9.5817	4.2146
3700.5	151.8962	.5573	.26303	125818	8.16786	3.90163	1.96649	3.9984	9.5218	4.1925
3710.5	152.2510	.5693	.26574	125707	8.19706	3.85548	1.94867	4.1394	9.4602	4.1696
3720.5	152.6056	+1.5812	9.26845	125597	-8.22596	+3.80919	+1.93077	+ 4.2793	- 9.3969	-4.1460
3730.5	152.9600	.5931	.27118	125486	8.25455	3.76276	1.91281	4.4177	9.3319	4.1217
3740.5	153.3142	.6049	.27392	125375	8.28284	3.71618	1.89477	4.5548	9.2654	4.0966
3750.5	153.6682	.6166	.27666	125264	8.31081	3.66947	1.87666	4.6906	9.1972	4.0708
3760.5	154.0220	+1.6283	9.27942	125152	-8.33848	+3.62262	+1.85849	+ 4.8250	- 9.1275	-4.0443
3770.5	154.3756	.6399	.28218	125040	8.36584	3.57563	1.84024	4.9581	9.0563	4.0171
3780.5	154.7290	.6514	.28495	124928	8.39289	3.52851	1.82192	5.0897	8.9835	3.9892
3790.5	155.0822	.6628	.28773	124816	8.41962	3.48126	1.80354	5.2199	8.9093	3.9607
3800.5	155.4352	+1.6742	9.29052	124704	-8.44604	+3.43388	+1.78509	+ 5.3486	- 8.8336	-3.9315
3810.5	155.7880	.6855	.29332	124591	8.47215	3.38638	1.76657	5.4759	8.7565	3.9016
3820.5	156.1405	.6967	.29612	124479	8.49795	3.33875	1.74799	5.6017	8.6780	3.8711
3830.5	156.4929	.7079	.29893	124366	8.52343	3.29099	1.72935	5.7261	8.5981	3.8400
3840.5	156.8451	+1.7190	9.30175	124253	-8.54860	+3.24311	+1.71064	+ 5.8490	- 8.5168	-3.8083
3850.5	157.1970	.7300	.30458	124139	8.57345	3.19511	1.69186	5.9703	8.4342	3.7759
3860.5	157.5487	.7409	.30741	124026	8.59799	3.14700	1.67303	6.0902	8.3503	3.7430
3870.5	157.9003	.7518	.31026	123912	8.62220	3.09877	1.65413	6.2085	8.2652	3.7095
3880.5	158.2516	+1.7626	9.31311	123799	-8.64610	+3.05042	+1.63517	+ 6.3253	- 8.1788	-3.6754
3890.5	158.6027	.7733	.31596	123685	8.66969	3.00196	1.61615	6.4405	8.0912	3.6407
3900.5	158.9536	.7840	.31883	123571	8.69295	2.95339	1.59707	6.5542	8.0024	3.6055
3910.5	159.3043	.7946	.32170	123457	8.71589	2.90471	1.57793	6.6663	7.9124	3.5698
3920.5	159.6547	+1.8051	9.32458	123343	-8.73852	+2.85593	+1.55874	+ 6.7768	- 7.8213	-3.5335
3930.5	160.0050	.8155	.32746	123228	8.76082	2.80704	1.53948	6.8858	7.7290	3.4967
3940.5	160.3551	.8259	.33035	123114	8.78281	2.75805	1.52017	6.9932	7.6357	3.4594
3950.5	160.7049	.8362	.33325	122999	8.80447	2.70895	1.50081	7.0990	7.5412	3.4216
3960.5	161.0545	+1.8464	9.33615	122884	-8.82581	+2.65976	+1.48139	+ 7.2031	- 7.4458	-3.3833
3970.5	161.4039	.8565	.33906	122770	8.84682	2.61047	1.46192	7.3057	7.3493	3.3445
3980.5	161.7531	.8666	.34198	122655	8.86752	2.56108	1.44239	7.4066	7.2518	3.3052
3990.5	162.1021	.8766	.34490	122540	8.88789	2.51160	1.42281	7.5060	7.1533	3.2655
4000.5	162.4509	+1.8865	9.34782	122425	-8.90793	+2.46203	+1.40318	+ 7.6037	- 7.0539	-3.2254
4010.5	162.7994	.8963	.35076	122309	8.92766	2.41237	1.38349	7.6997	6.9536	3.1848
4020.5	163.1478	.9061	.35370	122194	8.94705	2.36263	1.36376	7.7942	6.8523	3.1438
4030.5	163.4959	.9158	.35664	122079	8.96613	2.31279	1.34398	7.8870	6.7502	3.1023
4040.5	163.8438	+1.9254	9.35959	121964	-8.98487	+2.26287	+1.32414	+ 7.9781	- 6.6472	-3.0605
4050.5	164.1915	.9349	.36254	121848	8.90329	2.21287	1.30426	8.0676	6.5434	3.0182
4060.5	164.5390	.9444	.36550	121733	9.02139	2.16279	1.28434	8.1555	6.4388	2.9756
4070.5	164.8863	.9537	.36847	121617	9.03915	2.11263	1.26436	8.2417	6.3333	2.9326
4080.5	165.2333	+1.9630	9.37143	121502	-9.05659	+2.06240	+1.24434	+ 8.3263	- 6.2271	-2.8892
4090.5	165.5802	.9723	.37441	121386	9.07371	2.01209	1.22428	8.4092	6.1202	2.8454
4100.5	165.9268	.9814	.37739	121270	9.09049	1.96171	1.20417	8.4904	6.0125	2.8013
4110.5	166.2732	.9905	.38037	121155	9.10695	1.91125	1.18402	8.5700	5.9041	2.7569
4120.5	166.6194	+1.9994	9.38335	121039	-9.12308	+1.86073	+1.16382	+ 8.6479	- 5.7951	-2.7121

JUPITER

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
4120.5	141.3315	+0.8634	5.34702	654132	-4.17434	+3.03265	+1.40304	+ 7.7148	- 5.6048	-2.5930
4130.5	142.1169	.8767	.34988	653084	4.22198	2.98095	1.38203	7.7903	5.5004	2.5501
4140.5	142.9015	.8899	.35270	652049	4.26880	2.92868	1.36075	7.8642	5.3954	2.5068
4150.5	143.6853	.9029	.35550	651028	4.31480	2.87584	1.33920	7.9365	5.2897	2.4633
4160.5	144.4682	+0.9157	5.35827	650020	-4.35996	+2.82244	+1.31740	+ 8.0072	- 5.1835	-2.4194
4170.5	145.2504	.9284	.36100	649026	4.40429	2.76851	1.29535	8.0762	5.0767	2.3753
4180.5	146.0318	.9408	.36370	648046	4.44777	2.71404	1.27304	8.1436	4.9693	2.3309
4190.5	146.8124	.9531	.36637	647080	4.49040	2.65904	1.25049	8.2094	4.8613	2.2862
4200.5	147.5922	+0.9652	5.36901	646128	-4.53217	+2.60354	+1.22770	+ 8.2736	- 4.7528	-2.2412
4210.5	148.3713	.9771	.37161	645189	4.57307	2.54754	1.20468	8.3361	4.6438	2.1960
4220.5	149.1496	0.9888	.37418	644265	4.61309	2.49106	1.18143	8.3970	4.5344	2.1505
4230.5	149.9273	1.0003	.37671	643355	4.65224	2.43410	1.15795	8.4563	4.4244	2.1048
4240.5	150.7041	+1.0116	5.37921	642459	-4.69050	+2.37667	+1.13425	+ 8.5140	- 4.3140	-2.0588
4250.5	151.4803	.0227	.38167	641577	4.72787	2.31879	1.11033	8.5701	4.2032	2.0127
4260.5	152.2558	.0336	.38410	640711	4.76434	2.26047	1.08620	8.6245	4.0920	1.9663
4270.5	153.0306	.0443	.38649	639858	4.79990	2.20173	1.06187	8.6773	3.9803	1.9197
4280.5	153.8048	+1.0548	5.38884	639020	-4.83456	+2.14256	+1.03733	+ 8.7285	- 3.8683	-1.8728
4290.5	154.5782	.0651	.39116	638197	4.86830	2.08299	1.01260	8.7781	3.7559	1.8258
4300.5	155.3510	.0753	.39344	637388	4.90112	2.02302	0.98768	8.8261	3.6431	1.7786
4310.5	156.1232	.0852	.39568	636594	4.93302	1.96268	0.96257	8.8725	3.5301	1.7313
4320.5	156.8948	+1.0949	5.39788	635815	-4.96399	+1.90196	+0.93728	+ 8.9172	- 3.4167	-1.6837
4330.5	157.6657	.1044	.40004	635051	4.99402	1.84088	0.91181	8.9604	3.3030	1.6360
4340.5	158.4360	.1137	.40217	634301	5.02311	1.77946	0.88618	9.0020	3.1890	1.5881
4350.5	159.2058	.1227	.40426	633566	5.05126	1.71771	0.86037	9.0419	3.0748	1.5401
4360.5	159.9749	+1.1316	5.40630	632847	-5.07846	+1.65563	+0.83440	+ 9.0803	- 2.9603	-1.4919
4370.5	160.7435	.1403	.40831	632143	5.10471	1.59324	0.80828	9.1171	2.8455	1.4436
4380.5	161.5115	.1487	.41028	631453	5.13001	1.53055	0.78201	9.1523	2.7306	1.3952
4390.5	162.2790	.1570	.41221	630779	5.15434	1.46758	0.75559	9.1859	2.6155	1.3466
4400.5	163.0459	+1.1650	5.41409	630120	-5.17772	+1.40433	+0.72902	+ 9.2179	- 2.5001	-1.2979
4410.5	163.8124	.1728	.41594	629477	5.20012	1.34082	0.70233	9.2483	2.3846	1.2491
4420.5	164.5783	.1804	.41774	628848	5.22156	1.27706	0.67550	9.2772	2.2690	1.2002
4430.5	165.3437	.1878	.41950	628235	5.24203	1.21306	0.64854	9.3045	2.1532	1.1512
4440.5	166.1086	+1.1950	5.42122	627637	-5.26152	+1.14884	+0.62147	+ 9.3302	- 2.0372	-1.1020
4450.5	166.8731	.2019	.42290	627055	5.28003	1.08440	0.59428	9.3543	1.9212	1.0528
4460.5	167.6371	.2086	.42453	626488	5.29757	1.01976	0.56698	9.3769	1.8050	1.0036
4470.5	168.4006	.2152	.42613	625937	5.31412	0.95493	0.53957	9.3979	1.6888	0.9542
4480.5	169.1637	+1.2215	5.42768	625401	-5.32968	+0.88992	+0.51206	+ 9.4173	- 1.5725	-0.9048
4490.5	169.9264	.2275	.42918	624880	5.34426	0.82475	0.48446	9.4353	1.4561	0.8553
4500.5	170.6887	.2334	.43065	624375	5.35785	0.75943	0.45677	9.4516	1.3397	0.8058
4510.5	171.4505	.2390	.43207	623886	5.37045	0.69397	0.42899	9.4664	1.2232	0.7562
4520.5	172.2120	+1.2444	5.43344	623412	-5.38205	+0.62837	+0.40114	+ 9.4797	- 1.1068	-0.7065
4530.5	172.9731	.2496	.43477	622954	5.39267	0.56267	0.37321	9.4914	0.9903	0.6569
4540.5	173.7339	.2546	.43606	622512	5.40229	0.49685	0.34521	9.5016	0.8739	0.6072
4550.5	174.4943	.2593	.43730	622085	5.41091	0.43095	0.31715	9.5102	0.7574	0.5574
4560.5	175.2543	+1.2639	5.43850	621674	-5.41854	+0.36496	+0.28903	+ 9.5173	- 0.6410	-0.5077
4570.5	176.0141	.2682	.43965	621279	5.42517	0.29891	0.26086	9.5229	0.5247	0.4579
4580.5	176.7735	.2722	.44076	620900	5.43080	0.23281	0.23264	9.5270	0.4084	0.4081
4590.5	177.5326	.2761	.44182	620536	5.43543	0.16666	0.20437	9.5295	0.2922	0.3583
4600.5	178.2915	+1.2797	5.44284	620188	-5.43906	+0.10048	+0.17607	+ 9.5305	- 0.1761	-0.3085

SATURN

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Jupiter + Saturn		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.00						
4120.5	166.6194	+1.9994	9.38335	121039	-9.12308	+1.86073	+1.16382	+ 8.6479	- 5.7951	-2.7121
4130.5	166.9653	2.0084	.38635	120924	9.13888	1.81014	1.14359	8.7242	5.6854	2.6670
4140.5	167.3111	.0172	.38934	120808	9.15435	1.75949	1.12331	8.7988	5.5750	2.6215
4150.5	167.6566	.0259	.39234	120692	9.16949	1.70877	1.10299	8.8717	5.4640	2.5758
4160.5	168.0019	+2.0346	9.39534	120577	-9.18430	+1.65799	+1.08263	+ 8.9430	- 5.3524	-2.5298
4170.5	168.3470	.0432	.39835	120461	9.19878	1.60715	1.06224	9.0126	5.2403	2.4834
4180.5	168.6919	.0517	.40135	120345	9.21293	1.55626	1.04180	9.0806	5.1275	2.4368
4190.5	169.0366	.0601	.40437	120230	9.22676	1.50531	1.02133	9.1469	5.0142	2.3899
4200.5	169.3810	+2.0685	9.40738	120114	-9.24025	+1.45430	+1.00082	+ 9.2115	- 4.9005	-2.3428
4210.5	169.7252	.0768	.41040	119999	9.25341	1.40325	0.98028	9.2745	4.7861	2.2954
4220.5	170.0692	.0849	.41342	119883	9.26624	1.35214	0.95970	9.3358	4.6714	2.2477
4230.5	170.4130	.0931	.41645	119768	9.27874	1.30098	0.93908	9.3955	4.5561	2.1998
4240.5	170.7566	+2.1011	9.41947	119652	-9.29091	+1.24978	+0.91844	+ 9.4535	- 4.4404	-2.1517
4250.5	171.0999	.1090	.42250	119537	9.30275	1.19854	0.89776	9.5098	4.3243	2.1034
4260.5	171.4431	.1169	.42554	119421	9.31425	1.14725	0.87705	9.5645	4.2077	2.0548
4270.5	171.7860	.1247	.42857	119306	9.32543	1.09592	0.85630	9.6175	4.0908	2.0060
4280.5	172.1287	+2.1324	9.43161	119191	-9.33627	+1.04455	+0.83553	+ 9.6689	- 3.9735	-1.9570
4290.5	172.4712	.1400	.43464	119076	9.34678	0.99315	0.81473	9.7187	3.8558	1.9078
4300.5	172.8134	.1476	.43768	118961	9.35696	0.94171	0.79390	9.7668	3.7378	1.8585
4310.5	173.1555	.1550	.44073	118846	9.36681	0.89023	0.77304	9.8132	3.6195	1.8089
4320.5	173.4973	+2.1624	9.44377	118731	-9.37633	+0.83873	+0.75215	+ 9.8580	- 3.5008	-1.7592
4330.5	173.8389	.1697	.44681	118616	9.38552	0.78720	0.73124	9.9012	3.3819	1.7093
4340.5	174.1803	.1769	.44986	118502	9.39437	0.73564	0.71030	9.9427	3.2627	1.6593
4350.5	174.5214	.1841	.45291	118387	9.40289	0.68405	0.68933	9.9827	3.1432	1.6091
4360.5	174.8624	+2.1911	9.45596	118273	-9.41108	+0.63244	+0.66834	+10.0209	- 3.0235	-1.5587
4370.5	175.2031	.1981	.45901	118158	9.41894	0.58080	0.64733	10.0576	2.9035	1.5082
4380.5	175.5437	.2050	.46206	118044	9.42647	0.52915	0.62630	10.0926	2.7834	1.4576
4390.5	175.8839	.2118	.46511	117930	9.43366	0.47748	0.60524	10.1260	2.6631	1.4069
4400.5	176.2240	+2.2185	9.46816	117816	-9.44052	+0.42579	+0.58416	+10.1578	- 2.5425	-1.3560
4410.5	176.5639	.2252	.47121	117702	9.44706	0.37409	0.56306	10.1880	2.4218	1.3051
4420.5	176.9035	.2317	.47426	117588	9.45326	0.32237	0.54195	10.2165	2.3010	1.2540
4430.5	177.2430	.2382	.47732	117475	9.45912	0.27064	0.52081	10.2435	2.1800	1.2029
4440.5	177.5822	+2.2446	9.48037	117361	-9.46466	+0.21891	+0.49965	+10.2689	- 2.0589	-1.1516
4450.5	177.9212	.2509	.48342	117248	9.46987	0.16716	0.47848	10.2926	1.9377	1.1003
4460.5	178.2600	.2571	.48647	117135	9.47474	0.11541	0.45729	10.3148	1.8164	1.0488
4470.5	178.5985	.2633	.48953	117022	9.47929	0.06366	0.43609	10.3353	1.6951	0.9974
4480.5	178.9369	+2.2693	9.49258	116909	-9.48350	+0.01190	+0.41487	+10.3543	- 1.5736	-0.9458
4490.5	179.2750	.2753	.49563	116796	9.48738	-0.03985	0.39363	10.3717	1.4522	0.8942
4500.5	179.6129	.2812	.49868	116684	9.49094	0.09161	0.37238	10.3875	1.3307	0.8425
4510.5	179.9506	.2870	.50173	116571	9.49416	0.14336	0.35112	10.4017	1.2091	0.7908
4520.5	180.2881	+2.2928	9.50478	116459	-9.49705	-0.19511	+0.32985	+10.4143	- 1.0876	-0.7390
4530.5	180.6254	.2984	.50783	116347	9.49961	0.24685	0.30856	10.4254	0.9661	0.6872
4540.5	180.9624	.3040	.51087	116236	9.50184	0.29858	0.28727	10.4349	0.8445	0.6354
4550.5	181.2993	.3095	.51392	116124	9.50375	0.35030	0.26596	10.4428	0.7231	0.5835
4560.5	181.6359	+2.3149	9.51696	116013	-9.50532	-0.40200	+0.24465	+10.4492	- 0.6016	-0.5317
4570.5	181.9723	.3202	.52001	115901	9.50656	0.45370	0.22333	10.4540	0.4803	0.4798
4580.5	182.3085	.3254	.52305	115790	9.50748	0.50537	0.20200	10.4573	0.3590	0.4279
4590.5	182.6445	.3306	.52608	115680	9.50807	0.55703	0.18066	10.4590	0.2377	0.3760
4600.5	182.9803	+2.3356	9.52912	115569	-9.50833	-0.60868	+0.15931	+10.4592	- 0.1166	-0.3241

URANUS

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243	°	°		0.000						
6920.5	138.211	+0.697	18.4066	16035	-13.7230	+11.1634	+5.0855	+0.0285	-0.0232	-0.0106
6960.5	138.720	.700	.4025	16046	13.8283	11.0482	5.0365	.0287	.0229	.0105
7000.5	139.229	.703	.3984	16057	13.9326	10.9322	4.9872	.0290	.0227	.0104
7040.5	139.738	.706	.3944	16067	14.0358	10.8155	4.9375	.0292	.0225	.0103
7080.5	140.248	+0.709	18.3905	16078	-14.1379	+10.6979	+4.8874	+0.0294	-0.0223	-0.0102
7120.5	140.758	.711	.3866	16088	14.2389	10.5795	4.8369	.0297	.0220	.0101
7160.5	141.268	.714	.3828	16098	14.3389	10.4603	4.7861	.0299	.0218	.0100
7200.5	141.778	.716	.3791	16108	14.4377	10.3403	4.7350	.0301	.0216	.0099
7240.5	142.288	+0.719	18.3754	16117	-14.5355	+10.2196	+4.6834	+0.0303	-0.0213	-0.0098
7280.5	142.798	.721	.3718	16127	14.6322	10.0981	4.6316	.0305	.0211	.0097
7320.5	143.309	.724	.3683	16136	14.7277	9.9758	4.5793	.0308	.0208	.0096
7360.5	143.819	.726	.3648	16145	14.8221	9.8528	4.5268	.0310	.0206	.0095
7400.5	144.330	+0.729	18.3614	16154	-14.9154	+9.7291	+4.4739	+0.0312	-0.0203	-0.0094
7440.5	144.841	.731	.3581	16163	15.0076	9.6046	4.4206	.0314	.0201	.0092
7480.5	145.352	.733	.3548	16172	15.0986	9.4794	4.3670	.0316	.0198	.0091
7520.5	145.864	.735	.3516	16180	15.1885	9.3535	4.3131	.0318	.0196	.0090
7560.5	146.375	+0.737	18.3485	16188	-15.2772	+9.2269	+4.2589	+0.0320	-0.0193	-0.0089
7600.5	146.887	.739	.3455	16196	15.3648	9.0996	4.2044	.0322	.0191	.0088
7640.5	147.399	.741	.3425	16204	15.4512	8.9717	4.1495	.0324	.0188	.0087
7680.5	147.911	.743	.3396	16212	15.5364	8.8430	4.0943	.0326	.0186	.0086
7720.5	148.423	+0.745	18.3368	16219	-15.6204	+8.7137	+4.0388	+0.0328	-0.0183	-0.0085
7760.5	148.935	.747	.3341	16227	15.7033	8.5837	3.9830	.0330	.0180	.0084
7800.5	149.447	.748	.3314	16234	15.7850	8.4530	3.9270	.0332	.0178	.0083
7840.5	149.960	.750	.3288	16241	15.8654	8.3218	3.8706	.0333	.0175	.0081
7880.5	150.473	+0.752	18.3263	16247	-15.9447	+8.1899	+3.8139	+0.0335	-0.0172	-0.0080
7920.5	150.985	.753	.3238	16254	16.0227	8.0573	3.7569	.0337	.0169	.0079
7960.5	151.498	.755	.3215	16260	16.0996	7.9242	3.6996	.0339	.0167	.0078
8000.5	152.011	.756	.3192	16266	16.1752	7.7904	3.6421	.0341	.0164	.0077
8040.5	152.525	+0.757	18.3170	16272	-16.2496	+7.6561	+3.5843	+0.0342	-0.0161	-0.0075
8080.5	153.038	.759	.3148	16278	16.3227	7.5212	3.5262	.0344	.0158	.0074
8120.5	153.552	.760	.3128	16283	16.3946	7.3857	3.4678	.0345	.0156	.0073
8160.5	154.065	.761	.3108	16289	16.4653	7.2496	3.4092	.0347	.0153	.0072
8200.5	154.579	+0.762	18.3089	16294	-16.5347	+7.1130	+3.3503	+0.0349	-0.0150	-0.0071
8240.5	155.093	.763	.3070	16299	16.6028	6.9758	3.2912	.0350	.0147	.0069
8280.5	155.607	.764	.3053	16303	16.6697	6.8380	3.2318	.0352	.0144	.0068
8320.5	156.121	.765	.3036	16308	16.7354	6.6998	3.1721	.0353	.0141	.0067
8360.5	156.635	+0.766	18.3020	16312	-16.7997	+6.5610	+3.1122	+0.0355	-0.0139	-0.0066
8400.5	157.150	.767	.3005	16316	16.8628	6.4217	3.0520	.0356	.0136	.0064
8440.5	157.664	.768	.2990	16320	16.9246	6.2819	2.9917	.0357	.0133	.0063
8480.5	158.179	.769	.2976	16324	16.9851	6.1416	2.9311	.0359	.0130	.0062
8520.5	158.694	+0.769	18.2963	16327	-17.0442	+6.0009	+2.8702	+0.0360	-0.0127	-0.0061
8560.5	159.209	.770	.2951	16331	17.1021	5.8596	2.8091	.0361	.0124	.0059
8600.5	159.724	.770	.2939	16334	17.1587	5.7179	2.7478	.0363	.0121	.0058
8640.5	160.239	.771	.2928	16337	17.2140	5.5758	2.6863	.0364	.0118	.0057
8680.5	160.754	+0.771	18.2918	16339	-17.2680	+5.4332	+2.6246	+0.0365	-0.0115	-0.0056
8720.5	161.269	.771	.2909	16342	17.3206	5.2902	2.5627	.0366	.0112	.0054
8760.5	161.785	.772	.2900	16344	17.3719	5.1467	2.5006	.0367	.0109	.0053
8800.5	162.300	.772	.2892	16346	17.4219	5.0028	2.4382	.0369	.0106	.0052
8840.5	162.816	+0.772	18.2884	16348	-17.4705	+4.8586	+2.3757	+0.0370	-0.0103	-0.0050

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus + Neptune		
	Longitude l	Latitude b			x	y	z	X	Y	Z
243	°	°		0.0000						
6920.5	216.850	+1.769	30.3312	3584	-24.2598	-17.0529	-6.3750	+0.0418	-0.0138	-0.0071
6960.5	217.085	.770	.3311	3584	24.1848	17.1444	6.4143	.0420	.0135	.0069
7000.5	217.321	.770	.3310	3584	24.1093	17.2356	6.4536	.0422	.0133	.0068
7040.5	217.557	.771	.3309	3584	24.0334	17.3265	6.4928	.0424	.0130	.0067
7080.5	217.793	+1.771	30.3308	3584	-23.9570	-17.4171	-6.5318	+0.0426	-0.0127	-0.0066
7120.5	218.028	.772	.3307	3584	23.8803	17.5073	6.5707	.0428	.0124	.0065
7160.5	218.264	.772	.3305	3584	23.8032	17.5973	6.6095	.0429	.0121	.0063
7200.5	218.499	.772	.3304	3584	23.7256	17.6870	6.6482	.0431	.0118	.0062
7240.5	218.735	+1.773	30.3302	3584	-23.6477	-17.7763	-6.6867	+0.0433	-0.0116	-0.0061
7280.5	218.971	.773	.3300	3584	23.5694	17.8653	6.7252	.0435	.0113	.0060
7320.5	219.206	.773	.3299	3584	23.4906	17.9540	6.7635	.0437	.0110	.0059
7360.5	219.442	.773	.3297	3584	23.4115	18.0424	6.8017	.0438	.0107	.0057
7400.5	219.677	+1.774	30.3294	3584	-23.3320	-18.1304	-6.8397	+0.0440	-0.0104	-0.0056
7440.5	219.913	.774	.3292	3584	23.2521	18.2181	6.8777	.0442	.0101	.0055
7480.5	220.148	.774	.3290	3585	23.1718	18.3055	6.9155	.0443	.0098	.0053
7520.5	220.384	.774	.3288	3585	23.0911	18.3926	6.9532	.0445	.0095	.0052
7560.5	220.619	+1.774	30.3285	3585	-23.0100	-18.4794	-6.9908	+0.0446	-0.0092	-0.0051
7600.5	220.854	.774	.3283	3585	22.9286	18.5658	7.0282	.0448	.0089	.0050
7640.5	221.090	.774	.3280	3585	22.8468	18.6519	7.0655	.0449	.0086	.0048
7680.5	221.325	.774	.3278	3585	22.7646	18.7376	7.1027	.0451	.0083	.0047
7720.5	221.560	+1.774	30.3275	3585	-22.6820	-18.8231	-7.1398	+0.0452	-0.0080	-0.0046
7760.5	221.795	.774	.3273	3585	22.5991	18.9082	7.1768	.0454	.0077	.0044
7800.5	222.031	.774	.3270	3585	22.5158	18.9929	7.2136	.0455	.0073	.0043
7840.5	222.266	.774	.3267	3585	22.4321	19.0774	7.2503	.0457	.0070	.0042
7880.5	222.501	+1.774	30.3265	3585	-22.3480	-19.1615	-7.2868	+0.0458	-0.0067	-0.0040
7920.5	222.736	.774	.3262	3586	22.2636	19.2453	7.3233	.0459	.0064	.0039
7960.5	222.971	.774	.3260	3586	22.1789	19.3287	7.3596	.0461	.0061	.0037
8000.5	223.206	.773	.3257	3586	22.0937	19.4118	7.3958	.0462	.0057	.0036
8040.5	223.441	+1.773	30.3255	3586	-22.0083	-19.4946	-7.4318	+0.0463	-0.0054	-0.0035
8080.5	223.676	.773	.3252	3586	21.9224	19.5770	7.4677	.0464	.0051	.0033
8120.5	223.911	.773	.3250	3586	21.8362	19.6591	7.5035	.0465	.0048	.0032
8160.5	224.146	.772	.3247	3586	21.7497	19.7409	7.5392	.0467	.0044	.0031
8200.5	224.381	+1.772	30.3245	3586	-21.6628	-19.8223	-7.5747	+0.0468	-0.0041	-0.0029
8240.5	224.616	.771	.3243	3586	21.5756	19.9034	7.6101	.0469	.0038	.0028
8280.5	224.851	.771	.3241	3586	21.4880	19.9841	7.6454	.0470	.0035	.0026
8320.5	225.085	.771	.3239	3586	21.4000	20.0645	7.6806	.0471	.0031	.0025
8360.5	225.320	+1.770	30.3237	3586	-21.3118	-20.1446	-7.7156	+0.0472	-0.0028	-0.0023
8400.5	225.555	.769	.3235	3587	21.2231	20.2244	7.7505	.0473	.0025	.0022
8440.5	225.790	.769	.3234	3587	21.1342	20.3038	7.7852	.0473	.0021	.0021
8480.5	226.025	.768	.3232	3587	21.0449	20.3828	7.8199	.0474	.0018	.0019
8520.5	226.259	+1.768	30.3231	3587	-20.9552	-20.4616	-7.8544	+0.0475	-0.0014	-0.0017
8560.5	226.494	.767	.3229	3587	20.8652	20.5400	7.8888	.0476	.0011	.0016
8600.5	226.729	.766	.3228	3587	20.7749	20.6180	7.9230	.0477	.0007	.0015
8640.5	226.964	.766	.3227	3587	20.6842	20.6957	7.9571	.0478	.0004	.0013
8680.5	227.199	+1.765	30.3226	3587	-20.5932	-20.7731	-7.9911	+0.0478	-0.0001	-0.0012
8720.5	227.433	.764	.3225	3587	20.5019	20.8501	8.0249	.0479	.0003	.0010
8760.5	227.668	.763	.3224	3587	20.4102	20.9268	8.0587	.0480	.0006	.0009
8800.5	227.903	.763	.3224	3587	20.3182	21.0031	8.0922	.0480	.0010	.0007
8840.5	228.138	+1.762	30.3223	3587	-20.2259	-21.0791	-8.1257	+0.0481	+0.0013	-0.0006

URANUS

Julian Date	Heliocentric		Radius Vector r	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus only		
	Longitude l	Latitude b			x	y	z	X	Y	Z
243/4	°	°		0.000						
8840.5	162.816	+0.772	18.2884	16348	-17.4705	+ 4.8586	+2.3757	+0.0370	-0.0103	-0.0050
8880.5	163.332	.772	.2878	16350	17.5178	4.7139	2.3130	.0371	.0100	.0049
8920.5	163.848	.772	.2872	16352	17.5637	4.5689	2.2501	.0372	.0097	.0048
8960.5	164.363	.772	.2867	16353	17.6083	4.4235	2.1870	.0373	.0094	.0046
9000.5	164.879	+0.772	18.2862	16354	-17.6515	+ 4.2777	+2.1237	+0.0374	-0.0091	-0.0045
9040.5	165.396	.772	.2858	16355	17.6934	4.1316	2.0603	.0374	.0087	.0044
9080.5	165.912	.772	.2855	16356	17.7339	3.9852	1.9967	.0375	.0084	.0042
9120.5	166.428	.771	.2852	16357	17.7730	3.8384	1.9330	.0376	.0081	.0041
9160.5	166.944	+0.771	18.2850	16358	-17.8107	+ 3.6913	+1.8691	+0.0377	-0.0078	-0.0040
9200.5	167.461	.771	.2849	16358	17.8471	3.5439	1.8050	.0378	.0075	.0038
9240.5	167.977	.770	.2848	16358	17.8821	3.3963	1.7408	.0379	.0072	.0037
9280.5	168.493	.770	.2848	16358	17.9157	3.2483	1.6764	.0379	.0069	.0036
9320.5	169.010	+0.769	18.2848	16358	-17.9479	+ 3.1001	+1.6120	+0.0380	-0.0066	-0.0034
9360.5	169.526	.768	.2850	16358	17.9787	2.9516	1.5473	.0381	.0063	.0033
9400.5	170.043	.768	.2851	16357	18.0081	2.8029	1.4826	.0381	.0059	.0031
9440.5	170.560	.767	.2854	16357	18.0361	2.6540	1.4177	.0382	.0056	.0030
9480.5	171.076	+0.766	18.2857	16356	-18.0627	+ 2.5048	+1.3527	+0.0382	-0.0053	-0.0029
9520.5	171.593	.765	.2860	16355	18.0879	2.3554	1.2877	.0383	.0050	.0027
9560.5	172.110	.764	.2865	16354	18.1117	2.2059	1.2225	.0383	.0047	.0026
9600.5	172.626	.763	.2869	16352	18.1341	2.0561	1.1572	.0384	.0044	.0025
9640.5	173.143	+0.762	18.2875	16351	-18.1551	+ 1.9062	+1.0918	+0.0384	-0.0040	-0.0023
9680.5	173.660	.761	.2881	16349	18.1746	1.7561	1.0263	.0384	.0037	.0022
9720.5	174.176	.760	.2887	16348	18.1928	1.6059	0.9607	.0385	.0034	.0020
9760.5	174.693	.758	.2895	16346	18.2095	1.4555	0.8951	.0385	.0031	.0019
9800.5	175.210	+0.757	18.2902	16343	-18.2248	+ 1.3051	+0.8294	+0.0386	-0.0027	-0.0017
9840.5	175.726	.756	.2911	16341	18.2386	1.1545	0.7636	.0386	.0024	.0016
9880.5	176.243	.754	.2920	16339	18.2511	1.0038	0.6977	.0386	.0021	.0015
9920.5	176.760	.753	.2929	16336	18.2621	0.8530	0.6318	.0386	.0018	.0013
9960.5	177.276	+0.751	18.2939	16334	-18.2717	+ 0.7022	+0.5659	+0.0386	-0.0015	-0.0012
0000.5	177.793	.749	.2950	16331	18.2798	0.5513	0.4999	.0386	.0012	.0011
0040.5	178.309	.748	.2961	16328	18.2865	0.4003	0.4338	.0386	.0009	.0009
0080.5	178.825	.746	.2972	16325	18.2918	0.2493	0.3677	.0386	.0005	.0008
0120.5	179.342	+0.744	18.2985	16321	-18.2957	+ 0.0983	+0.3016	+0.0386	-0.0002	-0.0006
0160.5	179.858	.742	.2997	16318	18.2982	- 0.0527	0.2355	.0386	+ .0001	.0005
0200.5	180.374	.740	.3011	16314	18.2992	0.2038	0.1693	.0386	.0004	.0004
0240.5	180.891	.738	.3025	16311	18.2987	0.3548	0.1032	.0386	.0008	.0002
0280.5	181.407	+0.736	18.3039	16307	-18.2969	- 0.5058	+0.0370	+0.0386	+0.0011	-0.0001
0320.5	181.923	.734	.3054	16303	18.2936	0.6567	-0.0292	.0386	.0014	+ .0001
0360.5	182.439	.732	.3070	16299	18.2889	0.8076	0.0954	.0386	.0017	.0002
0400.5	182.954	.730	.3086	16294	18.2828	0.9584	0.1616	.0385	.0020	.0003
0440.5	183.470	+0.727	18.3102	16290	-18.2752	- 1.1092	-0.2277	+0.0385	+0.0023	+0.0005
0480.5	183.986	.725	.3120	16285	18.2662	1.2598	0.2939	.0385	.0027	.0006
0520.5	184.501	.722	.3137	.6281	18.2558	1.4104	0.3600	.0385	.0030	.0008
0560.5	185.017	.720	.3156	16276	18.2440	1.5609	0.4261	.0384	.0033	.0009
0600.5	185.532	+0.717	18.3174	16271	-18.2307	- 1.7112	-0.4921	+0.0384	+0.0036	+0.0010
0640.5	186.047	.715	.3194	16266	18.2160	1.8614	0.5582	.0383	.0039	.0012
0680.5	186.562	.712	.3214	16260	18.1999	2.0114	0.6241	.0383	.0042	.0013
0720.5	187.077	.709	.3234	16255	18.1824	2.1613	0.6900	.0382	.0046	.0015
0760.5	187.592	+0.707	18.3255	16249	-18.1635	- 2.3110	-0.7559	+0.0382	+0.0049	+0.0016

NEPTUNE

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus + Neptune		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
243/4	°	°		0.0000						
8840.5	228.138	+1.762	30.3223	3587	-20.2259	-21.0791	- 8.1257	+0.0481	+0.0013	-0.0006
8880.5	228.372	.761	.3223	3587	20.1332	21.1548	8.1590	.0481	.0017	.0004
8920.5	228.607	.760	.3222	3587	20.0402	21.2301	8.1922	.0482	.0020	.0003
8960.5	228.842	.759	.3222	3587	19.9468	21.3051	8.2253	.0482	.0024	- .0001
9000.5	229.077	+1.758	30.3222	3587	-19.8532	-21.3797	- 8.2582	+0.0483	+0.0027	+0.0001
9040.5	229.312	.757	.3222	3587	19.7591	21.4539	8.2910	.0483	.0031	.0002
9080.5	229.546	.756	.3222	3587	19.6648	21.5279	8.3236	.0483	.0034	.0004
9120.5	229.781	.755	.3222	3587	19.5701	21.6014	8.3561	.0484	.0038	.0005
9160.5	230.016	+1.754	30.3222	3587	-19.4751	-21.6746	- 8.3885	+0.0484	+0.0041	+0.0007
9200.5	230.251	.753	.3223	3587	19.3798	21.7475	8.4208	.0484	.0045	.0008
9240.5	230.486	.752	.3223	3587	19.2841	21.8200	8.4529	.0485	.0048	.0010
9280.5	230.721	.750	.3223	3587	19.1881	21.8922	8.4849	.0485	.0052	.0011
9320.5	230.956	+1.749	30.3224	3587	-19.0918	-21.9640	- 8.5167	+0.0485	+0.0055	+0.0013
9360.5	231.191	.748	.3224	3587	18.9952	22.0354	8.5484	.0485	.0059	.0014
9400.5	231.426	.747	.3225	3587	18.8982	22.1065	8.5800	.0485	.0062	.0016
9440.5	231.661	.745	.3226	3587	18.8009	22.1772	8.6114	.0485	.0066	.0017
9480.5	231.896	+1.744	30.3226	3587	-18.7033	-22.2476	- 8.6427	+0.0485	+0.0069	+0.0019
9520.5	232.131	.743	.3227	3587	18.6053	22.3175	8.6738	.0485	.0073	.0021
9560.5	232.366	.741	.3228	3587	18.5071	22.3872	8.7048	.0485	.0076	.0022
9600.5	232.601	.740	.3228	3587	18.4085	22.4564	8.7356	.0485	.0080	.0024
9640.5	232.836	+1.738	30.3229	3587	-18.3096	-22.5253	- 8.7663	+0.0485	+0.0084	+0.0025
9680.5	233.071	.737	.3230	3587	18.2103	22.5938	8.7969	.0485	.0087	.0027
9720.5	233.306	.735	.3230	3587	18.1108	22.6620	8.8273	.0484	.0091	.0028
9760.5	233.542	.734	.3231	3587	18.0109	22.7297	8.8576	.0484	.0094	.0030
9800.5	233.777	+1.732	30.3232	3587	-17.9107	-22.7971	- 8.8877	+0.0484	+0.0098	+0.0031
9840.5	234.012	.731	.3232	3587	17.8102	22.8641	8.9177	.0484	.0101	.0033
9880.5	234.247	.729	.3233	3587	17.7094	22.9307	8.9476	.0483	.0105	.0035
9920.5	234.483	.727	.3233	3587	17.6083	22.9970	8.9772	.0483	.0108	.0036
9960.5	234.718	+1.726	30.3234	3587	-17.5068	-23.0629	- 9.0068	+0.0482	+0.0112	+0.0037
0000.5	234.953	.724	.3234	3587	17.4051	23.1283	9.0362	.0482	.0115	.0039
0040.5	235.189	.722	.3234	3587	17.3030	23.1934	9.0654	.0481	.0119	.0041
0080.5	235.424	.720	.3235	3587	17.2007	23.2581	9.0945	.0481	.0122	.0042
0120.5	235.660	+1.719	30.3235	3587	-17.0980	-23.3224	- 9.1234	+0.0480	+0.0126	+0.0044
0160.5	235.895	.717	.3235	3587	16.9950	23.3863	9.1522	.0480	.0130	.0045
0200.5	236.131	.715	.3235	3587	16.8917	23.4499	9.1808	.0479	.0133	.0047
0240.5	236.366	.713	.3235	3587	16.7882	23.5130	9.2093	.0479	.0137	.0048
0280.5	236.602	+1.711	30.3235	3587	-16.6843	-23.5757	- 9.2376	+0.0478	+0.0140	+0.0050
0320.5	236.837	.709	.3234	3587	16.5801	23.6380	9.2658	.0477	.0144	.0052
0360.5	237.073	.707	.3234	3587	16.4756	23.7000	9.2938	.0476	.0147	.0053
0400.5	237.309	.705	.3233	3587	16.3709	23.7615	9.3216	.0475	.0151	.0055
0440.5	237.544	+1.703	30.3233	3587	-16.2658	-23.8226	- 9.3493	+0.0475	+0.0154	+0.0056
0480.5	237.780	.701	.3232	3587	16.1605	23.8833	9.3768	.0474	.0158	.0058
0520.5	238.015	.699	.3231	3587	16.0548	23.9436	9.4042	.0473	.0161	.0059
0560.5	238.251	.697	.3230	3587	15.9489	24.0035	9.4314	.0472	.0165	.0061
0600.5	238.487	+1.695	30.3229	3587	-15.8427	-24.0630	- 9.4584	+0.0471	+0.0168	+0.0062
0640.5	238.723	.692	.3228	3587	15.7362	24.1220	9.4853	.0470	.0172	.0064
0680.5	238.958	.690	.3226	3587	15.6294	24.1807	9.5120	.0469	.0175	.0065
0720.5	239.194	.688	.3225	3587	15.5224	24.2389	9.5386	.0468	.0179	.0067
0760.5	239.430	+1.686	30.3223	3587	-15.4151	-24.2967	- 9.5649	+0.0467	+0.0182	+0.0069

URANUS

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus only		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
244	°	°		0.000						
0760.5	187.592	+0.707	18.3255	16249	-18.1635	-2.3110	-0.7559	+0.0382	+0.0049	+0.0016
0800.5	188.107	.704	.3277	16244	18.1431	2.4606	0.8217	.0381	.0052	.0017
0840.5	188.621	.701	.3299	16238	18.1214	2.6099	0.8875	.0381	.0055	.0019
0880.5	189.136	.698	.3321	16232	18.0982	2.7590	0.9531	.0380	.0058	.0020
0920.5	189.650	+0.695	18.3344	16226	-18.0737	-2.9079	-1.0187	+0.0379	+0.0061	+0.0021
0960.5	190.164	.692	.3368	16219	18.0477	3.0566	1.0842	.0379	.0064	.0023
1000.5	190.678	.689	.3392	16213	18.0204	3.2050	1.1496	.0378	.0067	.0024
1040.5	191.192	.686	.3417	16206	17.9916	3.3532	1.2150	.0377	.0070	.0026
1080.5	191.705	+0.683	18.3442	16200	-17.9615	-3.5011	-1.2802	+0.0377	+0.0073	+0.0027
1120.5	192.219	.679	.3468	16193	17.9300	3.6487	1.3453	.0376	.0076	.0028
1160.5	192.732	.676	.3495	16186	17.8970	3.7960	1.4104	.0375	.0080	.0030
1200.5	193.245	.673	.3522	16179	17.8628	3.9431	1.4753	.0374	.0083	.0031
1240.5	193.758	+0.669	18.3549	16171	-17.8271	-4.0898	-1.5400	+0.0373	+0.0086	+0.0032
1280.5	194.271	.666	.3577	16164	17.7901	4.2362	1.6047	.0372	.0089	.0034
1320.5	194.783	.662	.3606	16156	17.7517	4.3822	1.6692	.0371	.0092	.0035
1360.5	195.295	.659	.3635	16149	17.7119	4.5279	1.7337	.0370	.0095	.0036
1400.5	195.807	+0.655	18.3665	16141	-17.6708	-4.6732	-1.7979	+0.0369	+0.0098	+0.0038
1440.5	196.319	.651	.3695	16133	17.6283	4.8182	1.8620	.0368	.0101	.0039
1480.5	196.831	.647	.3726	16125	17.5845	4.9628	1.9260	.0367	.0104	.0040
1520.5	197.342	.644	.3758	16116	17.5393	5.1070	1.9898	.0366	.0107	.0042
1560.5	197.853	+0.640	18.3790	16108	-17.4928	-5.2508	-2.0535	+0.0365	+0.0109	+0.0043
1600.5	198.364	.636	.3822	16099	17.4450	5.3942	2.1170	.0363	.0112	.0044
1640.5	198.875	.632	.3856	16091	17.3958	5.5371	2.1803	.0362	.0115	.0045
1680.5	199.386	.628	.3889	16082	17.3454	5.6796	2.2435	.0361	.0118	.0047
1720.5	199.896	+0.624	18.3924	16073	-17.2936	-5.8217	-2.3065	+0.0360	+0.0121	+0.0048
1760.5	200.406	.620	.3959	16064	17.2404	5.9633	2.3693	.0358	.0124	.0049
1800.5	200.916	.616	.3994	16054	17.1860	6.1045	2.4319	.0357	.0127	.0051
1840.5	201.425	.612	.4030	16045	17.1303	6.2451	2.4943	.0356	.0130	.0052
1880.5	201.934	+0.607	18.4067	16035	-17.0733	-6.3853	-2.5566	+0.0354	+0.0133	+0.0053
1920.5	202.443	.603	.4104	16026	17.0150	6.5250	2.6186	.0353	.0135	.0054
1960.5	202.952	.599	.4142	16016	16.9554	6.6642	2.6804	.0351	.0138	.0056
2000.5	203.461	.594	.4181	16006	16.8946	6.8029	2.7420	.0350	.0141	.0057
2040.5	203.969	+0.590	18.4220	15995	-16.8325	-6.9410	-2.8034	+0.0348	+0.0144	+0.0058
2080.5	204.477	.586	.4259	15985	16.7691	7.0786	2.8646	.0347	.0146	.0059
2120.5	204.985	.581	.4300	15975	16.7044	7.2157	2.9256	.0345	.0149	.0061
2160.5	205.492	.577	.4341	15964	16.6386	7.3522	2.9864	.0344	.0152	.0062
2200.5	205.999	+0.572	18.4382	15953	-16.5714	-7.4881	-3.0469	+0.0342	+0.0155	+0.0063
2240.5	206.506	.567	.4424	15942	16.5031	7.6235	3.1072	.0341	.0157	.0064
2280.5	207.013	.563	.4467	15931	16.4335	7.7583	3.1672	.0339	.0160	.0065
2320.5	207.519	.558	.4510	15920	16.3626	7.8925	3.2270	.0337	.0163	.0067
2360.5	208.025	+0.553	18.4554	15908	-16.2906	-8.0261	-3.2866	+0.0335	+0.0165	+0.0068
2400.5	208.531	.549	.4599	15897	16.2174	8.1591	3.3459	.0334	.0168	.0069
2440.5	209.037	.544	.4644	15885	16.1429	8.2915	3.4049	.0332	.0170	.0070
2480.5	209.542	.539	.4690	15873	16.0672	8.4232	3.4637	.0330	.0173	.0071
2520.5	210.047	+0.534	18.4737	15861	-15.9904	-8.5544	-3.5223	+0.0328	+0.0176	+0.0072
2560.5	210.552	.529	.4784	15849	15.9124	8.6849	3.5806	.0326	.0178	.0073
2600.5	211.056	.524	.4832	15837	15.8332	8.8147	3.6386	.0324	.0181	.0075
2640.5	211.560	.519	.4880	15825	15.7528	8.9439	3.6963	.0323	.0183	.0076
2680.5	212.064	+0.514	18.4929	15812	-15.6713	-9.0724	-3.7538	+0.0321	+0.0186	+0.0077

NEPTUNE

Julian Date	Heliocentric		Radius Vector <i>r</i>	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus + Neptune		
	Longitude <i>l</i>	Latitude <i>b</i>			<i>x</i>	<i>y</i>	<i>z</i>	<i>X</i>	<i>Y</i>	<i>Z</i>
244	°	°		0.0000						
0760.5	239.430	+1.686	30.3223	3587	-15.4151	-24.2967	- 9.5649	+ 0.0467	+ 0.0182	+ 0.0069
0800.5	239.666	.683	.3221	3587	15.3075	24.3541	9.5912	.0466	.0186	.0070
0840.5	239.901	.681	.3219	3587	15.1996	24.4110	9.6172	.0464	.0189	.0072
0880.5	240.137	.679	.3217	3587	15.0915	24.4676	9.6431	.0463	.0193	.0073
0920.5	240.373	+1.676	30.3214	3587	-14.9831	-24.5237	- 9.6688	+ 0.0462	+ 0.0196	+ 0.0075
0960.5	240.609	.674	.3212	3587	14.8744	24.5794	9.6944	.0461	.0199	.0076
1000.5	240.845	.672	.3209	3587	14.7655	24.6347	9.7197	.0459	.0203	.0078
1040.5	241.080	.669	.3206	3587	14.6563	24.6895	9.7450	.0458	.0206	.0079
1080.5	241.316	+1.667	30.3203	3588	-14.5468	-24.7439	- 9.7700	+ 0.0457	+ 0.0210	+ 0.0081
1120.5	241.552	.664	.3200	3588	14.4371	24.7979	9.7949	.0455	.0213	.0082
1160.5	241.788	.661	.3197	3588	14.3272	24.8514	9.8196	.0454	.0216	.0084
1200.5	242.024	.659	.3193	3588	14.2170	24.9045	9.8441	.0452	.0220	.0085
1240.5	242.260	+1.656	30.3190	3588	-14.1065	-24.9572	- 9.8684	+ 0.0451	+ 0.0223	+ 0.0087
1280.5	242.496	.654	.3186	3588	13.9958	25.0094	9.8926	.0449	.0226	.0088
1320.5	242.731	.651	.3182	3588	13.8849	25.0612	9.9166	.0448	.0229	.0089
1360.5	242.967	.648	.3178	3588	13.7737	25.1125	9.9405	.0446	.0233	.0091
1400.5	243.203	+1.646	30.3173	3589	-13.6623	-25.1634	- 9.9641	+ 0.0444	+ 0.0236	+ 0.0092
1440.5	243.439	.643	.3169	3589	13.5507	25.2139	9.9876	.0442	.0239	.0094
1480.5	243.675	.640	.3164	3589	13.4388	25.2639	10.0109	.0441	.0243	.0095
1520.5	243.911	.637	.3159	3589	13.3267	25.3135	10.0340	.0439	.0246	.0097
1560.5	244.146	+1.634	30.3154	3589	-13.2144	-25.3626	-10.0570	+ 0.0437	+ 0.0249	+ 0.0098
1600.5	244.382	.632	.3149	3590	13.1018	25.4113	10.0798	.0436	.0252	.0100
1640.5	244.618	.629	.3144	3590	12.9891	25.4596	10.1024	.0434	.0255	.0101
1680.5	244.854	.626	.3139	3590	12.8761	25.5074	10.1248	.0432	.0259	.0102
1720.5	245.090	+1.623	30.3133	3590	-12.7629	-25.5547	-10.1470	+ 0.0430	+ 0.0262	+ 0.0104
1760.5	245.325	.620	.3127	3590	12.6495	25.6016	10.1691	.0428	.0265	.0105
1800.5	245.561	.617	.3122	3591	12.5359	25.6481	10.1910	.0426	.0268	.0107
1840.5	245.797	.614	.3116	3591	12.4221	25.6941	10.2127	.0424	.0271	.0108
1880.5	246.032	+1.611	30.3110	3591	-12.3080	-25.7396	-10.2342	+ 0.0422	+ 0.0274	+ 0.0109
1920.5	246.268	.608	.3104	3591	12.1938	25.7847	10.2556	.0420	.0277	.0111
1960.5	246.504	.605	.3097	3591	12.0794	25.8294	10.2767	.0418	.0280	.0112
2000.5	246.739	.602	.3091	3592	11.9648	25.8736	10.2977	.0416	.0283	.0113
2040.5	246.975	+1.598	30.3085	3592	-11.8500	-25.9173	-10.3185	+ 0.0414	+ 0.0286	+ 0.0115
2080.5	247.211	.595	.3078	3592	11.7350	25.9606	10.3391	.0411	.0289	.0116
2120.5	247.446	.592	.3072	3592	11.6198	26.0035	10.3596	.0409	.0292	.0118
2160.5	247.682	.589	.3065	3593	11.5045	26.0459	10.3799	.0407	.0295	.0119
2200.5	247.917	+1.586	30.3058	3593	-11.3889	-26.0879	-10.4000	+ 0.0405	+ 0.0298	+ 0.0120
2240.5	248.153	.582	.3052	3593	11.2732	26.1294	10.4199	.0403	.0301	.0121
2280.5	248.388	.579	.3045	3593	11.1573	26.1704	10.4396	.0400	.0304	.0123
2320.5	248.624	.576	.3038	3594	11.0412	26.2110	10.4591	.0398	.0307	.0124
2360.5	248.859	+1.572	30.3031	3594	-10.9250	-26.2512	-10.4785	+ 0.0396	+ 0.0310	+ 0.0125
2400.5	249.095	.569	.3024	3594	10.8086	26.2909	10.4977	.0393	.0313	.0127
2440.5	249.330	.566	.3018	3594	10.6920	26.3301	10.5167	.0391	.0316	.0128
2480.5	249.566	.562	.3011	3594	10.5753	26.3690	10.5355	.0388	.0318	.0129
2520.5	249.801	+1.559	30.3004	3595	-10.4584	-26.4073	-10.5542	+ 0.0386	+ 0.0321	+ 0.0131
2560.5	250.036	.555	.2997	3595	10.3413	26.4452	10.5727	.0383	.0324	.0132
2600.5	250.272	.552	.2991	3595	10.2241	26.4827	10.5910	.0381	.0327	.0133
2640.5	250.507	.548	.2984	3595	10.1067	26.5197	10.6091	.0378	.0329	.0134
2680.5	250.742	+1.545	30.2978	3596	- 9.9892	-26.5563	-10.6270	+ 0.0376	+ 0.0332	+ 0.0135

URANUS

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus only		
	Longitude	Latitude			x	y	z	X	Y	Z
	<i>l</i>	<i>b</i>	<i>r</i>							
244	°	°		0.000						
2680.5	212.064	+0.514	18.4929	15812	-15.6713	-9.0724	-3.7538	+0.0321	+0.0186	+0.0077
2720.5	212.568	.509	.4979	15799	15.5886	9.2002	3.8110	.0319	.0188	.0078
2760.5	213.071	.504	.5029	15786	15.5047	9.3274	3.8679	.0317	.0191	.0079
2800.5	213.574	.499	.5080	15773	15.4197	9.4539	3.9245	.0315	.0193	.0080
2840.5	214.077	+0.493	18.5131	15760	-15.3336	-9.5797	-3.9808	+0.0313	+0.0195	+0.0081
2880.5	214.579	.488	.5183	15747	15.2464	9.7047	4.0368	.0311	.0198	.0082
2920.5	215.082	.483	.5236	15733	15.1580	9.8291	4.0926	.0309	.0200	.0083
2960.5	215.584	.478	.5289	15720	15.0685	9.9527	4.1480	.0307	.0202	.0084
3000.5	216.085	+0.472	18.5343	15706	-14.9779	-10.0756	-4.2031	+0.0304	+0.0205	+0.0085
3040.5	216.587	.467	.5398	15692	14.8862	10.1978	4.2580	.0302	.0207	.0086
3080.5	217.088	.462	.5453	15678	14.7933	10.3192	4.3125	.0300	.0209	.0088
3120.5	217.588	.456	.5508	15664	14.6995	10.4399	4.3667	.0298	.0212	.0089
3160.5	218.089	+0.451	18.5564	15650	-14.6045	-10.5598	-4.4206	+0.0296	+0.0214	+0.0090
3200.5	218.589	.445	.5621	15636	14.5084	10.6790	4.4741	.0294	.0216	.0091
3240.5	219.089	.440	.5678	15621	14.4113	10.7973	4.5273	.0291	.0218	.0092
3280.5	219.589	.434	.5736	15607	14.3131	10.9149	4.5803	.0289	.0220	.0093
3320.5	220.088	+0.429	18.5795	15592	-14.2139	-11.0317	-4.6328	+0.0287	+0.0223	+0.0094
3360.5	220.587	.423	.5854	15577	14.1136	11.1477	4.6851	.0285	.0225	.0095
3400.5	221.086	.417	.5913	15562	14.0123	11.2629	4.7370	.0282	.0227	.0095
3440.5	221.585	.412	.5973	15547	13.9099	11.3773	4.7885	.0280	.0229	.0096
3480.5	222.083	+0.406	18.6033	15532	-13.8065	-11.4909	-4.8397	+0.0278	+0.0231	+0.0097
3520.5	222.581	.400	.6094	15517	13.7021	11.6036	4.8906	.0275	.0233	.0098
3560.5	223.079	.395	.6155	15502	13.5967	11.7155	4.9411	.0273	.0235	.0099
3600.5	223.576	.389	.6217	15486	13.4903	11.8265	4.9913	.0270	.0237	.0100
3640.5	224.074	+0.383	18.6279	15471	-13.3829	-11.9367	-5.0411	+0.0268	+0.0239	+0.0101
3680.5	224.570	.377	.6342	15455	13.2745	12.0461	5.0905	.0266	.0241	.0102
3720.5	225.067	.371	.6405	15439	13.1652	12.1545	5.1396	.0263	.0243	.0103
3760.5	225.563	.366	.6469	15424	13.0548	12.2621	5.1883	.0261	.0245	.0104
3800.5	226.059	+0.360	18.6533	15408	-12.9435	-12.3688	-5.2366	+0.0258	+0.0247	+0.0104
3840.5	226.555	.354	.6597	15392	12.8313	12.4747	5.2845	.0256	.0249	.0105
3880.5	227.050	.348	.6662	15376	12.7181	12.5796	5.3321	.0253	.0250	.0106
3920.5	227.546	.342	.6727	15360	12.6039	12.6836	5.3793	.0250	.0252	.0107
3960.5	228.040	+0.336	18.6793	15343	-12.4889	-12.7867	-5.4261	+0.0248	+0.0254	+0.0108
4000.5	228.535	.330	.6858	15327	12.3729	12.8889	5.4725	.0245	.0256	.0109
4040.5	229.029	.324	.6925	15311	12.2560	12.9902	5.5185	.0243	.0257	.0109
4080.5	229.523	.318	.6991	15295	12.1382	13.0905	5.5641	.0240	.0259	.0110
4120.5	230.017	+0.312	18.7058	15278	-12.0195	-13.1899	-5.6094	+0.0238	+0.0261	+0.0111
4160.5	230.510	.306	.7125	15262	11.8999	13.2884	5.6542	.0235	.0262	.0112
4200.5	231.003	.300	.7193	15245	11.7795	13.3859	5.6986	.0232	.0264	.0112
4240.5	231.496	.294	.7261	15229	11.6582	13.4824	5.7426	.0230	.0266	.0113
4280.5	231.988	+0.287	18.7329	15212	-11.5360	-13.5780	-5.7862	+0.0227	+0.0267	+0.0114
4320.5	232.480	.281	.7397	15195	11.4130	13.6726	5.8294	.0224	.0269	.0115
4360.5	232.972	.275	.7466	15179	11.2892	13.7662	5.8721	.0222	.0270	.0115
4400.5	233.464	.269	.7535	15162	11.1645	13.8588	5.9145	.0219	.0272	.0116
4440.5	233.955	+0.263	18.7604	15145	-11.0390	-13.9504	-5.9564	+0.0216	+0.0273	+0.0117
4480.5	234.446	.256	.7673	15128	10.9127	14.0411	5.9979	.0214	.0275	.0117
4520.5	234.936	.250	.7743	15112	10.7856	14.1307	6.0390	.0211	.0276	.0118
4560.5	235.426	.244	.7813	15095	10.6577	14.2193	6.0796	.0208	.0278	.0119
4600.5	235.916	+0.238	18.7883	15078	-10.5290	-14.3069	-6.1198	+0.0205	+0.0279	+0.0119

Julian Date	Heliocentric		Radius Vector	$\frac{1}{r^3}$	Heliocentric Equatorial Co-ordinates			Attractions on the Sun Uranus + Neptune		
	Longitude	Latitude			x	y	z	X	Y	Z
	l	b	r							
244	°	°		0.0000						
2680.5	250.742	+1.545	30.2978	3596	- 9.9892	-26.5563	-10.6270	+0.0376	+0.0332	+0.0135
2720.5	250.977	.541	.2971	3596	9.8715	26.5924	10.6448	.0373	.0335	.0137
2760.5	251.213	.537	.2965	3596	9.7537	26.6281	10.6623	.0371	.0337	.0138
2800.5	251.448	.534	.2958	3596	9.6357	26.6633	10.6797	.0368	.0340	.0139
2840.5	251.683	+1.530	30.2952	3597	- 9.5176	-26.6981	-10.6970	+0.0365	+0.0342	+0.0140
2880.5	251.918	.526	.2946	3597	9.3993	26.7325	10.7140	.0363	.0345	.0141
2920.5	252.154	.523	.2940	3597	9.2809	26.7664	10.7309	.0360	.0348	.0142
2960.5	252.389	.519	.2934	3597	9.1623	26.7998	10.7475	.0357	.0350	.0144
3000.5	252.624	+1.515	30.2928	3597	- 9.0436	-26.8329	-10.7641	+0.0354	+0.0353	+0.0145
3040.5	252.859	.511	.2922	3598	8.9247	26.8654	10.7804	.0351	.0355	.0146
3080.5	253.094	.508	.2917	3598	8.8057	26.8976	10.7965	.0349	.0358	.0147
3120.5	253.329	.504	.2911	3598	8.6866	26.9292	10.8125	.0346	.0360	.0148
3160.5	253.565	+1.500	30.2906	3598	- 8.5673	-26.9605	-10.8283	+0.0343	+0.0362	+0.0149
3200.5	253.800	.496	.2900	3598	8.4479	26.9913	10.8439	.0340	.0365	.0150
3240.5	254.035	.492	.2895	3599	8.3283	27.0216	10.8594	.0337	.0367	.0151
3280.5	254.270	.488	.2890	3599	8.2086	27.0515	10.8746	.0334	.0370	.0152
3320.5	254.505	+1.484	30.2885	3599	- 8.0888	-27.0810	-10.8897	+0.0331	+0.0372	+0.0154
3360.5	254.741	.480	.2880	3599	7.9688	27.1100	10.9046	.0328	.0374	.0155
3400.5	254.976	.476	.2876	3599	7.8487	27.1386	10.9193	.0325	.0376	.0156
3440.5	255.211	.472	.2871	3599	7.7285	27.1667	10.9339	.0323	.0379	.0157
3480.5	255.446	+1.468	30.2867	3600	- 7.6081	-27.1944	-10.9482	+0.0319	+0.0381	+0.0158
3520.5	255.682	.464	.2862	3600	7.4876	27.2216	10.9624	.0316	.0383	.0159
3560.5	255.917	.460	.2858	3600	7.3670	27.2484	10.9764	.0314	.0385	.0160
3600.5	256.152	.455	.2854	3600	7.2462	27.2747	10.9903	.0310	.0388	.0161
3640.5	256.388	+1.451	30.2850	3600	- 7.1254	-27.3006	-11.0039	+0.0307	+0.0390	+0.0162
3680.5	256.623	.447	.2846	3600	7.0044	27.3260	11.0174	.0304	.0392	.0163
3720.5	256.858	.443	.2842	3600	6.8832	27.3510	11.0307	.0301	.0394	.0164
3760.5	257.094	.439	.2838	3601	6.7620	27.3755	11.0438	.0298	.0396	.0165
3800.5	257.329	+1.434	30.2834	3601	- 6.6406	-27.3996	-11.0567	+0.0295	+0.0398	+0.0165
3840.5	257.565	.430	.2831	3601	6.5191	27.4232	11.0694	.0292	.0400	.0166
3880.5	257.800	.426	.2827	3601	6.3975	27.4464	11.0820	.0288	.0402	.0167
3920.5	258.036	.421	.2824	3601	6.2757	27.4691	11.0943	.0285	.0404	.0168
3960.5	258.271	+1.417	30.2820	3601	- 6.1539	-27.4914	-11.1065	+0.0282	+0.0406	+0.0169
4000.5	258.507	.412	.2817	3601	6.0319	27.5132	11.1185	.0279	.0408	.0170
4040.5	258.742	.408	.2814	3602	5.9098	27.5345	11.1304	.0275	.0409	.0171
4080.5	258.978	.404	.2810	3602	5.7876	27.5554	11.1420	.0272	.0411	.0172
4120.5	259.214	+1.399	30.2807	3602	- 5.6653	-27.5758	-11.1534	+0.0269	+0.0413	+0.0173
4160.5	259.449	.395	.2804	3602	5.5429	27.5958	11.1647	.0266	.0415	.0173
4200.5	259.685	.390	.2801	3602	5.4203	27.6153	11.1758	.0262	.0417	.0174
4240.5	259.921	.386	.2797	3602	5.2977	27.6343	11.1867	.0259	.0418	.0175
4280.5	260.157	+1.381	30.2794	3602	- 5.1749	-27.6529	-11.1974	+0.0256	+0.0420	+0.0176
4320.5	260.393	.376	.2791	3602	5.0521	27.6710	11.2079	.0252	.0422	.0177
4360.5	260.628	.372	.2788	3602	4.9291	27.6886	11.2182	.0249	.0423	.0177
4400.5	260.864	.367	.2785	3602	4.8061	27.7058	11.2283	.0246	.0425	.0178
4440.5	261.100	+1.362	30.2781	3603	- 4.6829	-27.7225	-11.2383	+0.0242	+0.0426	+0.0179
4480.5	261.336	.358	.2778	3603	4.5597	27.7387	11.2480	.0239	.0428	.0180
4520.5	261.572	.353	.2775	3603	4.4363	27.7545	11.2576	.0235	.0430	.0180
4560.5	261.808	.348	.2771	3603	4.3129	27.7698	11.2670	.0232	.0431	.0181
4600.5	262.044	+1.343	30.2768	3603	- 4.1894	-27.7846	-11.2762	+0.0229	+0.0433	+0.0182

PLUTO
HELIOCENTRIC EQUATORIAL CO-ORDINATES

J.D.	x	y	z	J.D.	x	y	z
243				243A			
6920.5	-298210	+102549	+122750	8840.5	-305468	+ 43686	+106384
6960.5	298449	101345	122443	8880.5	305525	42439	106007
7000.5	298684	100139	122135	8920.5	305578	41191	105629
7040.5	298916	98933	121825	8960.5	305626	39943	105248
7080.5	-299144	+ 97725	+121513	9000.5	-305671	+ 38694	+104867
7120.5	299368	96517	121201	9040.5	305711	37444	104484
7160.5	299589	95307	120886	9080.5	305747	36194	104099
7200.5	299806	94097	120571	9120.5	305779	34943	103713
7240.5	-300019	+ 92885	+120254	9160.5	-305807	+ 33691	+103325
7280.5	300229	91673	119935	9200.5	305830	32439	102936
7320.5	300434	90459	119615	9240.5	305850	31186	102545
7360.5	300637	89245	119294	9280.5	305865	29933	102153
7400.5	-300835	+ 88029	+118971	9320.5	-305875	+ 28679	+101760
7440.5	301030	86813	118647	9360.5	305882	27424	101365
7480.5	301220	85595	118321	9400.5	305884	26169	100968
7520.5	301408	84377	117994	9440.5	305882	24914	100570
7560.5	-301591	+ 83158	+117666	9480.5	-305875	+ 23658	+100170
7600.5	301771	81938	117336	9520.5	305864	22401	99769
7640.5	301947	80716	117004	9560.5	305849	21144	99367
7680.5	302119	79494	116672	9600.5	305829	19887	98963
7720.5	-302288	+ 78272	+116337	9640.5	-305805	+ 18629	+ 98557
7760.5	302453	77048	116002	9680.5	305776	17371	98151
7800.5	302614	75823	115665	9720.5	305743	16112	97742
7840.5	302771	74598	115326	9760.5	305705	14853	97333
7880.5	-302925	+ 73371	+114986	9800.5	-305663	+ 13594	+ 96921
7920.5	303075	72144	114645	9840.5	305617	12335	96509
7960.5	303221	70916	114302	9880.5	305566	11075	96095
8000.5	303364	69687	113957	9920.5	305510	09815	95679
8040.5	-303502	+ 68457	+113612	9960.5	-305450	+ 08555	+ 95262
8080.5	303637	67226	113264	0000.5	305385	07294	94844
8120.5	303768	65995	112916	0040.5	305316	06034	94424
8160.5	303896	64762	112565	0080.5	305242	04773	94003
8200.5	-304019	+ 63529	+112214	0120.5	-305164	+ 03512	+ 93581
8240.5	304139	62295	111860	0160.5	305081	02251	93157
8280.5	304255	61060	111506	0200.5	304993	+ 00990	92732
8320.5	304367	59824	111150	0240.5	304901	- 00270	92305
8360.5	-304475	+ 58588	+110792	0280.5	-304804	- 01531	+ 91877
8400.5	304580	57350	110433	0320.5	304703	02792	91448
8440.5	304680	56112	110073	0360.5	304597	04053	91017
8480.5	304777	54873	109710	0400.5	304486	05314	90585
8520.5	-304869	+ 53633	+109347	0440.5	-304371	- 06575	+ 90152
8560.5	304958	52392	108982	0480.5	304251	07836	89717
8600.5	305043	51151	108615	0520.5	304127	09096	89281
8640.5	305124	49909	108247	0560.5	303997	10356	88844
8680.5	-305201	+ 48666	+107878	0600.5	-303864	- 11617	+ 88405
8720.5	305274	47422	107507	0640.5	303725	12876	87965
8760.5	305343	46177	107134	0680.5	303582	14136	87524
8800.5	305408	44932	106760	0720.5	303434	15396	87081
8840.5	-305468	+ 43686	+106384	0760.5	-303281	- 16655	+ 86637

PLUTO

HELIOCENTRIC EQUATORIAL CO-ORDINATES

J.D.	x	y	z	J.D.	x	y	z
244				244			
07605	-303281	- 1.6655	+ 8.6637	26805	-29.0488	- 7.6301	+ 6.3942
08005	303124	1.7913	8.6192	27205	29.0109	7.7520	6.3442
08405	302962	1.9172	8.5746	27605	28.9725	7.8737	6.2941
08805	302796	2.0430	8.5298	28005	28.9337	7.9954	6.2438
09205	-302624	- 2.1688	+ 8.4850	28405	-28.8944	- 8.1169	+ 6.1935
09605	302448	2.2945	8.4399	28805	28.8546	8.2383	6.1431
10005	302268	2.4202	8.3948	29205	28.8144	8.3596	6.0925
10405	302082	2.5458	8.3495	29605	28.7737	8.4807	6.0419
10805	-301892	- 2.6714	+ 8.3042	30005	-28.7325	- 8.6017	+ 5.9911
11205	301698	2.7969	8.2587	30405	28.6909	8.7226	5.9403
11605	301498	2.9224	8.2130	30805	28.6488	8.8434	5.8893
12005	301294	3.0478	8.1673	31205	28.6063	8.9640	5.8383
12405	-301085	- 3.1731	+ 8.1214	31605	-28.5633	- 9.0845	+ 5.7871
12805	300872	3.2984	8.0754	32005	28.5198	9.2049	5.7358
13205	300654	3.4237	8.0293	32405	28.4758	9.3251	5.6844
13605	300431	3.5488	7.9831	32805	28.4314	9.4452	5.6330
14005	-300204	- 3.6739	+ 7.9367	33205	-28.3865	- 9.5651	+ 5.5814
14405	299972	3.7990	7.8903	33605	28.3411	9.6849	5.5297
14805	299735	3.9239	7.8437	34005	28.2953	9.8045	5.4779
15205	299493	4.0488	7.7970	34405	28.2490	9.9241	5.4261
15605	-299247	- 4.1736	+ 7.7502	34805	-28.2022	-10.0434	+ 5.3741
16005	298997	4.2983	7.7033	35205	28.1549	10.1626	5.3220
16405	298741	4.4230	7.6562	35605	28.1071	10.2816	5.2698
16805	298481	4.5475	7.6091	36005	28.0589	10.4005	5.2176
17205	-298217	- 4.6720	+ 7.5618	36405	-28.0102	-10.5193	+ 5.1652
17605	297947	4.7964	7.5144	36805	27.9610	10.6378	5.1128
18005	297674	4.9207	7.4669	37205	27.9114	10.7562	5.0602
18405	297395	5.0449	7.4193	37605	27.8612	10.8744	5.0076
18805	-297112	- 5.1691	+ 7.3716	38005	-27.8106	-10.9925	+ 4.9548
19205	296824	5.2931	7.3238	38405	27.7595	11.1104	4.9020
19605	296532	5.4170	7.2759	38805	27.7079	11.2281	4.8491
20005	296235	5.5409	7.2278	39205	27.6558	11.3456	4.7961
20405	-295934	- 5.6646	+ 7.1796	39605	-27.6033	-11.4630	+ 4.7430
20805	295628	5.7882	7.1314	40005	27.5502	11.5801	4.6898
21205	295317	5.9118	7.0830	40405	27.4967	11.6971	4.6366
21605	295002	6.0352	7.0345	40805	27.4427	11.8139	4.5832
22005	-294682	- 6.1585	+ 6.9859	41205	-27.3882	-11.9305	+ 4.5298
22405	294358	6.2818	6.9372	41605	27.3332	12.0469	4.4763
22805	294029	6.4049	6.8884	42005	27.2778	12.1631	4.4227
23205	293695	6.5279	6.8394	42405	27.2218	12.2791	4.3690
23605	-293357	- 6.6508	+ 6.7904	42805	-27.1654	-12.3949	+ 4.3153
24005	293015	6.7736	6.7412	43205	27.1085	12.5105	4.2615
24405	292667	6.8963	6.6920	43605	27.0511	12.6259	4.2076
24805	292316	7.0189	6.6426	44005	26.9932	12.7410	4.1536
25205	-291959	- 7.1414	+ 6.5931	44405	-26.9348	-12.8560	+ 4.0995
25605	291598	7.2637	6.5436	44805	26.8760	12.9707	4.0454
26005	291233	7.3859	6.4939	45205	26.8166	13.0852	3.9912
26405	290863	7.5081	6.4441	45605	26.7568	13.1995	3.9369
26805	-290488	- 7.6301	+ 6.3942	46005	-26.6965	-13.3135	+ 3.8826