ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152001 2004 JH_{18}	16.3	X	274.75315	274.82424	212.02586	6.75891	0.0401053	0.27565785	2.3382403	20	12 28.9	19.0
152002 2004 JE_{19}	15.1	X	339.88875	254.39877	30.69701	8.91998	0.0419478	0.18937021	3.0032739	20	6 17.3	19.2
152003 2004 JV_{21}	16.4	X	38.18236	248.52543	215.67802	3.49387	0.1106345	0.23324293	2.6137481	20	1 11.5	19.4
152004 2004 JX_{26}	16.8	X	201.94612	21.29692	217.71232	2.24989	0.1266638	0.28002292	2.3138773	20	—	—
152005 2004 JJ_{27}	15.5	X	220.17242	274.37189	38.51245	4.96476	0.2574321	0.22993561	2.6387519	20	2 13.7	20.2
152006 2004 JX_{30}	16.3	X	297.09014	119.97650	97.03131	3.63633	0.0981943	0.29294096	2.2453428	20	—	—
152007 2004 JR_{32}	15.9	X	214.56957	179.55270	148.10021	4.83875	0.2110459	0.23345907	2.6121346	20	2 25.5	20.3
152008 2004 JS_{32}	16.6	X	305.63355	325.69703	196.73745	5.86089	0.0305944	0.28659143	2.2783857	20	—	—
152009 2004 JW_{32}	16.6	X	276.96134	286.59576	204.37886	6.54336	0.0572556	0.27652627	2.3333423	20	—	—
152010 2004 JC_{33}	16.0	X	205.92623	179.59123	166.97327	5.92213	0.1091351	0.23632592	2.5909666	20	3 13.1	19.8
152011 2004 JM_{34}	15.9	X	228.38506	173.52798	140.26790	5.34922	0.1654448	0.23253671	2.6190374	20	2 22.2	20.0
152012 2004 JG_{35}	15.9	X	51.49445	202.99945	91.26015	9.69275	0.2416360	0.25977926	2.4325759	20	11 20.3	19.4
152013 2004 JG_{36}	16.4	X	306.25618	161.05289	139.35903	6.30019	0.1811948	0.24571389	2.5245438	20	5 1.7	19.4
152014 2004 JR_{42}	15.4	X	320.02556	221.08174	102.23072	4.12786	0.1033808	0.19061199	2.9902161	20	7 4.4	19.0
152015 2004 JH_{43}	16.5	X	237.75588	123.78995	97.57416	5.16235	0.1703062	0.28338800	2.2955235	20	—	—
152016 2004 JP_{51}	16.4	X	100.92825	159.67579	120.93501	7.04552	0.0970430	0.27070007	2.3667033	20	12 11.0	19.8
152017 2004 KR_{6}	16.3	X	97.71517	194.10499	147.44804	5.47739	0.1231450	0.21622595	2.7491441	20	—	—
152018 2004 KJ_{9}	17.0	X	211.40136	199.91777	28.48156	3.86972	0.1234059	0.28033290	2.3121713	20	—	—
152019 2004 KO_{10}	15.2	X	316.08404	120.37314	92.25042	28.98571	0.2848039	0.23115600	2.6294562	20	1 1.9	19.0
152020 2004 KS_{13}	16.3	X	165.57359	198.42286	145.87301	9.95627	0.1065752	0.29233222	2.2484588	20	1 20.8	19.5
152021 2004 LH_{2}	16.2	X	270.26828	348.28256	333.28413	1.36901	0.1634335	0.24017241	2.5632284	20	4 12.0	19.7
152022 2004 LF_{23}	16.1	X	83.88654	322.58944	330.52569	4.86671	0.1421902	0.26313692	2.4118383	20	12 9.4	19.7
152023 2004 MC_{4}	15.3	X	285.99030	164.47426	148.58202	14.08832	0.2465272	0.24002044	2.5643102	20	4 13.1	19.1
152024 2004 MZ_{6}	15.3	X	265.38415	252.48670	134.53508	10.46529	0.0891708	0.18376611	3.0640260	20	7 11.7	19.6
152025 2004 NP	16.2	X	26.04396	164.66387	62.48990	4.42462	0.0929508	0.24368501	2.5385371	20	6 12.7	18.9
152026 2004 NO_{5}	16.6	X	117.06602	228.86448	12.09331	3.13913	0.1463260	0.26098394	2.4250844	20	11 6.5	20.5
152027 2004 ND_{8}	16.3	X	123.26051	114.30653	150.76821	2.79531	0.2013122	0.26473301	2.4021345	20	12 13.9	20.3
152028 2004 NB_{21}	15.4	X	137.53198	169.94320	147.45103	10.17588	0.1694590	0.21215930	2.7841630	20	—	—
152029 2004 ND_{21}	15.9	X	182.84486	139.35316	171.33990	5.33486	0.1074502	0.21878148	2.7276942	20	1 7.9	20.1
152030 2004 NT_{21}	16.2	X	112.87324	336.44322	285.78226	2.50392	0.2065773	0.26200406	2.4187856	20	12 1.4	20.2
152031 2004 NL_{23}	16.3	X	7.77544	76.90419	180.93976	4.02579	0.1764034	0.24466127	2.5317796	20	7 1.6	18.5
152032 2004 NW_{23}	15.6	X	9.23628	322.44616	292.93455	12.61397	0.1523334	0.24162921	2.5529154	20	6 30.1	17.9
152033 2004 NF_{26}	16.1	X	155.54173	132.56050	164.21156	4.35000	0.1899063	0.21240376	2.7820264	20	—	—
152034 2004 NH_{27}	16.2	X	154.21532	210.72304	147.34574	6.55854	0.0604722	0.22218827	2.6997401	20	1 30.9	20.1
152035 2004 NQ_{29}	16.2	X	202.61599	303.28780	245.89133	5.55190	0.2408194	0.26789209	2.3832126	20	11 16.8	20.0
152036 2004 OR_{2}	15.8	X	139.66791	101.73841	223.15306	4.18717	0.0273290	0.21366643	2.7710552	20	—	—
152037 2004 OQ_{11}	14.4	X	282.03564	186.46022	115.76906	26.84535	0.1298583	0.17099688	3.2147257	20	4 23.1	19.5
152038 2004 OW_{12}	16.6	X	61.69544	140.94630	132.68117	2.05266	0.1627830	0.25496334	2.4631124	20	10 24.1	19.9
152039 2004 PR_{7}	15.2	X	298.03030	192.86947	147.93366	17.94529	0.1967298	0.17771880	3.1331448	20	6 12.2	19.6
152040 2004 PA_{10}	15.3	X	269.20643	89.60006	312.97904	9.81690	0.0766751	0.18365298	3.0652841	20	8 7.9	19.6
152041 2004 PA_{13}	16.4	X	102.22114	30.80769	237.22342	1.55732	0.1398154	0.25987574	2.4319738	20	11 26.1	20.2
152042 2004 PP_{14}	15.1	X	320.35845	274.45441	139.77645	11.44908	0.0661400	0.19318323	2.9636240	20	11 10.5	19.1
152043 2004 PP_{20}	14.7	X	279.32816	52.97403	309.66521	12.68059	0.0573103	0.17850762	3.1239078	20	7 4.7	19.1
152044 2004 PS_{21}	15.3	X	293.17582	53.72906	319.62195	10.42379	0.0908399	0.18337127	3.0684227	20	8 1.7	19.2
152045 2004 PS_{23}	15.4	X	13.95666	256.12427	112.99240	2.75917	0.1505226	0.19594578	2.9357029	20	12 7.7	18.9
152046 2004 PB_{30}	15.6	X	220.38582	119.23345	153.95982	9.57202	0.1383738	0.21583617	2.7524529	20	—	—
152047 2004 PJ_{31}	16.2	X	76.68970	154.13349	172.73150	0.71968	0.1226085	0.20048280	2.8912433	20	12 28.9	20.4
152048 2004 PB_{37}	15.8	X	67.32074	184.41322	174.55596	1.99349	0.0830639	0.20357249	2.8619146	20	—	—
152049 2004 PT_{38}	15.5	X	125.06346	9.02653	345.42326	6.87362	0.1003369	0.21142265	2.7906264	20	—	—
152050 2004 PB_{39}	15.2	X	270.25372	256.70942	94.09028	2.33681	0.1757392	0.17270545	3.1934884	20	5 20.8	20.0
152051 2004 PH_{39}	15.5	X	318.99030	289.80281	306.12194	5.49041	0.1081678	0.22730910	2.6590398	20	3 1.8	19.0
152052 2004 PC_{40}	15.3	X	220.15684	114.53011	164.54433	15.81866	0.1133651	0.21644949	2.7472510	20	1 6.6	19.9
152053 2004 PN_{44}	15.6	X	27.72244	249.36493	303.85067	13.05517	0.1127154	0.23511465	2.5998578	20	4 21.4	18.8
152054 2004 PR_{50}	15.6	X	350.94768	292.42165	69.45782	2.98246	0.0586932	0.19232746	2.9724086	20	10 15.6	19.4
152055 2004 PN_{54}	16.4	X	24.75539	342.90962	291.66570	3.35399	0.1337116	0.24640555	2.5198173	20	8 24.9	19.2
152056 2004 PD_{69}	15.9	X	302.98001	303.86014	67.22168	2.32726	0.2324421	0.18117630	3.0931558	20	7 23.1	19.4
152057 2004 PX_{71}	15.1	X	289.89288	216.93574	327.08250	14.17696	0.1481759	0.21596765	2.7513357	20	—	—
152058 2004 PZ_{71}	16.1	X	196.35160	321.06430	8.86491	1.13573	0.0781807	0.22267543	2.6958012	20	2 13.2	20.0
152059 2004 PB_{75}	16.0	X	237.61198	178.26230	117.57223	5.35009	0.0631761	0.22382774	2.6865409	20	2 16.6	19.9
152060 2004 PK_{76}	15.2	X	194.65543	287.02216	133.86333	11.71650	0.0606942	0.17461295	3.1701884	20	6 7.1	20.1
152061 2004 PM_{77}	15.0	X	303.08083	51.32982	297.77874	10.53984	0.0902831	0.18091206	3.0961670	20	7 14.4	19.0
152062 2004 PQ_{79}	16.0	X	0.28553	329.27799	268.41998	4.62794	0.2454323	0.23854478	2.5748747	20	5 8.9	17.8
152063 2004 PH_{90}	15.4	X	159.83012	161.54686	177.67064	10.19996	0.3419700	0.21306894	2.7762333	20	2 2.9	20.5
152064 2004 PL_{94}	15.8	X	202.15319	146.12058	159.42759	13.53626	0.1888222	0.21774662	2.7363297	20	1 20.9	20.6
152065 2004 PC_{96}	15.8	X	357.19630	205.70093	193.79359	1.69268	0.0812390	0.19707825	2.9244459	20	12 13.2	19.5
152066 2004 PT_{108}	16.3	X	0.48759	287.35269	335.66381	2.28464	0.2000011	0.24045385	2.5612279	20	6 23.9	18.3
152067 Deboy	16.1	X	127.41668	264.07450	44.79549	2.35618	0.1122042	0.20510815	2.8476117	20	—	—
152068 2004 QG_{11}	15.0	X	175.01190	96.53468	80.61548	8.61122	0.0474655	0.19105399	2.9856024	20	10 12.7	19.5
152069 2004 QV_{21}	15.6	X	60.56343	9.68078	262.80586	3.91902	0.1654178	0.19002631	2.9963571	20	10 8.4	19.8
152070 2004 RV_{5}	15.3	X	50.50182	36.72964	141.12045	22.65009	0.0883473	0.23126690	2.6286155	20	5 20.3	19.1
152071 2004 RW_{7}	16.6	X	274.61998	348.48130	280.67520	3.14605	0.1279419	0.22712318	2.6604906	20	2 15.4	20.4
152072 2004 RF_{9}	16.0	X	293.27965	97.08416	151.92625	14.01204	0.1296464	0.22542047	2.6738712	20	2 12.2	19.6
152073 2004 RH_{12}	15.0	X	46.12905	31.42458	231.10988	6.80480	0.0443235	0.18360014	3.0658722	20	8 18.1	19.4
152074 2004 RC_{14}	15.6	X	314.90319	173.06277	162.60469	10.44856	0.0996646	0.17905233	3.1175689	20	7 11.7	19.7
152075 2004 RL_{14}	15.4	X	278.68580	35.56879	167.15072	12.29581	0.1033611	0.21420908	2.7663734	20	—	—
152076 2004 RD_{16}	15.9	X	163.11548	135.62428	184.22888	4.12298	0.0626629	0.21261949	2.7801442	20	—	—
152077 2004 RA_{17}	16.0	X	308.54096	61.61822	189.70705	2.89691	0.0460500	0.22642359	2.6659680	20	3 18.4	19.5
152078 2004 RW_{19}	15.0	X	200.06581	123.61170	50.81059	10.14420	0.0203485	0.19318602	2.9635954	20	11 6.2	19.3
152079 2004 RS_{21}	16.1	X	236.22485	103.53592	170.83520	3.52382	0.1132746	0.21841037	2.7307831	20	1 16.3	20.3
152080 2004 RV_{21}	15.0	X	108.42651	317.42738	170.81324	6.73126	0.0624966	0.16751061	3.2591761	20	5 24.3	19.7

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152081 2004 RD_{27}	15.8	X	333.67387	229.66090	113.14656	3.87348	0.1031510	0.18287838	3.0739335	20	8 23.0	19.5
152082 2004 RR_{29}	16.4	X	104.42946	102.27518	146.30942	7.91943	0.1595681	0.25699447	2.4501172	20	11 7.6	20.3
152083 2004 RH_{30}	15.8	X	168.36033	300.15054	13.89566	4.76158	0.0647272	0.21361276	2.7715194	20	—	—
152084 2004 RR_{33}	15.2	X	23.22386	138.11794	138.81265	11.89316	0.1017043	0.18189169	3.0850401	20	8 14.4	19.0
152085 2004 RE_{34}	14.9	X	60.04008	74.59488	146.09323	10.64909	0.0446284	0.17706412	3.1408631	20	7 15.4	19.3
152086 2004 RT_{34}	15.3	X	15.13077	208.65343	97.97410	4.54902	0.0816788	0.18455819	3.0552529	20	9 10.7	19.2
152087 2004 RJ_{37}	15.1	X	55.06846	241.11736	16.02066	7.24308	0.0630055	0.18425993	3.0585490	20	8 31.6	19.3
152088 2004 RB_{39}	16.0	X	231.52082	99.79927	15.81341	1.28323	0.0537056	0.18793753	3.0185176	20	9 26.7	20.4
152089 2004 RW_{43}	15.5	X	326.82218	73.24375	232.55550	1.17580	0.1184511	0.17677106	3.1443335	20	6 19.5	19.4
152090 2004 RR_{49}	15.5	X	185.84065	328.56190	357.91632	3.83835	0.2187122	0.21779158	2.7359532	20	2 4.1	20.1
152091 2004 RD_{50}	16.2	X	110.19166	350.53842	356.98991	0.76859	0.0960871	0.20669747	2.8329959	20	—	—
152092 2004 RB_{63}	15.9	X	139.35491	69.15307	245.47635	1.08911	0.0797204	0.20633104	2.8363490	20	—	—
152093 2004 RX_{63}	15.7	X	25.54560	209.97274	172.06750	2.00927	0.1210397	0.19637619	2.9314117	20	—	—
152094 2004 RO_{71}	14.0	X	311.00616	277.01877	151.74776	9.62801	0.2305758	0.12558999	3.9491112	20	10 14.5	18.7
152095 2004 RP_{72}	14.7	X	119.64167	335.03433	184.91894	9.42558	0.0304875	0.17383698	3.1796154	20	7 10.4	19.4
152096 2004 RT_{74}	15.6	X	108.63586	163.84993	146.79667	6.86541	0.1688846	0.20030313	2.8929720	20	—	—
152097 2004 RB_{90}	15.1	X	37.99676	358.43026	313.11214	8.01358	0.0653351	0.19071432	2.9891463	20	10 11.9	19.3
152098 2004 RZ_{91}	15.2	X	273.13029	128.24174	257.02348	7.57013	0.0751476	0.17933338	3.1143109	20	7 20.1	19.5
152099 2004 RT_{92}	15.3	X	356.13128	22.84942	288.61575	8.85380	0.0515342	0.18260400	3.0770120	20	8 12.7	19.4
152100 2004 RD_{101}	14.7	X	276.92476	121.61536	223.33072	3.83101	0.1992207	0.17271670	3.1933499	20	5 17.9	19.3
152101 2004 RU_{101}	16.0	X	327.09432	354.40842	273.42014	2.13620	0.2109344	0.23421911	2.6064806	20	4 12.1	18.6
152102 2004 RD_{107}	15.2	X	210.37708	106.51941	323.72599	3.69259	0.1486696	0.17395636	3.1781606	20	6 28.9	20.3
152103 2004 RN_{109}	15.3	X	341.83390	177.42976	156.73839	3.30809	0.1017702	0.18047487	3.1011652	20	8 23.4	19.0
152104 2004 RX_{120}	15.1	X	107.67741	352.13207	159.06326	17.78923	0.1346219	0.17199745	3.2022462	20	6 28.9	20.2
152105 2004 RM_{121}	15.8	X	282.40566	9.89749	30.62727	2.22765	0.1005733	0.18227810	3.0806786	20	8 20.6	19.8
152106 2004 RJ_{146}	15.4	X	277.28387	229.78409	353.47361	7.84876	0.1125932	0.21640386	2.7476372	20	—	—
152107 2004 RF_{149}	16.5	X	173.29816	224.56864	68.68363	2.21042	0.2263905	0.27273528	2.3549146	20	—	—
152108 2004 RK_{153}	15.1	X	241.85878	280.31835	220.81742	9.08739	0.0256206	0.19361446	2.9592218	20	11 15.2	19.3
152109 2004 RE_{154}	15.3	X	230.62945	172.38382	332.31300	10.71691	0.0628421	0.19238494	2.9718166	20	10 26.2	19.8
152110 2004 RS_{170}	14.9	X	315.69554	32.61504	352.17265	9.06693	0.0706929	0.18291128	3.0735649	20	9 19.7	18.7
152111 2004 RA_{182}	14.0	X	141.10496	66.04659	343.91477	16.83645	0.1216815	0.15722083	3.3998727	20	3 26.6	19.4
152112 2004 RJ_{192}	14.7	X	36.68131	355.28442	296.22665	9.71613	0.1355883	0.18273495	3.0755418	20	9 21.9	18.9
152113 2004 RG_{207}	14.1	X	140.46596	123.67417	268.43393	17.68016	0.1040525	0.15685173	3.4052044	20	2 28.6	19.6
152114 2004 RV_{209}	14.9	X	72.18610	91.19851	235.98353	10.91614	0.0918277	0.19776629	2.9176591	20	12 20.1	19.2
152115 2004 RB_{210}	14.8	X	359.75013	13.50945	266.10671	10.87071	0.0282954	0.17591833	3.1544863	20	7 7.5	19.1
152116 2004 RU_{224}	15.8	X	339.08488	238.96214	51.38921	1.65237	0.1361222	0.17852405	3.1237161	20	6 18.0	19.5
152117 2004 RK_{242}	15.9	X	357.60781	166.95756	120.59479	1.00892	0.1719289	0.17892939	3.1189968	20	7 19.2	19.3
152118 2004 RZ_{253}	15.0	X	38.92567	250.18041	82.16451	11.74005	0.1045248	0.19181689	2.9776809	20	11 20.1	19.0
152119 2004 RN_{255}	15.0	X	106.75318	188.79476	82.60787	13.19191	0.0280674	0.19113305	2.9847791	20	11 17.2	19.3
152120 2004 RL_{276}	16.4	X	10.63262	280.19290	327.02002	2.28580	0.1480976	0.23956618	2.5675508	20	6 18.8	18.9
152121 2004 RA_{315}	15.6	X	337.23630	226.53547	72.64308	2.15550	0.1462742	0.17593124	3.1543320	20	6 26.2	19.2
152122 2004 RT_{318}	14.2	X	280.49689	231.66666	215.79855	8.09830	0.2245979	0.12429829	3.9764234	20	9 16.6	19.7
152123 2004 SU_{13}	15.8	X	146.96251	138.08272	146.08073	8.90744	0.0949421	0.20310700	2.8662856	20	—	—
152124 2004 SX_{20}	14.7	X	323.13979	189.61796	151.41140	32.29009	0.1991157	0.17813338	3.1282816	20	7 23.5	18.6
152125 2004 SR_{33}	15.3	X	336.11282	178.33326	147.52077	5.63472	0.2688739	0.17792459	3.1307285	20	7 22.1	18.0
152126 2004 SU_{56}	15.3	X	178.78807	90.30412	172.28215	14.83221	0.1253841	0.20480368	2.8504333	20	—	—
152127 2004 TL_{25}	15.2	X	192.12298	239.61714	359.36223	6.97046	0.2656858	0.20358845	2.8617649	20	12 24.9	20.2
152128 2004 TF_{58}	15.6	X	321.52167	90.38982	290.83423	0.50662	0.0394280	0.18334838	3.0686780	20	9 25.6	19.7
152129 2004 TL_{99}	15.6	X	85.89984	167.08859	92.71869	1.98663	0.1621710	0.18512770	3.0489837	20	10 22.0	20.2
152130 2004 TZ_{116}	15.3	X	272.64404	291.54535	269.21160	11.18796	0.1192737	0.21139302	2.7908873	20	—	—
152131 2004 TW_{117}	15.0	X	354.28524	147.69254	172.92371	5.65134	0.1372730	0.17793026	3.1306620	20	8 26.0	18.7
152132 2004 TG_{123}	13.8	X	308.99735	274.43405	165.79995	9.40015	0.1081576	0.12531191	3.9549514	20	11 6.3	19.0
152133 2004 TN_{126}	14.0	X	297.56807	7.06150	68.31138	7.16689	0.0675878	0.12548332	3.9513489	20	10 20.4	19.3
152134 2004 TR_{129}	14.8	X	349.22033	243.85858	45.02523	9.52945	0.0707831	0.17439706	3.1728043	20	7 6.1	19.0
152135 2004 TC_{145}	14.8	X	305.34184	302.73003	36.00302	3.32860	0.0893372	0.16993113	3.2281528	20	7 3.4	19.0
152136 2004 TW_{192}	15.7	X	21.30360	122.80547	146.91805	2.30575	0.0872905	0.17525114	3.1624875	20	7 30.2	19.5
152137 2004 TE_{298}	14.6	X	293.54950	87.59066	252.74885	12.18808	0.0257592	0.17038889	3.2223685	20	6 26.6	19.1
152138 2004 TU_{334}	15.6	X	252.74859	250.62114	154.46192	1.88776	0.0515627	0.17757535	3.1348319	20	7 24.2	20.0
152139 2004 TA_{364}	15.5	X	23.95822	261.24468	103.27929	3.51652	0.0100256	0.19520074	2.9431682	20	11 27.2	19.4
152140 2004 UO_{2}	14.7	X	39.88753	220.11457	62.26395	12.15673	0.2128517	0.18404372	3.0609440	20	10 8.0	18.9
152141 2004 VZ_{61}	14.1	X	278.52785	298.74955	64.33985	23.49697	0.0875867	0.16998513	3.2274691	20	6 25.6	18.8
152142 2005 JT	16.6	X	143.66934	121.27491	124.93165	4.63878	0.2531305	0.22478891	2.6788771	20	12 2.1	21.4
152143 2005 JK_{3}	17.2	X	25.09574	50.87441	171.90079	1.17285	0.1382319	0.26608287	2.3940035	20	6 9.9	19.5
152144 2005 JZ_{17}	16.6	X	256.33232	321.96845	42.99348	4.98602	0.1156259	0.26722128	2.3871994	20	5 29.3	19.8
152145 2005 JW_{112}	14.5	X	208.59248	111.43104	208.48196	15.83392	0.2714087	0.24136354	2.5547884	20	2 6.1	19.4
152146 Rosenlappin	17.0	X	66.15688	291.85113	58.42981	0.30095	0.2276976	0.28210341	2.3024868	20	—	—
152147 2005 LD_{16}	16.4	X	10.02454	209.31722	120.82173	9.43500	0.0368630	0.27321695	2.3521461	20	10 18.6	19.4
152148 2005 MH_{1}	16.5	X	306.41749	124.78994	315.23147	6.04409	0.0804480	0.27466554	2.3438686	20	12 11.5	19.0
152149 2005 MN_{21}	16.8	X	268.42850	114.68966	271.57863	0.48755	0.1971189	0.25862355	2.4398174	20	7 2.2	19.8
152150 2005 MS_{33}	17.2	X	75.88925	213.61408	152.65462	2.94002	0.1779719	0.28826931	2.2695362	20	—	—
152151 2005 MC_{36}	16.3	X	327.45357	323.48842	21.92221	1.62114	0.1969599	0.26427025	2.4049379	20	8 23.3	17.9
152152 2005 MY_{37}	16.1	X	84.10259	254.70581	131.38875	12.21439	0.2023334	0.22484893	2.6784004	20	—	—
152153 2005 MD_{39}	16.5	X	167.86418	29.52343	128.43001	6.43979	0.0347378	0.26824381	2.3811289	20	9 19.0	19.6
152154 2005 MU_{44}	15.8	X	190.72469	21.10250	259.07590	8.69840	0.0910513	0.22922131	2.6442310	20	—	—
152155 2005 MQ_{47}	16.9	X	331.97466	283.43354	145.87049	5.83157	0.1432140	0.28138812	2.3063872	20	—	—
152156 2005 MV_{50}	15.7	X	171.06421	270.11160	119.79997	7.21792	0.2432984	0.17423432	3.1747796	20	4 11.3	21.3
152157 2005 NF_{11}	16.1	X	351.50186	350.55844	269.81505	3.90258	0.0904632	0.25800350	2.4437249	20	5 31.4	18.4
152158 2005 NY_{13}	16.4	X	111.97965	76.02841	319.68415	13.57292	0.2011685	0.22802150	2.6534985	20	2 14.9	20.0
152159 2005 NE_{56}	16.2	X	214.27138	322.09230	36.51177	4.50279	0.1924539	0.24589638	2.5232946	20	4 2.9	20.2
152160 2005 NX_{68}	15.9	X	67.52296	50.17338	291.96204	7.09593	0.1977870	0.27876996	2.3208054	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152161 2005 NH_{96}	15.8	X	222.53330	301.83000	73.87909	0.75054	0.1851929	0.18401268	3.0612882	20	5 2.6	20.7
152162 2005 NQ_{96}	16.7	X	170.66448	8.05227	296.57886	7.64110	0.2048961	0.29542700	2.2327285	20	—	—
152163 2005 NO_{97}	16.3	X	286.62212	186.44209	197.67025	4.77401	0.1492699	0.25978082	2.4325662	20	8 2.4	19.0
152164 2005 NV_{100}	16.3	X	0.33341	133.92039	234.05717	6.66086	0.1466660	0.27126740	2.3634023	20	12 6.5	18.8
152165 2005 OF	16.1	X	48.68095	36.62871	307.62529	5.85720	0.2054431	0.27431553	2.3458620	20	—	—
152166 2005 OY_3	15.5	X	224.91886	237.36204	103.67458	6.20441	0.1643449	0.17879248	3.1205888	20	3 28.9	20.6
152167 2005 OA_4	16.3	X	260.99069	340.95570	66.47308	7.39001	0.1420487	0.26039825	2.4287194	20	8 2.4	19.4
152168 2005 OL_4	16.0	X	193.42007	312.51454	80.61268	6.02456	0.1999066	0.24456173	2.5324666	20	4 28.6	20.3
152169 2005 OK_5	16.9	X	247.28320	165.24598	239.34684	1.61803	0.1626970	0.25719137	2.4488665	20	7 5.8	20.3
152170 2005 OM_{12}	16.7	X	52.65058	9.16192	16.63930	3.42889	0.1685473	0.28333255	2.2958230	20	—	—
152171 2005 OE_{14}	15.5	X	88.29058	40.45859	336.34508	12.30306	0.1181927	0.22141095	2.7060552	20	—	—
152172 2005 OO_{14}	16.2	X	17.68312	219.22009	139.84174	4.16456	0.2184658	0.27173473	2.3606918	20	12 31.6	19.0
152173 2005 OH_{21}	17.0	X	112.21289	287.80212	118.05319	6.06623	0.1431632	0.29893064	2.2152484	20	2 12.3	19.4
152174 2005 OW_{22}	16.8	X	280.71369	101.57089	285.46529	0.43437	0.1824588	0.25972053	2.4329426	20	7 23.9	19.5
152175 2005 OL_{26}	15.9	X	347.36863	219.25825	163.05442	11.79154	0.1945362	0.27221123	2.3579360	20	12 13.5	18.4
152176 2005 PO_3	15.8	X	129.34315	224.75808	48.11684	12.94502	0.1507620	0.21802770	2.7339774	20	12 18.7	20.3
152177 2005 PD_{15}	16.5	X	140.70455	41.42587	26.39153	4.93079	0.2394821	0.23882828	2.5728367	20	4 26.6	20.7
152178 2005 QB_4	17.0	X	339.44007	46.23150	310.65693	1.71271	0.1967328	0.26519140	2.3993656	20	10 11.9	18.7
152179 2005 QJ_4	16.6	X	1.99298	27.85773	345.00634	1.87800	0.2253829	0.27092695	2.3653818	20	12 29.1	18.9
152180 2005 QP_8	15.2	X	212.58343	159.81120	178.90707	4.52973	0.1535580	0.17289338	3.1911739	20	3 13.0	20.2
152181 2005 QU_8	17.3	X	207.41076	27.78120	326.94910	1.88847	0.1214359	0.30771521	2.1728850	20	3 18.5	20.4
152182 2005 QZ_8	16.3	X	319.83805	221.09573	152.21934	4.75950	0.1456933	0.26359898	2.4090190	20	9 24.2	18.3
152183 2005 QK_9	16.8	X	251.07149	285.44144	135.80094	2.63916	0.1778817	0.25676222	2.4515945	20	7 31.3	19.9
152184 2005 QV_{11}	16.9	X	41.73737	38.60246	341.81331	7.15881	0.2179580	0.28129928	2.3068727	20	—	—
152185 2005 QY_{16}	17.0	X	240.78418	269.54599	24.24610	2.02487	0.1118652	0.30375963	2.1917079	20	2 4.6	19.9
152186 2005 QC_{27}	16.6	X	165.89053	136.46251	96.12055	4.14603	0.0273190	0.27560506	2.3385388	20	12 25.5	19.6
152187 2005 QY_{32}	16.3	X	295.28299	189.39694	196.56430	2.08863	0.1699411	0.26308973	2.4121267	20	8 18.8	18.8
152188 Morricone	15.6	X	150.82891	28.88035	30.40809	14.79815	0.1811429	0.24107801	2.5568053	20	4 21.3	19.4
152189 2005 QX_{55}	16.9	X	345.40890	22.48263	22.82412	1.58355	0.1824292	0.27191849	2.3596281	20	—	—
152190 2005 QZ_{56}	15.9	X	95.84213	197.61844	178.08794	5.61362	0.2570954	0.22078900	2.7111347	20	1 10.1	19.4
152191 2005 QP_{59}	16.4	X	348.34980	99.29747	258.61550	1.10154	0.2468214	0.26598248	2.3946058	20	11 12.2	18.1
152192 2005 QL_{60}	16.0	X	66.13569	56.04362	328.15896	13.41812	0.2134396	0.21779044	2.7359627	20	—	—
152193 2005 QQ_{63}	16.6	X	238.92899	108.16017	354.80346	7.34320	0.0835262	0.26560340	2.3968837	20	9 26.1	19.7
152194 2005 QZ_{64}	15.7	X	187.17924	245.95559	138.97849	5.95117	0.2014634	0.17231890	3.1982625	20	4 16.4	21.1
152195 2005 QV_{79}	16.0	X	89.14392	59.11823	293.66153	8.01582	0.1944412	0.21879193	2.7276074	20	—	—
152196 2005 QK_{85}	15.7	X	53.56432	13.17481	353.87152	13.76178	0.2009037	0.21151101	2.7898492	20	—	—
152197 2005 QY_{85}	15.2	X	85.88337	24.96143	339.06074	11.73099	0.1650681	0.21631403	2.7483978	20	—	—
152198 2005 QN_{100}	16.1	X	28.44861	108.89761	313.27732	8.75207	0.1198221	0.21771486	2.7365959	20	—	—
152199 2005 QG_{104}	16.8	X	66.37179	283.26827	187.12617	4.69840	0.1902460	0.23253629	2.6190406	20	3 19.2	19.7
152200 2005 QD_{112}	17.2	X	353.85338	31.76149	344.68556	1.93163	0.1298233	0.27028604	2.3691195	20	12 4.4	19.7
152201 2005 QA_{142}	16.3	X	4.74055	60.16736	285.26819	2.88596	0.1120131	0.26633953	2.3924652	20	11 3.6	18.9
152202 2005 QE_{143}	15.7	X	338.86979	193.37458	211.96942	12.54659	0.2531247	0.20346890	2.8628858	20	12 7.6	18.4
152203 2005 QD_{153}	16.7	X	153.05589	13.75398	325.49560	2.10104	0.1907096	0.29219944	2.2491399	20	1 10.6	19.9
152204 2005 QQ_{154}	16.2	X	132.39303	55.76677	302.93660	13.38819	0.1764105	0.22755447	2.6571280	20	1 20.9	20.1
152205 2005 QP_{155}	16.1	X	26.16457	318.21341	43.68117	3.00009	0.2237638	0.27149386	2.3620878	20	—	—
152206 2005 QW_{168}	14.9	X	351.36093	351.26537	271.71801	10.47978	0.0442084	0.18260326	3.0770203	20	6 4.9	19.0
152207 2005 QX_{168}	16.0	X	358.67822	170.58341	247.73469	7.34944	0.1744308	0.20939539	2.8086092	20	—	—
152208 2005 QS_{171}	15.6	X	229.68193	82.76182	293.55848	4.16579	0.1775287	0.17868016	3.1218964	20	5 8.9	20.7
152209 2005 QF_{173}	16.8	X	74.87120	68.20452	250.83175	1.88294	0.1692260	0.27612657	2.3355935	20	—	—
152210 2005 QH_{174}	16.5	X	69.36076	45.17026	294.64303	6.15082	0.1370963	0.27945093	2.3170336	20	—	—
152211 2005 QH_{176}	16.2	X	298.79617	92.12849	3.32661	6.60072	0.0779923	0.27230196	2.3574123	20	12 20.2	18.7
152212 2005 RG	16.4	X	49.25456	220.55732	121.14688	7.14635	0.1479910	0.27604283	2.3360658	20	—	—
152213 2005 RS_5	16.5	X	161.09507	8.64774	329.57459	2.33981	0.2238264	0.22896680	2.6461901	20	1 27.5	20.8
152214 2005 RJ_9	15.8	X	277.31962	336.06496	45.54031	11.42242	0.2334842	0.25639672	2.4539238	20	7 2.1	19.0
152215 2005 RA_{10}	15.8	X	317.80820	71.48533	318.89434	11.39246	0.2130331	0.19453651	2.9498639	20	9 16.9	19.0
152216 2005 RH_{21}	16.7	X	99.47133	109.43965	24.69582	6.08001	0.1264015	0.24247521	2.5469739	20	5 26.6	20.2
152217 Akosipov	16.2	X	34.94365	11.00869	328.23290	5.64235	0.1683570	0.27084786	2.3658422	20	12 19.9	19.3
152218 2005 RQ_{23}	15.2	X	264.22095	67.11983	317.82433	11.32811	0.1228442	0.18248825	3.0783130	20	7 4.5	19.6
152219 2005 RX_{23}	16.0	X	94.33464	356.39058	330.48929	6.85348	0.1400182	0.27890494	2.3200566	20	—	—
152220 2005 RC_{25}	15.2	X	63.25440	186.17865	216.32011	11.81625	0.1419707	0.21811924	2.7332125	20	—	—
152221 2005 RV_{27}	16.1	X	94.89984	49.53021	311.06205	7.30267	0.1429345	0.28341230	2.2953923	20	—	—
152222 2005 RS_{28}	15.2	X	187.31908	93.11859	324.78066	24.36096	0.3068430	0.17464181	3.1698392	20	5 15.1	21.4
152223 2005 RF_{33}	15.7	X	281.03714	208.85495	135.90989	12.06531	0.2929885	0.18360242	3.0658467	20	5 13.4	20.4
152224 2005 SJ	15.4	X	44.53833	244.71606	122.26188	14.08613	0.2152456	0.21165820	2.7885557	20	—	—
152225 2005 ST_2	15.4	X	208.61091	255.48109	178.76256	8.59532	0.1983189	0.18092047	3.0960710	20	6 28.8	20.7
152226 Saracole	14.9	X	220.44105	13.87103	11.61332	5.20534	0.1699036	0.17704036	3.1411441	20	5 12.1	19.9
152227 Argoli	16.4	X	350.47914	226.58197	302.07908	5.54398	0.1208241	0.22772166	2.6558272	20	1 20.2	19.5
152228 2005 SK_9	15.5	X	3.31985	233.08721	223.29025	7.53904	0.1620364	0.21458182	2.7631689	20	—	—
152229 2005 SU_{12}	17.0	X	177.44266	189.89831	5.27436	1.27115	0.0878433	0.27047271	2.3680294	20	11 13.3	20.3
152230 2005 SU_{13}	16.3	X	81.39990	211.10460	170.79619	2.78472	0.0846896	0.21808074	2.7335342	20	—	—
152231 2005 SF_{15}	16.5	X	354.98760	188.88144	275.26260	2.10194	0.0589511	0.21719499	2.7409610	20	—	—
152232 2005 SV_{17}	16.0	X	194.91517	227.40058	162.71582	0.50649	0.1686246	0.17326446	3.1866159	20	4 26.8	21.2
152233 Van Till	16.0	X	215.48113	243.76296	165.28401	0.75519	0.2043949	0.17705514	3.1409693	20	6 4.5	21.2
152234 2005 SU_{22}	16.4	X	24.64769	342.98820	50.08389	4.20534	0.0972698	0.21039821	2.7996776	20	—	—
152235 2005 SK_{28}	16.0	X	97.89937	54.91485	340.96777	6.75369	0.0793420	0.22327593	2.6909654	20	1 13.6	19.5
152236 2005 SQ_{43}	16.8	X	215.66946	201.89848	349.07999	4.55809	0.1282129	0.27371808	2.3492743	20	12 19.1	19.8
152237 2005 SA_{51}	15.1	X	184.21885	87.80749	22.95579	9.70426	0.0370239	0.18400839	3.0613358	20	7 30.8	19.7
152238 2005 SZ_{63}	17.0	X	289.75865	290.13973	193.29780	1.19372	0.0693249	0.27461788	2.3441398	20	—	—
152239 2005 SJ_{68}	15.9	X	3.57229	264.22427	202.22118	11.42877	0.1551640	0.21636228	2.7479892	20	—	—
152240 2005 SR_{69}	14.8	X	191.96569	350.10322	80.84032	18.54990	0.2104687	0.17644845	3.1481650	20	6 11.0	20.0

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152241 2005 SR_{70}	15.5	X	313.57401	332.38445	68.20585	11.58659	0.0775151	0.19655532	2.9296305	20	10 15.3	19.3
152242 2005 SX_{70}	16.4	X	103.41987	337.08164	94.78506	4.65597	0.0673284	0.23239129	2.6201299	20	3 4.9	19.8
152243 2005 SS_{76}	16.8	X	258.70520	357.71532	180.63118	5.98324	0.0445812	0.28149833	2.3057851	20	—	—
152244 2005 SD_{88}	16.4	X	76.16664	46.60889	16.20530	6.47763	0.0896576	0.28990094	2.2610125	20	1 4.1	18.7
152245 2005 SH_{89}	16.1	X	355.60833	130.93872	14.41037	9.94003	0.1008500	0.22186070	2.7023968	20	1 1.8	19.6
152246 2005 SO_{89}	16.0	X	134.59153	124.84683	226.86381	1.20485	0.1010535	0.22213444	2.7001763	20	1 5.8	19.7
152247 2005 SW_{90}	16.4	X	177.16169	138.34200	15.73446	3.08834	0.1225429	0.25749963	2.4469118	20	9 17.4	20.1
152248 2005 SJ_{91}	17.3	X	225.89178	72.23400	198.00112	2.47552	0.1363996	0.29309456	2.2445582	20	—	—
152249 2005 SF_{97}	15.9	X	82.37735	117.38586	309.35663	13.66550	0.0860411	0.22626404	2.6672212	20	1 30.9	19.3
152250 2005 SN_{98}	17.1	X	240.74983	279.11139	300.74112	5.33340	0.1445915	0.28539138	2.2847682	20	—	—
152251 2005 SM_{100}	16.9	X	103.92117	30.88128	262.39525	2.59382	0.1077345	0.27443441	2.3451845	20	12 30.6	20.2
152252 2005 SQ_{101}	16.5	X	137.59423	103.76242	345.86602	6.84808	0.1222043	0.23839427	2.5759584	20	5 10.1	20.5
152253 2005 SQ_{114}	16.7	X	109.44954	131.67366	238.89745	2.20217	0.0839818	0.28889681	2.2662486	20	—	—
152254 2005 SD_{116}	16.4	X	320.47519	85.37416	344.32921	1.38152	0.0539321	0.20379747	2.8598078	20	11 28.8	19.9
152255 2005 SW_{116}	15.6	X	43.57839	216.13787	180.85547	16.90474	0.1881260	0.21529960	2.7570241	20	—	—
152256 2005 SU_{128}	15.7	X	212.71331	198.28165	232.35471	2.89953	0.2068687	0.17890754	3.1192507	20	6 27.7	20.9
152257 2005 SJ_{129}	16.1	X	357.29243	17.16006	24.83452	2.24040	0.0708464	0.20446978	2.8535356	20	12 17.3	19.6
152258 2005 SZ_{129}	17.0	X	204.19640	317.16858	355.45561	4.90758	0.1719049	0.29859350	2.2169155	20	1 24.5	20.4
152259 2005 ST_{134}	15.4	X	280.69034	197.54566	210.26861	12.38855	0.1183349	0.19156786	2.9802609	20	8 20.8	19.5
152260 2005 SY_{141}	15.7	X	176.10427	289.18558	165.59184	5.05980	0.1236837	0.17884516	3.1199760	20	6 26.8	20.7
152261 2005 SC_{146}	17.2	X	247.44208	131.48745	56.11208	3.92459	0.1567497	0.28053665	2.3110516	20	—	—
152262 2005 SY_{148}	15.0	X	230.99887	2.93108	33.10272	10.08514	0.0909652	0.17917298	3.1161693	20	6 10.9	19.7
152263 2005 SZ_{162}	16.3	X	11.26861	293.72341	184.14408	4.65418	0.1414687	0.21988120	2.7185916	20	—	—
152264 2005 SL_{166}	15.6	X	68.03619	257.51502	126.58080	10.45971	0.1526156	0.21591399	2.7517916	20	—	—
152265 2005 SU_{173}	16.4	X	333.16681	153.71943	227.26252	4.08376	0.1394870	0.26694003	2.3888758	20	11 2.7	18.5
152266 2005 SV_{180}	17.1	X	171.38172	141.31621	157.93409	2.87136	0.1823292	0.29121722	2.2541943	20	—	—
152267 2005 SB_{191}	17.0	X	26.75589	234.84149	125.57511	1.92875	0.1351877	0.27198501	2.3592433	20	—	—
152268 2005 SV_{193}	15.4	X	250.33678	246.28750	211.99523	8.41141	0.1125415	0.19241808	2.9714753	20	9 17.9	19.8
152269 2005 SZ_{197}	15.6	X	114.71044	321.98206	175.92387	6.43053	0.1646210	0.18043900	3.1015761	20	6 22.8	20.5
152270 2005 SC_{209}	15.1	X	222.09202	239.10113	141.84624	8.30121	0.1611516	0.17592996	3.1543473	20	5 12.6	20.3
152271 2005 SP_{213}	16.1	X	166.24607	133.69373	306.13096	0.86149	0.1237252	0.17319133	3.1875129	20	5 29.9	21.2
152272 2005 SK_{217}	14.9	X	239.82456	228.47845	34.38885	11.92930	0.1571498	0.22447704	2.6813577	20	1 4.6	19.4
152273 2005 SL_{220}	15.1	X	251.84401	14.79597	281.02498	14.68892	0.1102656	0.23501541	2.6005896	20	2 19.3	19.3
152274 2005 SD_{231}	15.1	X	88.30282	281.63101	166.50369	14.69219	0.1973106	0.22686637	2.6624981	20	3 25.9	18.5
152275 2005 SV_{231}	16.8	X	195.14116	50.92065	209.76061	1.84044	0.0256579	0.21408191	2.7674688	20	—	—
152276 2005 SF_{234}	17.3	X	16.72366	242.53594	173.48367	3.27651	0.0715338	0.28349287	2.2949573	20	—	—
152277 2005 SO_{237}	15.4	X	225.20320	51.33069	308.48170	1.53200	0.0574292	0.17154448	3.2078808	20	4 24.3	20.1
152278 2005 SQ_{255}	16.7	X	223.87720	243.36746	226.61852	0.79003	0.1025093	0.26196903	2.4190012	20	9 13.1	19.9
152279 2005 SS_{262}	16.9	X	78.12157	49.20883	31.49490	3.53380	0.0951907	0.22658873	2.6646726	20	2 14.9	20.1
152280 2005 TE_{1}	15.3	X	52.09606	135.59644	306.85446	13.88649	0.0718715	0.22449338	2.6812277	20	1 7.5	18.6
152281 2005 TT_{2}	15.7	X	1.80412	122.92255	4.10230	13.61853	0.1739934	0.22012863	2.7165541	20	—	—
152282 2005 TH_{5}	15.7	X	93.86539	27.27388	350.79905	10.90725	0.1912946	0.21917620	2.7244183	20	1 2.9	19.2
152283 2005 TK_{6}	15.4	X	229.59820	81.24584	327.78993	9.48792	0.1239445	0.18089803	3.0963270	20	6 24.5	20.2
152284 2005 TP_{8}	16.4	X	86.03714	192.70053	158.66195	2.72103	0.0481402	0.21252756	2.7809459	20	—	—
152285 2005 TJ_{10}	15.5	X	245.24152	95.80942	278.73409	6.63142	0.1863295	0.17937513	3.1138276	20	5 21.2	20.3
152286 2005 TL_{10}	15.3	X	227.91324	65.45874	8.64858	15.78233	0.2063142	0.18255451	3.0775681	20	7 20.3	20.5
152287 2005 TM_{11}	15.7	X	303.89024	12.43144	48.84178	5.90031	0.0299487	0.19717440	2.9234950	20	10 26.8	19.7
152288 2005 TS_{12}	15.9	X	139.46207	143.58221	186.21684	4.99131	0.1662803	0.21978226	2.7194075	20	—	—
152289 2005 TB_{18}	15.5	X	52.30082	238.04799	101.46433	3.37025	0.0565292	0.20542423	2.8446899	20	12 9.9	19.3
152290 2005 TB_{23}	16.2	X	54.27965	76.85808	333.12269	4.32139	0.1278572	0.21809604	2.7334063	20	—	—
152291 2005 TD_{24}	15.5	X	268.26042	179.74297	186.47523	2.69374	0.0924170	0.18042171	3.1017743	20	6 18.3	19.9
152292 2005 TH_{28}	15.1	X	252.43565	18.08831	38.05201	9.16546	0.0967784	0.18520777	3.0481049	20	8 4.9	19.6
152293 2005 TJ_{28}	14.3	X	213.90796	238.75804	216.42294	15.98702	0.1514327	0.18297591	3.0728411	20	7 27.9	19.5
152294 2005 TX_{38}	15.8	X	58.65241	200.98108	195.61344	13.32142	0.0360716	0.21525198	2.7574307	20	—	—
152295 2005 TX_{42}	16.2	X	142.48870	314.28455	15.69534	7.38866	0.1610250	0.28540815	2.2846787	20	—	—
152296 2005 TE_{47}	15.4	X	137.55178	260.60876	270.35724	9.17547	0.2004827	0.18919185	3.0051612	20	8 22.2	20.6
152297 2005 TH_{49}	13.1	X	272.67081	165.40031	133.72098	13.04175	0.0661483	0.08462832	5.1379779	20	4 14.3	20.1
152298 2005 TV_{49}	16.3	X	51.01165	292.84708	233.15727	7.30404	0.0848281	0.23835577	2.5762357	20	4 24.9	19.3
152299 Vanautgaerden	16.4	X	28.98967	174.23906	140.68793	6.76466	0.1343581	0.26203045	2.4186232	20	11 4.8	19.4
152300 2005 TF_{51}	16.1	X	62.93559	261.33220	319.55446	6.52824	0.0542800	0.25353100	2.4723807	20	7 28.1	19.2
152301 2005 TN_{57}	16.3	X	193.82192	124.33890	35.04505	4.32956	0.0512945	0.26251862	2.4156238	20	10 19.5	19.3
152302 2005 TF_{73}	15.5	X	32.88035	246.79510	145.78437	12.91123	0.0782652	0.20927258	2.8097079	20	—	—
152303 2005 TG_{73}	15.0	X	245.10248	248.26296	124.59405	11.22816	0.0586404	0.17801919	3.1296192	20	6 4.9	19.6
152304 2005 TK_{73}	15.1	X	211.95714	322.35668	85.32952	11.58516	0.0904258	0.17675510	3.1445228	20	6 6.6	19.9
152305 2005 TN_{73}	15.5	X	86.64227	262.36071	161.37849	11.70744	0.1892145	0.22239196	2.6980914	20	2 17.3	18.9
152306 2005 TP_{73}	16.2	X	64.13474	282.43195	102.86158	4.02343	0.1066481	0.21759023	2.7376407	20	—	—
152307 2005 TL_{74}	15.0	X	249.81697	213.19382	178.78347	12.56436	0.1173717	0.18016132	3.1047622	20	6 25.1	19.8
152308 2005 TW_{74}	15.5	X	235.82277	89.20661	332.61383	11.42042	0.2137551	0.18255332	3.0775815	20	7 9.4	20.6
152309 2005 TS_{95}	16.1	X	121.78801	98.49215	13.93729	5.34220	0.0629389	0.23900065	2.5715995	20	5 16.6	19.7
152310 2005 TJ_{125}	17.1	X	142.60168	29.08622	214.75619	5.95093	0.0721715	0.27057332	2.3674423	20	12 8.5	20.3
152311 2005 TU_{132}	16.8	X	180.92997	159.42253	172.78871	1.04525	0.0985744	0.22731195	2.6590175	20	1 30.6	20.9
152312 2005 TL_{141}	16.7	X	71.47923	38.24614	125.43932	2.91730	0.1384688	0.23966837	2.5668209	20	6 2.1	19.8
152313 2005 TQ_{148}	16.6	X	313.53377	32.86177	157.52259	5.61709	0.0941006	0.29187296	2.2508167	20	—	—
152314 2005 TF_{153}	16.5	X	102.80088	136.13241	226.10622	3.00635	0.1406498	0.22053471	2.7132184	20	—	—
152315 2005 TT_{164}	17.2	X	217.05391	276.11761	337.00438	1.91709	0.1007780	0.28600792	2.2814836	20	—	—
152316 2005 TF_{172}	15.8	X	339.27005	26.72973	274.15905	13.89298	0.1251436	0.25328566	2.4739769	20	7 7.7	18.2
152317 2005 TW_{176}	15.0	X	156.99974	326.76835	129.46027	8.17747	0.1165695	0.17491768	3.1665055	20	6 10.8	20.0
152318 2005 TQ_{183}	14.9	X	65.46020	174.85511	131.82191	14.61434	0.1265159	0.20050917	2.8909898	20	11 27.2	19.4
152319 Pynchon	15.9	X	298.39890	298.90742	351.19410	9.57635	0.1099033	0.24051379	2.5608024	20	4 11.3	19.2
152320 Lichtenknecker	15.8	X	282.19262	195.03121	177.03114	2.68657	0.1097455	0.18229261	3.0805151	20	7 11.3	19.9

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152321 2005 US_{8}	16.2	X	321.17665	162.11932	212.92292	5.57831	0.1152127	0.26422034	2.4052408	20	9 27.9	18.7
152322 2005 UP_{10}	15.4	X	325.66932	187.72269	183.04906	10.38438	0.1092710	0.19241503	2.9715068	20	9 15.9	19.0
152323 2005 UZ_{11}	15.2	X	214.51150	17.91107	66.85779	10.78545	0.0671130	0.18142489	3.0903296	20	7 29.9	19.9
152324 2005 UO_{17}	16.0	X	116.53224	214.64498	154.10293	3.42002	0.1367962	0.21942161	2.7223865	20	1 10.7	19.8
152325 2005 UT_{17}	15.8	X	263.28450	157.18324	114.80588	4.86657	0.0619784	0.22805651	2.6532270	20	2 15.7	19.5
152326 2005 UJ_{18}	16.6	X	327.08238	191.83287	3.58011	5.32562	0.1276560	0.29423363	2.2387616	20	1 7.1	19.2
152327 2005 UV_{18}	14.9	X	213.44884	22.86866	61.84499	17.73160	0.0788419	0.17999410	3.1066849	20	7 28.6	19.8
152328 2005 UM_{20}	14.3	X	270.85316	45.22194	44.13811	4.51362	0.1633276	0.12565893	3.9476668	20	9 19.9	19.7
152329 2005 UR_{24}	15.7	X	221.04992	184.96787	28.46251	4.70402	0.0127707	0.20936668	2.8088659	20	—	—
152330 2005 UT_{26}	15.8	X	26.41343	275.85673	244.81304	3.79023	0.0758708	0.22944204	2.6425348	20	3 7.8	19.0
152331 2005 UW_{29}	14.7	X	69.20645	73.99502	40.67366	17.79792	0.1208088	0.15880371	3.3772428	20	4 2.4	19.4
152332 2005 UC_{30}	14.7	X	233.64840	351.15883	57.80175	8.10714	0.0716002	0.17778084	3.1324158	20	7 3.9	19.3
152333 2005 UC_{35}	15.7	X	283.72520	342.46211	227.95665	6.80165	0.1226454	0.21759776	2.7375776	20	—	—
152334 2005 UC_{37}	15.3	X	212.66131	258.65312	224.26777	6.15999	0.1478578	0.18711004	3.0274105	20	9 1.8	20.1
152335 2005 UZ_{42}	14.9	X	190.58684	352.59981	55.72751	7.21550	0.1197172	0.17222489	3.1994263	20	5 15.3	19.9
152336 2005 UN_{51}	14.5	X	143.94563	205.84348	233.78567	14.55545	0.0451784	0.16925841	3.2367007	20	5 1.4	19.2
152337 2005 UO_{55}	15.5	X	229.94676	30.50744	16.56280	1.07740	0.1883458	0.17740172	3.1368770	20	6 15.9	20.5
152338 2005 UK_{61}	15.2	X	352.41377	302.23654	69.41497	19.26191	0.0475703	0.19430458	2.9522108	20	11 3.9	19.3
152339 2005 UU_{61}	15.8	X	147.61814	292.42017	54.67244	5.98848	0.1354737	0.22113750	2.7082855	20	1 19.9	19.9
152340 2005 UN_{63}	16.4	X	296.31024	64.09836	193.03038	1.72766	0.0565549	0.22985353	2.6393800	20	3 7.7	19.9
152341 2005 UE_{67}	15.3	X	266.27427	21.22567	82.30716	13.80115	0.0649103	0.19616190	2.9335463	20	10 30.6	19.4
152342 2005 UP_{73}	15.6	X	12.57417	319.12654	67.22402	2.94367	0.0685529	0.20168724	2.8797212	20	12 17.7	19.2
152343 2005 UW_{73}	15.6	X	123.72169	315.90216	46.23744	5.69924	0.1261115	0.21891060	2.7266215	20	1 10.8	19.5
152344 2005 UY_{75}	15.7	X	151.36448	106.97336	327.87037	13.49529	0.0686185	0.23774244	2.5806647	20	4 27.8	19.7
152345 2005 UO_{79}	16.2	X	124.35737	226.91260	140.23801	3.42295	0.1302461	0.22033257	2.7148776	20	1 17.0	20.0
152346 2005 UY_{79}	15.8	X	172.87313	205.41194	166.50828	4.09816	0.1210527	0.23008758	2.6375899	20	3 12.2	19.6
152347 2005 UC_{83}	16.3	X	305.86307	209.21241	43.48598	4.89555	0.0736698	0.23430100	2.6058732	20	3 14.3	19.6
152348 2005 UD_{83}	16.9	X	128.19304	189.03745	30.08613	1.51541	0.1318850	0.26134049	2.4228782	20	10 21.2	20.5
152349 2005 UK_{84}	17.0	X	286.22007	342.44860	103.66497	1.24342	0.1482195	0.19621291	2.9330378	20	10 20.0	20.4
152350 2005 UN_{87}	16.4	X	325.57647	359.66432	107.32097	1.66295	0.0314916	0.20881585	2.8138033	20	—	—
152351 2005 UD_{97}	16.3	X	202.04966	229.11439	135.17677	2.72156	0.0822655	0.23429490	2.6059184	20	4 1.7	20.0
152352 2005 UZ_{112}	15.5	X	272.31614	357.03650	238.02646	6.85857	0.0376787	0.22032948	2.7149029	20	1 12.9	19.3
152353 2005 UZ_{114}	14.8	X	191.25810	341.52652	70.63102	10.48024	0.1408812	0.17243287	3.1968531	20	5 20.9	20.0
152354 2005 UZ_{116}	16.0	X	133.26975	102.72500	281.34559	1.42960	0.1098353	0.22509875	2.6764183	20	2 13.7	19.7
152355 2005 UC_{117}	16.1	X	87.35062	143.54201	147.60292	2.38659	0.0467376	0.19800313	2.9153320	20	11 19.9	20.2
152356 2005 UO_{121}	16.3	X	283.66744	239.26299	8.28876	1.53605	0.0352639	0.22770187	2.6559811	20	2 12.5	19.7
152357 2005 UE_{125}	16.7	X	106.57201	217.53140	20.00471	2.55731	0.1693523	0.25919048	2.4362584	20	10 24.7	20.5
152358 2005 UG_{126}	16.3	X	130.61748	328.52617	44.19058	2.50839	0.0894702	0.22203390	2.7009913	20	1 26.6	20.0
152359 2005 UM_{129}	16.1	X	223.05067	161.29215	312.75393	0.73419	0.0701413	0.18890505	3.0082021	20	9 12.4	20.4
152360 2005 UM_{130}	14.8	X	236.83513	301.40807	92.12235	13.47054	0.1516995	0.17780584	3.1321222	20	6 10.1	19.6
152361 2005 UX_{140}	15.1	X	211.92809	43.14736	73.55272	10.48113	0.0262074	0.18862900	3.0111363	20	9 13.4	19.5
152362 2005 UD_{141}	15.2	X	287.22927	245.10596	109.58806	3.46069	0.0925502	0.17940233	3.1135129	20	6 28.3	19.5
152363 2005 US_{141}	15.1	X	150.80977	100.87301	69.43127	11.33693	0.0856525	0.18563527	3.0434235	20	9 8.8	20.0
152364 2005 UK_{142}	15.2	X	242.76669	251.74638	155.44682	9.56927	0.1217154	0.18016828	3.1046822	20	7 5.6	19.9
152365 2005 UK_{143}	15.2	X	158.58937	160.88334	150.07174	13.13172	0.1168160	0.21514942	2.7583069	20	—	—
152366 2005 UW_{150}	15.5	X	191.02958	50.65483	21.77034	1.66935	0.0837691	0.17416071	3.1756741	20	6 14.8	20.3
152367 2005 UN_{155}	15.4	X	71.65154	305.39897	91.59386	14.53358	0.1278044	0.21427854	2.7657755	20	—	—
152368 2005 UM_{158}	15.1	X	226.95472	15.29263	63.53854	9.72774	0.0430272	0.18350318	3.0669520	20	8 9.8	19.6
152369 2005 UO_{159}	16.1	X	57.85118	202.88023	155.99809	5.06205	0.1191383	0.20867971	2.8150270	20	—	—
152370 2005 UZ_{159}	15.8	X	303.61031	37.93723	35.83632	10.38969	0.0621115	0.19964311	2.8993446	20	11 7.9	19.4
152371 2005 UN_{162}	15.3	X	226.78663	330.96742	136.51544	9.94534	0.0975337	0.18865307	3.0108802	20	9 7.4	19.8
152372 2005 UT_{169}	16.1	X	39.05724	141.60678	334.82770	1.15322	0.0353698	0.22274254	2.6952596	20	1 30.1	19.6
152373 2005 UG_{171}	15.0	X	268.78496	187.92882	278.72679	2.25936	0.1757313	0.12596463	3.9412770	20	10 3.1	20.5
152374 2005 UH_{173}	16.7	X	4.17930	210.36615	51.84633	0.58539	0.1044901	0.24528423	2.5274911	20	6 27.1	19.3
152375 2005 UW_{173}	16.3	X	25.26682	38.14439	294.81976	1.01329	0.0856608	0.19559688	2.9391929	20	10 29.2	20.0
152376 2005 UO_{180}	15.3	X	174.95834	57.52631	74.85028	6.73145	0.1030377	0.18051211	3.1007386	20	8 13.8	20.2
152377 2005 UT_{182}	16.2	X	262.44719	205.00954	222.83954	0.30287	0.0565629	0.18659228	3.0330084	20	9 4.0	20.4
152378 2005 UK_{184}	15.6	X	181.66588	274.09535	50.47994	5.72411	0.0815052	0.22290302	2.6939658	20	1 23.5	19.6
152379 2005 UW_{184}	16.1	X	213.82983	161.38027	95.97427	1.81050	0.0197467	0.21375704	2.7702721	20	—	—
152380 2005 UB_{202}	16.0	X	260.89517	172.38642	83.28804	3.26448	0.0263933	0.22333272	2.6905092	20	1 27.8	19.7
152381 2005 UK_{205}	16.0	X	355.72253	134.66319	64.89589	5.42546	0.1394515	0.22809459	2.6529317	20	3 12.7	18.8
152382 2005 UO_{205}	15.9	X	334.90147	209.34165	141.05476	1.37516	0.1320881	0.18868777	3.0105110	20	9 3.7	19.3
152383 2005 UW_{205}	16.0	X	298.32448	145.60296	54.16754	13.72715	0.1054656	0.21798644	2.7343225	20	—	—
152384 2005 UH_{206}	16.1	X	137.21146	259.51400	56.77119	2.94427	0.0476949	0.21659202	2.7460456	20	—	—
152385 2005 UE_{216}	15.7	X	345.68738	68.48341	57.53547	6.03803	0.0803685	0.21458142	2.7631724	20	—	—
152386 2005 UB_{217}	15.9	X	206.55258	45.83942	51.50119	2.30838	0.1464786	0.18215358	3.0820823	20	7 29.4	20.9
152387 2005 UD_{226}	15.9	X	348.51880	126.85227	202.86780	1.78010	0.0873588	0.18807021	3.0170977	20	8 28.9	19.7
152388 2005 UF_{226}	16.2	X	337.80197	254.37929	208.02826	2.25159	0.0416712	0.20873836	2.8144997	20	—	—
152389 2005 US_{228}	16.5	X	21.04231	155.92137	70.39259	4.49664	0.1289394	0.24021997	2.5628900	20	6 5.8	19.1
152390 2005 UJ_{237}	15.8	X	265.74841	210.31467	90.63066	6.16168	0.1992854	0.23627061	2.5913709	20	3 11.9	19.9
152391 2005 UU_{243}	14.9	X	38.35899	254.30737	309.12617	3.66177	0.0770271	0.16805427	3.2521433	20	5 27.7	19.2
152392 2005 UH_{245}	16.0	X	77.55212	13.27551	265.51819	9.53731	0.1990453	0.26205943	2.4184449	20	11 19.7	19.7
152393 2005 UL_{245}	15.1	X	288.94384	352.21304	28.50074	10.61111	0.1193226	0.18321486	3.0701688	20	8 4.6	19.3
152394 2005 UN_{250}	15.5	X	248.47577	85.78038	308.43029	8.89660	0.0788181	0.18218579	3.0817191	20	7 2.5	19.9
152395 2005 UJ_{253}	16.3	X	176.30431	22.74416	344.30110	1.33837	0.1194528	0.23062965	2.6334553	20	3 9.3	20.4
152396 2005 UB_{270}	16.1	X	321.86520	228.44520	127.08960	1.68800	0.1121635	0.18812570	3.0165044	20	8 19.9	19.5
152397 2005 UC_{271}	15.3	X	297.80569	203.46039	136.72673	2.82404	0.1299762	0.17970328	3.1100357	20	6 18.7	19.4
152398 2005 UP_{282}	15.8	X	203.08833	214.58605	60.15556	5.92793	0.1252105	0.22037179	2.7145555	20	—	—
152399 2005 UT_{287}	16.3	X	330.06576	250.16802	137.21978	2.76785	0.1010709	0.19598577	2.9353036	20	10 18.7	19.7
152400 2005 UN_{293}	16.7	X	287.87367	274.10086	309.60339	2.37155	0.1527186	0.22189035	2.7021561	20	1 4.2	20.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152401 2005 UQ_{294}	15.8	X	225.00098	299.36644	260.46218	5.29228	0.1577348	0.20401840	2.8577430	20	12 20.5	19.8
152402 2005 US_{299}	16.3	X	231.44780	16.83440	204.06884	0.71143	0.1177732	0.21000317	2.8031875	20	—	—
152403 2005 UT_{307}	16.2	X	149.71058	302.48381	39.42877	3.58108	0.0253476	0.21858077	2.7293637	20	1 3.1	19.9
152404 2005 UE_{313}	15.1	X	157.90974	215.20338	268.29539	7.84132	0.0376312	0.17730297	3.1380417	20	7 11.3	19.6
152405 2005 UF_{316}	16.3	X	29.16001	359.08398	223.98900	3.21767	0.1102894	0.24147008	2.5540369	20	6 14.3	19.0
152406 2005 UM_{319}	16.5	X	99.47465	101.93293	338.28364	1.56031	0.0559229	0.22802377	2.6534809	20	3 6.9	19.9
152407 2005 UD_{322}	16.0	X	148.56357	13.05122	294.30030	2.76167	0.0817143	0.21176403	2.7876265	20	—	—
152408 2005 US_{322}	15.1	X	248.61100	319.72910	66.17740	12.02899	0.0783418	0.17870904	3.1215601	20	6 20.6	19.6
152409 2005 US_{323}	14.3	X	287.05594	296.04961	91.47627	13.13681	0.2489176	0.18140396	3.0905673	20	7 17.6	18.4
152410 2005 UY_{333}	15.8	X	12.30766	152.98018	190.29898	2.65738	0.0317422	0.19164516	2.9794595	20	10 18.3	19.6
152411 2005 UE_{340}	15.7	X	343.01866	250.65856	105.23151	3.15504	0.0714741	0.19143321	2.9816583	20	9 26.8	19.5
152412 2005 UA_{343}	14.5	X	151.59237	131.16756	301.23780	15.01620	0.1471954	0.23645338	2.5900354	20	5 1.2	18.8
152413 2005 UG_{345}	16.1	X	193.70309	188.19610	85.48166	4.94357	0.0622936	0.21242739	2.7818201	20	—	—
152414 2005 UW_{349}	14.6	X	339.89787	295.61550	26.26784	15.11425	0.0443883	0.18283946	3.0743697	20	8 12.7	19.0
152415 2005 UT_{357}	15.7	X	35.11994	199.67389	131.62452	7.70548	0.1251098	0.19851002	2.9103670	20	11 18.6	19.7
152416 2005 UW_{365}	16.5	X	312.02824	76.92318	168.60064	5.35136	0.1028022	0.29946808	2.2125972	20	2 26.6	19.0
152417 2005 UX_{373}	17.3	X	148.97860	263.24027	30.14352	4.07208	0.1226174	0.27810555	2.3245003	20	—	—
152418 2005 UX_{381}	14.6	X	196.73168	272.93964	116.79298	14.34054	0.1477730	0.17258013	3.1950342	20	5 3.9	20.0
152419 2005 UG_{382}	14.9	X	223.76747	320.00006	72.05221	17.99910	0.1482108	0.17778197	3.1324025	20	5 26.7	19.8
152420 2005 UH_{383}	14.0	X	243.31491	291.45102	76.07566	27.59674	0.2114161	0.17581370	3.1557378	20	5 16.1	19.3
152421 2005 UK_{384}	15.8	X	212.63337	205.23860	144.99885	16.09960	0.1501206	0.23411466	2.6072558	20	3 26.9	20.1
152422 2005 UE_{386}	15.8	X	1.37576	320.07443	152.19936	9.61077	0.0837789	0.21719014	2.7410017	20	—	—
152423 2005 UK_{386}	16.4	X	83.52430	337.85521	54.67601	2.92913	0.0696484	0.21728997	2.7401621	20	—	—
152424 2005 UJ_{393}	15.0	X	177.49457	11.05106	79.36464	12.24990	0.1356639	0.17505422	3.1648587	20	6 22.5	20.0
152425 2005 UL_{396}	15.6	X	100.70645	256.79578	156.20232	15.70264	0.0279377	0.22329186	2.6908374	20	1 29.1	19.4
152426 2005 UW_{396}	15.9	X	277.97833	289.61666	128.12285	7.53500	0.1170817	0.19172909	2.9785899	20	9 5.6	19.8
152427 2005 UM_{397}	15.5	X	344.96935	37.59220	206.39556	14.65762	0.0612942	0.23856148	2.5747546	20	4 29.3	18.6
152428 2005 UY_{397}	15.2	X	169.61094	31.58630	51.60134	3.94979	0.1843019	0.17197917	3.2024731	20	6 7.1	20.6
152429 2005 UO_{398}	15.5	X	4.23562	187.21743	42.53185	15.84595	0.0897445	0.23878771	2.5731281	20	5 7.9	18.4
152430 2005 UX_{406}	16.4	X	245.14084	358.86512	140.63158	2.79195	0.0136138	0.20302902	2.8670194	20	11 21.3	20.3
152431 2005 UV_{408}	16.2	X	40.65997	65.61843	76.01053	3.18457	0.1471748	0.22755481	2.6571253	20	3 14.3	18.9
152432 2005 UZ_{414}	15.2	X	62.25332	61.94697	114.25526	2.71013	0.0836669	0.17030293	3.2234527	20	5 28.4	19.6
152433 2005 UO_{438}	17.3	X	145.52442	337.96955	273.08129	0.71509	0.1472625	0.27189166	2.3597833	20	12 18.0	20.7
152434 2005 UV_{438}	15.1	X	329.33451	338.08188	47.18517	12.07581	0.0827111	0.19280492	2.9674994	20	10 16.4	18.8
152435 2005 UJ_{439}	14.9	X	161.76424	124.53741	306.12448	10.21021	0.1473695	0.17235433	3.1978241	20	5 12.8	20.2
152436 2005 UA_{440}	15.0	X	140.00075	221.66393	248.53423	10.16932	0.1244752	0.17429399	3.1740549	20	6 10.6	19.8
152437 2005 UM_{442}	15.7	X	243.19453	357.50327	305.98755	12.90575	0.1352194	0.23420208	2.6066070	20	2 21.0	19.7
152438 2005 UO_{442}	15.0	X	84.47425	158.45942	352.24282	12.97766	0.1662563	0.23484616	2.6018389	20	6 3.5	18.8
152439 2005 UP_{446}	15.3	X	28.23588	313.37585	18.06822	12.16873	0.0620315	0.19707507	2.9244773	20	10 26.9	19.3
152440 2005 UN_{447}	15.1	X	200.10328	221.08136	252.40278	9.94994	0.1162497	0.18266688	3.0763058	20	8 9.1	20.0
152441 2005 UE_{449}	16.6	X	18.38038	235.74624	352.84054	2.95942	0.1709710	0.23993790	2.5648983	20	6 7.4	19.0
152442 2005 US_{455}	15.1	X	215.49721	97.78272	306.49458	8.49541	0.0680619	0.17732331	3.1378017	20	6 6.8	19.9
152443 2005 UY_{460}	15.6	X	2.61465	48.12718	330.90713	1.20451	0.1124281	0.19712523	2.9239812	20	11 28.2	19.0
152444 2005 UV_{468}	15.2	X	112.72084	219.89491	281.17225	3.98573	0.0573075	0.17199664	3.2022562	20	6 12.5	19.7
152445 2005 UF_{473}	16.3	X	328.49204	284.32130	345.97940	2.14562	0.1217881	0.23772922	2.5807603	20	5 1.6	19.0
152446 2005 UQ_{476}	15.6	X	333.47256	106.28327	160.11529	13.71281	0.1335920	0.24161603	2.5530082	20	5 8.5	18.6
152447 2005 US_{476}	16.4	X	332.68242	325.63863	115.37030	8.86947	0.0695342	0.27095094	2.3652421	20	—	—
152448 2005 UZ_{484}	16.0	X	250.26873	181.65176	117.01525	6.29739	0.2064848	0.23559958	2.5962890	20	2 21.7	20.1
152449 2005 UK_{491}	15.8	X	6.65921	7.24519	78.72629	4.65489	0.0643943	0.21362257	2.7714346	20	—	—
152450 2005 UK_{496}	15.0	X	232.45110	282.13849	125.08631	12.24974	0.0403530	0.17678584	3.1441582	20	7 3.6	19.5
152451 2005 UA_{501}	15.8	X	305.97691	105.74902	150.55649	14.48568	0.0819977	0.23348866	2.6119139	20	3 18.3	19.2
152452 2005 UB_{501}	15.7	X	214.89502	179.33902	120.91531	12.63775	0.0646230	0.22491547	2.6778721	20	1 27.2	19.6
152453 2005 UP_{501}	15.4	X	182.38822	351.01848	148.09906	12.29370	0.0738995	0.18415434	3.0597180	20	8 29.2	19.9
152454 Darnyi	17.1	X	173.34739	227.46566	28.99508	6.51483	0.0418593	0.28002047	2.3138908	20	—	—
152455 2005 VN_{7}	15.1	X	318.31968	345.36762	53.02547	10.21892	0.0567446	0.19232509	2.9724331	20	10 17.5	19.0
152456 2005 VF_{8}	16.6	X	205.27767	186.60307	224.40120	0.92365	0.0613643	0.17560273	3.1582648	20	6 4.7	21.3
152457 2005 VT_{13}	16.8	X	89.52108	174.14118	159.17237	5.77241	0.1735103	0.27752160	2.3277599	20	—	—
152458 2005 VY_{13}	15.5	X	28.27685	330.89549	179.04455	9.74265	0.1832717	0.22426914	2.6830146	20	2 29.9	18.1
152459 2005 VG_{15}	14.6	X	97.93997	198.99683	331.68446	16.37921	0.1437777	0.17487987	3.1669619	20	7 17.3	19.5
152460 2005 VY_{16}	16.1	X	119.87226	111.10537	343.40375	12.30533	0.0661840	0.23516968	2.5994522	20	4 16.5	19.9
152461 2005 VL_{43}	15.4	X	192.25348	197.75216	83.16254	10.44305	0.0769176	0.21699890	2.7426119	20	—	—
152462 2005 VF_{71}	14.8	X	317.00446	273.71145	72.68375	11.55560	0.1697808	0.18394048	3.0620892	20	7 24.9	18.5
152463 2005 VE_{77}	14.9	X	217.61770	226.98661	242.81896	10.77571	0.1219049	0.18540061	3.0459910	20	8 21.4	19.8
152464 2005 VD_{81}	16.0	X	273.77104	353.95534	57.65543	1.11895	0.1785533	0.18496150	3.0508100	20	8 11.1	20.0
152465 2005 VJ_{96}	15.9	X	177.06628	7.27133	315.18725	1.89641	0.0944636	0.22233234	2.6985737	20	1 15.7	19.9
152466 2005 VJ_{106}	15.5	X	275.99002	351.78271	31.53511	1.52961	0.1825439	0.18151801	3.0892726	20	7 7.2	19.8
152467 2005 VC_{114}	16.5	X	320.27881	31.08479	240.11727	1.99221	0.1541190	0.23650263	2.5896758	20	4 14.4	19.4
152468 2005 VN_{114}	16.1	X	63.73766	106.07157	173.54493	4.48559	0.0438558	0.18995483	2.9971086	20	10 6.4	20.3
152469 2005 VG_{124}	16.0	X	284.20021	217.09920	74.32761	14.98892	0.1527145	0.23475955	2.6024788	20	3 31.5	19.9
152470 2005 WJ	15.3	X	231.55660	301.92532	355.42920	13.63355	0.1065502	0.22935796	2.6431806	20	2 12.2	19.4
152471 2005 WE_{1}	15.5	X	137.15190	162.98308	351.96185	11.34170	0.0328176	0.17824412	3.1269857	20	7 30.6	20.1
152472 2005 WZ_{3}	15.3	X	107.30788	265.07653	81.93212	13.35993	0.0698396	0.21181815	2.7871517	20	—	—
152473 2005 WS_{4}	15.4	X	287.89468	54.99442	340.44817	10.63694	0.1143262	0.18518849	3.0483165	20	8 20.6	19.3
152474 2005 WY_{5}	15.0	X	299.82500	311.94136	65.28880	10.04581	0.0949521	0.18476210	3.0530046	20	8 19.9	19.1
152475 2005 WD_{10}	15.9	X	260.57325	155.38038	56.41530	0.89508	0.0123573	0.21282919	2.7783178	20	—	—
152476 2005 WH_{19}	15.4	X	197.03152	200.50354	100.50525	18.64947	0.0812333	0.21816982	2.7327900	20	1 10.2	19.6
152477 2005 WE_{25}	16.2	X	231.35789	260.27061	336.12274	2.84984	0.0416118	0.21100918	2.7942707	20	—	—
152478 2005 WP_{30}	15.2	X	215.59744	355.86662	59.45745	10.70336	0.0736145	0.17331420	3.1860062	20	6 20.1	20.0
152479 2005 WF_{33}	14.9	X	94.25889	313.69772	255.42387	9.11845	0.0541121	0.17994132	3.1072923	20	8 11.7	19.5
152480 2005 WB_{56}	15.0	X	76.01660	162.65389	74.94547	10.21098	0.0241409	0.18144295	3.0901245	20	8 29.9	19.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152481 Stabia	15.1	*X*	204.40417	329.29154	112.51809	23.49269	0.0525626	0.17689785	3.1428308	20	7 13.1	19.6
152482 2005 WG_{59}	14.7	*X*	223.00593	310.55761	104.90080	18.05555	0.2378283	0.17552089	3.1592465	20	6 17.6	20.1
152483 2005 WV_{59}	14.7	*X*	219.60262	251.79000	128.43842	19.40796	0.1826827	0.17182270	3.2044170	20	5 12.6	20.3
152484 2005 WX_{59}	15.4	*X*	162.25364	215.68472	131.93935	15.04210	0.0919162	0.22251062	2.6971321	20	1 30.3	19.4
152485 2005 WD_{64}	15.8	*X*	331.78817	352.40661	242.43966	1.31553	0.2375781	0.22534369	2.6744785	20	3 1.6	18.9
152486 2005 WJ_{74}	15.6	*X*	283.34885	261.20776	152.52610	11.81253	0.1391939	0.18781316	3.0198499	20	9 2.9	19.4
152487 2005 WD_{77}	16.0	*X*	109.53710	312.96171	5.03352	1.74459	0.0559301	0.20366640	2.8610347	20	—	—
152488 2005 WA_{79}	14.3	*X*	26.47484	328.13150	263.89741	13.78235	0.0153808	0.16933861	3.2356788	20	6 12.3	18.7
152489 2005 WE_{89}	14.8	*X*	103.00837	178.31028	66.97141	7.99324	0.0173104	0.18911994	3.0059228	20	10 11.0	19.1
152490 2005 WX_{89}	15.4	*X*	290.08594	330.74947	84.69381	9.59048	0.0174704	0.19095351	2.9866497	20	10 5.7	19.6
152491 2005 WX_{90}	15.3	*X*	132.16250	79.08832	70.65088	5.83082	0.1085561	0.17448133	3.1717826	20	7 21.2	20.1
152492 2005 WM_{91}	14.8	*X*	3.46100	225.72832	60.89135	9.99165	0.0630907	0.17831110	3.1262027	20	7 26.6	19.0
152493 2005 WE_{92}	15.7	*X*	153.85605	80.52490	56.63813	1.75345	0.1199140	0.17540265	3.1606661	20	7 27.7	20.7
152494 2005 WK_{100}	14.8	*X*	31.81428	195.45019	71.72286	10.69152	0.0736657	0.18066985	3.0989335	20	8 14.8	19.0
152495 2005 WH_{104}	16.0	*X*	91.06654	248.14030	143.61379	2.52346	0.0638642	0.21497076	2.7598351	20	—	—
152496 2005 WA_{106}	15.3	*X*	254.44248	303.41847	86.39137	18.18734	0.1515554	0.17814891	3.1280999	20	6 23.2	19.9
152497 2005 WJ_{120}	15.3	*X*	27.90873	304.78881	248.03787	12.88112	0.1250112	0.23125644	2.6286947	20	4 27.2	18.3
152498 2005 WS_{123}	16.6	*X*	7.10956	90.65193	72.99233	1.43468	0.0602968	0.22734699	2.6587444	20	2 14.3	19.7
152499 2005 WO_{155}	16.9	*X*	210.39700	190.55592	135.41476	6.76348	0.2031103	0.29825611	2.2185871	20	2 15.0	20.4
152500 2005 WX_{165}	15.8	*X*	26.02078	132.25695	147.44558	0.72205	0.0439240	0.18237435	3.0795945	20	8 15.8	19.9
152501 2005 WD_{168}	15.5	*X*	120.45142	102.66024	87.15808	2.44703	0.1217537	0.17818835	3.1276382	20	8 28.9	20.4
152502 2005 WO_{181}	15.3	*X*	193.06953	294.71015	174.87692	9.44420	0.0521223	0.18037505	3.1023092	20	8 2.5	20.0
152503 2005 WW_{182}	15.7	*X*	39.18935	225.08044	114.20185	8.92645	0.0112490	0.19648280	2.9303514	20	11 17.6	19.8
152504 2005 WS_{184}	15.4	*X*	306.89308	329.32107	114.74225	10.20925	0.0137397	0.19833463	2.9120826	20	11 30.6	19.5
152505 2005 WD_{185}	16.7	*X*	86.88904	163.72117	145.83075	6.83412	0.1571488	0.27009694	2.3702252	20	—	—
152506 2005 XN_{1}	15.5	*X*	109.37514	109.03058	51.03516	1.97646	0.1057815	0.17103501	3.2142479	20	7 8.4	20.3
152507 2005 XZ_{3}	15.5	*X*	249.90372	202.52207	79.40918	11.97961	0.0247694	0.22486785	2.6782501	20	2 20.5	19.4
152508 2005 XZ_{4}	15.7	*X*	108.95704	221.73146	133.83716	16.04799	0.2571913	0.21578731	2.7528684	20	1 3.5	19.6
152509 2005 XE_{39}	16.6	*X*	39.03493	266.29872	332.14420	1.35156	0.0397435	0.24501636	2.5293329	20	7 14.4	19.6
152510 2005 XA_{64}	15.3	*X*	322.44994	315.02658	55.56134	2.60768	0.2486418	0.18747027	3.0235312	20	8 30.7	18.0
152511 2005 YC_{1}	17.0	*X*	142.98695	82.64619	3.73395	4.70718	0.1892641	0.24025840	2.5626167	20	5 17.7	21.2
152512 2005 YF_{1}	14.9	*X*	79.17350	112.15795	66.56462	19.38337	0.0795049	0.16856367	3.2455880	20	6 20.3	19.5
152513 2005 YQ_{49}	15.2	*X*	43.61404	278.53754	158.89422	21.90921	0.0576733	0.21676743	2.7445640	20	—	—
152514 2005 YJ_{137}	15.6	*X*	42.29180	236.11446	33.24950	1.83204	0.1556785	0.17426161	3.1744482	20	9 9.2	19.6
152515 2005 YO_{186}	14.4	*X*	141.11268	142.27494	106.67757	11.34932	0.0876399	0.18413028	3.0599846	20	11 28.3	19.2
152516 2006 AG_{70}	15.8	*X*	145.68864	34.76662	209.10739	1.28900	0.0813423	0.18606981	3.0386833	20	11 25.1	20.5
152517 2006 AD_{72}	13.3	*X*	210.79387	192.37471	154.85297	4.31654	0.0699950	0.08272806	5.2163591	20	3 31.3	20.5
152518 2006 BH_{47}	15.9	*X*	298.36620	254.71655	113.07933	3.26150	0.0939762	0.18249221	3.0782684	20	7 31.8	19.7
152519 2006 CT_{61}	12.6	*X*	19.55423	219.79880	352.58047	21.14885	0.0583820	0.08426859	5.1525896	20	5 4.5	19.4
152520 2006 GQ_{47}	15.8	*X*	295.68569	150.91245	20.21611	0.94424	0.1553939	0.19159124	2.9800185	20	—	—
152521 2006 KU_{1}	15.9	*X*	10.37719	94.63848	136.88543	8.39470	0.1708799	0.21193697	2.7861099	20	5 28.2	18.8
152522 2006 SQ_{48}	16.7	*X*	265.33651	218.12673	172.25127	6.30014	0.1658118	0.27174771	2.3606166	20	7 8.7	19.8
152523 2006 UH_{55}	15.9	*X*	73.38547	69.20669	327.98637	2.78061	0.1165772	0.23117516	2.6293109	20	—	—
152524 2006 UZ_{67}	16.1	*X*	202.08979	324.99868	75.69448	8.47483	0.1259460	0.25964170	2.4334350	20	5 16.8	19.8
152525 2006 VU_{54}	15.8	*X*	206.13798	1.28453	71.34784	1.94061	0.0351283	0.18947067	3.0022122	20	7 5.3	20.1
152526 2006 VG_{58}	16.4	*X*	233.60707	161.55969	77.37719	7.42130	0.1524195	0.30177982	2.2012832	20	—	—
152527 2006 VC_{62}	15.9	*X*	296.78804	328.24559	43.84290	1.50041	0.0693290	0.19621458	2.9330211	20	8 9.1	19.6
152528 2006 VU_{124}	14.6	*X*	79.55821	309.74360	100.32750	7.36367	0.0374370	0.15794252	3.3895080	20	1 12.5	19.2
152529 2006 XS_{6}	15.7	*X*	168.92709	323.89088	276.79647	7.98513	0.0955467	0.21193371	2.7861384	20	12 19.0	19.8
152530 2006 YY_{14}	16.4	*X*	58.08434	309.71172	134.83112	8.32448	0.1911220	0.22512182	2.6762355	20	1 29.4	19.1
152531 2006 YY_{47}	16.9	*X*	131.43270	236.84588	147.84630	7.41048	0.2282931	0.30685110	2.1769624	20	2 17.9	19.8
152532 2007 AP_{20}	15.0	*X*	239.10770	314.44716	119.10067	23.06617	0.0674299	0.18617992	3.0374851	20	8 12.9	19.4
152533 Aggas	16.7	*X*	206.09834	337.30717	295.62761	5.41231	0.1030063	0.29462870	2.2367598	20	—	—
152534 2007 BZ_{7}	16.3	*X*	87.77974	69.83329	345.65803	12.19243	0.2671128	0.23165814	2.6256551	20	2 21.9	19.4
152535 2007 BR_{8}	16.7	*X*	314.44002	177.33144	326.19569	18.19288	0.0616988	0.36130495	1.9523310	20	—	—
152536 4265 *P–L*	16.2	*X*	118.90178	23.88663	356.53949	1.59226	0.1673716	0.22069900	2.7118717	20	2 1.7	19.9
152537 2056 *T–1*	15.3	*X*	146.92091	162.94340	19.11855	3.92490	0.1079059	0.18891405	3.0081065	20	9 15.2	20.0
152538 3035 *T–1*	15.5	*X*	252.40022	46.47054	198.04240	9.93623	0.2829251	0.21582467	2.7525507	20	—	—
152539 3194 *T–1*	16.3	*X*	64.01419	339.07342	218.33623	4.22152	0.1590991	0.24426103	2.5345445	20	7 11.2	19.4
152540 4358 *T–1*	15.9	*X*	334.87456	220.41883	47.37989	4.29318	0.1630055	0.24229223	2.5482560	20	5 5.1	18.3
152541 1140 *T–2*	16.9	*X*	169.88510	267.87078	1.00901	2.77614	0.1485437	0.27989148	2.3146017	20	—	—
152542 3135 *T–2*	15.9	*X*	166.54442	183.89031	143.95350	3.50548	0.1896278	0.21947922	2.7219101	20	1 18.2	20.3
152543 3420 *T–2*	15.7	*X*	344.11552	51.87688	14.13332	13.07929	0.1920469	0.21299496	2.7768761	20	—	—
152544 4427 *T–2*	17.2	*X*	49.10461	297.96590	55.53195	2.91567	0.1625993	0.27697478	2.3308227	20	—	—
152545 4473 *T–2*	16.8	*X*	204.47483	2.15660	39.11800	3.12073	0.1536464	0.24586884	2.5234830	20	5 17.5	20.8
152546 4729 *T–2*	16.2	*X*	204.46135	327.75730	76.18673	4.12851	0.1699921	0.24581894	2.5238245	20	5 21.0	20.1
152547 5052 *T–2*	15.4	*X*	251.73806	336.20344	305.77905	8.54627	0.2457248	0.22245372	2.6975920	20	1 31.2	20.1
152548 5085 *T–2*	16.4	*X*	181.34744	186.97626	242.66355	7.97897	0.1611626	0.24558716	2.5254122	20	6 1.2	20.3
152549 1119 *T–3*	15.2	*X*	179.48065	76.48300	349.97760	12.58450	0.2985534	0.17426333	3.1744272	20	5 23.6	21.1
152550 2677 *T–3*	16.3	*X*	41.31898	164.50616	204.96630	6.92635	0.1312914	0.27962066	2.3160959	20	—	—
152551 3190 *T–3*	16.7	*X*	181.79813	270.25497	149.14117	2.88921	0.1848684	0.24455172	2.5325356	20	5 20.3	20.9
152552 3810 *T–3*	15.7	*X*	196.16074	4.18020	65.28638	1.69951	0.1794035	0.17559864	3.1583138	20	6 13.4	20.9
152553 4264 *T–3*	15.5	*X*	10.70426	338.70654	62.24156	8.75921	0.0806010	0.20995953	2.8035759	20	—	—
152554 4320 *T–3*	16.0	*X*	94.76030	234.91312	130.60067	5.21784	0.1468867	0.21335398	2.7737600	20	—	—
152555 1975 SD_{1}	14.8	*X*	332.31731	169.08824	189.03686	12.87857	0.0923090	0.17337344	3.1852804	20	9 6.0	19.0
152556 1980 FK_{4}	15.8	*X*	17.31956	330.94961	177.35748	8.85763	0.1927594	0.22078401	2.7111756	20	2 3.6	18.4
152557 1981 ED_{29}	16.6	*X*	173.51454	235.13348	334.01133	8.74288	0.1755718	0.26512412	2.3997715	20	11 17.0	20.5
152558 1990 *SA*	16.7	*X*	168.22195	115.14158	172.17231	38.14038	0.4417250	0.34489683	2.0137702	20	—	—
152559 Bodelschwingh	14.8	*X*	146.27808	291.01264	46.59006	18.41794	0.2887114	0.21098033	2.7945254	20	1 25.4	19.8
152560 1991 *BN*	19.1	*X*	67.17517	80.89741	268.86297	3.44564	0.3979200	0.56836014	1.4434009	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152561 1991 RB	19.0	X	100.78175	68.94159	359.31916	19.57670	0.4857607	0.56194457	1.4543660	20	3 28.0	18.8
152562 1991 RO_{42}	16.4	X	348.28612	172.22775	276.79438	4.59107	0.1140063	0.27871026	2.3211368	20	—	—
152563 1992 BF	19.8	X	122.94826	336.59124	315.26056	7.25729	0.2715856	1.13977199	0.9076618	20	—	—
152564 1992 HF	19.8	X	346.92468	128.30227	213.39548	13.31846	0.5618081	0.60076655	1.3910163	20	—	—
152565 1992 SH_{11}	17.4	X	241.59584	155.39003	171.49285	0.92735	0.1239292	0.30596835	2.1811476	20	3 18.5	20.4
152566 1993 FH_{17}	15.5	X	347.72720	321.05199	157.48139	9.00110	0.2648723	0.21212649	2.7844501	20	—	—
152567 1993 FF_{32}	15.4	X	232.33690	217.27538	34.43350	9.25064	0.2059975	0.20882961	2.8136797	20	—	—
152568 1993 FN_{33}	15.5	X	275.75896	175.55473	37.91553	4.87672	0.1392195	0.21068588	2.7971286	20	—	—
152569 1993 FH_{50}	16.5	X	238.73784	33.51071	189.06042	6.87675	0.0541488	0.28122476	2.3072802	20	—	—
152570 1993 FL_{69}	15.9	X	282.22390	228.46439	334.37507	3.48637	0.0305496	0.21087956	2.7954157	20	—	—
152571 1993 QG_{9}	16.9	X	138.36398	203.80199	107.06982	1.70248	0.2294211	0.27003224	2.3706038	20	—	—
152572 1993 TE_{23}	16.4	X	84.83513	247.71312	44.54523	5.69068	0.0989070	0.25995789	2.4314614	20	12 5.0	19.9
152573 1993 TG_{32}	16.6	X	106.24223	207.20675	112.88148	3.23197	0.2134155	0.26555226	2.3971914	20	—	—
152574 1994 CR_{9}	15.8	X	93.61210	151.59526	337.12443	12.53984	0.1272356	0.23287290	2.6165161	20	5 7.9	19.6
152575 1994 GY	17.0	X	334.53322	190.50990	33.75236	12.31897	0.5234726	0.22372354	2.6873749	20	1 6.5	20.8
152576 1994 NR_{2}	17.2	X	151.12787	26.63814	281.54160	1.81963	0.2537686	0.28372548	2.2937028	20	—	—
152577 1994 PA_{10}	15.7	X	212.99426	124.92219	153.44239	8.22050	0.1975536	0.20964165	2.8064092	20	—	—
152578 1994 PU_{11}	15.4	X	320.28357	47.41141	316.90127	8.59935	0.1025667	0.18916963	3.0053965	20	8 28.1	19.2
152579 1994 PJ_{37}	16.4	X	45.93953	207.30308	171.69427	4.59777	0.2426263	0.27571419	2.3379218	20	—	—
152580 1994 SL_{1}	16.1	X	293.87222	15.24568	76.84689	2.06266	0.1117516	0.19260269	2.9695763	20	11 12.1	19.7
152581 1994 SE_{5}	16.3	X	214.48984	163.35493	27.47838	2.15063	0.0548532	0.19619407	2.9332255	20	12 8.9	20.4
152582 1994 SL_{6}	16.4	X	7.32161	216.01417	176.40913	4.86644	0.1867704	0.27129786	2.3632254	20	—	—
152583 1994 TF	16.6	X	63.03809	250.47784	75.19768	0.72936	0.2826076	0.27357264	2.3501069	20	—	—
152584 1994 UU_{5}	15.5	X	203.57195	74.04705	21.50478	9.86036	0.0682505	0.18110196	3.0940022	20	8 1.1	20.2
152585 1994 WM_{7}	15.8	X	293.87191	209.22930	153.64078	6.66781	0.2098343	0.18204325	3.0833275	20	6 30.4	19.8
152586 1994 WZ_{7}	16.5	X	76.90484	193.56072	184.18409	6.40990	0.1265300	0.27512084	2.3412820	20	—	—
152587 1994 XH_{4}	17.3	X	1.25125	210.47308	152.40016	5.73740	0.1544148	0.26583205	2.3955091	20	12 1.4	19.8
152588 1995 EY_{4}	16.4	X	257.66320	301.54163	42.01531	2.22204	0.0958846	0.24202330	2.5501434	20	5 5.3	19.8
152589 1995 ME_{3}	15.1	X	133.03036	187.54054	199.98823	11.38431	0.1777993	0.22639266	2.6662108	20	2 22.6	19.2
152590 1995 OC_{1}	16.5	X	283.35892	105.94059	195.37076	10.50855	0.1806773	0.22870443	2.6482135	20	3 30.6	20.3
152591 1995 QZ_{6}	17.0	X	119.96830	33.66559	337.60520	5.24637	0.1785492	0.29308350	2.2446147	20	1 12.7	19.6
152592 1995 SK_{1}	16.0	X	206.13670	288.76975	350.03180	4.39702	0.0324880	0.21356711	2.7719143	20	—	—
152593 1995 SM_{40}	16.5	X	12.37182	333.68592	133.12570	1.77014	0.0884088	0.21342550	2.7731403	20	—	—
152594 1995 SV_{45}	17.6	X	141.11397	188.50493	169.93683	2.87508	0.1309200	0.29597137	2.2299900	20	1 13.4	20.3
152595 1995 SA_{51}	16.2	X	316.89587	248.13745	226.15531	1.54180	0.2140317	0.20330750	2.8644008	20	—	—
152596 1995 SO_{70}	16.9	X	207.09651	4.21010	8.35139	2.06130	0.1447914	0.30384628	2.1912912	20	4 11.1	19.9
152597 1995 TP_{6}	16.3	X	33.68225	30.73221	328.76457	1.14403	0.0815105	0.20054984	2.8905990	20	12 13.6	20.2
152598 1995 TE_{7}	16.0	X	308.61686	162.07173	7.17112	3.90411	0.0413384	0.20906229	2.8115917	20	—	—
152599 1995 UX_{10}	15.8	X	246.83517	110.69750	288.65922	1.68809	0.0786622	0.18966607	3.0001499	20	7 6.7	20.1
152600 1995 US_{13}	15.4	X	314.50556	109.64843	23.89298	15.19283	0.0925514	0.20620834	2.8374740	20	—	—
152601 1995 UV_{37}	17.3	X	222.01013	74.11428	221.11931	2.44396	0.1404423	0.29695140	2.2250808	20	1 17.2	20.6
152602 1995 UF_{54}	17.0	X	313.03306	173.08030	21.43166	5.69798	0.0563029	0.29261360	2.2470171	20	—	—
152603 1995 VF_{2}	17.9	X	281.23081	262.36019	54.61584	3.87300	0.3000943	0.30565063	2.1826588	20	3 30.2	21.1
152604 1995 VJ_{16}	15.4	X	174.78742	91.83714	234.30410	4.13765	0.1624028	0.21216210	2.7841386	20	1 21.9	20.0
152605 1995 WG_{10}	16.3	X	54.07186	61.17859	314.14510	1.46919	0.0460159	0.20423360	2.8557351	20	—	—
152606 1995 WL_{19}	15.5	X	314.72986	251.16585	216.63183	12.13529	0.0695595	0.20097050	2.8865639	20	—	—
152607 1995 YE_{20}	16.2	X	263.67366	353.57246	142.76263	3.21610	0.0460038	0.19331474	2.9622797	20	12 3.9	20.2
152608 1996 AO_{7}	16.0	X	260.68909	79.74630	16.72897	2.33695	0.1819384	0.18940353	3.0029216	20	9 20.7	20.0
152609 1996 BJ_{7}	17.0	X	220.12856	159.78500	85.00507	3.70352	0.2015572	0.27852463	2.3221680	20	—	—
152610 1996 BK_{17}	16.4	X	201.94390	283.87926	1.75959	6.44885	0.1015555	0.28259933	2.2997924	20	—	—
152611 1996 ES_{7}	17.2	X	309.85173	56.50342	14.51009	1.44961	0.1647192	0.27008132	2.3703166	20	12 2.9	19.0
152612 1996 EW_{8}	16.9	X	194.22918	178.41059	38.26775	2.07867	0.1414576	0.27066979	2.3668797	20	12 24.5	20.2
152613 1996 FH_{14}	16.8	X	105.90171	156.28600	136.95591	3.16886	0.2177486	0.26594102	2.3948547	20	—	—
152614 1996 GB_{8}	16.7	X	239.67674	28.53512	72.89816	2.50183	0.1371512	0.26233885	2.4167273	20	9 18.4	19.7
152615 1996 GL_{16}	15.6	X	120.89183	132.64099	59.57354	6.64553	0.0899735	0.17791308	3.1308635	20	9 1.1	20.4
152616 1996 HG_{19}	15.1	X	53.79781	172.05443	88.03926	2.74640	0.1696387	0.17291517	3.1909058	20	9 15.8	19.5
152617 1996 JR_{14}	15.6	X	98.39622	83.38442	127.31093	2.56945	0.1577671	0.17421712	3.1749886	20	9 3.6	20.4
152618 1996 MJ_{1}	16.2	X	89.91454	144.34049	118.76946	7.43912	0.1071586	0.25890232	2.4380658	20	11 7.6	19.8
152619 1996 RW_{6}	16.4	X	111.12318	59.57922	347.09959	2.55155	0.0982072	0.22579494	2.6709140	20	2 14.9	19.9
152620 1996 RX_{11}	16.3	X	25.85963	94.81100	150.87679	7.83171	0.0759632	0.24156071	2.5533980	20	7 7.6	19.4
152621 1996 RY_{11}	16.2	X	85.07323	138.46566	12.20602	4.67882	0.1287747	0.23615860	2.5921903	20	5 31.1	19.6
152622 1996 TS_{35}	16.0	X	16.30240	145.44407	111.40057	4.90377	0.1919541	0.23963193	2.5670811	20	7 21.3	18.1
152623 1996 XL_{12}	16.7	X	169.73072	298.08792	73.34704	5.02528	0.1672915	0.30489490	2.1862640	20	3 7.5	19.9
152624 1996 XS_{20}	15.8	X	59.30532	2.71356	61.52791	6.32067	0.0559959	0.21696058	2.7429349	20	—	—
152625 1996 XQ_{23}	15.4	X	211.12894	122.10263	280.30864	8.27999	0.0960427	0.18515485	3.0486857	20	5 28.7	20.2
152626 1997 CY_{11}	15.7	X	171.08152	85.97415	335.35652	9.27704	0.1720268	0.18253782	3.0777557	20	5 9.9	21.0
152627 1997 DF	18.1	X	129.45200	268.59571	145.79014	18.67145	0.1468422	0.51490435	1.5416472	20	2 16.3	18.0
152628 1997 EF_{30}	15.7	X	249.58343	91.27426	5.71942	11.39806	0.0999909	0.19085116	2.9877174	20	9 20.4	19.8
152629 1997 EH_{32}	16.1	X	281.83709	15.67744	1.24503	2.89749	0.0772401	0.18348802	3.0671210	20	7 23.3	20.2
152630 1997 GP_{4}	17.0	X	5.04730	104.96510	6.56670	6.15744	0.0850563	0.29083991	2.2561435	20	—	—
152631 1997 GO_{5}	17.1	X	153.51259	6.39394	6.74010	7.78776	0.1666095	0.29589876	2.2303548	20	2 23.0	20.2
152632 1997 GG_{16}	16.3	X	297.76925	153.92812	136.32961	1.64234	0.1042170	0.30048485	2.2076031	20	4 11.6	18.5
152633 1997 GO_{35}	15.9	X	234.57479	258.35732	61.95304	3.91084	0.1535760	0.29371265	2.2414081	20	3 3.8	19.2
152634 1997 HN	15.7	X	115.46045	245.25930	43.29707	3.13890	0.2009203	0.19039163	2.9925229	20	12 22.9	20.8
152635 1997 JF_{8}	16.8	X	200.34105	173.77818	132.85003	4.98121	0.2373901	0.28731603	2.2745534	20	1 15.3	20.6
152636 1997 KR_{2}	17.3	X	342.19472	345.77979	151.36425	3.37275	0.0581565	0.28611184	2.2809311	20	—	—
152637 1997 NC_{1}	17.9	X	315.45948	16.59135	96.49628	16.72539	0.2082279	1.22497621	0.8650694	20	—	—
152638 1997 OD_{2}	16.6	X	43.60257	202.02762	161.51526	2.51766	0.2146857	0.26817014	2.3815650	20	—	—
152639 1997 PT	17.0	X	30.68762	162.34763	168.39361	3.27631	0.2134768	0.26400757	2.4065328	20	12 8.7	20.0
152640 1997 PP_{3}	15.9	X	19.52218	25.26560	351.44919	6.41358	0.1323870	0.26526207	2.3989394	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152641 Fredreed	16.3	*X*	155.21704	123.03442	217.92222	3.30573	0.2330130	0.23702987	2.5858342	20	1 24.4	20.5
152642 1997 RV_9	15.6	*X*	44.72691	327.23057	11.45119	7.54827	0.1030245	0.26263535	2.4149080	20	12 19.5	18.9
152643 1997 SP_6	16.9	*X*	216.08839	29.19956	166.20645	1.17746	0.1305160	0.26889953	2.3772563	20	12 23.9	20.0
152644 1997 SZ_6	17.0	*X*	159.86189	176.32634	356.22221	4.55736	0.0673757	0.25854110	2.4403361	20	9 23.8	20.4
152645 1997 SN_{18}	16.9	*X*	101.58035	320.94114	344.44876	2.20336	0.1884274	0.26899777	2.3766775	20	—	—
152646 1997 SM_{33}	15.7	*X*	334.41834	183.81015	198.88419	8.76394	0.2162780	0.25776770	2.4452150	20	11 12.7	17.5
152647 Rinako	15.9	*X*	328.21089	337.54906	35.17320	12.26496	0.2519822	0.25567886	2.4585148	20	10 12.2	17.3
152648 1997 UL_{20}	16.0	*X*	356.48716	208.38069	199.34723	28.86771	0.1840032	0.35127754	1.9893100	20	—	—
152649 1997 UX_{22}	15.9	*X*	313.27725	22.70964	3.82277	7.94574	0.1248559	0.25597109	2.4566433	20	9 29.0	18.0
152650 1997 VR_5	15.6	*X*	158.15494	181.64951	245.46784	4.77387	0.1485021	0.23803853	2.5785242	20	5 6.1	19.6
152651 1997 VN_8	16.1	*X*	154.31102	71.35549	17.15016	4.27980	0.2354329	0.23943823	2.5684654	20	6 2.1	20.5
152652 1997 WG_8	16.3	*X*	154.80060	24.53547	48.62765	14.18949	0.1702226	0.23988930	2.5652447	20	5 11.8	20.2
152653 1997 WV_{10}	16.0	*X*	163.97208	272.00316	38.33699	6.85100	0.2076483	0.27387696	2.3483656	20	—	—
152654 1997 WB_{15}	16.9	*X*	67.70365	16.76218	276.15686	0.74505	0.1775644	0.25949312	2.4343638	20	11 25.8	20.5
152655 1997 WL_{18}	16.4	*X*	40.04459	62.57756	275.09467	4.13875	0.1241000	0.26050440	2.4280596	20	12 15.2	19.6
152656 1997 WC_{29}	16.4	*X*	193.87733	273.07979	102.71777	3.00430	0.2333058	0.23945484	2.5683466	20	4 7.3	20.8
152657 Yukifumi	16.6	*X*	143.51778	302.90173	114.59879	5.15199	0.2417874	0.23478881	2.6022626	20	4 19.4	21.0
152658 1997 XG_6	17.1	*X*	183.86000	2.27884	60.65725	7.55451	0.2158308	0.24195868	2.5505974	20	5 25.5	21.4
152659 1997 XQ_9	15.9	*X*	191.00648	26.09179	24.51492	5.79037	0.1421485	0.24103340	2.5571207	20	5 16.0	19.9
152660 1998 CW	16.2	*X*	33.54796	227.78883	211.92631	4.63852	0.1409095	0.21897164	2.7261148	20	—	—
152661 1998 DS_1	15.6	*X*	94.42715	162.39448	251.37995	2.77536	0.2170438	0.22331012	2.6906907	20	2 18.8	19.2
152662 1998 DQ_8	15.8	*X*	354.40657	56.39682	72.24004	9.63092	0.0848395	0.21734285	2.7397176	20	—	—
152663 1998 DF_{32}	15.5	*X*	74.91742	342.10609	77.30603	9.71081	0.1836322	0.22065437	2.7122374	20	1 26.9	18.7
152664 1998 FW_4	19.7	*X*	231.47785	85.06733	354.05551	3.41638	0.7157177	0.24540666	2.5266504	20	6 24.9	25.4
152665 1998 FG_6	16.3	*X*	58.16078	12.68646	81.57837	2.67292	0.0618088	0.21890947	2.7266309	20	1 31.2	19.8
152666 1998 FN_7	16.4	*X*	200.48906	323.50720	31.92782	2.33355	0.0934436	0.22629936	2.6669436	20	3 19.9	20.5
152667 1998 FR_{11}	16.3	*X*	233.91856	158.57529	129.87175	6.66643	0.7065225	0.20898680	2.8122687	20	1 15.4	22.7
152668 1998 FS_{59}	15.6	*X*	252.66440	156.16605	105.53335	3.15216	0.1862401	0.21549233	2.7553800	20	1 13.3	19.9
152669 1998 FK_{135}	15.6	*X*	309.50653	235.52643	352.14771	12.93183	0.1234573	0.22092798	2.7099976	20	2 11.6	19.2
152670 1998 GN_3	15.1	*X*	289.96349	2.70680	152.91934	27.11258	0.2187496	0.21177770	2.7875066	20	—	—
152671 1998 HL_3	20.1	*X*	51.58062	188.12732	163.67307	2.67958	0.3659621	0.82177508	1.1288444	20	—	—
152672 1998 HS_5	15.4	*X*	7.54514	93.82923	44.97898	10.03796	0.1556837	0.21749371	2.7384507	20	1 8.3	18.5
152673 1998 HU_{14}	15.7	*X*	286.04574	223.99301	57.44586	3.99497	0.1508532	0.22216262	2.6999480	20	3 15.5	19.4
152674 1998 HB_{50}	15.2	*X*	182.91949	280.68273	42.50883	9.22400	0.1659652	0.21433107	2.7653236	20	1 29.3	19.8
152675 1998 HS_{59}	16.3	*X*	278.83300	350.80857	215.89660	0.99274	0.1667637	0.21263996	2.7799659	20	—	—
152676 1998 HT_{96}	15.7	*X*	286.18301	32.23302	190.32825	5.64691	0.0632492	0.21432668	2.7653614	20	1 12.1	19.6
152677 1998 HA_{114}	15.2	*X*	260.07527	169.23732	74.34372	9.91435	0.0957625	0.21378162	2.7700597	20	1 6.2	19.3
152678 1998 HE_{126}	15.5	*X*	227.06296	118.92302	140.60038	8.68869	0.1831716	0.20940433	2.8085292	20	—	—
152679 1998 KU_2	16.6	*X*	155.39683	120.26639	205.74776	4.92675	0.5527377	0.29172165	2.2515950	20	1 22.9	21.1
152680 1998 KJ_9	19.4	*X*	191.42995	260.05869	98.58317	10.93084	0.6396611	0.56580292	1.4477467	20	3 13.6	22.4
152681 1998 KY_{10}	15.6	*X*	5.64775	186.28019	156.62303	10.68859	0.1102270	0.19177799	2.9780835	20	10 19.1	19.4
152682 1998 KT_{21}	15.3	*X*	241.01872	44.57862	235.22536	8.73086	0.2674474	0.21213184	2.7844033	20	1 18.8	20.4
152683 1998 KT_{23}	15.2	*X*	288.14396	38.29508	217.27247	12.96876	0.1545460	0.21688494	2.7435726	20	2 8.1	19.5
152684 1998 KV_{26}	15.3	*X*	228.82762	44.80133	233.03232	12.65938	0.1709647	0.21245900	2.7815442	20	1 10.2	20.1
152685 1998 MZ	19.2	*X*	59.81106	39.81925	121.69450	0.14622	0.5730181	0.63064385	1.3467282	20	8 4.9	20.3
152686 1998 QG_{42}	16.2	*X*	206.22838	4.99160	333.19065	7.91430	0.2450096	0.29775982	2.2210516	20	2 26.1	19.9
152687 1998 QP_{58}	17.7	*X*	264.84764	112.54315	163.80933	2.27398	0.1693293	0.29819150	2.2189075	20	2 2.3	20.8
152688 1998 QE_{61}	16.8	*X*	196.96029	27.50469	323.33976	13.92323	0.2547099	0.25288528	2.4765876	20	3 5.1	21.2
152689 1998 QC_{63}	16.6	*X*	354.45296	344.75901	283.14813	4.06976	0.1222993	0.30966308	2.1637634	20	6 19.8	18.2
152690 1998 QS_{75}	15.0	*X*	300.28515	181.72340	199.26877	17.54447	0.2107974	0.17543602	3.1602652	20	7 29.8	19.4
152691 1998 QJ_{103}	16.5	*X*	118.49615	8.98407	13.37190	9.84763	0.2148858	0.28962308	2.2624584	20	2 4.0	19.5
152692 1998 QN_{111}	16.0	*X*	332.13773	154.30957	181.04075	4.47377	0.1724852	0.17576644	3.1563035	20	8 2.9	19.5
152693 1998 RM_4	17.2	*X*	248.19842	218.13255	184.34708	24.04731	0.0967503	0.39901823	1.8272903	20	7 19.6	19.7
152694 1998 RX_6	14.8	*X*	290.07403	347.66198	346.92043	15.44577	0.1546076	0.17184342	3.2041594	20	5 23.1	19.5
152695 1998 RN_{15}	16.1	*X*	89.45479	106.80202	177.66389	1.55720	0.1115744	0.18547422	3.0451849	20	11 18.3	20.5
152696 1998 RO_{52}	16.6	*X*	202.38073	313.64821	30.67001	5.53185	0.1750798	0.29716840	2.2239975	20	3 3.9	20.0
152697 1998 RU_{53}	16.4	*X*	112.54482	52.86304	292.56394	4.67783	0.1891388	0.28560216	2.2836440	20	—	—
152698 1998 RG_{58}	17.0	*X*	245.80306	151.47665	168.69973	2.29042	0.1330391	0.29997748	2.2100916	20	3 13.9	19.9
152699 1998 RM_{60}	16.6	*X*	10.15009	89.88065	303.84376	4.37365	0.1679767	0.27668364	2.3324575	20	—	—
152700 1998 RN_{65}	17.0	*X*	72.32170	194.77034	180.61524	3.67427	0.1857712	0.28283126	2.2985349	20	—	—
152701 1998 RF_{69}	16.8	*X*	239.04898	140.69251	172.41282	5.56066	0.2271527	0.29885574	2.2156185	20	2 20.9	20.5
152702 1998 RE_{73}	16.9	*X*	111.10637	8.42037	322.87473	1.36394	0.2659512	0.28420762	2.2911080	20	—	—
152703 1998 RJ_{79}	16.7	*X*	41.47175	217.80533	144.80510	6.69320	0.2386714	0.27768528	2.3268451	20	—	—
152704 1998 SD_4	18.5	*X*	257.70460	144.16219	181.78874	13.67194	0.1253494	0.52865701	1.5147933	20	3 15.4	19.2
152705 1998 SY_{37}	17.0	*X*	37.45447	142.22895	230.64325	0.75970	0.2085322	0.27939670	2.3173335	20	—	—
152706 1998 SU_{54}	16.7	*X*	191.97859	321.86584	2.62596	4.81299	0.1786330	0.29375241	2.2412059	20	1 29.2	20.2
152707 1998 SM_{71}	15.1	*X*	338.27986	325.20542	45.06916	6.19694	0.1661007	0.17791971	3.1307857	20	10 6.6	18.6
152708 1998 SU_{81}	16.8	*X*	255.62070	334.74395	340.93388	2.51085	0.1672565	0.30089578	2.2055927	20	3 14.9	19.8
152709 1998 ST_{86}	14.9	*X*	298.71557	32.47762	332.73586	4.46450	0.1599783	0.17302447	3.1895619	20	7 19.2	19.0
152710 1998 SW_{86}	16.4	*X*	58.38840	244.00537	217.93191	5.74301	0.0306502	0.29177532	2.2513189	20	1 23.6	18.9
152711 1998 SZ_{97}	14.8	*X*	4.35528	163.23780	180.03506	12.86805	0.0501413	0.17966424	3.1104863	20	10 7.8	19.0
152712 1998 SE_{106}	16.8	*X*	357.93055	190.01488	170.39648	4.96694	0.1721129	0.27185917	2.3599713	20	11 26.7	19.2
152713 1998 SD_{114}	16.5	*X*	326.86793	357.09203	45.19535	6.16905	0.2262772	0.27127418	2.3633629	20	11 30.6	17.9
152714 1998 SB_{115}	14.8	*X*	15.45643	299.53585	8.61486	4.84501	0.1073185	0.17671475	3.1450014	20	9 13.3	18.7
152715 1998 SV_{120}	15.0	*X*	64.03185	145.48958	169.95909	12.07235	0.1351904	0.18420209	3.0591892	20	12 1.9	19.7
152716 1998 SR_{125}	14.8	*X*	51.99113	297.32763	36.82069	9.49311	0.1441284	0.18446234	3.0563113	20	12 8.9	19.2
152717 1998 SY_{157}	17.1	*X*	176.16282	141.11134	163.41649	2.62486	0.2372134	0.28988044	2.2611191	20	—	—
152718 1998 SK_{162}	17.0	*X*	342.69659	30.15643	351.65052	2.88171	0.2567527	0.27100552	2.3649246	20	12 11.1	18.7
152719 1998 TQ_{13}	17.1	*X*	223.19146	66.30497	61.67454	1.15888	0.1753786	0.26529896	2.3987170	20	9 28.4	20.2
152720 1998 TF_{17}	17.3	*X*	336.51299	147.91022	262.28887	1.65991	0.1832272	0.27263838	2.3554726	20	12 31.2	19.2

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152721 1998 TU_{25}	17.5	X	327.79519	95.19182	29.08421	4.18039	0.0735787	0.27954835	2.3164953	20	—	—
152722 1998 UG_{3}	16.8	X	298.94945	86.97733	277.33232	0.86782	0.2211242	0.26350268	2.4096059	20	7 14.4	19.0
152723 1998 UM_{31}	17.1	X	311.10606	87.92843	306.98229	1.03447	0.2242955	0.26831786	2.3806908	20	10 2.9	18.6
152724 1998 UW_{38}	16.2	X	131.34461	217.21859	141.92530	1.26901	0.2195856	0.28797919	2.2710602	20	1 16.5	19.1
152725 1998 UL_{44}	16.4	X	162.26341	317.57505	47.75578	2.93273	0.2444579	0.24658148	2.5186186	20	3 1.2	20.7
152726 1998 UT_{45}	16.5	X	74.45148	7.22792	14.91835	7.46907	0.1111658	0.28396619	2.2924065	20	—	—
152727 1998 VW_{13}	16.2	X	95.95934	12.69338	350.56443	3.90606	0.2206459	0.28331172	2.2959355	20	—	—
152728 1998 VR_{14}	13.9	X	317.96957	344.26651	35.74072	27.57948	0.1271461	0.17506463	3.1647332	20	9 27.4	18.2
152729 1998 VJ_{20}	15.1	X	274.57363	332.57413	66.88930	6.11360	0.1416067	0.17078685	3.2173607	20	8 2.1	19.5
152730 1998 VZ_{22}	16.5	X	346.77657	151.58380	238.92809	1.76365	0.1665850	0.27130683	2.3631733	20	12 18.5	18.5
152731 1998 VU_{43}	16.4	X	315.70060	304.34867	106.09425	3.91328	0.1674364	0.26482744	2.4015634	20	11 13.2	18.3
152732 1998 VN_{55}	16.5	X	238.94486	339.56467	235.28352	6.18275	0.0725169	0.27946611	2.3169498	20	—	—
152733 1998 WL_{8}	16.2	X	66.38323	52.62678	67.92944	4.30462	0.2557623	0.24103906	2.5570807	20	4 15.1	18.9
152734 1998 WR_{11}	16.7	X	2.09698	193.70442	184.93853	3.15398	0.1873528	0.27167951	2.3610116	20	12 30.7	19.2
152735 1998 WS_{13}	16.6	X	347.58691	355.15093	42.02731	7.48412	0.2278435	0.27139121	2.3626834	20	—	—
152736 1998 WX_{21}	16.7	X	155.24148	315.61657	54.48993	3.56223	0.1282850	0.28992833	2.2608701	20	2 16.9	19.8
152737 1998 WF_{28}	16.6	X	43.33160	137.64435	219.21759	1.28201	0.2161861	0.27546333	2.3393409	20	—	—
152738 1998 WM_{31}	16.5	X	263.45169	50.38436	271.13133	0.80934	0.1903117	0.29909428	2.2144403	20	3 28.6	19.6
152739 1998 WC_{32}	16.6	X	235.74341	318.47204	34.22623	6.65327	0.2499785	0.29953732	2.2122562	20	4 8.6	20.2
152740 1998 WW_{34}	17.1	X	190.99392	219.09149	25.44280	3.06473	0.0860610	0.27918176	2.3185227	20	—	—
152741 1998 WT_{42}	16.6	X	7.58987	45.24745	301.74835	2.38843	0.3045391	0.27075408	2.3663885	20	12 14.9	19.1
152742 1998 XE_{12}	19.1	X	141.15170	353.12080	280.05373	13.43503	0.7391575	1.19755499	0.8782249	20	—	—
152743 1998 YK_{6}	15.7	X	104.66138	292.03524	95.70523	9.78228	0.1590450	0.23691389	2.5866780	20	1 21.0	19.0
152744 1998 YC_{9}	17.2	X	327.62091	283.41171	122.57600	2.01409	0.1774607	0.26938594	2.3743939	20	12 4.2	19.1
152745 1998 YN_{11}	15.4	X	125.30797	117.41202	260.68699	10.42334	0.1917829	0.23777160	2.5804536	20	2 2.7	19.2
152746 1998 YH_{15}	17.3	X	351.00103	28.59202	346.47230	0.82389	0.2026657	0.26572025	2.3961810	20	12 7.0	19.2
152747 1998 YK_{15}	17.4	X	192.45261	135.12933	326.48383	1.19299	0.1800124	0.25368291	2.4713936	20	7 22.8	21.2
152748 1998 YF_{27}	17.2	X	76.07315	32.52300	119.60816	46.29622	0.1961649	0.38066487	1.8855621	20	6 19.6	20.1
152749 1998 YB_{32}	16.8	X	281.80164	327.63972	101.95742	3.23094	0.1910157	0.26553861	2.3972736	20	9 29.5	19.0
152750 Brloh	16.2	X	87.43101	227.19168	188.24260	2.01560	0.2029796	0.23506504	2.6002235	20	2 7.9	19.3
152751 1999 BL_{27}	17.2	X	226.56086	169.47385	339.00712	0.62411	0.1234194	0.26266729	2.4147122	20	11 4.6	20.4
152752 1999 CX_{3}	17.1	X	316.46810	79.78726	155.98553	23.78474	0.1039557	0.37431434	1.9068290	20	2 6.1	19.1
152753 1999 CK_{156}	17.4	X	239.66688	67.17434	13.65384	1.43477	0.1545637	0.25570313	2.4583593	20	8 16.9	20.8
152754 1999 GS_{6}	19.0	X	150.42789	134.93777	314.44691	2.02052	0.4974936	0.75810267	1.1911982	20	6 12.2	19.9
152755 1999 GC_{16}	16.0	X	17.25503	207.02013	19.44953	9.13319	0.1679684	0.23786744	2.5797604	20	5 30.4	18.6
152756 1999 JV_{3}	18.8	X	325.94144	101.53706	229.05097	15.22501	0.4149902	0.56402579	1.4507862	20	12 31.1	20.0
152757 1999 JL_{11}	16.2	X	15.80117	42.90425	223.72165	3.37164	0.1874213	0.23965073	2.5669469	20	8 2.5	18.6
152758 1999 JC_{33}	15.9	X	49.49796	194.18914	58.85466	6.16801	0.1714836	0.24281059	2.5446280	20	9 12.9	19.1
152759 1999 JD_{45}	16.1	X	327.26227	219.64148	52.54343	7.41822	0.2637610	0.23287359	2.6165110	20	4 13.5	18.6
152760 1999 KH	16.3	X	206.72625	145.42338	171.18539	1.84476	0.2166689	0.22197033	2.7015070	20	2 6.8	21.0
152761 1999 LE	15.6	X	15.95321	135.00404	158.68034	8.70789	0.1786386	0.24145219	2.5541631	20	9 14.9	18.2
152762 1999 LS_{2}	15.8	X	312.55703	96.50140	181.39954	11.86868	0.1570548	0.23118455	2.6292397	20	4 13.8	18.9
152763 1999 LN_{4}	15.5	X	351.86720	113.75203	170.35057	28.44337	0.2548327	0.23592646	2.5938904	20	7 6.8	18.3
152764 1999 LJ_{10}	15.4	X	175.35923	144.98443	161.95386	9.75130	0.2424979	0.21508688	2.7588416	20	1 4.4	20.2
152765 1999 LN_{10}	15.9	X	354.46180	140.28396	126.96467	12.38818	0.1523598	0.23560966	2.5962150	20	6 17.1	18.6
152766 1999 LZ_{11}	15.6	X	75.02944	84.30813	158.04048	5.36376	0.1960440	0.24387880	2.5371921	20	10 1.5	19.2
152767 1999 NP_{12}	15.7	X	35.48375	3.40073	267.19620	12.25796	0.2537513	0.24044944	2.5612593	20	9 19.2	19.0
152768 1999 NC_{16}	16.6	X	273.00881	116.05799	186.10680	1.31058	0.3037568	0.22538159	2.6741787	20	3 7.3	20.9
152769 1999 RM_{20}	14.6	X	297.38285	223.50974	191.62971	8.61424	0.1239536	0.18821047	3.0155985	20	9 27.2	18.4
152770 1999 RR_{28}	18.4	X	339.25288	284.54880	178.21962	7.14003	0.6546224	0.38307696	1.8776387	20	—	—
152771 1999 RB_{34}	15.3	X	336.55996	104.57597	183.81120	27.77017	0.3876675	0.23185140	2.6241958	20	5 7.7	17.6
152772 1999 RE_{60}	15.8	X	164.67957	126.78862	179.65085	7.74832	0.2230188	0.20968787	2.8059968	20	—	—
152773 1999 RO_{90}	15.6	X	182.35057	289.82320	55.15400	4.38840	0.1196613	0.21316514	2.7753980	20	2 21.1	19.9
152774 1999 RM_{114}	15.2	X	215.79843	47.04821	348.32439	15.65635	0.2507737	0.17518276	3.1633103	20	5 11.4	20.9
152775 1999 RV_{149}	15.1	X	239.34600	32.58841	322.96392	5.04749	0.2960793	0.17549485	3.1595590	20	4 13.5	20.6
152776 1999 RF_{152}	14.7	X	175.28812	356.28425	335.90932	7.55892	0.2193490	0.21245058	2.7816177	20	2 3.2	19.4
152777 1999 RA_{160}	15.6	X	223.97207	266.33642	68.92606	3.61567	0.1890417	0.21925696	2.7237493	20	3 16.4	20.1
152778 1999 RF_{163}	15.5	X	235.55310	133.74565	186.99098	9.28363	0.1599975	0.21894087	2.7263701	20	3 7.7	19.9
152779 1999 RL_{169}	15.0	X	212.06311	325.12155	336.68647	13.44729	0.1702189	0.21352091	2.7723142	20	1 29.3	19.7
152780 1999 RG_{189}	15.2	X	293.40556	232.53330	179.40479	11.47112	0.0865575	0.18780625	3.0199241	20	9 21.9	19.0
152781 1999 RH_{190}	14.9	X	283.54771	202.17761	198.12072	12.28883	0.1883384	0.18458577	3.0549486	20	8 4.2	19.2
152782 1999 RG_{200}	14.6	X	19.04251	143.54685	233.50402	12.57806	0.1062373	0.19512055	2.9439745	20	12 17.7	18.5
152783 1999 RZ_{223}	15.2	X	226.94269	76.16320	215.83165	8.93975	0.1402107	0.21372087	2.7705847	20	1 25.8	19.8
152784 1999 RW_{232}	15.1	X	221.73226	318.18643	7.96826	7.60613	0.1182404	0.21869121	2.7284447	20	3 6.4	19.3
152785 1999 RG_{249}	14.8	X	323.30303	258.00053	164.65313	10.32460	0.0916960	0.19287261	2.9668050	20	11 23.4	18.6
152786 1999 TS	15.1	X	174.41616	133.70614	202.02831	8.55840	0.1694066	0.21030435	2.8005106	20	1 31.9	19.9
152787 1999 TB_{10}	18.6	X	241.26006	137.36816	1.91316	15.95236	0.2316045	0.61933204	1.3630769	20	—	—
152788 1999 TS_{28}	15.2	X	338.24407	190.94198	191.59123	7.63683	0.2043820	0.18886177	3.0086616	20	10 26.2	18.2
152789 1999 TA_{38}	15.6	X	222.83340	290.59459	100.37419	2.02926	0.2182114	0.17404418	3.1770915	20	5 19.5	21.0
152790 1999 TR_{43}	15.8	X	167.01954	46.94196	205.73276	1.42573	0.0273221	0.19913417	2.9042825	20	—	—
152791 1999 TC_{57}	15.5	X	82.84429	323.35673	40.55207	2.69851	0.0625707	0.19919985	2.9036441	20	—	—
152792 1999 TS_{60}	16.1	X	221.06273	73.88812	197.19105	8.14087	0.1652624	0.21098543	2.7944804	20	—	—
152793 1999 TP_{82}	15.1	X	131.96144	47.83139	187.45233	11.13793	0.1053997	0.19150970	2.9808642	20	11 4.4	19.8
152794 1999 TL_{85}	15.1	X	269.95067	202.24580	216.93064	9.73550	0.1004583	0.18062249	3.0994752	20	8 22.8	19.5
152795 1999 TW_{113}	15.4	X	229.90399	98.43788	203.14573	8.73992	0.1655031	0.21451298	2.7637601	20	2 7.6	20.1
152796 1999 TB_{115}	15.5	X	312.34603	49.63718	319.12566	5.25190	0.1752676	0.18364077	3.0654199	20	8 13.8	19.0
152797 1999 TG_{121}	14.8	X	358.05712	201.30161	177.46639	9.11531	0.1004497	0.19104298	2.9857172	20	11 20.2	18.6
152798 1999 TP_{125}	14.7	X	181.29360	124.50566	5.74760	23.32678	0.1801466	0.18022893	3.1039857	20	8 23.5	20.1
152799 1999 TC_{134}	15.2	X	75.02484	293.14700	11.21132	10.64782	0.0899291	0.19261310	2.9694692	20	11 22.4	19.7
152800 1999 TG_{136}	15.1	X	0.12316	115.42876	217.51115	4.41159	0.1696200	0.18618165	3.0374663	20	9 26.0	18.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152801 1999 TQ_{143}	14.9	X	305.05927	16.12395	357.34122	11.67477	0.0809598	0.18309065	3.0715572	20	8 23.2	18.9
152802 1999 TC_{163}	15.3	X	308.99343	288.95491	92.66028	3.29190	0.0854049	0.18391240	3.0624008	20	9 6.6	19.2
152803 1999 TN_{166}	15.2	X	293.52780	58.23191	336.60272	10.57471	0.1466176	0.18344107	3.0676443	20	8 22.7	19.0
152804 1999 TZ_{178}	15.5	X	244.05287	68.46086	296.45041	4.33061	0.1646874	0.17337188	3.1852995	20	5 10.0	20.6
152805 1999 TL_{180}	15.1	X	185.60673	184.13106	241.96748	2.93347	0.1646376	0.17098828	3.2148335	20	5 31.6	20.2
152806 1999 TW_{185}	15.2	X	221.12417	56.08116	357.65719	24.95560	0.2444510	0.17427225	3.1743189	20	6 8.7	21.1
152807 1999 TT_{190}	15.2	X	316.13866	94.51939	301.94806	9.58712	0.0821431	0.18602250	3.0391985	20	9 30.5	19.2
152808 1999 TG_{195}	14.8	X	337.75807	113.56954	259.20529	9.55841	0.0661620	0.18527710	3.0473445	20	10 3.6	18.9
152809 1999 TU_{197}	14.4	X	88.60399	55.10080	255.78960	13.35003	0.1334194	0.19228155	2.9728818	20	12 20.9	19.0
152810 1999 TJ_{241}	14.9	X	265.25521	227.06788	170.57666	12.05510	0.1149367	0.17853902	3.1235416	20	7 19.9	19.6
152811 1999 TR_{241}	15.2	X	225.73959	232.97820	78.63300	8.95685	0.2306978	0.21395233	2.7685861	20	2 19.6	20.1
152812 1999 TC_{244}	14.9	X	321.54080	348.62207	11.73139	15.55831	0.1434182	0.18464862	3.0542553	20	8 29.6	18.6
152813 1999 TK_{257}	15.6	X	115.45925	302.18916	57.33542	2.96172	0.0646538	0.20455248	2.8527665	20	—	—
152814 1999 TW_{260}	15.3	X	79.79134	102.16662	214.54536	3.41064	0.1137009	0.19395031	2.9558047	20	12 17.9	19.6
152815 1999 TC_{270}	15.3	X	69.15344	42.11551	300.79789	8.80200	0.1051466	0.19616578	2.9335076	20	—	—
152816 1999 TA_{283}	15.3	X	131.01912	280.49607	65.01496	2.99380	0.0772062	0.20394564	2.8584225	20	—	—
152817 1999 TO_{301}	15.7	X	134.24510	340.08224	253.79540	0.88591	0.0516707	0.18761475	3.0219787	20	10 31.7	20.1
152818 1999 UK_{4}	15.5	X	303.86272	28.76405	349.17908	4.00637	0.1063695	0.18125527	3.0922573	20	8 21.3	19.3
152819 1999 UY_{11}	16.0	X	118.66057	163.97189	62.26509	1.84656	0.0086405	0.18390133	3.0625237	20	10 1.9	20.2
152820 1999 UF_{19}	15.5	X	100.39911	216.18511	66.48696	0.72321	0.0594170	0.19113369	2.9847724	20	11 23.6	19.9
152821 1999 UJ_{29}	16.1	X	284.00981	311.37164	93.77906	2.62403	0.0930825	0.18368162	3.0649655	20	8 30.4	20.0
152822 1999 UM_{39}	15.1	X	295.28277	234.18220	32.76439	14.04912	0.1694672	0.21797097	2.7344518	20	3 10.9	19.1
152823 1999 UK_{41}	15.1	X	81.17837	25.21950	265.51624	3.52256	0.0723201	0.19062026	2.9901296	20	11 12.6	19.4
152824 1999 UU_{43}	14.8	X	222.80748	57.39152	43.66660	11.35948	0.0699875	0.18120735	3.0928025	20	9 1.1	19.5
152825 1999 UE_{49}	15.5	X	6.93933	353.03471	17.36848	14.43121	0.1118427	0.18976354	2.9991224	20	11 17.7	19.4
152826 1999 UU_{56}	14.8	X	142.43859	254.78462	204.12520	9.93033	0.0858140	0.16946282	3.2340974	20	5 28.3	19.8
152827 1999 VA_{24}	16.8	X	143.22989	132.15751	256.89724	4.21308	0.1195988	0.30532498	2.1842105	20	2 21.6	19.6
152828 1999 VT_{25}	21.2	X	75.03816	319.15431	221.99666	5.14838	0.5230573	0.78667255	1.1621800	20	9 14.4	22.4
152829 1999 VQ_{33}	15.7	X	274.16875	34.57328	0.97737	0.73188	0.1820022	0.17697731	3.1418901	20	7 20.4	19.9
152830 1999 VD_{57}	17.2	X	81.53025	66.61211	21.39987	2.09367	0.1132887	0.30390126	2.1910269	20	2 19.9	19.3
152831 1999 VJ_{57}	15.6	X	197.90502	219.97756	202.60024	1.51614	0.1693965	0.17172873	3.2055859	20	6 7.1	20.9
152832 1999 VV_{60}	15.5	X	318.11641	172.52652	167.67536	1.50604	0.2749678	0.18083715	3.0970219	20	6 30.5	18.6
152833 1999 VT_{64}	14.6	X	168.67501	79.96740	46.97621	18.88373	0.1426933	0.17456320	3.1707908	20	8 4.2	20.1
152834 1999 VL_{71}	14.9	X	45.62524	298.86374	48.64852	11.89858	0.1252120	0.19194961	2.9763082	20	12 16.8	19.2
152835 1999 VD_{74}	16.6	X	126.53013	197.17565	252.56438	0.48454	0.2449294	0.16443167	3.2997350	20	5 13.5	21.9
152836 1999 VS_{77}	15.3	X	21.64431	81.34471	285.32512	2.49422	0.1102746	0.18992653	2.9974063	20	12 7.9	19.1
152837 1999 VL_{95}	15.2	X	45.47301	314.75508	37.14161	10.12117	0.0926288	0.19340348	2.9613735	20	12 17.9	19.4
152838 1999 VG_{100}	15.6	X	7.60027	312.46210	26.52814	1.20166	0.1954649	0.18573207	3.0423660	20	10 22.2	18.9
152839 1999 VQ_{102}	15.9	X	261.05709	351.02787	19.06103	0.66968	0.1515326	0.17448681	3.1717161	20	6 6.1	20.6
152840 1999 VD_{103}	15.9	X	247.14254	349.92630	47.56056	0.29725	0.1636858	0.17475823	3.1684313	20	6 23.6	20.6
152841 1999 VF_{107}	17.6	X	175.29629	13.61191	51.97712	1.98750	0.0654499	0.31232921	2.1514321	20	5 18.8	20.3
152842 1999 VS_{107}	15.5	X	202.62278	16.30459	80.60931	2.16179	0.1315397	0.17409167	3.1765136	20	7 25.2	20.5
152843 1999 VR_{121}	15.1	X	149.11605	209.69682	37.26467	9.65767	0.0566714	0.19214670	2.9742725	20	12 1.9	19.6
152844 1999 VY_{144}	15.0	X	4.71555	354.50027	17.16355	9.94603	0.0872721	0.18866827	3.0107184	20	11 14.7	19.0
152845 1999 VX_{146}	16.4	X	306.79997	270.73661	84.44507	0.37819	0.1881359	0.17924154	3.1153746	20	7 14.2	20.1
152846 1999 VO_{156}	15.8	X	310.27966	304.24535	59.51763	1.28705	0.1046868	0.17886888	3.1197002	20	8 12.1	19.6
152847 1999 VZ_{156}	15.6	X	235.59210	12.05704	52.92882	1.82770	0.1560975	0.17366577	3.1817050	20	7 16.8	20.5
152848 1999 VU_{164}	14.3	X	160.66142	130.07122	50.18932	27.78434	0.1965180	0.18034728	3.1026276	20	10 8.5	19.9
152849 1999 VR_{170}	17.3	X	185.36408	88.10690	282.86572	3.20550	0.1527492	0.30740622	2.1743408	20	3 16.8	20.5
152850 1999 VG_{183}	17.1	X	184.58362	149.56744	237.72004	4.31124	0.0921197	0.30862213	2.1686261	20	4 5.2	20.0
152851 1999 VE_{187}	15.5	X	36.86139	277.79437	107.07231	3.08562	0.1179636	0.19438888	2.9513571	20	—	—
152852 1999 VU_{198}	14.9	X	176.06482	258.42355	188.43844	14.73647	0.2102246	0.17027269	3.2238343	20	6 17.2	20.6
152853 1999 VM_{199}	15.0	X	183.70522	355.32130	111.42761	16.45666	0.2071892	0.17180903	3.2045869	20	7 17.1	20.5
152854 1999 VD_{213}	16.1	X	154.85123	35.15086	71.94604	2.29980	0.1167421	0.16936101	3.2353934	20	6 21.0	21.0
152855 1999 VV_{215}	15.1	X	301.59757	355.75270	7.70030	11.03908	0.1102683	0.17905030	3.1175925	20	8 1.2	19.3
152856 1999 WF_{12}	14.7	X	31.65278	238.90427	80.43186	10.12825	0.1426686	0.18329477	3.0692764	20	10 30.5	18.8
152857 1999 XD_{27}	15.1	X	295.35029	214.56225	141.39249	1.79610	0.2490709	0.17822845	3.1271691	20	6 17.2	19.2
152858 1999 XN_{35}	15.5	X	115.58614	307.44388	54.91992	23.28811	0.3246257	0.29608661	2.2294113	20	1 18.7	18.8
152859 1999 XC_{41}	16.5	X	135.02687	172.58842	243.86210	5.94949	0.0653800	0.30653587	2.1784546	20	3 11.8	19.3
152860 1999 XV_{49}	15.1	X	332.72504	288.42069	48.39526	2.94779	0.1854056	0.17931626	3.1145091	20	8 8.3	18.5
152861 1999 XO_{50}	15.3	X	211.86902	221.38581	221.52164	4.55299	0.0929948	0.17383306	3.1796633	20	7 18.5	20.2
152862 1999 XQ_{64}	14.7	X	90.36464	142.21150	72.80103	16.82313	0.0390512	0.17523990	3.1626227	20	8 22.6	19.5
152863 1999 XZ_{114}	15.0	X	267.01247	7.89843	13.57679	16.31382	0.3220812	0.17670692	3.1450943	20	6 2.1	20.2
152864 1999 XT_{143}	16.8	X	148.01940	257.14616	100.48759	2.74145	0.3608920	0.30020877	2.2089564	20	2 13.3	20.4
152865 1999 XW_{144}	15.7	X	339.20695	253.12907	168.54446	1.41784	0.0560337	0.19069957	2.9893005	20	12 11.9	19.5
152866 1999 XP_{216}	17.3	X	186.49572	305.78441	103.69850	1.96549	0.0693296	0.30795911	2.1717376	20	5 10.6	20.2
152867 1999 XT_{223}	17.1	X	75.85023	322.33724	100.25745	6.41827	0.0940147	0.29492945	2.2352390	20	1 1.6	19.3
152868 1999 XH_{251}	17.0	X	156.33365	256.31739	103.65275	7.31589	0.2378372	0.30003233	2.2098223	20	2 14.1	20.4
152869 1999 XM_{254}	17.4	X	48.59046	326.00578	117.23719	0.43060	0.1266752	0.29370288	2.2414578	20	—	—
152870 1999 YK_{8}	18.0	X	115.11909	8.37253	34.91656	0.64109	0.2196540	0.29928396	2.2135046	20	2 23.8	20.5
152871 1999 YC_{22}	17.1	X	135.12101	343.60794	93.23375	4.22374	0.0773194	0.30677587	2.1773183	20	4 17.0	19.8
152872 2000 AF_{27}	16.5	X	143.56710	34.89247	27.66905	2.00611	0.0984305	0.30443050	2.1884868	20	4 8.1	19.3
152873 2000 AG_{36}	16.8	X	28.11235	174.52557	286.70638	6.84384	0.1492300	0.29343831	2.2428050	20	—	—
152874 2000 AQ_{45}	17.0	X	149.71545	146.71767	268.60210	3.28595	0.1660155	0.30599885	2.1810026	20	4 9.7	20.2
152875 2000 AX_{49}	16.8	X	17.05802	107.68753	94.07532	2.51764	0.0849562	0.30439909	2.1886374	20	4 16.8	18.7
152876 2000 AZ_{82}	14.9	X	267.03068	203.18660	204.43895	3.17302	0.1675540	0.17406692	3.1768147	20	7 27.6	19.5
152877 2000 AY_{126}	16.6	X	139.24320	277.24132	155.22215	2.73087	0.1310747	0.30332124	2.1938192	20	4 21.2	19.4
152878 2000 AT_{140}	16.5	X	137.95667	256.46958	132.75083	8.90190	0.1621970	0.30066129	2.2067393	20	2 25.1	19.3
152879 2000 AV_{160}	16.9	X	17.56200	188.56316	328.16723	4.93524	0.1213310	0.29686795	2.2254978	20	2 5.3	18.6
152880 2000 AX_{211}	16.6	X	88.67644	201.48282	159.02369	2.88323	0.2497499	0.28583616	2.2823975	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152881 2000 AY_{257}	16.5	X	335.84127	39.29169	149.25771	6.15202	0.0615955	0.29437600	2.2380397	20	1 19.2	19.1
152882 2000 BR_{2}	15.4	X	261.45885	145.31232	309.56216	24.54889	0.1807935	0.27691529	2.3311565	20	9 16.9	18.8
152883 2000 BD_{20}	16.6	X	316.34803	132.83108	135.55225	7.79153	0.1113735	0.30195374	2.2004378	20	4 9.9	19.0
152884 2000 BS_{47}	17.0	X	192.75589	216.75618	126.60891	1.29543	0.2047721	0.29952876	2.2122984	20	2 21.5	20.3
152885 2000 CG_{15}	16.4	X	155.13426	221.39927	141.71565	7.09851	0.1973946	0.29691556	2.2252599	20	2 12.0	19.4
152886 2000 CW_{16}	16.2	X	324.24854	335.91738	260.11006	4.73116	0.1498420	0.29815691	2.2190792	20	2 21.6	18.5
152887 2000 CX_{20}	16.8	X	336.89328	198.34956	298.07810	5.20480	0.0899783	0.28805735	2.2706494	20	—	—
152888 2000 CA_{42}	16.8	X	27.44985	154.32986	265.12680	2.24411	0.1521692	0.28679853	2.2772888	20	—	—
152889 2000 CF_{59}	16.5	X	168.36542	222.43587	141.77107	41.56226	0.6407056	0.45292295	1.6792673	20	3 12.3	20.5
152890 2000 CU_{67}	17.2	X	82.23267	254.71211	154.07928	1.73188	0.1495798	0.29293450	2.2453758	20	—	—
152891 2000 CA_{79}	17.1	X	351.70737	64.31405	312.65833	5.06042	0.1501158	0.27511632	2.3413076	20	12 5.7	19.5
152892 2000 CD_{98}	16.3	X	280.27471	301.84233	317.63946	4.69147	0.1448041	0.29482236	2.2357802	20	1 31.3	19.4
152893 2000 CQ_{98}	16.5	X	65.55712	73.36743	314.51646	4.47750	0.1657880	0.28727215	2.2747850	20	—	—
152894 2000 CJ_{99}	17.0	X	100.42305	6.95511	359.85742	0.64498	0.2176209	0.28894084	2.2660184	20	—	—
152895 2000 CQ_{101}	18.1	X	281.47620	173.93884	29.84921	2.97067	0.4912249	0.28400702	2.2921867	20	—	—
152896 2000 CG_{149}	16.5	X	305.41102	281.61004	233.73020	5.80797	0.1087275	0.28383084	2.2931352	20	—	—
152897 2000 DO_{4}	16.7	X	9.42394	22.99745	109.80782	7.22203	0.0488546	0.29114724	2.2545555	20	—	—
152898 2000 DC_{12}	17.0	X	231.19144	326.93743	171.02346	5.08806	0.1104621	0.27069531	2.3667310	20	11 1.8	19.9
152899 2000 DR_{17}	15.7	X	29.58280	72.39220	343.46967	23.53574	0.1916705	0.28392693	2.2926178	20	—	—
152900 2000 DC_{27}	14.5	X	223.53423	239.26881	248.40665	1.77920	0.1559681	0.12595906	3.9413934	20	9 12.9	20.5
152901 2000 DR_{31}	17.3	X	298.35813	302.56397	199.06883	2.07303	0.0979269	0.28226486	2.3016088	20	—	—
152902 2000 DC_{32}	16.8	X	214.63474	63.14997	175.12927	6.10838	0.1419018	0.28133645	2.3066696	20	—	—
152903 2000 DP_{46}	17.1	X	305.85372	324.73955	262.06222	1.01162	0.0930802	0.29255053	2.2473400	20	1 25.8	19.7
152904 2000 DW_{52}	17.1	X	209.03943	40.91712	165.20780	4.82102	0.1806610	0.27595774	2.3365460	20	12 23.9	20.3
152905 2000 DW_{60}	16.1	X	179.65242	341.24026	355.24226	6.00162	0.1605360	0.29091741	2.2557428	20	2 1.5	19.4
152906 2000 DN_{64}	16.5	X	342.94960	138.67123	331.87757	3.71650	0.1902610	0.28480559	2.2879000	20	—	—
152907 2000 DP_{65}	17.0	X	13.48891	74.65161	339.02301	6.73256	0.1000960	0.28098832	2.3085743	20	—	—
152908 2000 DH_{70}	16.4	X	316.35614	18.88660	158.91981	5.89784	0.0440548	0.28756720	2.2732288	20	—	—
152909 2000 DW_{72}	16.7	X	286.80500	182.89426	1.67881	4.14836	0.0795788	0.28401748	2.2921305	20	—	—
152910 2000 DS_{74}	16.5	X	292.75566	44.43394	184.86743	5.59265	0.0949312	0.28984202	2.2613189	20	1 11.8	19.6
152911 2000 DY_{78}	16.7	X	342.31008	171.41033	332.93250	5.27783	0.0862779	0.28679602	2.2773021	20	—	—
152912 2000 DQ_{86}	16.6	X	222.86863	277.51531	336.85979	7.16512	0.0940054	0.28617283	2.2806070	20	—	—
152913 2000 DX_{100}	16.1	X	223.42692	359.31343	37.37892	4.74941	0.1516216	0.30771315	2.1728947	20	5 30.3	19.3
152914 2000 DK_{103}	16.8	X	304.41310	52.22568	49.36392	5.59387	0.1359725	0.27836615	2.3230493	20	—	—
152915 2000 DA_{114}	16.6	X	320.88551	108.04161	337.68712	9.25977	0.0314057	0.27696909	2.3308546	20	—	—
152916 2000 EL_{4}	17.4	X	28.88092	297.18211	160.20670	2.58942	0.1056572	0.28999731	2.2605116	20	—	—
152917 2000 EM_{4}	17.2	X	279.90140	30.16646	150.44591	2.72535	0.0962405	0.28431562	2.2905278	20	—	—
152918 2000 EN_{21}	16.9	X	308.18223	323.39795	143.71593	23.50387	0.1742628	0.28002025	2.3138920	20	—	—
152919 2000 EU_{21}	15.9	X	246.10476	118.03170	150.12101	21.06723	0.2373996	0.28826149	2.2695772	20	1 4.9	20.0
152920 2000 EG_{29}	16.7	X	17.60402	329.94130	100.69806	5.17509	0.1685690	0.28686978	2.2769117	20	—	—
152921 2000 EK_{32}	16.1	X	263.45247	277.62526	2.17515	4.45532	0.1372485	0.29352118	2.2423828	20	2 10.5	19.3
152922 2000 EC_{51}	16.5	X	65.68209	65.71596	328.67136	4.04974	0.2434759	0.28653101	2.2787060	20	—	—
152923 2000 EC_{60}	17.0	X	318.54584	336.35912	175.17466	1.13697	0.1062176	0.28403018	2.2920622	20	—	—
152924 2000 EM_{65}	16.8	X	162.49019	229.04623	355.87439	5.12819	0.1326858	0.27038170	2.3685607	20	12 1.4	20.4
152925 2000 EB_{67}	17.0	X	160.28533	57.92703	188.36176	5.25453	0.1896178	0.27170738	2.3608502	20	12 23.5	20.8
152926 2000 EJ_{76}	16.5	X	350.26756	104.63566	47.55900	6.17237	0.0831328	0.28995691	2.2607216	20	—	—
152927 2000 EG_{77}	16.3	X	220.45554	186.95604	73.36361	5.24054	0.1502948	0.28459339	2.2890372	20	—	—
152928 2000 EG_{91}	16.7	X	213.52089	343.59888	214.70632	4.91185	0.1833752	0.27466813	2.3438539	20	12 18.4	19.7
152929 2000 EZ_{92}	16.5	X	323.25130	266.54968	257.82802	2.85302	0.1516784	0.28607404	2.2811320	20	—	—
152930 2000 EB_{102}	16.8	X	194.72678	308.62919	343.36348	5.24944	0.1691411	0.28364222	2.2941517	20	—	—
152931 2000 EA_{107}	16.1	X	18.28065	278.01207	52.89426	28.57925	0.4557339	1.09944369	0.9297240	20	—	—
152932 2000 EM_{128}	16.7	X	151.73019	157.32325	97.71464	3.47192	0.1650479	0.27261485	2.3556081	20	12 28.1	20.1
152933 2000 EO_{131}	15.9	X	214.28199	310.01938	353.49975	6.21539	0.1139910	0.28868097	2.2673781	20	1 23.4	19.2
152934 2000 EO_{133}	17.4	X	230.34998	186.86037	1.63789	2.37055	0.1659365	0.27581327	2.3373618	20	12 30.5	20.0
152935 2000 EZ_{134}	17.2	X	229.84816	166.99014	43.10582	7.04395	0.1898224	0.27732326	2.3288696	20	—	—
152936 2000 EP_{135}	15.7	X	195.67562	179.32431	127.46124	5.01055	0.1539937	0.28496196	2.2870629	20	1 9.0	19.2
152937 2000 EO_{142}	16.6	X	145.35887	34.88113	341.55442	4.80198	0.1609620	0.29520122	2.2338668	20	2 16.2	19.6
152938 2000 EU_{193}	16.7	X	178.48925	49.67792	182.87725	5.83400	0.0961271	0.27475380	2.3433666	20	—	—
152939 2000 FY_{4}	17.2	X	276.50296	100.94418	18.06666	2.58265	0.1493766	0.27415333	2.3467871	20	12 9.7	19.2
152940 2000 FU_{5}	16.4	X	225.32110	159.46877	11.95443	6.57176	0.0535689	0.27218010	2.3581158	20	12 16.3	19.5
152941 2000 FM_{10}	17.6	X	286.99197	343.94207	18.54680	8.73430	0.6807546	0.54682300	1.4810562	20	4 15.5	19.9
152942 2000 FN_{10}	16.7	X	151.64332	235.41974	8.19536	27.07844	0.4561909	0.36512504	1.9386897	20	12 8.9	21.0
152943 2000 FY_{10}	16.0	X	276.21269	147.42614	34.89918	27.86716	0.1436340	0.28363733	2.2941781	20	—	—
152944 2000 FD_{25}	15.8	X	245.66402	96.67476	179.70233	20.75885	0.1576298	0.28668122	2.2779100	20	1 15.1	19.7
152945 2000 FR_{25}	15.5	X	136.38001	291.80817	26.01393	12.84413	0.2087509	0.27722126	2.3294409	20	—	—
152946 2000 FG_{28}	16.9	X	248.66736	42.90448	209.30403	5.58336	0.0784060	0.28501844	2.2867608	20	—	—
152947 2000 FE_{30}	16.6	X	193.38656	239.24254	24.07440	7.73804	0.1012271	0.27864312	2.3215097	20	—	—
152948 2000 FP_{32}	16.9	X	326.00495	82.47752	50.68969	2.59747	0.2791567	0.28425369	2.2908605	20	—	—
152949 2000 FG_{58}	16.5	X	175.55767	222.77336	41.07122	7.75892	0.1862553	0.27612764	2.3355874	20	—	—
152950 2000 FQ_{64}	16.3	X	192.23612	263.13027	303.01325	5.00180	0.1208671	0.27164290	2.3612237	20	12 11.1	19.5
152951 2000 FJ_{71}	17.1	X	114.30498	251.97126	24.95733	0.70165	0.0173221	0.27112363	2.3642377	20	12 17.8	19.9
152952 2000 GC_{2}	17.6	X	55.75075	280.23707	358.69413	55.29510	0.1871005	0.60565783	1.3835170	20	—	—
152953 2000 GT_{21}	16.1	X	47.82259	130.12772	22.17646	1.60626	0.1492744	0.24686581	2.5166844	20	4 8.2	18.6
152954 2000 GN_{27}	16.3	X	152.71185	233.54519	25.22065	4.53387	0.1636094	0.27162258	2.3613415	20	—	—
152955 2000 GM_{35}	16.5	X	173.96930	226.95608	12.86999	6.26427	0.1992139	0.27182072	2.3601939	20	12 27.7	20.2
152956 2000 GM_{37}	16.8	X	236.84304	294.32922	202.46730	6.98201	0.0532871	0.26922614	2.3753334	20	11 16.0	19.8
152957 2000 GD_{42}	17.1	X	210.31072	307.20214	301.65244	1.12479	0.1990266	0.27753389	2.3276912	20	—	—
152958 2000 GX_{47}	17.1	X	200.37821	177.17551	32.58129	1.61581	0.1229904	0.27270185	2.3551071	20	12 25.5	20.3
152959 2000 GJ_{50}	17.2	X	304.83939	129.90228	35.69187	3.01126	0.1618940	0.28244985	2.3006037	20	—	—
152960 2000 GA_{52}	16.6	X	266.33805	130.46830	47.06123	2.95716	0.1515630	0.27825401	2.3236735	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
152961 2000 GH_{60}	16.8	X	247.36356	113.44385	24.76075	2.97888	0.0882932	0.27034651	2.3687662	20	11 26.2	19.7
152962 2000 GZ_{67}	16.9	X	164.31469	62.06871	185.35567	3.98640	0.1877669	0.27067133	2.3668708	20	12 28.3	20.6
152963 2000 GF_{68}	17.0	X	157.01175	210.53691	46.72841	4.42303	0.1713006	0.27082859	2.3659544	20	—	—
152964 2000 GP_{82}	17.7	X	146.81450	333.04965	114.88041	13.22995	0.3933513	0.59731586	1.3963684	20	6 5.9	19.6
152965 2000 GW_{86}	16.7	X	192.93572	123.10442	137.42745	5.74137	0.2116952	0.27681765	2.3317046	20	—	—
152966 2000 GK_{104}	15.5	X	130.06617	254.19946	47.56269	6.31124	0.2319168	0.27220087	2.3579959	20	—	—
152967 2000 GV_{105}	15.8	X	146.82455	242.40686	8.61273	9.96722	0.2076889	0.26885815	2.3775003	20	12 15.9	20.0
152968 2000 GX_{116}	16.7	X	167.83719	26.53653	262.41296	0.91823	0.2109031	0.27857752	2.3218741	20	—	—
152969 2000 GC_{117}	17.1	X	177.78857	247.58259	341.68799	1.86867	0.1626711	0.27314533	2.3525572	20	12 21.3	20.5
152970 2000 GB_{120}	17.5	X	161.99906	81.15037	196.02619	1.96049	0.1741245	0.27506541	2.3415965	20	—	—
152971 2000 GU_{120}	16.8	X	24.17885	318.41920	36.35632	2.74215	0.1941671	0.26829890	2.3808030	20	12 30.0	19.7
152972 2000 GD_{121}	16.7	X	311.55169	7.73509	14.61929	5.02954	0.1584019	0.26343559	2.4100151	20	9 19.6	18.6
152973 2000 GV_{121}	16.7	X	126.17990	144.66364	113.21800	6.05360	0.2067046	0.26556310	2.3971262	20	12 8.3	20.6
152974 2000 GZ_{122}	16.2	X	222.83696	40.00321	202.65332	22.09105	0.1906112	0.27756022	2.3275440	20	—	—
152975 2000 GM_{135}	16.3	X	188.58947	168.76202	88.56690	7.40403	0.1014986	0.27623695	2.3349712	20	—	—
152976 2000 GK_{140}	16.4	X	143.72056	137.48715	138.35480	3.22679	0.1604228	0.27174010	2.3606606	20	—	—
152977 2000 GJ_{141}	16.3	X	248.38525	63.71625	158.80517	10.19956	0.0937862	0.28060272	2.3106888	20	—	—
152978 2000 GJ_{147}	19.6	X	315.43128	240.80322	57.86762	25.00681	0.2367480	0.78662713	1.1622247	20	4 4.5*	20.4
152979 2000 GR_{148}	17.4	X	291.51186	18.23262	127.49069	0.72010	0.0833907	0.27986001	2.3147752	20	—	—
152980 2000 GP_{150}	16.8	X	63.75976	167.87688	175.03399	1.18037	0.1916260	0.27127019	2.3633861	20	—	—
152981 2000 GM_{156}	17.1	X	199.05520	62.29480	204.33734	3.05619	0.0538146	0.27998281	2.3140983	20	—	—
152982 2000 GM_{158}	16.6	X	246.56934	175.00508	25.59977	6.31698	0.1010916	0.27926272	2.3180746	20	—	—
152983 2000 GB_{162}	16.6	X	215.69211	148.51531	72.93257	7.59179	0.1438651	0.27540210	2.3396876	20	—	—
152984 2000 GJ_{162}	16.4	X	311.05707	87.63658	57.57441	3.69756	0.0862821	0.28235291	2.3011303	20	—	—
152985 Kenkellermann	16.4	X	45.80563	197.72961	179.26762	6.47899	0.1256544	0.27740705	2.3284007	20	—	—
152986 2000 HS_3	17.1	X	273.71358	289.66169	206.28726	0.39086	0.0998869	0.27449617	2.3448327	20	—	—
152987 2000 HM_{14}	15.5	X	180.58281	236.75942	43.58656	23.51332	0.2319663	0.27561250	2.3384968	20	—	—
152988 2000 HH_{22}	16.3	X	103.97452	289.82698	27.79392	3.84344	0.2418931	0.26984829	2.3716810	20	—	—
152989 2000 HO_{23}	16.2	X	102.20648	244.13584	65.81683	6.23140	0.1372367	0.26985980	2.3716135	20	—	—
152990 2000 HB_{26}	16.7	X	258.84099	116.60932	73.18929	5.14543	0.1029149	0.27716909	2.3297332	20	—	—
152991 2000 HV_{37}	16.3	X	174.76628	150.25184	130.16504	10.24451	0.1939171	0.27452587	2.3446636	20	—	—
152992 2000 HD_{38}	17.2	X	315.06961	292.98337	196.37210	2.88921	0.1841164	0.28033867	2.3121395	20	—	—
152993 2000 HH_{44}	16.2	X	110.74637	188.66554	99.55079	4.27289	0.1650280	0.26823617	2.3811741	20	12 31.1	19.9
152994 2000 HX_{44}	16.3	X	217.38098	194.11957	60.30174	7.55024	0.1064010	0.27953614	2.3165628	20	—	—
152995 2000 HW_{53}	16.3	X	140.03260	94.36968	204.21298	4.47658	0.1837606	0.27140459	2.3626058	20	—	—
152996 2000 HM_{60}	16.0	X	85.15212	277.36912	37.56897	6.87214	0.1197965	0.26849769	2.3796277	20	—	—
152997 2000 HH_{71}	16.6	X	222.26621	95.38430	133.54058	2.84725	0.1733827	0.27663001	2.3327589	20	—	—
152998 2000 HG_{79}	16.1	X	193.52462	189.90713	64.18972	23.16829	0.1658381	0.27706333	2.3303260	20	—	—
152999 2000 HW_{85}	16.1	X	159.36155	121.29621	100.70047	4.93496	0.1375996	0.26698222	2.3886242	20	11 25.6	19.8
153000 2000 HP_{86}	16.4	X	94.53188	196.04821	104.28586	2.49426	0.1843516	0.26620323	2.3932818	20	12 31.8	20.2
153001 2000 JM_4	16.3	X	113.55780	257.70647	54.70328	3.28370	0.1863858	0.27036228	2.3686741	20	—	—
153002 2000 JG_5	18.2	X	11.56051	233.43107	213.07762	31.43550	0.7960017	0.63499297	1.3405719	20	—	—
153003 2000 JH_{30}	16.5	X	223.41653	239.25467	36.52308	7.83038	0.1551338	0.28088582	2.3091360	20	—	—
153004 2000 JU_{30}	16.4	X	235.70359	225.14752	30.02291	10.28624	0.2132646	0.28006547	2.3136430	20	—	—
153005 2000 JA_{31}	15.3	X	88.98091	308.45249	24.54347	7.80911	0.1344690	0.26972289	2.3724160	20	—	—
153006 2000 JQ_{35}	16.1	X	152.41469	266.92073	41.18308	5.43219	0.2374078	0.27346755	2.3507089	20	—	—
153007 2000 JU_{35}	16.6	X	19.62655	261.46887	32.12276	2.62498	0.1653126	0.25475018	2.4644861	20	9 21.9	19.0
153008 2000 JA_{44}	16.3	X	163.07061	217.12003	58.19127	12.71752	0.2216480	0.27131694	2.3631146	20	—	—
153009 2000 JM_{52}	15.5	X	91.62441	267.68291	36.36446	12.40607	0.2680021	0.26396595	2.4067858	20	—	—
153010 2000 JZ_{55}	16.5	X	147.45332	63.96130	212.72572	5.75541	0.1936818	0.26963724	2.3729184	20	—	—
153011 2000 JN_{78}	17.0	X	243.15150	119.39063	111.43843	17.93015	0.2225183	0.42860048	1.7422118	20	—	—
153012 2000 JG_{87}	16.5	X	195.42830	162.69585	121.37560	2.52791	0.1989746	0.27946795	2.3169396	20	—	—
153013 2000 KO_8	16.5	X	129.41435	106.36588	222.16566	5.55778	0.1366506	0.27529809	2.3402769	20	—	—
153014 2000 KQ_8	17.0	X	35.40766	106.80822	193.26820	0.77893	0.1769654	0.25819977	2.4424864	20	10 27.8	20.0
153015 2000 KP_{27}	15.9	X	141.28257	218.17445	71.61461	8.68856	0.1658251	0.26975395	2.3722339	20	—	—
153016 2000 KM_{36}	17.1	X	114.76684	64.40514	169.38724	1.20886	0.1422667	0.26126719	2.4233314	20	10 27.3	20.9
153017 2000 KR_{38}	17.0	X	31.86059	76.96711	240.79908	0.57708	0.1956165	0.25955923	2.4339504	20	11 18.9	19.8
153018 2000 KN_{41}	16.6	X	183.54493	114.34328	142.62200	2.76468	0.1866393	0.27244972	2.3565598	20	—	—
153019 2000 KW_{41}	16.4	X	183.67565	119.10405	146.13632	6.17417	0.1665234	0.27330449	2.3516438	20	—	—
153020 2000 KF_{49}	17.0	X	82.83496	359.76246	301.20745	0.63874	0.1744529	0.26472562	2.4021792	20	12 21.3	20.6
153021 2000 KU_{57}	17.0	X	262.30285	51.39304	173.78704	3.45644	0.1590421	0.28131417	2.3067914	20	—	—
153022 2000 LV_6	16.7	X	187.36387	23.42987	182.88566	4.19031	0.0415493	0.26762234	2.3848138	20	12 14.6	19.9
153023 2000 LA_{32}	15.2	X	192.84845	284.08771	280.25656	20.28735	0.2706437	0.26573039	2.3961200	20	11 22.9	19.4
153024 2000 LQ_{36}	16.7	X	232.72851	76.73218	171.61986	2.35655	0.1961201	0.27819374	2.3240090	20	—	—
153025 2000 NK_{23}	15.8	X	221.01942	280.43599	46.71949	2.88688	0.2094093	0.23007369	2.6376960	20	3 2.4	20.2
153026 2000 NH_{25}	15.5	X	310.32413	220.45376	108.48935	6.14776	0.2171763	0.24358336	2.5392432	20	6 11.4	18.0
153027 2000 OP	16.4	X	121.68078	166.32192	102.34588	2.36637	0.2063792	0.26176509	2.4202574	20	12 16.4	20.5
153028 2000 OW_7	14.8	X	215.11302	84.78845	301.41997	15.06133	0.1464576	0.18623106	3.0369290	20	5 5.8	20.0
153029 2000 OT_{37}	14.9	X	264.62760	164.52048	210.32871	11.52551	0.1280919	0.24224627	2.5485783	20	6 20.7	18.5
153030 2000 PV_1	14.6	X	42.94587	106.13486	299.96127	7.16779	0.3488215	0.21428132	2.7657516	20	—	—
153031 2000 PM_9	15.0	X	293.75646	235.25518	69.59844	15.57790	0.2943282	0.23899759	2.5716214	20	4 8.6	18.8
153032 2000 PB_{15}	16.6	X	69.01500	196.80425	105.59078	3.55454	0.1835298	0.25775177	2.4453157	20	12 9.6	20.1
153033 2000 PC_{16}	16.1	X	356.88896	345.81632	270.52277	3.67033	0.1973435	0.24278275	2.5448225	20	6 2.9	18.0
153034 2000 PY_{17}	16.0	X	150.04296	13.49659	330.45543	7.81711	0.1697019	0.22254850	2.6968261	20	1 21.9	20.2
153035 2000 PR_{18}	16.3	X	341.79799	304.76442	356.72447	3.24108	0.1707837	0.24439996	2.5335839	20	7 13.3	18.4
153036 2000 PC_{24}	16.9	X	131.46587	145.77425	158.58206	1.50020	0.1834373	0.26490179	2.4011141	20	—	—
153037 2000 PZ_{25}	15.1	X	135.81363	141.29649	233.04636	13.43447	0.1844669	0.21921062	2.7241331	20	2 8.5	19.6
153038 2000 QT	15.4	X	185.02828	6.31610	334.63060	11.81082	0.1979812	0.22567870	2.6718311	20	2 18.6	19.9
153039 2000 QH_4	16.9	X	134.49266	102.87432	168.60867	2.41250	0.2236054	0.26148212	2.4220032	20	12 29.5	20.9
153040 2000 QX_6	16.9	X	95.13536	260.43021	147.69059	23.74491	0.0756349	0.37183884	1.9152827	20	—	—

* The additional opposition: 11 17.1, $V = 17.4$

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153041 2000 QZ_{10}	16.3	X	266.68103	346.30306	308.93356	5.15642	0.2294402	0.23416957	2.6068482	20	2 27.6	20.5
153042 2000 QP_{14}	15.7	X	307.56099	256.09499	115.19536	2.44775	0.1184769	0.24698801	2.5158542	20	8 25.9	18.3
153043 2000 QN_{25}	15.3	X	159.05959	194.87933	142.70582	19.14329	0.1908949	0.22160348	2.7044876	20	1 22.6	19.7
153044 2000 QG_{47}	16.2	X	278.36331	324.74550	353.96595	3.38352	0.2405415	0.23703345	2.5858081	20	4 7.4	20.0
153045 2000 QV_{53}	16.2	X	279.26604	192.89762	103.82086	2.88230	0.2977474	0.23541324	2.5976589	20	3 7.6	20.3
153046 2000 QE_{66}	15.0	X	83.29685	251.58456	125.64067	10.23629	0.2200981	0.21316287	2.7754177	20	—	—
153047 2000 QW_{68}	15.7	X	158.41739	161.15575	207.89692	3.14304	0.2741733	0.22376147	2.6870712	20	3 3.5	20.3
153048 2000 QN_{75}	16.9	X	333.46081	313.66064	1.01318	1.06898	0.2201030	0.24366024	2.5387091	20	7 10.5	18.6
153049 2000 QK_{77}	16.2	X	250.25164	347.56824	328.77853	3.26321	0.2118164	0.23208327	2.6224476	20	3 11.7	20.6
153050 2000 QL_{95}	15.4	X	42.11269	106.60907	328.38125	7.46517	0.1735968	0.21427351	2.7658188	20	—	—
153051 2000 QV_{95}	16.0	X	319.81913	144.76611	157.62983	2.70580	0.1922840	0.23921919	2.5700331	20	5 24.7	18.5
153052 2000 QO_{98}	15.4	X	331.58225	164.87421	159.13948	15.30388	0.1880088	0.24301265	2.5432173	20	7 22.5	17.8
153053 2000 QQ_{100}	15.7	X	276.69161	308.93255	35.56131	4.77328	0.1722076	0.23715236	2.5849437	20	5 19.1	19.3
153054 2000 QF_{117}	16.8	X	177.72231	332.12972	346.32528	19.01192	0.0464722	0.36894869	1.9252719	20	—	—
153055 2000 QZ_{125}	15.2	X	102.61783	178.93731	193.54918	7.61613	0.1052007	0.21619351	2.7494191	20	—	—
153056 2000 QN_{138}	15.8	X	115.69605	195.15924	170.23016	14.14050	0.2367458	0.21661503	2.7458512	20	1 18.3	20.0
153057 2000 QE_{146}	15.9	X	125.20427	301.10644	73.30043	4.36691	0.2629535	0.21874380	2.7280074	20	2 13.7	20.1
153058 2000 QA_{152}	15.9	X	264.21851	148.22744	183.47638	12.82572	0.1191733	0.23386843	2.6090855	20	4 27.0	19.6
153059 2000 QE_{158}	15.9	X	226.26348	180.14794	184.26225	17.32033	0.1260487	0.23412146	2.6072053	20	4 26.7	20.0
153060 2000 QU_{166}	16.2	X	319.16802	86.73224	243.76813	3.77808	0.0992363	0.24240428	2.5474707	20	7 16.4	19.0
153061 2000 QY_{168}	15.2	X	83.41625	226.35813	173.95016	14.11900	0.1751022	0.21691381	2.7433291	20	1 11.2	18.8
153062 2000 QD_{172}	15.8	X	91.25189	34.64935	343.71068	8.33879	0.1714125	0.21474948	2.7617306	20	—	—
153063 2000 QC_{176}	16.0	X	180.49268	146.32216	241.69993	3.22909	0.2215792	0.22925336	2.6439845	20	4 9.5	20.6
153064 2000 QG_{179}	15.5	X	21.57304	139.09058	287.02226	6.72876	0.2125095	0.21174923	2.7877564	20	—	—
153065 2000 QO_{186}	15.9	X	265.61490	345.46238	355.14554	13.43175	0.1816584	0.23736501	2.5833996	20	4 24.5	19.9
153066 2000 QT_{187}	15.9	X	225.71381	353.66484	1.97744	8.07151	0.0903445	0.23333342	2.6130723	20	4 13.1	19.7
153067 2000 QG_{195}	15.9	X	259.96168	202.15344	133.27024	6.98639	0.1079102	0.23627201	2.5913607	20	4 29.0	19.6
153068 2000 QE_{201}	16.4	X	273.47346	280.78377	56.75416	3.55520	0.2218470	0.23757250	2.5818952	20	4 30.0	20.2
153069 2000 QQ_{202}	16.4	X	75.59996	240.65976	75.12356	2.92590	0.2342321	0.25797186	2.4439248	20	—	—
153070 2000 QX_{206}	15.2	X	94.36855	31.24963	358.37639	8.25509	0.2757396	0.21580895	2.7526844	20	2 1.9	18.8
153071 2000 QW_{207}	16.1	X	173.83440	13.29211	13.30643	2.18273	0.2173798	0.22686599	2.6625010	20	4 3.4	20.5
153072 2000 QK_{210}	16.4	X	227.84377	307.92177	6.69108	1.90571	0.1959186	0.22795155	2.6540413	20	2 21.9	20.7
153073 2000 QS_{212}	15.9	X	63.96887	204.11778	169.55471	12.41032	0.2399980	0.20922660	2.8101195	20	—	—
153074 2000 QV_{214}	15.4	X	233.87975	302.84448	5.51407	9.48254	0.2313434	0.22863895	2.6487191	20	2 20.4	20.0
153075 2000 QR_{222}	16.0	X	86.20861	257.07860	21.67777	10.35213	0.2509346	0.25691931	2.4505950	20	11 29.1	20.2
153076 2000 QO_{228}	15.4	X	68.64554	257.74369	173.10664	13.06746	0.1977574	0.21840410	2.7308354	20	1 30.2	18.6
153077 2000 QY_{231}	15.2	X	151.15845	66.76770	6.82697	22.03705	0.0639907	0.23115658	2.6294518	20	4 24.0	19.2
153078 Giovale	16.1	X	276.05633	208.59593	173.78444	6.63193	0.1211069	0.24246326	2.5470576	20	7 17.9	19.4
153079 2000 RF_4	15.5	X	324.70813	306.28897	22.91095	13.64715	0.1841812	0.24044557	2.5612867	20	7 21.6	18.2
153080 2000 RJ_8	17.0	X	172.46183	57.14245	330.45755	19.70417	0.0467537	0.37856848	1.8925168	20	3 7.7	19.1
153081 2000 RU_{19}	15.9	X	159.52532	204.75645	195.65639	13.59370	0.2012780	0.22681121	2.6629297	20	4 7.9	20.3
153082 2000 RB_{22}	16.5	X	341.33658	145.80041	187.51246	11.24091	0.2549478	0.24555956	2.5256014	20	9 1.4	18.2
153083 2000 RH_{28}	12.1	X	230.40886	166.93915	199.56881	19.88129	0.0844050	0.08112756	5.2847419	20	5 10.1	19.4
153084 2000 RQ_{29}	15.3	X	312.49429	342.09232	324.28087	14.12839	0.1934065	0.23830972	2.5765676	20	5 10.2	18.7
153085 2000 RU_{38}	15.3	X	108.00129	164.64194	214.33459	8.30453	0.2138426	0.21189229	2.7865015	20	1 23.1	19.3
153086 2000 RX_{41}	15.2	X	35.30422	30.75353	320.34371	12.24654	0.1348030	0.20295186	2.8677460	20	12 13.5	19.3
153087 2000 RG_{43}	16.4	X	172.46389	136.97188	194.19987	21.58710	0.0710809	0.36967528	1.9227483	20	—	—
153088 2000 RP_{45}	15.3	X	300.62504	341.52882	349.85802	7.64760	0.2054022	0.23749389	2.5824649	20	5 28.5	18.5
153089 2000 RL_{49}	15.0	X	86.97342	216.21573	211.70151	12.76215	0.1886199	0.21810753	2.7333104	20	2 20.1	18.8
153090 2000 RL_{54}	14.9	X	19.90314	220.59529	218.24486	11.60711	0.1514563	0.21162844	2.7888170	20	—	—
153091 2000 RN_{58}	16.3	X	255.12050	339.66254	318.57927	3.05420	0.2459212	0.22905542	2.6455075	20	2 21.3	20.5
153092 2000 RU_{74}	15.7	X	60.97401	28.17592	7.80431	10.31281	0.2618632	0.21258229	2.7804686	20	—	—
153093 2000 RP_{76}	15.7	X	161.82211	19.05372	346.96063	8.80655	0.1389526	0.22594354	2.6697428	20	2 25.5	19.8
153094 2000 RB_{93}	15.0	X	108.18483	153.23626	251.95314	11.72539	0.1508500	0.21739458	2.7392831	20	2 12.3	19.0
153095 2000 RY_{93}	15.7	X	79.36242	218.81835	158.98932	5.56331	0.1752259	0.21334238	2.7738606	20	—	—
153096 2000 SZ_2	16.1	X	254.30661	187.78479	198.16363	12.56743	0.2001013	0.24008934	2.5638196	20	6 13.7	20.1
153097 2000 SQ_3	15.5	X	273.51702	280.32090	35.84314	14.02267	0.1148104	0.23440577	2.6050967	20	4 17.7	19.1
153098 2000 ST_4	16.7	X	84.62920	73.86058	18.14142	21.65873	0.0699539	0.37487013	1.9049438	20	2 25.5	18.8
153099 2000 SY_{10}	16.7	X	82.61172	250.18195	208.26100	21.21709	0.0744932	0.37665951	1.8989058	20	2 9.9	19.0
153100 2000 SN_{11}	17.2	X	310.64309	86.54115	180.32919	21.91689	0.0832092	0.38085127	1.8849469	20	3 21.9	18.8
153101 2000 SW_{15}	16.1	X	327.93579	102.96529	203.49246	7.01010	0.1560000	0.24042100	2.5614612	20	6 20.6	18.7
153102 2000 SB_{30}	16.5	X	292.57962	314.63764	31.31390	4.98722	0.1875003	0.23974822	2.5662510	20	6 10.1	19.5
153103 2000 ST_{32}	15.7	X	131.92072	280.41160	137.10158	4.17183	0.0855446	0.22539510	2.6740718	20	3 24.1	19.4
153104 2000 SG_{42}	16.1	X	45.25975	47.33473	324.30893	3.01311	0.0902418	0.20690897	2.8310650	20	—	—
153105 2000 SZ_{42}	15.2	X	302.03359	282.07132	6.07389	27.09122	0.1623248	0.23297063	2.6157844	20	4 4.4	18.6
153106 2000 SF_{44}	16.8	X	39.45393	94.31754	16.76002	19.91750	0.0918466	0.36780733	1.9292528	20	—	—
153107 2000 SY_{55}	12.5	X	220.44870	174.82133	192.71451	11.29209	0.0462925	0.08140138	5.2728838	20	5 4.2	19.6
153108 2000 SJ_{56}	15.8	X	334.78587	278.01084	358.09300	12.89582	0.1505384	0.23738827	2.5832308	20	5 13.9	18.7
153109 2000 SN_{62}	15.8	X	246.82361	124.96115	192.72500	5.74815	0.1171987	0.22948947	2.6421707	20	3 18.1	19.8
153110 2000 SB_{66}	15.8	X	181.34233	243.24828	169.19599	3.03540	0.0696973	0.23120843	2.6290586	20	5 10.7	19.7
153111 2000 SR_{67}	16.5	X	12.10939	131.51487	162.43061	3.29637	0.2546346	0.24566985	2.5248455	20	9 20.8	18.6
153112 2000 SH_{69}	15.0	X	20.38774	273.46182	177.27391	13.16319	0.1811666	0.21127733	2.7919059	20	—	—
153113 2000 SH_{70}	15.6	X	44.23873	93.60350	180.41745	8.73170	0.1854825	0.24617331	2.5214019	20	10 4.3	18.7
153114 2000 SF_{72}	15.6	X	62.39010	236.92934	158.74060	8.16908	0.1364197	0.21118333	2.7927343	20	—	—
153115 2000 SK_{72}	15.9	X	229.10809	173.59832	163.99533	10.08284	0.1457906	0.22850956	2.6497189	20	3 24.9	20.0
153116 2000 SB_{74}	15.5	X	66.98823	326.53098	45.54581	8.73836	0.2342451	0.20933858	2.8091172	20	—	—
153117 2000 SA_{78}	15.9	X	118.03523	226.30908	200.07348	3.50632	0.1289285	0.22386669	2.6862292	20	3 22.7	19.6
153118 2000 SA_{83}	15.9	X	117.68285	50.71623	351.46933	4.72975	0.0781277	0.22171031	2.7036188	20	2 15.7	19.5
153119 2000 SN_{86}	15.8	X	354.75709	127.55771	170.90260	13.13588	0.1931116	0.24113247	2.5564203	20	8 5.2	18.2
153120 2000 SR_{90}	15.4	X	239.02788	46.71943	293.03720	12.68005	0.1025920	0.23240485	2.6200280	20	4 1.2	19.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153121 2000 SM_{95}	15.4	X	2.91768	214.25193	225.28314	8.36417	0.1338298	0.20938487	2.8087032	20	—	—
153122 2000 SA_{97}	12.2	X	345.93321	22.81347	229.53309	14.70074	0.0660608	0.08319340	5.1968894	20	5 15.7	18.7
153123 2000 SW_{98}	15.7	X	188.34711	74.46881	324.39961	4.14758	0.1036191	0.23029569	2.6360007	20	4 28.2	19.8
153124 2000 SR_{102}	16.3	X	325.89670	61.04153	0.27999	13.22975	0.2876609	0.19997698	2.8961166	20	11 21.9	18.8
153125 2000 SG_{111}	15.9	X	272.29425	156.02672	170.22381	4.03815	0.2420002	0.23439571	2.6051713	20	4 12.4	19.7
153126 2000 SQ_{128}	15.3	X	145.52532	153.44754	176.13555	9.50498	0.1975723	0.21463919	2.7626765	20	1 2.2	19.7
153127 2000 SV_{130}	15.3	X	73.59066	243.00150	269.42184	13.91351	0.0765363	0.23206536	2.6225826	20	5 7.5	18.9
153128 2000 SF_{132}	15.1	X	317.58269	44.26578	255.59649	13.97741	0.1393146	0.23726676	2.5841127	20	5 23.9	17.9
153129 2000 SH_{134}	15.6	X	52.57257	136.48252	280.20874	6.98642	0.0673975	0.21370343	2.7707354	20	—	—
153130 2000 SO_{141}	15.8	X	264.22921	330.88040	340.30172	12.54785	0.1909609	0.23020691	2.6366783	20	3 18.4	19.9
153131 2000 SK_{144}	15.4	X	243.78583	326.28312	8.61235	13.51535	0.1225942	0.23005041	2.6378740	20	4 4.5	19.3
153132 2000 SW_{161}	14.9	X	118.57949	250.48630	143.36684	13.58700	0.2050137	0.21957359	2.7211301	20	2 23.0	18.8
153133 2000 SC_{172}	14.8	X	227.22095	35.24827	311.50542	13.50995	0.0784414	0.17745656	3.1362307	20	4 2.2	19.8
153134 2000 SD_{174}	15.4	X	232.49503	46.57309	275.49369	10.59209	0.1976954	0.22788781	2.6545362	20	2 28.9	20.1
153135 2000 ST_{184}	16.0	X	24.07348	80.20613	353.74538	8.10497	0.1251711	0.21157323	2.7893022	20	—	—
153136 2000 SW_{185}	15.9	X	40.48088	177.75701	76.17633	0.28149	0.1451557	0.24182046	2.5515692	20	8 23.7	18.8
153137 2000 SB_{191}	16.3	X	279.19071	208.57881	133.25278	4.02658	0.1632542	0.23721113	2.5845167	20	5 21.9	19.7
153138 2000 SW_{191}	16.4	X	220.07815	224.95135	142.20154	2.04871	0.1201912	0.23160781	2.6260354	20	4 22.7	20.3
153139 2000 SM_{197}	16.4	X	8.89797	253.00192	144.60888	2.36798	0.1250670	0.20573319	2.8418413	20	—	—
153140 2000 SC_{203}	16.2	X	57.46117	37.13329	342.07670	3.45647	0.1567525	0.21013665	2.8020003	20	—	—
153141 2000 SP_{203}	12.6	X	271.38458	308.17341	5.19530	17.20991	0.0711883	0.08104989	5.2881173	20	4 18.9	19.7
153142 2000 SG_{205}	16.1	X	243.96554	140.43349	187.70039	4.91873	0.1833254	0.22977929	2.6399485	20	3 23.1	20.1
153143 2000 ST_{215}	16.5	X	259.62705	181.97452	187.23395	4.04348	0.0538277	0.23669333	2.5882846	20	6 18.2	20.0
153144 2000 SY_{230}	16.0	X	239.64930	303.53245	20.78109	4.35445	0.1320714	0.22730857	2.6590439	20	3 19.5	20.1
153145 2000 SQ_{239}	15.7	X	347.58112	245.17254	14.53652	11.94370	0.1487832	0.23549547	2.5970542	20	5 16.2	18.5
153146 2000 SQ_{243}	15.8	X	72.80385	60.63495	332.08250	4.27232	0.0524211	0.21537384	2.7563905	20	—	—
153147 2000 SW_{243}	16.0	X	103.79538	224.08799	122.17867	5.07069	0.0966897	0.21357203	2.7718718	20	—	—
153148 2000 SH_{248}	16.2	X	216.54280	19.35351	293.36040	2.05269	0.0851995	0.22504966	2.6768075	20	2 12.1	20.1
153149 2000 SE_{250}	16.3	X	224.13819	244.17442	98.56350	3.50288	0.1477236	0.22919718	2.6444166	20	3 26.8	20.4
153150 2000 SK_{254}	16.4	X	93.54982	78.01461	196.74997	10.43357	0.2277801	0.25442992	2.4665538	20	12 1.6	20.6
153151 2000 SV_{266}	15.5	X	52.01584	39.94353	210.96525	11.65753	0.1197583	0.24342628	2.5403355	20	8 28.3	19.0
153152 2000 SE_{276}	15.6	X	320.32539	265.72799	51.43834	8.69090	0.1619055	0.23721875	2.5844613	20	6 20.6	18.3
153153 2000 SP_{288}	15.6	X	221.17994	316.14549	321.50847	13.98310	0.0881578	0.22135341	2.7065241	20	1 8.6	19.8
153154 2000 SF_{290}	15.8	X	153.27419	82.85286	255.15277	3.87861	0.1694773	0.21869384	2.7284229	20	1 16.4	20.0
153155 2000 SO_{298}	12.3	X	345.55995	22.99543	227.89055	12.71742	0.0788118	0.08193761	5.2498536	20	5 12.9	18.7
153156 2000 SM_{301}	15.7	X	118.91706	53.07669	308.36449	4.59373	0.0578045	0.21499690	2.7596113	20	—	—
153157 2000 SJ_{307}	15.8	X	104.45361	40.40601	328.17878	7.60122	0.1059096	0.21388532	2.7691644	20	—	—
153158 2000 SN_{309}	16.0	X	122.50935	4.51623	347.11408	6.02042	0.1269970	0.21704366	2.7422349	20	—	—
153159 2000 SA_{311}	14.6	X	136.66995	112.99501	312.27620	15.67291	0.1222418	0.17389675	3.1788868	20	4 4.9	19.8
153160 2000 SX_{313}	14.3	X	223.52406	57.30348	278.06645	13.30910	0.0457329	0.17509385	3.1643811	20	3 17.8	19.3
153161 2000 SP_{317}	15.7	X	288.52448	347.95594	301.35761	13.87356	0.1223336	0.23215672	2.6218945	20	3 21.8	19.7
153162 2000 SB_{327}	16.1	X	146.68456	357.72592	39.11996	2.62839	0.0558776	0.22328586	2.6908856	20	3 11.6	20.0
153163 2000 SP_{339}	15.8	X	108.63629	236.24695	142.13113	5.94006	0.0700516	0.21638098	2.7478308	20	1 3.9	19.4
153164 2000 TC_{3}	16.2	X	125.27872	225.83106	182.07498	1.42204	0.0782044	0.22402835	2.6849368	20	3 1.5	20.0
153165 2000 TG_{5}	16.2	X	320.84349	285.49306	3.54363	11.99672	0.1709651	0.23687158	2.5869860	20	5 4.5	19.2
153166 2000 TS_{6}	15.9	X	8.08353	235.23017	8.87267	12.02698	0.2104765	0.23714184	2.5850201	20	6 9.6	18.4
153167 2000 TJ_{28}	16.1	X	335.70579	283.65563	356.21200	7.07652	0.2094487	0.23674722	2.5878918	20	5 17.0	18.6
153168 2000 TP_{30}	15.5	X	216.49975	265.91258	40.38066	11.83218	0.0138127	0.22044207	2.7139785	20	2 12.3	19.5
153169 2000 TK_{36}	14.8	X	239.04841	293.70328	25.05226	9.55576	0.0738056	0.17522268	3.1628299	20	3 22.3	19.5
153170 2000 TW_{37}	15.6	X	58.21427	351.37700	50.28102	9.94239	0.1608788	0.21365566	2.7711484	20	—	—
153171 2000 TJ_{42}	16.7	X	334.52271	177.10828	133.95355	8.55848	0.2705056	0.24296145	2.5435746	20	6 30.8	18.4
153172 2000 TY_{59}	15.1	X	54.96935	350.90147	113.96467	14.21374	0.1158218	0.21780707	2.7358234	20	2 16.5	18.4
153173 2000 TJ_{64}	15.0	X	63.34016	175.93808	36.24298	10.68418	0.1138882	0.23617814	2.5920473	20	7 27.6	18.5
153174 2000 TZ_{64}	16.2	X	55.93285	264.51902	204.15461	2.23722	0.1205902	0.21890724	2.7266494	20	2 20.1	19.4
153175 2000 UN_{2}	15.1	X	265.97341	294.36490	9.86875	10.83267	0.0842226	0.17762749	3.1342184	20	3 30.8	19.7
153176 2000 UF_{21}	15.6	X	148.48984	298.62046	28.92608	8.20952	0.1051547	0.21447481	2.7640879	20	—	—
153177 2000 UM_{35}	16.1	X	166.97035	204.09088	195.24079	2.92571	0.1028033	0.22503618	2.6769144	20	4 8.7	20.2
153178 2000 UF_{36}	15.9	X	311.98930	178.75275	189.48970	0.64259	0.2513401	0.19113620	2.9847463	20	8 2.3	18.9
153179 2000 UM_{36}	15.3	X	343.77686	225.14605	38.60457	13.08583	0.1877519	0.23295343	2.6159131	20	5 13.1	17.7
153180 2000 UJ_{37}	15.7	X	115.88832	304.72549	73.88788	3.57842	0.2101963	0.21538174	2.7563231	20	2 2.9	19.6
153181 2000 UZ_{41}	15.7	X	292.60470	259.59381	51.13194	8.12706	0.1180801	0.23080930	2.6320887	20	5 4.5	19.0
153182 2000 UL_{46}	15.2	X	193.39763	298.79753	41.47571	8.01803	0.0483083	0.21936891	2.7228225	20	2 26.1	19.2
153183 2000 UY_{58}	15.5	X	137.72957	349.53914	8.48407	6.88909	0.1319129	0.21678453	2.7444197	20	1 23.8	19.6
153184 2000 UQ_{65}	15.7	X	72.55969	148.54950	254.12541	3.03707	0.1069327	0.21265658	2.7798210	20	—	—
153185 2000 UJ_{73}	15.0	X	57.79134	12.23855	217.81620	11.15340	0.1276632	0.23701577	2.5859367	20	8 7.9	18.6
153186 2000 UX_{76}	16.0	X	127.43398	163.78962	205.33346	4.33111	0.1049143	0.21605550	2.7505898	20	1 19.5	20.0
153187 2000 UD_{82}	15.5	X	202.59638	91.67372	229.46170	7.15506	0.1261319	0.21922953	2.7239764	20	2 6.5	19.9
153188 2000 UO_{83}	15.7	X	176.70879	175.16298	208.31727	13.81957	0.0731646	0.22589501	2.6701252	20	3 26.8	19.7
153189 2000 US_{89}	15.5	X	298.70731	145.16729	192.80829	7.12898	0.2079301	0.23694351	2.5864624	20	6 6.1	18.6
153190 2000 UU_{89}	14.9	X	281.45707	270.36697	192.53679	11.81197	0.1696854	0.19562376	2.9389237	20	11 1.4	18.5
153191 2000 US_{101}	16.0	X	316.49274	348.36994	332.41585	5.26421	0.2469495	0.23787033	2.5797395	20	6 4.2	18.6
153192 2000 VP_{1}	15.5	X	357.87556	237.78619	36.11643	27.71162	0.2252675	0.23754705	2.5820796	20	7 7.8	18.4
153193 2000 VJ_{42}	16.4	X	346.71778	307.38832	18.65975	4.06843	0.2245015	0.24267001	2.5456106	20	9 6.8	18.3
153194 2000 VC_{49}	15.6	X	160.51935	169.65038	193.29168	5.59401	0.0401411	0.21799916	2.7342161	20	2 10.7	19.6
153195 2000 WB_{1}	17.5	X	117.32563	262.90183	21.40412	41.10963	0.6191217	0.66397144	1.3012771	20	—	—
153196 2000 WC_{16}	15.7	X	249.77258	166.99991	279.63518	2.47583	0.0767962	0.18941416	3.0028093	20	9 8.1	19.8
153197 2000 WC_{21}	15.6	X	153.33733	87.38782	121.97978	2.31797	0.2209372	0.18528517	3.0472560	20	10 23.7	20.8
153198 2000 WC_{45}	15.9	X	194.01619	196.25573	187.76240	5.79252	0.0297714	0.22478907	2.6788759	20	4 18.8	19.7
153199 2000 WU_{79}	15.6	X	299.03860	299.30414	47.80290	5.39072	0.2318882	0.23678624	2.5876075	20	6 14.6	18.5
153200 2000 WR_{81}	15.6	X	291.92157	301.91391	34.17353	3.51924	0.1646323	0.23314792	2.6144581	20	5 29.9	19.0

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153201 2000 WO_{107}	19.3	X	206.45025	213.71858	69.25179	7.77031	0.7807037	1.13254766	0.9115176	20	12 2.3	16.5
153202 2000 WJ_{109}	15.5	X	138.83077	326.76800	23.94229	5.78990	0.1362684	0.21294248	2.7773323	20	1 16.5	19.6
153203 2000 WF_{122}	15.8	X	231.14216	348.18271	59.12597	2.03269	0.1778808	0.18062326	3.0994664	20	6 18.3	20.8
153204 2000 WR_{129}	15.9	X	106.11437	341.31365	37.46942	4.91728	0.0813829	0.21242539	2.7818375	20	1 4.3	19.6
153205 2000 WV_{159}	15.8	X	310.24699	343.30623	88.22291	6.30794	0.0990251	0.19654305	2.9297525	20	11 14.3	19.4
153206 2000 WH_{163}	15.4	X	13.13975	11.46121	59.77820	6.57514	0.0589688	0.20582391	2.8410061	20	—	—
153207 2000 XX	15.3	X	247.30793	224.07582	192.85302	17.94049	0.2407971	0.18389464	3.0625980	20	7 7.3	20.5
153208 2000 XP_{3}	15.5	X	265.04318	321.65714	16.35669	12.91162	0.1768543	0.23075944	2.6324677	20	4 24.1	19.4
153209 2000 XL_{9}	14.9	X	199.76128	19.40556	67.71491	18.78188	0.2451635	0.17669489	3.1452371	20	7 4.9	20.5
153210 2000 XQ_{14}	15.3	X	209.54471	24.34412	90.24465	10.10950	0.0900432	0.18381376	3.0634964	20	8 30.6	20.0
153211 2000 XJ_{16}	15.0	X	218.23272	331.96055	321.42881	11.09504	0.1139346	0.21652742	2.7465918	20	1 23.8	19.2
153212 2000 XK_{41}	15.4	X	217.90706	142.65963	342.51400	12.90691	0.2410666	0.18761271	3.0220006	20	9 4.4	20.4
153213 2000 XX_{44}	16.5	X	45.54125	36.76409	356.93871	19.49473	0.0945222	0.35540300	1.9738857	20	—	—
153214 2000 XP_{51}	15.4	X	126.75839	321.78351	26.60386	9.41312	0.1676386	0.21061695	2.7977389	20	1 4.4	19.6
153215 2000 YR_{8}	14.8	X	177.68428	212.57712	282.01070	14.81045	0.0329118	0.18100718	3.0950821	20	8 13.2	19.5
153216 2000 YR_{19}	15.2	X	182.61849	67.00105	47.86638	18.29621	0.2077658	0.17826219	3.1267744	20	7 31.2	20.8
153217 2000 YX_{19}	15.5	X	195.37161	293.79507	154.47334	9.71625	0.2141424	0.17959039	3.1113389	20	7 4.1	20.9
153218 2000 YU_{23}	15.5	X	161.98097	229.07690	283.00945	3.96879	0.1059085	0.18100193	3.0951420	20	8 21.3	20.3
153219 2000 YM_{29}	18.4	X	151.51510	0.81478	116.56292	40.33525	0.4348159	0.32601623	2.0907875	20	7 14.2	22.5
153220 2000 YN_{29}	17.4	X	260.13032	138.16193	67.87561	5.87950	0.6759196	0.24601201	2.5225039	20	12 3.5	20.9
153221 2000 YU_{37}	15.0	X	240.12609	180.08587	270.47532	8.56993	0.0608822	0.18493828	3.0510653	20	8 30.7	19.5
153222 2000 YD_{43}	15.5	X	202.47152	248.99448	154.59623	4.67643	0.2482823	0.17488262	3.1669287	20	5 18.0	21.1
153223 2000 YR_{47}	14.8	X	278.22729	274.71063	117.87113	16.88317	0.3638750	0.18492463	3.0512154	20	6 26.5	19.4
153224 2000 YR_{48}	15.3	X	239.29630	172.50301	273.31132	4.16666	0.1888512	0.18367782	3.0650077	20	8 10.8	20.0
153225 2000 YH_{52}	15.6	X	240.83717	82.62651	358.62011	0.95441	0.2149584	0.18362133	3.0656363	20	8 5.4	20.4
153226 2000 YZ_{57}	15.1	X	189.45448	182.14828	284.41442	6.18187	0.1114912	0.17818052	3.1277299	20	7 24.2	20.0
153227 2000 YL_{58}	15.1	X	198.75713	215.40996	279.46341	9.78189	0.0957211	0.18367684	3.0650186	20	9 3.6	20.0
153228 2000 YJ_{59}	15.2	X	255.21475	296.23412	103.65944	8.39929	0.0368722	0.17848855	3.1241303	20	7 23.5	19.5
153229 2000 YE_{85}	15.5	X	278.01742	289.35468	152.41248	2.47125	0.2344810	0.19072003	2.9890867	20	9 17.3	19.4
153230 2000 YS_{89}	15.3	X	179.67051	283.87921	288.84600	8.28218	0.0535995	0.19275701	2.9679911	20	11 24.6	19.8
153231 2000 YV_{98}	15.0	X	182.51613	222.11695	286.11737	8.05184	0.0749677	0.18279511	3.0748670	20	9 5.0	19.8
153232 2000 YG_{111}	15.3	X	217.91976	155.19184	307.70213	6.92948	0.1361751	0.18237828	3.0795503	20	8 15.7	20.1
153233 2000 YP_{112}	15.4	X	212.94437	125.09930	314.64104	7.57228	0.1502055	0.17799179	3.1299404	20	7 13.6	20.3
153234 2000 YV_{114}	15.3	X	141.34226	199.30602	313.27178	9.47530	0.1582271	0.17696252	3.1420651	20	8 4.8	20.4
153235 2000 YL_{133}	15.4	X	145.12014	287.04212	182.94967	24.01969	0.3745161	0.17286380	3.1915379	20	6 25.6	21.7
153236 2000 YF_{138}	15.7	X	332.20170	341.20961	81.13728	3.82153	0.0758112	0.19678130	2.9273872	20	12 5.2	19.4
153237 2001 AY_{1}	15.2	X	172.13712	184.59223	302.68558	13.44475	0.1874500	0.17857181	3.1231592	20	7 31.9	20.3
153238 2001 AG_{27}	15.1	X	227.67574	108.66474	333.07191	14.04425	0.1964269	0.18087422	3.0965987	20	7 28.7	20.2
153239 2001 AK_{37}	14.8	X	195.72340	109.88966	345.77620	16.01044	0.1938619	0.17645433	3.1480951	20	7 18.5	20.3
153240 2001 AG_{39}	14.9	X	198.83457	324.57894	118.41010	16.70314	0.0417660	0.17456429	3.1707776	20	7 8.7	19.6
153241 2001 AS_{46}	14.8	X	152.53671	60.28575	47.99280	26.59216	0.2180910	0.17223131	3.1993467	20	6 20.2	20.5
153242 2001 AO_{47}	16.1	X	18.27821	60.11024	20.56697	20.37776	0.0952596	0.35490489	1.9757321	20	—	—
153243 2001 AU_{47}	17.4	X	104.61750	9.35915	311.90851	35.97873	0.5306979	0.66572651	1.2989890	20	—	—
153244 2001 AQ_{50}	15.3	X	73.77319	91.46916	104.23810	14.80992	0.1568954	0.17226462	3.1989343	20	7 18.5	19.8
153245 2001 BK	14.9	X	184.77503	28.76866	84.39123	5.90490	0.1063156	0.17599443	3.1535769	20	7 29.3	19.9
153246 2001 BK_{1}	14.9	X	186.00364	105.34875	22.29647	11.12139	0.1267132	0.17990863	3.1076687	20	8 20.7	20.0
153247 2001 BT_{1}	15.3	X	198.41669	160.09229	305.98276	4.02734	0.1231829	0.17640469	3.1486856	20	8 1.4	20.1
153248 2001 BU_{6}	15.0	X	138.87813	185.16145	304.92306	16.93461	0.1606108	0.17289024	3.1912125	20	7 7.9	20.2
153249 2001 BW_{15}	15.2	X	23.23626	297.95719	328.89654	41.24141	0.5909936	0.31985453	2.1175535	20	10 7.3	19.2
153250 2001 BL_{21}	14.7	X	229.21147	297.11116	156.95380	9.68527	0.0421781	0.17807856	3.1289236	20	8 27.8	19.2
153251 2001 BR_{22}	15.3	X	319.58856	107.58107	301.11611	8.57193	0.0753735	0.19026601	2.9938399	20	10 24.1	19.3
153252 2001 BQ_{26}	15.0	X	151.76175	75.13994	126.74762	3.66141	0.2058535	0.18208307	3.0828780	20	10 14.1	20.3
153253 2001 BZ_{45}	15.3	X	207.12403	258.57646	161.81700	16.24109	0.2287900	0.17591820	3.1544879	20	6 11.6	20.9
153254 2001 BF_{47}	15.1	X	264.17644	262.75148	188.29636	9.52038	0.0700901	0.18620023	3.0372642	20	10 4.1	19.2
153255 2001 BQ_{53}	14.5	X	95.89936	79.30260	124.72032	14.65890	0.1017094	0.17451272	3.1714022	20	8 18.1	19.2
153256 2001 BR_{57}	14.9	X	118.06666	340.15473	203.44194	11.07984	0.2013590	0.17476106	3.1683971	20	8 20.4	20.2
153257 2001 BK_{59}	14.6	X	212.39282	188.58765	307.36025	14.07052	0.0638523	0.18360670	3.0657991	20	9 20.2	19.3
153258 2001 BZ_{63}	15.1	X	231.79193	287.09034	201.71709	5.21421	0.1867592	0.18586821	3.0408802	20	9 25.9	19.8
153259 2001 BY_{66}	15.1	X	94.95323	79.80027	128.82357	10.69858	0.1736164	0.17468027	3.1693739	20	8 31.5	20.0
153260 2001 BM_{67}	14.3	X	130.39331	292.77350	298.40796	17.66804	0.1637963	0.18256718	3.0774257	20	10 20.3	19.7
153261 2001 BS_{70}	15.0	X	172.07475	273.78036	251.91748	4.73630	0.2294997	0.18211357	3.0825338	20	9 13.7	20.4
153262 2001 CN_{5}	14.6	X	118.31371	265.36715	331.08458	10.33693	0.1224794	0.18210086	3.0826773	20	10 16.8	19.6
153263 2001 CD_{12}	14.9	X	309.55233	250.00516	121.13062	17.54282	0.1166366	0.18037091	3.1023566	20	8 21.4	18.8
153264 2001 CT_{14}	15.7	X	126.53944	38.81740	110.35472	11.77927	0.2145264	0.17231971	3.1982525	20	7 21.7	20.9
153265 2001 CF_{19}	14.7	X	92.66825	300.26589	306.38526	14.81678	0.1598135	0.17981305	3.1087699	20	10 3.3	19.8
153266 2001 CH_{21}	14.6	X	37.53275	37.49686	258.37532	9.93118	0.0292188	0.18172814	3.0868908	20	9 14.0	19.1
153267 2001 CB_{32}	17.8	X	64.56785	330.49118	75.56576	9.67310	0.6136869	0.41446415	1.7816049	20	—	—
153268 2001 CV_{32}	14.7	X	175.87981	39.04862	101.18433	29.09060	0.2095835	0.17944484	3.1130211	20	8 25.4	20.4
153269 2001 CR_{33}	14.4	X	97.32921	163.43353	56.85172	19.67568	0.1602788	0.17598726	3.1536626	20	9 25.1	19.6
153270 2001 CW_{33}	14.6	X	194.61529	141.44317	19.35762	17.03988	0.1389707	0.18356275	3.0662885	20	10 4.7	19.5
153271 2001 CL_{42}	17.2	X	247.70298	270.83097	12.05642	21.65304	0.4025128	0.50722798	1.5571624	20	1 1.7	20.4
153272 2001 CM_{45}	14.6	X	110.57253	135.58605	84.53646	15.38252	0.2374671	0.17472578	3.1688236	20	10 9.8	20.2
153273 2001 CQ_{46}	15.4	X	181.57770	110.16895	344.39539	20.35357	0.2335508	0.17568607	3.1572660	20	7 4.5	21.2
153274 2001 CU_{49}	14.5	X	63.62724	259.10125	352.67089	14.78171	0.2494932	0.17341729	3.1847434	20	9 25.2	19.2
153275 2001 DA_{10}	15.0	X	47.33363	162.99019	100.71858	10.20417	0.0531257	0.17449233	3.1716493	20	8 27.9	19.4
153276 2001 DC_{32}	14.7	X	125.66729	154.28695	10.18568	8.87220	0.0342830	0.17175134	3.2053045	20	7 27.9	19.5
153277 2001 DY_{40}	15.0	X	146.00069	137.96230	4.87879	5.45618	0.1290333	0.17297533	3.1901659	20	7 28.4	20.1
153278 2001 DH_{49}	14.9	X	145.06752	96.59274	45.39450	7.35060	0.2009603	0.17429288	3.1740684	20	7 30.0	20.3
153279 2001 DY_{50}	15.2	X	159.77036	176.08951	26.79410	10.70378	0.0725236	0.18192310	3.0846849	20	10 21.0	19.8
153280 2001 DB_{52}	14.7	X	155.47936	354.34029	130.70788	29.10216	0.1323530	0.17202280	3.2019316	20	7 15.1	20.0

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153281 2001 DF_{56}	14.6	X	73.47375	263.49681	335.85581	11.54328	0.0808200	0.17509474	3.1643704	20	8 31.2	18.9
153282 2001 DE_{69}	14.8	X	135.65610	355.18399	162.51636	8.92498	0.0488834	0.17239717	3.1972944	20	7 28.3	19.6
153283 2001 DY_{91}	14.9	X	74.25171	240.37875	356.92186	4.86564	0.1137436	0.17240532	3.1971937	20	9 3.9	19.4
153284 Frieman	15.0	X	168.38530	125.95520	66.29798	6.76669	0.1027741	0.18593374	3.0401657	20	10 19.5	19.7
153285 2001 DD_{111}	15.0	X	132.55414	173.01424	55.39909	10.19036	0.1638803	0.18097311	3.0954705	20	10 28.5	20.0
153286 2001 EL_{7}	14.8	X	145.27618	52.55047	105.63738	5.46498	0.1133210	0.17303880	3.1893858	20	8 14.3	19.8
153287 2001 EY_{24}	14.6	X	137.01704	91.74054	90.83498	16.23211	0.1224690	0.17490516	3.1666566	20	9 11.5	19.9
153288 2001 FG_{4}	16.4	X	48.97335	331.64501	343.30087	7.11635	0.1558228	0.28589048	2.2821083	20	12 5.3	19.6
153289 Rebeccawatson	14.2	X	180.47568	337.70156	2.11098	9.65313	0.0848460	0.15026720	3.5039664	20	2 19.2	19.6
153290 2001 FH_{11}	14.6	X	52.31651	108.35864	179.88563	15.58339	0.1112266	0.17482706	3.1675996	20	10 10.9	18.9
153291 2001 FW_{19}	17.7	X	21.88308	16.46720	225.11079	1.89453	0.1210785	0.31785900	2.1264069	20	7 4.8	19.2
153292 2001 FE_{27}	14.6	X	88.38547	61.03079	198.03114	16.21833	0.0423213	0.17699563	3.1416732	20	10 7.7	19.2
153293 2001 FV_{62}	14.2	X	92.14488	281.47070	11.49796	21.98719	0.2214698	0.18026691	3.1035497	20	12 3.7	19.7
153294 2001 FJ_{95}	14.4	X	71.03629	214.66879	22.28222	22.47962	0.0526178	0.17122157	3.2119126	20	9 2.0	19.3
153295 2001 FB_{107}	15.1	X	86.26226	196.96060	33.47509	4.71861	0.1044054	0.17343046	3.1845822	20	9 9.6	19.7
153296 2001 FF_{108}	15.0	X	207.49532	70.27677	9.75393	4.99216	0.1614997	0.17107666	3.2137262	20	7 7.7	20.3
153297 2001 FN_{109}	15.0	X	142.75581	322.50801	190.60809	11.08393	0.0481209	0.16993292	3.2281301	20	7 29.2	20.0
153298 Paulmyers	15.1	X	74.76682	71.10712	194.80584	5.13648	0.1452589	0.17400614	3.1775544	20	10 13.4	19.7
153299 2001 FB_{154}	15.2	X	144.02135	332.84233	175.95225	21.11955	0.1836468	0.17277020	3.1926905	20	7 31.9	20.7
153300 2001 FD_{159}	15.2	X	130.09499	44.75157	124.79664	2.13047	0.1393335	0.17065878	3.2189703	20	8 13.6	20.2
153301 Alissamearle	15.3	X	266.01554	251.92519	185.64963	5.41816	0.1173286	0.17905389	3.1175508	20	9 10.5	19.5
153302 2001 FS_{186}	14.6	X	121.69396	98.19368	52.04673	7.49578	0.0365125	0.16785681	3.2546934	20	7 2.6	19.3
153303 2001 HC_{14}	16.1	X	178.03452	136.34240	186.90891	4.97093	0.2237321	0.29513672	2.2341923	20	1 15.3	19.7
153304 2001 HG_{61}	16.7	X	243.17874	76.24110	230.98151	3.90961	0.1858229	0.30200315	2.2001978	20	2 17.9	20.2
153305 2001 HV_{62}	16.8	X	325.85308	244.80465	75.79186	2.03878	0.2507318	0.31440398	2.1419567	20	7 2.3	17.3
153306 2001 JL_{1}	16.7	X	270.56139	272.43740	226.64862	26.98148	0.5231906	0.24169873	2.5524258	20	10 10.6	20.3
153307 2001 KF_{10}	17.0	X	4.48163	152.49791	111.09170	3.62547	0.1319168	0.31388794	2.1443037	20	7 6.2	18.4
153308 2001 KE_{17}	16.9	X	358.35055	112.02579	143.52737	3.84975	0.1409836	0.31194455	2.1532004	20	6 7.4	18.3
153309 2001 KB_{68}	15.2	X	172.48815	125.92058	104.08955	24.32443	0.2815350	0.28001457	2.3139233	20	12 13.1	19.3
153310 2001 LZ	16.4	X	333.87012	161.46365	160.85318	2.73521	0.1820642	0.31468978	2.1406597	20	8 7.7	17.5
153311 2001 MG_{1}	17.2	X	265.49244	218.44926	142.37515	28.42605	0.6461073	0.24937823	2.4997526	20	4 20.8	22.8
153312 2001 MK_{14}	16.4	X	186.72314	349.25884	306.17434	5.34491	0.1470480	0.28632841	2.2797808	20	—	—
153313 2001 MF_{22}	16.8	X	349.58166	253.44418	38.84166	4.10444	0.2129281	0.30955723	2.1642566	20	7 28.1	17.7
153314 2001 MR_{23}	16.0	X	264.09341	353.36315	318.08373	7.19802	0.1895768	0.29913740	2.2142275	20	3 13.7	19.2
153315 2001 NH_{6}	19.2	X	182.79833	288.40057	112.54759	34.70135	0.4496395	0.71612062	1.2373102	20	5 9.7	22.0
153316 2001 NL_{8}	16.2	X	46.78452	88.24878	298.59830	7.85871	0.1168445	0.27878775	2.3207067	20	—	—
153317 2001 NM_{21}	15.5	X	42.16039	43.29061	339.55788	9.09532	0.0970405	0.27411163	2.3470252	20	—	—
153318 2001 OJ_{6}	16.1	X	285.87860	16.58172	256.02813	7.18414	0.1874478	0.29814788	2.2191240	20	2 14.7	19.3
153319 2001 OT_{9}	16.4	X	1.56974	321.81884	261.63161	4.09759	0.1207201	0.30458516	2.1877460	20	4 16.9	18.2
153320 2001 OR_{13}	15.4	X	327.61078	28.20132	0.08190	9.19456	0.2818227	0.26121414	2.4236595	20	11 4.1	16.7
153321 2001 OW_{16}	16.7	X	122.29334	162.27484	183.31993	3.44173	0.2132577	0.28279928	2.2987082	20	—	—
153322 2001 OA_{22}	15.5	X	113.45826	0.45792	334.25216	8.45712	0.1934042	0.27797133	2.3252485	20	—	—
153323 2001 ON_{25}	16.6	X	353.15600	213.05897	152.39638	4.87693	0.1642285	0.26691948	2.3889984	20	11 22.9	18.9
153324 2001 OB_{28}	16.8	X	301.42292	245.51298	353.29399	6.71704	0.1364755	0.29729603	2.2233609	20	1 31.4	19.7
153325 2001 OV_{34}	16.4	X	96.39443	343.73026	10.68785	6.98646	0.1605975	0.28010896	2.3134035	20	—	—
153326 2001 OG_{35}	16.6	X	133.12455	2.36717	33.58009	6.56025	0.0913508	0.29324465	2.2437923	20	2 21.6	19.4
153327 2001 OM_{36}	17.0	X	251.14688	84.41740	166.68631	4.76261	0.1079683	0.28985567	2.2612480	20	—	—
153328 2001 OP_{40}	16.7	X	158.73491	323.11924	2.77792	5.96167	0.2323913	0.28460964	2.2889500	20	1 5.2	20.2
153329 2001 OM_{41}	16.0	X	285.44414	34.95326	345.99235	11.22480	0.2631157	0.25654667	2.4529675	20	7 10.6	19.0
153330 2001 OL_{42}	16.4	X	147.92491	96.69577	190.99663	7.40151	0.1173157	0.27626736	2.3347999	20	—	—
153331 2001 OO_{46}	16.6	X	181.03498	189.10750	142.06422	7.62446	0.1668156	0.29021475	2.2593823	20	1 25.3	19.9
153332 2001 OJ_{47}	16.2	X	163.43505	18.91086	316.55918	6.21462	0.1538669	0.28738251	2.2742026	20	1 13.9	19.3
153333 Jeanhugues	16.3	X	40.82775	238.74840	136.17208	2.91182	0.2112895	0.27329699	2.3516868	20	—	—
153334 2001 OO_{52}	16.6	X	104.02319	18.58196	14.21730	6.72047	0.1342535	0.28578058	2.2826933	20	1 14.6	19.2
153335 2001 OL_{60}	17.0	X	355.78851	213.57942	131.69834	3.94693	0.2099138	0.26522714	2.3991500	20	11 4.5	19.1
153336 2001 OF_{61}	16.9	X	82.20386	258.26708	50.16996	0.09309	0.2054914	0.27314139	2.3525798	20	—	—
153337 2001 OP_{63}	16.6	X	256.06825	184.64817	105.10676	5.59607	0.1931822	0.29709235	2.2243771	20	2 10.8	20.1
153338 2001 OY_{70}	16.0	X	208.22127	293.71845	23.14806	4.17141	0.1671424	0.28909239	2.2652264	20	2 3.6	19.5
153339 2001 OA_{87}	16.8	X	33.14744	263.05204	84.74739	3.25150	0.2431050	0.26802876	2.3824024	20	—	—
153340 2001 OQ_{89}	16.0	X	38.14810	22.78863	330.22961	5.13120	0.2681780	0.27036721	2.3686453	20	—	—
153341 2001 OA_{90}	16.7	X	130.41856	355.93748	342.52113	2.56739	0.1944490	0.28282665	2.2985599	20	—	—
153342 2001 OP_{93}	17.0	X	118.64890	303.93451	353.27663	1.97232	0.1149750	0.27802313	2.3249597	20	—	—
153343 2001 OE_{104}	15.8	X	144.58297	274.06953	129.06039	30.98549	0.3376398	0.23724280	2.5842867	20	4 17.2	21.1
153344 2001 OR_{106}	16.0	X	201.53715	349.75291	302.71941	8.08758	0.2758555	0.28756461	2.2732425	20	1 1.2	20.1
153345 2001 PW_{1}	16.2	X	82.04589	20.92283	346.91157	7.57951	0.1226096	0.28004532	2.3137539	20	—	—
153346 2001 PD_{2}	16.6	X	276.53138	292.62670	0.88195	4.37470	0.1825146	0.30011528	2.2094151	20	3 7.4	19.6
153347 2001 PT_{2}	16.3	X	326.99002	279.08406	132.76257	2.98379	0.1792120	0.26713752	2.3876984	20	12 11.2	18.1
153348 2001 PA_{8}	16.9	X	215.96538	293.12750	7.39403	8.46343	0.2220498	0.29136917	2.2534105	20	1 22.2	20.7
153349 2001 PJ_{9}	18.5	X	324.24287	291.17665	283.83710	10.53786	0.6389529	0.40835080	1.7993422	20	—	—
153350 2001 PJ_{13}	15.4	X	129.09843	25.15170	290.79664	13.75154	0.1230674	0.22871231	2.6481527	20	—	—
153351 2001 PV_{20}	16.8	X	123.97519	165.62393	127.06125	5.56221	0.1660339	0.27706351	2.3303250	20	—	—
153352 2001 PP_{21}	16.2	X	271.85191	6.23682	25.29898	2.55557	0.2140549	0.25574865	2.4580676	20	7 12.0	19.2
153353 2001 PW_{22}	16.2	X	336.35504	299.49718	72.62489	4.25204	0.2289114	0.26341461	2.4101430	20	11 3.6	17.8
153354 2001 PF_{23}	16.2	X	24.55408	33.31237	310.27752	5.94117	0.1890096	0.26773039	2.3841721	20	12 14.5	19.2
153355 2001 PQ_{23}	16.9	X	341.96966	220.11939	121.63475	2.01995	0.2073743	0.26117905	2.4238765	20	9 24.6	18.5
153356 2001 PE_{25}	16.4	X	199.86839	122.93411	185.90670	6.19483	0.1316596	0.28841162	2.2687896	20	1 13.4	19.8
153357 2001 PN_{26}	14.3	X	152.22811	279.29446	44.81336	3.57195	0.2477980	0.12545261	3.9519938	20	1 17.1	20.7
153358 2001 PB_{53}	15.7	X	274.37159	313.96736	316.84464	13.90760	0.0303559	0.24303864	2.5430360	20	2 25.5	19.2
153359 2001 PE_{53}	16.5	X	55.38230	240.76547	161.86410	4.45345	0.0921939	0.28083022	2.3094408	20	—	—
153360 2001 PK_{55}	16.8	X	328.26444	47.59402	325.90601	5.99372	0.1390256	0.26353306	2.4094208	20	10 7.8	19.2

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153361 2001 PA_{58}	16.6	X	246.96308	20.19374	218.71999	4.74181	0.1666270	0.28654161	2.2786498	20	—	—
153362 2001 PA_{61}	17.0	X	122.31259	290.71998	0.26441	2.76193	0.1387957	0.27697897	2.3307992	20	—	—
153363 2001 PC_{61}	16.5	X	350.10898	61.58466	333.58228	7.01015	0.1049920	0.27030126	2.3690306	20	12 21.9	19.1
153364 2001 QL	15.5	X	36.40890	36.42186	356.60589	4.76390	0.2347969	0.27346636	2.3507157	20	—	—
153365 2001 QQ	16.8	X	318.74079	187.73824	164.27425	4.89922	0.1678015	0.25890395	2.4380555	20	8 12.9	18.9
153366 2001 QB_{1}	16.7	X	33.13457	184.09092	162.34261	3.63268	0.2407940	0.26886006	2.3774890	20	—	—
153367 2001 QJ_{3}	15.7	X	95.02910	120.69421	325.55143	14.21422	0.0401599	0.24143028	2.5543176	20	3 2.1	19.0
153368 2001 QP_{5}	16.0	X	344.36897	61.70301	331.10660	5.46042	0.1165119	0.26821518	2.3812984	20	12 8.9	18.5
153369 2001 QQ_{6}	16.3	X	45.17805	187.47787	168.88195	4.83130	0.0610455	0.27277736	2.3546724	20	—	—
153370 2001 QU_{7}	16.4	X	143.82897	33.47723	318.59532	5.48673	0.1885504	0.28566101	2.2833303	20	1 18.3	19.5
153371 2001 QM_{9}	17.0	X	272.96103	114.20699	163.31754	5.60023	0.2101172	0.29707944	2.2244415	20	2 7.9	20.4
153372 2001 QG_{13}	15.4	X	76.70420	322.19995	338.38645	8.80586	0.2007117	0.21746973	2.7386520	20	12 7.7	19.8
153373 2001 QR_{14}	16.3	X	340.89539	342.74076	37.08037	3.21508	0.2096594	0.26489693	2.4011434	20	11 23.7	18.2
153374 2001 QF_{15}	16.7	X	251.20632	271.28063	37.83476	3.62787	0.1758021	0.29721393	2.2237704	20	3 3.5	19.9
153375 2001 QH_{20}	16.4	X	133.71498	11.53321	312.23312	4.11381	0.1712424	0.27995804	2.3142348	20	—	—
153376 2001 QU_{21}	15.8	X	325.31535	351.73777	357.77619	5.39103	0.2556124	0.25780823	2.4449587	20	8 19.4	17.1
153377 2001 QY_{22}	16.3	X	179.86406	191.09612	174.83157	2.88190	0.2042889	0.28965438	2.2622954	20	3 9.9	20.0
153378 2001 QA_{23}	16.1	X	290.05692	195.70286	164.58771	4.71284	0.2891990	0.25266477	2.4780283	20	6 10.7	19.1
153379 2001 QB_{23}	16.2	X	262.51868	269.92044	19.12938	4.45660	0.1980935	0.29605579	2.2295661	20	2 16.2	19.5
153380 2001 QJ_{24}	16.7	X	20.69080	0.35909	339.68426	5.28317	0.2112195	0.26547102	2.3976805	20	12 6.8	19.7
153381 2001 QU_{24}	15.6	X	235.01241	318.24172	96.26420	4.15617	0.2162302	0.25079204	2.4903490	20	6 29.3	19.5
153382 2001 QO_{27}	16.3	X	58.50605	250.23180	114.36952	2.73356	0.2430901	0.27151159	2.3619850	20	—	—
153383 2001 QS_{29}	15.7	X	46.13907	349.25773	19.38972	6.53704	0.2603090	0.26910730	2.3760326	20	—	—
153384 2001 QW_{37}	16.6	X	191.60702	180.04140	127.52635	5.89842	0.1915491	0.28905546	2.2654193	20	1 7.5	20.1
153385 2001 QT_{41}	16.4	X	236.90406	271.21246	332.36350	5.99132	0.0782139	0.28732116	2.2745263	20	—	—
153386 2001 QT_{50}	13.9	X	129.69973	331.83679	346.62015	10.93517	0.2146923	0.12387144	3.9855529	20	—	—
153387 2001 QR_{52}	16.7	X	301.68873	151.94075	115.31695	5.49134	0.1443558	0.29991469	2.2104001	20	3 9.9	19.3
153388 2001 QA_{56}	16.9	X	293.94988	212.68291	93.17353	4.27778	0.1600135	0.30333626	2.1937468	20	4 20.6	19.5
153389 2001 QK_{56}	17.2	X	127.45745	177.95456	115.09527	3.36276	0.2130280	0.27776830	2.3263815	20	—	—
153390 2001 QA_{64}	16.4	X	111.61996	176.37488	150.30600	6.40702	0.1437401	0.27664323	2.3326846	20	—	—
153391 2001 QQ_{74}	14.9	X	116.28407	72.45930	9.87941	13.02163	0.1531103	0.23396133	2.6083948	20	4 11.1	18.6
153392 2001 QV_{76}	15.1	X	350.62819	0.45918	19.09334	6.27127	0.1350503	0.26044408	2.4284345	20	11 29.9	17.6
153393 2001 QX_{88}	14.9	X	123.56605	44.30040	246.40065	22.92113	0.2180344	0.27199949	2.3591596	20	—	—
153394 2001 QQ_{100}	16.5	X	347.88603	192.44561	167.26321	4.37023	0.1896829	0.26126127	2.4233680	20	11 5.6	18.6
153395 2001 QF_{102}	17.0	X	19.84037	6.96865	321.81797	12.50042	0.2095326	0.26707438	2.3880746	20	11 16.9	20.1
153396 2001 QY_{104}	15.3	X	354.10343	347.59435	16.32349	6.52389	0.1695747	0.26012423	2.4304247	20	11 17.7	17.6
153397 2001 QK_{106}	15.4	X	188.98700	268.29517	150.90443	5.61356	0.2542549	0.24063340	2.5599537	20	5 26.1	20.0
153398 2001 QQ_{108}	16.3	X	171.03784	31.16975	259.34027	6.06745	0.1234823	0.28108316	2.3080550	20	—	—
153399 2001 QC_{109}	15.8	X	176.27816	233.22982	131.49592	15.78115	0.1676962	0.23785746	2.5798326	20	3 11.5	20.1
153400 2001 QB_{116}	16.1	X	195.06427	310.59528	321.40636	9.55528	0.1190971	0.28188896	2.3036545	20	—	—
153401 2001 QG_{119}	16.3	X	189.70335	343.56808	299.33980	6.11870	0.1073165	0.28261863	2.2996877	20	—	—
153402 2001 QH_{120}	16.0	X	133.01020	317.18691	3.64996	12.53718	0.2497747	0.27926227	2.3180771	20	—	—
153403 2001 QC_{121}	16.2	X	33.18829	270.89652	123.17409	7.43693	0.1123630	0.27615906	2.3354103	20	—	—
153404 2001 QH_{122}	16.6	X	58.28003	12.06005	356.09511	7.18061	0.1229057	0.27570249	2.3379879	20	—	—
153405 2001 QL_{123}	16.4	X	308.65055	340.41768	56.98393	4.16504	0.1260490	0.26293402	2.4130789	20	10 10.4	18.6
153406 2001 QT_{125}	16.8	X	215.16057	346.84731	31.97772	3.33964	0.2531887	0.24543868	2.5264306	20	4 25.2	21.1
153407 2001 QT_{131}	16.1	X	224.92942	140.37212	140.25269	6.66405	0.1481842	0.28731081	2.2745810	20	1 3.3	19.5
153408 2001 QV_{137}	15.7	X	150.66825	357.94546	317.15791	6.50112	0.1721354	0.27855259	2.3220126	20	—	—
153409 2001 QG_{139}	15.1	X	129.92040	80.54897	211.33438	21.60642	0.2853244	0.27403498	2.3474628	20	—	—
153410 2001 QZ_{141}	16.2	X	311.61255	327.13577	40.33694	3.42965	0.2130828	0.25613966	2.4555654	20	8 18.8	18.3
153411 2001 QX_{142}	15.6	X	331.33617	175.03123	158.60375	12.82834	0.2808855	0.25638492	2.4539991	20	8 1.5	17.0
153412 2001 QR_{145}	16.9	X	322.62869	224.82902	161.41119	1.78842	0.1830102	0.26367619	2.4085487	20	10 20.1	18.5
153413 2001 QN_{147}	15.9	X	68.53058	306.80718	111.14927	13.34967	0.2834651	0.22370739	2.6875043	20	1 27.6	18.4
153414 2001 QB_{151}	15.5	X	166.15251	326.66321	291.24396	23.64945	0.0756486	0.27450381	2.3447892	20	—	—
153415 2001 QP_{153}	17.1	X	217.15162	244.27967	317.68124	50.20876	0.2138573	1.17108613	0.8914086	20	—	—
153416 2001 QO_{160}	16.1	X	235.00722	221.41506	335.54747	6.78249	0.0836034	0.27778597	2.3262828	20	—	—
153417 2001 QU_{162}	17.0	X	120.54124	87.40501	229.78239	2.22930	0.1559150	0.27864215	2.3215151	20	—	—
153418 2001 QE_{174}	16.2	X	297.19660	48.02590	341.14810	6.19459	0.1396203	0.25623894	2.4549310	20	9 1.0	18.5
153419 2001 QU_{175}	16.6	X	334.42412	170.80043	238.70350	0.65380	0.1697930	0.26802946	2.3823982	20	12 22.3	18.6
153420 2001 QJ_{178}	15.9	X	55.74929	185.25580	177.97047	7.69305	0.2454198	0.27061138	2.3672203	20	—	—
153421 2001 QX_{178}	16.1	X	209.63623	306.24280	32.69613	9.15628	0.2386863	0.29116325	2.2544728	20	3 5.5	20.0
153422 2001 QT_{179}	16.4	X	129.82056	163.40381	150.63891	7.11141	0.1362501	0.27798566	2.3251686	20	—	—
153423 2001 QN_{203}	16.2	X	300.88289	325.88475	82.28380	3.78757	0.1654592	0.26413845	2.4057378	20	10 8.5	18.2
153424 2001 QC_{204}	16.8	X	7.74531	191.90599	206.93491	6.99185	0.1043144	0.27181061	2.3602524	20	—	—
153425 2001 QD_{205}	16.5	X	349.04660	135.11761	235.26727	4.74781	0.0217651	0.26577079	2.3958772	20	11 4.6	19.4
153426 2001 QO_{208}	16.6	X	88.60160	227.66586	62.49871	3.28227	0.1165512	0.27060355	2.3672660	20	12 10.4	19.9
153427 2001 QV_{212}	16.9	X	41.73612	349.84828	321.39253	2.76268	0.1305789	0.26511849	2.3998055	20	11 13.5	20.0
153428 2001 QY_{212}	16.5	X	39.90337	83.15824	323.74769	3.06370	0.2176172	0.22205093	2.7008533	20	—	—
153429 2001 QB_{216}	16.8	X	305.31807	200.06925	143.51867	3.01361	0.1912996	0.25448852	2.4661752	20	6 28.9	19.4
153430 2001 QL_{216}	16.9	X	287.51992	187.07699	79.34813	1.76145	0.2137315	0.29664686	2.2266034	20	2 9.4	20.1
153431 2001 QP_{217}	16.5	X	177.64396	58.33494	353.92881	7.34682	0.2930810	0.24211615	2.5494913	20	5 5.7	21.2
153432 2001 QK_{218}	16.6	X	288.94997	168.20214	166.57823	5.18612	0.1345595	0.25185621	2.4833291	20	5 30.3	19.8
153433 2001 QR_{218}	16.6	X	198.97835	239.37118	162.06811	6.32905	0.2270364	0.24519200	2.5281249	20	5 12.9	20.9
153434 2001 QK_{222}	16.2	X	299.54035	13.82555	226.28680	5.34097	0.1772177	0.29607174	2.2294860	20	1 21.7	19.3
153435 2001 QN_{224}	16.6	X	253.26396	102.36861	144.48244	7.73299	0.1043062	0.29087877	2.2559426	20	—	—
153436 2001 QH_{227}	15.8	X	60.66283	87.06854	273.56902	8.09442	0.0908145	0.22075754	2.7113922	20	—	—
153437 2001 QD_{230}	16.9	X	157.88580	32.90269	349.19851	4.20988	0.2677064	0.23608331	2.5927413	20	3 17.9	21.4
153438 2001 QT_{230}	16.4	X	207.35858	326.51895	250.52971	6.08938	0.0633936	0.27620077	2.3351751	20	—	—
153439 2001 QR_{234}	16.5	X	351.24338	13.04012	353.70455	2.32054	0.1985959	0.26333394	2.4106352	20	11 22.9	18.6
153440 2001 QB_{244}	15.5	X	277.01587	142.65301	355.39411	6.56030	0.0574705	0.27044518	2.3681900	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153441 2001 QW_{245}	16.0	X	317.49414	164.25706	181.48515	8.60131	0.2377670	0.25541229	2.4602252	20	7 19.1	18.3
153442 2001 QV_{252}	16.7	X	135.77802	159.85535	140.78847	9.97668	0.1032543	0.27835878	2.3230904	20	—	—
153443 2001 QW_{256}	16.4	X	167.21275	163.07845	148.83168	7.25802	0.1382288	0.28221608	2.3018740	20	—	—
153444 2001 QU_{259}	16.8	X	192.90067	287.90747	25.28224	5.40243	0.2482036	0.28752216	2.2734662	20	1 19.4	20.7
153445 2001 QR_{262}	15.9	X	58.88136	236.49661	175.31568	5.12106	0.1887890	0.22296780	2.6934440	20	—	—
153446 2001 QS_{267}	17.5	X	166.76866	67.86330	210.52664	2.84762	0.2251826	0.28157502	2.3053665	20	—	—
153447 2001 QN_{272}	16.4	X	264.12620	178.52022	88.92577	6.27167	0.1723009	0.29452585	2.2372805	20	1 22.7	19.6
153448 2001 QE_{273}	16.4	X	123.08493	358.94692	6.80982	7.21744	0.1319377	0.28438031	2.2901805	20	1 3.8	19.2
153449 2001 QR_{278}	16.5	X	176.45718	194.50254	98.94856	7.01793	0.1397062	0.28375641	2.2935362	20	—	—
153450 2001 QN_{279}	16.3	X	110.62715	216.38518	65.85921	7.19242	0.0985371	0.27174208	2.3606492	20	12 22.6	19.7
153451 2001 QK_{283}	15.5	X	189.48847	100.99172	283.92104	13.29609	0.2073474	0.24216340	2.5491597	20	4 6.8	20.1
153452 2001 QQ_{286}	16.0	X	165.98849	248.76046	183.63401	26.45523	0.3569785	0.24253395	2.5465626	20	5 27.4	21.3
153453 2001 QR_{287}	16.9	X	100.78615	92.60276	240.02819	2.82234	0.1075984	0.27553427	2.3389394	20	—	—
153454 2001 QC_{290}	15.8	X	293.78998	109.46239	312.34565	6.66366	0.1026386	0.26440856	2.4040991	20	10 16.1	18.5
153455 2001 QT_{296}	15.8	X	335.02789	342.46231	40.87810	2.04587	0.1958850	0.26018503	2.4300461	20	11 12.6	17.6
153456 2001 QC_{304}	16.9	X	189.75895	267.79692	143.37482	2.42285	0.2410026	0.24460143	2.5321925	20	5 16.4	21.3
153457 2001 QX_{310}	16.9	X	16.18757	13.99263	10.67804	5.16107	0.1297348	0.26983882	2.3717365	20	—	—
153458 2001 QD_{328}	16.7	X	329.58699	1.32339	35.53175	3.14070	0.1713118	0.26527473	2.3988631	20	11 21.2	18.6
153459 2001 QD_{329}	16.6	X	147.34171	246.00540	156.48227	23.67408	0.2374861	0.23756122	2.5819769	20	4 5.7	21.1
153460 2001 RN	19.6	X	89.37907	30.37713	211.48287	10.09199	0.5811031	0.58639562	1.4136511	20	11 29.9	22.2
153461 2001 RF_{1}	16.7	X	192.13377	141.62573	264.51346	0.63668	0.2348723	0.24440376	2.5335577	20	5 11.2	20.9
153462 2001 RE_{2}	15.8	X	241.03547	246.65245	331.52019	22.86487	0.1963035	0.28328590	2.2960750	20	—	—
153463 2001 RX_{4}	16.4	X	307.56185	15.42483	325.67577	12.14431	0.1494857	0.25454002	2.4658425	20	7 8.9	19.2
153464 2001 RW_{6}	12.4	X	243.47824	299.37988	21.84542	9.02029	0.0847132	0.08191664	5.2507496	20	4 2.4	19.5
153465 2001 RF_{7}	15.8	X	65.29462	307.73837	23.04210	7.18408	0.1359341	0.26849276	2.3796568	20	—	—
153466 2001 RC_{11}	16.4	X	15.31737	348.58766	334.81099	0.98358	0.1846441	0.26138926	2.4225768	20	10 31.4	18.9
153467 2001 RU_{13}	16.1	X	257.10995	168.90256	341.56399	5.03565	0.1541255	0.27078001	2.3662374	20	12 19.1	18.5
153468 2001 RO_{16}	16.5	X	18.39607	104.17578	222.93133	1.47541	0.2316215	0.26342284	2.4100928	20	11 19.5	19.0
153469 2001 RW_{22}	16.8	X	207.99097	91.05153	180.72253	5.13415	0.1144007	0.28477267	2.2880764	20	—	—
153470 2001 RB_{26}	17.1	X	42.21332	183.65521	152.34352	4.27337	0.2636134	0.26871475	2.3783460	20	—	—
153471 2001 RU_{29}	17.3	X	144.54550	338.47477	344.03780	2.08629	0.1352537	0.28160932	2.3051793	20	—	—
153472 2001 RX_{31}	16.3	X	5.08765	338.65134	278.09426	4.02917	0.1322763	0.30781556	2.1724127	20	6 24.8	17.7
153473 2001 RX_{38}	16.7	X	252.59586	292.08163	284.65074	1.67271	0.0325762	0.28225991	2.3016357	20	—	—
153474 2001 RK_{43}	16.2	X	323.42506	233.81220	49.67687	9.39962	0.3743780	0.30496091	2.1859486	20	3 27.8	18.3
153475 2001 RR_{45}	16.9	X	210.89980	145.58876	151.76505	2.04679	0.1850904	0.28717573	2.2752942	20	1 11.6	20.6
153476 2001 RT_{58}	16.7	X	96.59230	182.92538	117.44411	4.11646	0.1395065	0.27133339	2.3630190	20	—	—
153477 2001 RC_{66}	16.0	X	226.67672	178.79452	269.03485	5.02564	0.0838110	0.25437395	2.4669156	20	8 17.1	19.5
153478 2001 RE_{66}	16.1	X	159.56028	79.51979	223.77247	5.86989	0.1254254	0.27960323	2.3161922	20	—	—
153479 2001 RQ_{66}	15.9	X	237.35367	235.14070	232.41089	6.01213	0.0796981	0.25900832	2.4374006	20	9 28.2	19.0
153480 2001 RT_{66}	15.8	X	322.61566	131.90395	244.88062	6.71283	0.1772248	0.25896719	2.4376586	20	9 28.5	17.8
153481 2001 RY_{68}	16.3	X	221.41186	45.22889	337.30022	7.87898	0.2295355	0.24456041	2.5324757	20	5 2.8	20.6
153482 2001 RK_{69}	16.3	X	185.83404	112.85909	273.88435	3.21064	0.1758746	0.23992037	2.5650232	20	4 10.8	20.6
153483 2001 RK_{76}	15.6	X	355.10241	224.77666	156.87778	5.77723	0.2170779	0.26200466	2.4187819	20	12 25.3	18.1
153484 2001 RQ_{80}	15.8	X	3.55476	173.12777	205.59698	4.31597	0.0829387	0.21372820	2.7705213	20	11 30.9	19.2
153485 2001 RZ_{81}	15.8	X	111.84472	311.22787	150.93943	4.41622	0.2226962	0.23578892	2.5948990	20	5 13.5	19.7
153486 2001 RB_{82}	15.8	X	270.68933	18.38032	16.31131	12.47108	0.2030110	0.19977897	2.8980300	20	7 15.9	20.1
153487 2001 RF_{86}	16.6	X	114.65021	176.11758	160.54454	1.92661	0.1971696	0.27787126	2.3258068	20	—	—
153488 2001 RL_{87}	16.2	X	168.14067	237.80810	191.09286	5.21690	0.2050983	0.24196132	2.5505789	20	5 20.8	20.6
153489 2001 RT_{87}	16.5	X	288.95905	164.69684	179.71230	4.60171	0.1424475	0.25096687	2.4891923	20	6 11.2	19.5
153490 2001 RF_{89}	15.5	X	28.20826	4.48727	21.02507	7.21249	0.1157190	0.27042935	2.3682824	20	—	—
153491 2001 RK_{90}	16.3	X	29.97985	19.51338	38.05305	7.88256	0.0993745	0.27476258	2.3433168	20	—	—
153492 2001 RJ_{93}	15.9	X	354.56390	0.05466	31.67544	7.15919	0.1050303	0.26584098	2.3954554	20	12 22.3	18.6
153493 2001 RX_{101}	16.2	X	300.15361	57.12359	22.81783	6.55931	0.1302730	0.26625521	2.3929703	20	11 24.6	18.5
153494 2001 RF_{107}	16.9	X	348.79132	16.31888	21.73362	7.08082	0.1462623	0.26643583	2.3918887	20	12 28.5	19.4
153495 2001 RQ_{113}	16.4	X	141.90081	256.91943	153.71837	7.28837	0.1613988	0.23818407	2.5774737	20	4 2.7	20.3
153496 2001 RY_{113}	16.3	X	124.36149	315.11361	5.77867	6.34039	0.0394293	0.27768836	2.3268279	20	—	—
153497 2001 RV_{118}	16.0	X	36.10168	55.60425	0.89423	14.75961	0.2518186	0.22209913	2.7004625	20	—	—
153498 2001 RL_{119}	15.7	X	79.66030	291.34183	162.32690	25.59543	0.2186116	0.23368114	2.6104795	20	3 24.7	19.0
153499 2001 RL_{122}	16.7	X	207.73045	31.68956	142.38892	3.27393	0.1233514	0.26764966	2.3846515	20	11 17.6	19.8
153500 2001 RN_{122}	12.7	X	228.95148	179.82763	164.80310	15.69574	0.0226639	0.08531126	5.1105205	20	4 21.2	19.7
153501 2001 RG_{126}	16.3	X	321.53515	81.90122	12.14069	11.43502	0.1067394	0.27106833	2.3645592	20	—	—
153502 2001 RU_{128}	16.3	X	140.43203	122.60540	154.12776	6.09024	0.1168321	0.27438113	2.3454880	20	—	—
153503 2001 RB_{129}	16.7	X	208.88976	155.15543	118.07233	3.09047	0.0688003	0.28307614	2.2972092	20	—	—
153504 2001 RE_{130}	16.7	X	252.39563	247.47275	27.06242	3.15745	0.1411001	0.29083620	2.2561627	20	1 22.9	19.9
153505 2001 RV_{130}	16.2	X	231.04332	70.40415	72.57622	2.20056	0.1339906	0.26480392	2.4017056	20	11 2.6	19.2
153506 2001 RC_{133}	16.5	X	142.00074	283.09214	119.74061	4.93914	0.2596880	0.23580087	2.5948113	20	4 1.4	20.8
153507 2001 RL_{135}	16.3	X	144.49305	248.07119	44.39662	4.97038	0.1136385	0.27660778	2.3328839	20	—	—
153508 2001 RF_{137}	16.8	X	301.46528	301.92828	89.43657	3.27397	0.2076050	0.25800311	2.4437274	20	9 5.0	18.9
153509 2001 RJ_{139}	15.7	X	336.55072	201.81537	357.33420	9.70119	0.2079195	0.23916264	2.5704381	20	1 26.9	18.7
153510 2001 RB_{146}	16.0	X	250.21869	193.30432	259.66859	6.03872	0.0359558	0.26103618	2.4247608	20	10 2.3	19.1
153511 2001 RT_{146}	16.3	X	195.32101	231.57578	76.55967	10.27193	0.1320391	0.28746664	2.2737589	20	1 9.6	19.7
153512 2001 SB_{3}	16.0	X	113.65723	52.79235	29.28466	8.76225	0.1712356	0.23489642	2.6014677	20	4 12.6	19.6
153513 2001 SJ_{6}	16.7	X	312.97933	255.01919	196.77188	1.41541	0.0907357	0.27000344	2.3707723	20	—	—
153514 2001 SZ_{6}	17.1	X	221.81049	90.90521	159.75460	5.23933	0.1537250	0.28475227	2.2881856	20	—	—
153515 2001 SD_{13}	16.0	X	30.47594	14.83518	357.33279	18.61213	0.0142897	0.27030809	2.3689907	20	—	—
153516 2001 SH_{14}	16.4	X	272.88244	43.95432	6.16362	3.84121	0.1080687	0.25698365	2.4501860	20	8 28.1	19.3
153517 2001 SO_{14}	16.3	X	33.26830	188.00989	171.86622	0.72834	0.0952930	0.26871352	2.3783533	20	—	—
153518 2001 ST_{14}	17.2	X	31.95364	159.53447	171.86775	2.05932	0.1979952	0.26578930	2.3957659	20	12 9.2	20.1
153519 2001 SD_{17}	17.1	X	41.20997	171.55731	165.71365	2.52964	0.2192820	0.26763354	2.3847472	20	12 30.2	20.4
153520 2001 SW_{28}	16.4	X	171.67849	138.76290	176.08013	5.92131	0.2478252	0.28425155	2.2908720	20	1 3.0	20.1

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153521 2001 SV_{36}	17.0	X	207.21004	220.83925	179.96245	3.36397	0.2722603	0.24378864	2.5378176	20	5 16.3	21.5
153522 2001 SN_{38}	16.5	X	295.31078	202.20559	178.93788	6.74988	0.1514985	0.25492489	2.4633600	20	8 12.3	19.1
153523 2001 SS_{38}	15.8	X	171.15078	48.97443	43.67586	3.13945	0.1931829	0.24405870	2.5359451	20	6 21.3	19.9
153524 2001 SG_{39}	16.4	X	94.06345	306.93289	163.01908	5.86492	0.2583536	0.23441043	2.6050622	20	5 9.3	20.2
153525 2001 SL_{43}	16.9	X	196.19735	329.77100	67.36639	0.46551	0.2105611	0.24274848	2.5450620	20	5 3.9	21.1
153526 2001 SB_{44}	16.7	X	119.08967	196.10008	126.77818	3.01808	0.2431836	0.27745803	2.3281155	20	—	—
153527 2001 SM_{47}	15.8	X	192.82654	289.94199	36.39239	7.65815	0.1476531	0.28752828	2.2734339	20	2 2.2	19.3
153528 2001 SZ_{49}	16.1	X	150.10724	338.87721	80.95164	5.91557	0.2439842	0.23748353	2.5825400	20	4 27.3	20.5
153529 2001 SD_{53}	16.1	X	319.98314	336.50427	33.32977	6.65921	0.0829605	0.25699800	2.4500948	20	9 21.8	18.7
153530 2001 SL_{61}	16.4	X	168.96061	216.61352	182.44474	3.51853	0.1245604	0.23843906	2.5756358	20	4 11.1	20.2
153531 2001 SH_{63}	15.9	X	175.31743	29.89413	49.15747	4.09195	0.2081182	0.24254549	2.5464819	20	6 7.5	20.2
153532 2001 SK_{63}	16.9	X	24.65696	193.43512	148.22557	3.49846	0.1522357	0.26348282	2.4097270	20	12 5.9	19.9
153533 2001 SE_{66}	16.0	X	118.05056	20.84614	36.76896	12.64260	0.2580574	0.23130250	2.6283458	20	3 31.1	20.1
153534 2001 SH_{66}	16.2	X	26.20987	163.77147	179.08460	7.35138	0.0430327	0.26174702	2.4203688	20	11 23.2	19.3
153535 2001 SZ_{66}	16.4	X	328.29541	187.50561	165.06247	7.82940	0.2480226	0.25642504	2.4537431	20	9 1.3	17.7
153536 2001 SF_{93}	17.1	X	221.90881	33.50438	184.88733	6.83347	0.0687740	0.27685994	2.3314671	20	—	—
153537 2001 SQ_{93}	16.4	X	168.66806	142.29017	350.36974	9.89338	0.1767857	0.25336716	2.4734464	20	8 12.6	20.4
153538 2001 SO_{97}	17.0	X	31.43333	189.52551	239.91356	4.63013	0.2062822	0.27527536	2.3404057	20	—	—
153539 2001 SD_{101}	15.9	X	203.00258	136.14322	276.54424	5.02703	0.1697790	0.24554783	2.5256819	20	5 30.2	20.0
153540 2001 SA_{103}	16.8	X	196.59424	31.39519	222.31918	2.67559	0.1228179	0.27853739	2.3220971	20	—	—
153541 2001 SW_{106}	16.0	X	270.90874	61.02430	346.16973	8.49269	0.2010396	0.25255845	2.4787236	20	8 5.9	19.1
153542 2001 SS_{107}	15.4	X	117.79580	253.31881	227.98179	20.57397	0.5074819	0.17877668	3.1207727	20	6 27.3	21.7
153543 2001 SM_{110}	15.7	X	343.37035	7.50123	346.01839	4.65682	0.1940525	0.25733093	2.4479811	20	10 12.3	17.6
153544 2001 SR_{112}	15.9	X	346.33880	158.84640	219.69683	5.70862	0.1355235	0.26028829	2.4294034	20	11 22.6	18.2
153545 2001 SS_{114}	16.5	X	165.32449	311.93616	352.40159	2.77858	0.1903373	0.28106454	2.3081570	20	—	—
153546 2001 SZ_{114}	15.9	X	155.14465	236.05115	189.56747	8.39312	0.1468128	0.23929808	2.5694681	20	5 3.0	19.9
153547 2001 SY_{118}	16.8	X	176.11486	350.93424	310.64975	4.26438	0.2271589	0.28426750	2.2907863	20	—	—
153548 2001 SN_{120}	16.6	X	249.81138	224.55983	192.00353	6.94953	0.1463981	0.25391769	2.4698699	20	7 25.8	20.1
153549 2001 SG_{124}	16.1	X	97.99011	227.41275	203.69827	3.65725	0.2576055	0.23287592	2.6164935	20	3 21.9	19.8
153550 2001 SJ_{125}	16.2	X	164.22860	274.24098	328.24653	6.36967	0.0666114	0.27251056	2.3562091	20	—	—
153551 2001 SG_{131}	16.0	X	268.80532	177.14043	344.91998	4.79024	0.0865500	0.27328561	2.3517521	20	—	—
153552 2001 SZ_{132}	16.2	X	166.00391	147.44930	272.12154	2.50678	0.2186962	0.24083097	2.5585534	20	5 6.2	20.5
153553 2001 SM_{134}	16.8	X	95.81616	51.63331	240.32862	2.02039	0.0269980	0.26776869	2.3839448	20	12 13.9	19.9
153554 2001 SQ_{135}	17.0	X	136.82716	300.91515	356.48116	2.22102	0.2127998	0.27726573	2.3291918	20	—	—
153555 2001 SE_{136}	16.8	X	200.78781	38.11343	357.19251	8.39708	0.1494020	0.24383531	2.5374937	20	5 3.9	20.9
153556 2001 SJ_{138}	16.4	X	96.06625	332.11316	342.77779	2.84537	0.0492015	0.27089653	2.3655588	20	—	—
153557 2001 SA_{139}	16.8	X	238.57951	134.48375	324.66171	2.32656	0.1356611	0.25719777	2.4488259	20	9 11.4	20.0
153558 2001 SN_{139}	16.2	X	295.02451	191.27768	198.74576	2.17002	0.1074306	0.25682416	2.4512003	20	9 2.0	18.8
153559 2001 SJ_{141}	17.1	X	183.90779	4.52504	3.87915	2.19503	0.1640080	0.23792403	2.5793514	20	3 19.1	21.3
153560 2001 SF_{150}	16.3	X	175.86284	330.54759	335.87635	5.90857	0.1287071	0.28221781	2.3018646	20	—	—
153561 2001 SS_{155}	16.2	X	300.88915	79.50813	323.03096	1.50882	0.1733622	0.25760308	2.4462566	20	9 23.9	18.4
153562 2001 SL_{157}	15.8	X	95.48028	33.14015	267.81481	5.18862	0.1196293	0.26885729	2.3775054	20	12 30.8	19.2
153563 2001 SN_{157}	15.8	X	175.12878	304.04738	352.72457	11.29806	0.1085027	0.27974552	2.3154067	20	—	—
153564 2001 SE_{158}	15.3	X	128.18901	64.54989	354.17531	17.49112	0.1416545	0.18270646	3.0758615	20	3 26.3	20.0
153565 2001 SQ_{161}	16.1	X	117.56998	311.32652	355.99773	6.85825	0.1268790	0.27219019	2.3580576	20	—	—
153566 2001 SR_{163}	15.9	X	201.23536	231.34125	204.63714	5.12221	0.0980451	0.24753872	2.5121214	20	7 1.3	19.6
153567 2001 SV_{163}	15.7	X	116.80776	73.68409	10.41341	12.00834	0.1824386	0.23521195	2.5991407	20	4 17.0	19.6
153568 2001 SQ_{167}	17.5	X	115.91786	333.96127	334.23051	1.61093	0.2315229	0.27548339	2.3392274	20	—	—
153569 2001 SR_{173}	16.5	X	293.80300	231.29286	57.72802	4.80617	0.1284034	0.29672008	2.2262371	20	4 1.6	19.0
153570 2001 SH_{184}	16.6	X	350.70615	343.29780	26.11273	2.29994	0.1326763	0.26480539	2.4016967	20	11 17.3	18.8
153571 2001 SQ_{184}	17.0	X	201.15530	258.02012	347.11427	4.85168	0.1728347	0.28098322	2.3086023	20	—	—
153572 2001 SL_{197}	16.9	X	247.09284	171.56719	355.38669	1.38985	0.1325424	0.27156143	2.3616960	20	12 29.9	19.3
153573 2001 SU_{210}	16.5	X	58.69512	184.66314	163.83937	2.80586	0.2040547	0.27103402	2.3647588	20	—	—
153574 2001 SJ_{220}	16.9	X	163.03797	297.37880	111.90488	1.77347	0.2041574	0.23936724	2.5689732	20	4 21.9	21.0
153575 2001 SP_{226}	16.8	X	110.59004	152.81781	134.75518	3.07099	0.1893490	0.27109272	2.3644174	20	12 31.1	20.6
153576 2001 SJ_{230}	15.9	X	191.03920	128.68979	32.35068	2.75245	0.1506182	0.25877114	2.4388897	20	10 8.7	19.4
153577 2001 SN_{233}	16.3	X	135.63340	174.77085	107.69533	2.83065	0.1445240	0.27231181	2.3573554	20	—	—
153578 2001 SX_{237}	16.4	X	158.26692	279.13488	137.67934	4.39224	0.2088093	0.23818142	2.5774928	20	4 28.4	20.7
153579 2001 SH_{241}	17.2	X	85.08571	294.07207	29.02048	1.48389	0.1963883	0.27128875	2.3632783	20	—	—
153580 2001 SY_{241}	17.1	X	182.27862	260.47692	21.95211	4.54425	0.2717716	0.28144705	2.3060652	20	—	—
153581 2001 SH_{242}	15.8	X	128.33491	174.94314	22.91282	7.21358	0.0813993	0.25611584	2.4557176	20	9 23.2	19.3
153582 2001 SO_{243}	16.8	X	344.67360	257.09792	55.27073	1.95672	0.1786527	0.25429153	2.4674486	20	8 8.9	18.8
153583 2001 SG_{244}	16.9	X	139.95541	97.33846	173.82261	6.27501	0.1181631	0.27158402	2.3615650	20	—	—
153584 2001 SS_{245}	16.4	X	241.67828	303.62520	191.86541	6.12795	0.0566420	0.26203642	2.4185864	20	11 18.9	19.3
153585 2001 SM_{246}	16.6	X	176.80267	96.60413	38.36081	3.75289	0.0840199	0.25236909	2.4799634	20	8 25.1	20.2
153586 2001 SR_{246}	16.7	X	324.36999	310.46419	51.90803	1.96475	0.2009551	0.25703785	2.4498415	20	9 12.2	18.4
153587 2001 SG_{250}	16.6	X	145.67506	11.55466	68.49686	4.14559	0.1528944	0.23902055	2.5714567	20	5 11.5	20.4
153588 2001 SC_{251}	16.2	X	132.25619	150.85107	168.24482	4.54464	0.1408673	0.27600469	2.3362810	20	—	—
153589 2001 SS_{255}	15.7	X	249.04300	185.42895	27.46450	13.48023	0.2185222	0.27593304	2.3366854	20	—	—
153590 2001 SY_{256}	15.6	X	176.79821	257.65840	191.74200	10.85200	0.2258960	0.24135276	2.5548645	20	6 21.7	20.2
153591 2001 SN_{263}	16.9	X	140.37836	172.94840	325.76735	6.68926	0.4784926	0.35176237	1.9874817	20	8 4.9	20.9
153592 2001 SG_{266}	17.1	X	196.50237	111.67303	211.09347	3.31638	0.2566195	0.28735882	2.2743276	20	1 31.4	21.1
153593 2001 SX_{268}	17.5	X	168.45642	71.36764	187.39076	2.27766	0.0935962	0.27634895	2.3343403	20	—	—
153594 2001 SH_{271}	16.9	X	209.16273	194.35600	205.08591	0.76370	0.2101803	0.24408338	2.5357742	20	5 17.7	21.1
153595 2001 SW_{271}	16.7	X	356.73917	336.84270	10.47754	2.02011	0.1871577	0.26016304	2.4301830	20	11 1.9	18.9
153596 2001 SA_{277}	15.8	X	96.85761	210.15875	221.47335	12.64865	0.2572581	0.22878973	2.6475552	20	3 18.7	19.6
153597 2001 SE_{279}	15.7	X	85.28565	233.57648	218.74580	12.22779	0.2516133	0.22985585	2.6393623	20	3 31.5	19.3
153598 2001 SV_{279}	15.7	X	333.82830	3.22388	26.85648	3.06565	0.1796739	0.26047495	2.4282426	20	11 18.7	17.5
153599 2001 SD_{280}	15.2	X	129.27792	288.48812	180.75209	4.47727	0.1502344	0.23946815	2.5682515	20	6 1.5	19.0
153600 2001 SU_{280}	16.1	X	40.25299	189.24692	195.81418	2.23748	0.1821779	0.27005669	2.3704607	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153601 2001 SQ_{281}	16.0	X	177.14934	106.52986	298.87584	4.34364	0.1704742	0.23940550	2.5686995	20	4 25.8	20.2
153602 2001 SS_{283}	17.6	X	100.97742	52.69506	256.45731	0.82335	0.1879025	0.27244096	2.3566104	20	—	—
153603 2001 SL_{285}	16.0	X	252.51751	32.55560	13.05647	8.00611	0.2550708	0.19673157	2.9278805	20	6 30.1	20.6
153604 2001 SC_{293}	16.3	X	338.32204	53.02808	33.47522	7.26375	0.0808777	0.27106505	2.3645783	20	—	—
153605 2001 SD_{309}	17.2	X	69.06366	327.55013	302.83913	2.56069	0.1058927	0.26266869	2.4147037	20	10 20.2	20.4
153606 2001 SW_{312}	16.1	X	209.36598	50.06191	51.73991	7.21547	0.0820686	0.25464667	2.4651540	20	8 20.8	19.6
153607 2001 SZ_{315}	15.0	X	161.93681	65.19744	355.16012	13.69836	0.1442103	0.23701793	2.5859210	20	4 26.1	19.3
153608 2001 SQ_{318}	16.5	X	197.97441	299.92656	181.18749	6.31080	0.0871070	0.25629727	2.4545585	20	8 28.1	20.1
153609 2001 SP_{333}	16.9	X	266.70657	224.79860	28.49339	6.63572	0.1121939	0.28788258	2.2715683	20	1 13.7	20.1
153610 2001 SR_{338}	17.0	X	95.57028	265.34704	193.12804	7.38845	0.1826365	0.23546764	2.5972588	20	4 14.0	20.3
153611 2001 SO_{341}	15.6	X	131.30124	320.57792	305.66116	9.67915	0.1292171	0.26792080	2.3830423	20	12 23.5	19.3
153612 2001 SN_{353}	16.2	X	208.94273	211.65005	130.69472	16.27805	0.1553749	0.23735080	2.5835027	20	3 13.7	20.5
153613 2001 TK_{1}	16.8	X	181.49222	226.63859	165.27685	2.67338	0.1014036	0.23782122	2.5800947	20	4 14.5	20.6
153614 2001 TN_{3}	16.3	X	12.23721	351.64249	25.85051	2.30779	0.1454608	0.26561251	2.3968289	20	—	—
153615 2001 TM_{11}	15.6	X	219.71865	157.10880	236.16385	3.57222	0.0311824	0.24406402	2.5359083	20	6 1.6	18.8
153616 2001 TD_{17}	15.0	X	103.65301	187.27018	248.72542	21.14293	0.0466271	0.22814571	2.6525354	20	2 23.9	19.1
153617 2001 TR_{17}	16.3	X	9.98352	340.79327	15.56422	1.47571	0.1770421	0.26130526	2.4230960	20	12 7.2	18.8
153618 2001 TP_{19}	15.3	X	155.01709	166.41179	255.87119	12.23445	0.1085873	0.23748529	2.5825272	20	4 21.9	19.3
153619 2001 TT_{20}	15.6	X	71.65240	349.07476	336.23522	6.97903	0.1100100	0.26537621	2.3982515	20	—	—
153620 2001 TX_{20}	14.9	X	158.28944	23.97528	19.23269	13.24511	0.1703480	0.23417311	2.6068220	20	4 8.1	19.1
153621 2001 TC_{21}	15.3	X	91.67867	105.64372	358.04490	12.44626	0.1226719	0.23305767	2.6151330	20	4 3.6	18.7
153622 2001 TB_{33}	15.8	X	103.34229	118.62965	341.30567	5.88173	0.2229366	0.23219593	2.6215993	20	4 27.8	19.7
153623 2001 TF_{35}	15.8	X	152.06625	89.52870	357.85737	6.00176	0.1246740	0.23827764	2.5767989	20	5 23.7	19.8
153624 2001 TJ_{36}	16.0	X	211.71486	46.93622	32.02502	13.81891	0.1820185	0.24515781	2.5283599	20	7 13.4	20.3
153625 2001 TK_{39}	16.0	X	30.19490	95.90752	37.56295	17.02288	0.1211738	0.22568896	2.6717501	20	2 19.2	19.3
153626 2001 TF_{44}	15.3	X	13.17107	27.08002	312.16741	4.99064	0.2223665	0.25702965	2.4498936	20	11 23.7	18.1
153627 2001 TZ_{45}	16.1	X	150.96096	86.52138	317.03224	21.68241	0.0826113	0.23730921	2.5838045	20	3 14.1	20.2
153628 2001 TE_{48}	16.7	X	144.11594	222.68926	187.92143	2.57775	0.0728263	0.23431483	2.6057707	20	3 25.8	20.3
153629 2001 TD_{54}	16.2	X	87.41413	345.27734	334.73117	12.95147	0.0767786	0.27198199	2.3592608	20	—	—
153630 2001 TA_{57}	16.3	X	175.46623	239.75851	163.73019	18.01901	0.2743249	0.23819130	2.5774215	20	4 30.0	21.2
153631 2001 TF_{61}	16.7	X	116.80124	20.49118	64.12971	2.77628	0.1768984	0.23508674	2.6000635	20	4 20.2	20.6
153632 2001 TT_{63}	16.7	X	138.63663	11.78774	334.10781	1.20617	0.2298128	0.28092458	2.3089236	20	1 10.1	19.9
153633 2001 TM_{64}	16.2	X	346.97891	138.55651	210.51201	1.42375	0.1913990	0.25838213	2.4413370	20	10 15.3	18.2
153634 2001 TS_{65}	16.1	X	302.94628	236.70902	185.48043	1.02973	0.1664240	0.25941453	2.4348555	20	10 31.3	18.0
153635 2001 TU_{70}	15.8	X	135.44988	45.26016	41.22825	12.20332	0.2168782	0.23704963	2.5856905	20	5 12.9	19.9
153636 2001 TS_{73}	16.7	X	136.20697	235.74261	182.79169	2.26718	0.2287336	0.23405014	2.6077350	20	4 11.4	20.7
153637 2001 TS_{76}	15.2	X	257.29731	356.77378	39.91567	2.44234	0.1258188	0.19552457	2.9399176	20	7 10.2	19.3
153638 2001 TX_{76}	16.1	X	61.05892	247.82575	211.23116	6.26549	0.2029095	0.22681788	2.6628775	20	2 23.4	18.9
153639 2001 TZ_{76}	15.8	X	172.40572	283.71677	146.01158	4.47794	0.1630505	0.24032720	2.5621277	20	5 25.0	19.9
153640 2001 TS_{77}	16.1	X	196.71536	350.57996	51.92314	2.42601	0.1770985	0.24091939	2.5579274	20	5 11.6	20.1
153641 2001 TD_{79}	15.2	X	97.23695	254.18853	210.22164	12.59184	0.2504112	0.23120344	2.6290965	20	5 3.6	18.9
153642 2001 TS_{79}	16.1	X	73.46377	221.71265	138.16955	3.41567	0.1812947	0.27148814	2.3621210	20	—	—
153643 2001 TX_{82}	15.6	X	181.17770	60.77064	345.09090	8.18051	0.1052224	0.18916225	3.0054746	20	4 29.5	20.5
153644 2001 TO_{87}	16.2	X	315.87766	76.77749	332.58191	6.12449	0.0594253	0.26208785	2.4182700	20	11 7.3	19.0
153645 2001 TV_{93}	16.8	X	171.17373	61.87263	3.19600	8.03856	0.1620470	0.24120885	2.5558806	20	5 14.4	21.0
153646 2001 TC_{95}	17.0	X	351.08939	359.32445	350.16007	4.57698	0.1982760	0.25981957	2.4323243	20	10 24.6	19.1
153647 2001 TJ_{97}	15.6	X	230.06035	34.71001	15.76842	12.45015	0.0704172	0.24763496	2.5114705	20	7 6.0	19.3
153648 2001 TE_{101}	15.2	X	173.29470	356.86302	37.96951	12.35621	0.1581723	0.23520952	2.5991586	20	4 13.0	19.3
153649 2001 TJ_{102}	15.0	X	181.77353	188.96806	258.53855	14.93622	0.0880092	0.24592008	2.5231325	20	6 24.9	18.7
153650 2001 TO_{102}	15.3	X	237.66811	95.60311	259.45506	14.25740	0.1282695	0.24221513	2.5487968	20	4 19.9	19.4
153651 2001 TT_{102}	16.3	X	99.23014	247.53778	5.36438	5.14191	0.0763353	0.26142200	2.4223746	20	10 29.2	19.6
153652 2001 TC_{103}	13.7	X	336.12668	99.01380	72.76935	30.44983	0.3717178	0.21389056	2.7691191	20	—	—
153653 2001 TA_{104}	16.4	X	161.27455	57.79546	355.13402	6.04805	0.2016477	0.23784089	2.5799524	20	4 22.2	20.6
153654 2001 TB_{113}	16.6	X	93.25486	346.40058	306.54178	1.90068	0.1765548	0.26693762	2.3888902	20	12 21.5	20.3
153655 2001 TQ_{118}	16.0	X	97.24713	98.50424	333.07828	15.95159	0.1996686	0.23080284	2.6321378	20	3 10.3	19.6
153656 2001 TE_{122}	16.3	X	135.57122	71.29994	346.78619	10.98816	0.1995160	0.23410026	2.6073627	20	4 3.9	20.4
153657 2001 TO_{130}	15.8	X	120.42193	300.59893	157.63102	12.38319	0.2738277	0.23733317	2.5836306	20	5 23.1	20.3
153658 2001 TL_{134}	16.1	X	204.46666	199.44622	103.06912	8.04632	0.2044644	0.28502774	2.2867111	20	1 13.5	19.7
153659 2001 TC_{140}	16.4	X	176.74051	349.73568	75.38186	4.95653	0.1424892	0.24460333	2.5321794	20	5 22.2	20.2
153660 2001 TB_{146}	15.6	X	51.00861	0.26638	180.41479	13.18785	0.1014258	0.24187260	2.5512025	20	5 21.5	18.8
153661 2001 TH_{147}	16.3	X	154.28021	6.90109	70.67118	5.34799	0.2157635	0.23966866	2.5668188	20	5 19.7	20.6
153662 2001 TY_{150}	15.8	X	132.50561	9.25441	61.81804	10.20500	0.0695053	0.23691017	2.5867051	20	4 11.4	19.5
153663 2001 TL_{152}	16.7	X	211.72786	248.97957	157.40696	4.42687	0.1862819	0.24444335	2.5332841	20	5 30.7	20.9
153664 2001 TN_{152}	16.4	X	115.07017	326.33610	119.05606	3.99309	0.2060027	0.23422746	2.6064186	20	4 23.9	20.3
153665 2001 TL_{164}	16.4	X	136.09185	63.12373	32.25779	4.89645	0.1549419	0.23907002	2.5711020	20	5 20.5	20.4
153666 2001 TC_{170}	15.7	X	45.64308	53.70946	15.16044	10.31781	0.2935382	0.21809032	2.7334541	20	—	—
153667 2001 TK_{174}	16.7	X	196.01495	299.12594	102.06970	2.36336	0.1606015	0.24088149	2.5581957	20	5 10.3	20.9
153668 2001 TU_{181}	16.3	X	54.25267	103.32844	315.67764	4.42978	0.2109060	0.22246778	2.6974784	20	—	—
153669 2001 TL_{185}	16.2	X	211.79516	232.82300	358.88016	6.90032	0.1332741	0.27395165	2.3479388	20	—	—
153670 2001 TJ_{187}	17.0	X	18.01417	94.56228	244.58095	0.98109	0.1826920	0.26073404	2.4266337	20	11 26.6	19.8
153671 2001 TF_{188}	15.8	X	113.42302	111.24241	28.13756	12.15897	0.2403671	0.23891455	2.5722173	20	7 2.9	20.1
153672 2001 TO_{189}	15.5	X	51.12980	33.31029	271.55006	5.63256	0.1236799	0.25993583	2.4315990	20	11 14.9	18.8
153673 2001 TW_{189}	16.1	X	201.61017	129.75653	287.45314	3.40862	0.1710975	0.24294314	2.5437023	20	6 3.7	20.1
153674 2001 TE_{190}	16.3	X	92.42738	230.73248	17.52725	6.95366	0.0406257	0.25591437	2.4570063	20	10 11.6	19.4
153675 2001 TG_{190}	16.2	X	273.86525	68.33352	14.94036	6.29336	0.0866997	0.25742933	2.4473572	20	10 17.6	19.1
153676 2001 TY_{191}	15.8	X	13.55618	323.25133	9.96849	6.11450	0.1766204	0.25852997	2.4404062	20	11 8.0	18.4
153677 2001 TS_{194}	16.1	X	195.36327	45.04841	346.46906	6.74526	0.1301741	0.23940182	2.5687258	20	4 24.7	20.2
153678 2001 TM_{200}	16.6	X	284.46524	224.42409	152.48252	9.80191	0.1461977	0.25328387	2.4739886	20	7 19.7	19.7
153679 2001 TN_{206}	15.7	X	105.97276	29.75973	93.48582	17.33799	0.2522735	0.23623303	2.5916457	20	6 7.2	19.8
153680 2001 TW_{208}	16.3	X	120.49033	4.80074	79.64455	5.33194	0.2362045	0.23522722	2.5990282	20	5 1.0	20.3

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153681 2001 TC_{209}	15.5	X	54.81325	49.63329	31.26621	22.44067	0.0914470	0.22440428	2.6819373	20	1 13.0	19.2
153682 2001 TG_{224}	15.6	X	10.43416	185.48256	29.81821	15.23006	0.0573867	0.23902829	2.5714012	20	4 26.9	18.6
153683 2001 TL_{225}	16.1	X	178.44846	127.17569	41.20706	3.18998	0.1228930	0.25799605	2.4437720	20	10 7.4	19.8
153684 2001 TR_{225}	15.9	X	51.15047	167.87789	170.63936	15.46017	0.2938438	0.26657058	2.3910826	20	—	—
153685 2001 TW_{229}	16.0	X	157.09245	264.72292	128.22626	6.40496	0.2748067	0.23663990	2.5886742	20	4 2.7	20.5
153686 Pathall	16.4	X	22.92925	150.33709	283.07845	3.94316	0.1513307	0.22348440	2.6892917	20	—	—
153687 2001 UH_{3}	16.4	X	212.40467	322.73880	157.84872	4.99543	0.1003677	0.25474684	2.4645077	20	9 13.7	19.8
153688 2001 UB_{8}	17.1	X	146.05213	51.93510	24.14587	2.57749	0.1747073	0.23872857	2.5735530	20	5 7.4	21.2
153689 2001 UY_{10}	16.2	X	73.38018	251.63090	105.77415	4.41421	0.1904313	0.26950208	2.3737117	20	—	—
153690 2001 UH_{15}	15.4	X	305.46921	217.66124	112.98056	5.75063	0.1823131	0.24605473	2.5222119	20	6 11.2	18.0
153691 2001 UY_{15}	15.8	X	178.76426	239.38330	260.52171	6.16015	0.0679685	0.25255636	2.4787374	20	8 29.6	19.3
153692 2001 US_{17}	17.6	X	75.32226	260.90323	251.38429	17.88451	0.2065471	0.44927107	1.6883549	20	6 3.2	18.1
153693 2001 UG_{23}	15.6	X	342.10730	50.73872	293.16593	7.68918	0.0990178	0.25673084	2.4517942	20	9 15.2	18.4
153694 2001 UV_{28}	16.8	X	201.28654	222.45519	68.48807	3.53144	0.1519548	0.28289831	2.2981717	20	—	—
153695 2001 US_{35}	15.7	X	214.76578	283.81038	100.35001	9.18633	0.1089841	0.24152501	2.5536497	20	5 11.5	19.6
153696 2001 UO_{36}	16.6	X	63.12981	240.45791	160.57468	9.38996	0.2689505	0.22192375	2.7018850	20	—	—
153697 2001 UN_{40}	16.3	X	31.96855	47.33625	170.41475	4.28407	0.0338284	0.24406846	2.5358775	20	6 3.7	19.4
153698 2001 UJ_{43}	16.0	X	93.53458	54.40397	207.43611	6.01203	0.0995561	0.26082716	2.4260561	20	11 7.2	19.3
153699 2001 UB_{46}	16.7	X	41.83450	242.77141	85.29282	2.52279	0.2029595	0.26384238	2.4075372	20	12 16.5	20.1
153700 2001 UM_{46}	16.5	X	313.04170	170.73122	196.13350	6.24330	0.1464295	0.25443378	2.4665289	20	8 24.8	19.0
153701 2001 UT_{46}	16.4	X	174.30110	286.55232	133.91123	2.00823	0.1652380	0.23984535	2.5655580	20	5 14.6	20.5
153702 2001 UO_{47}	16.2	X	16.16190	235.48405	114.31210	2.53428	0.1727833	0.26206963	2.4183821	20	12 7.5	18.8
153703 2001 UK_{48}	16.4	X	205.55500	184.29050	165.96897	6.38428	0.2306862	0.23752684	2.5822260	20	3 15.8	20.8
153704 2001 UJ_{53}	16.1	X	81.46432	252.05928	180.87978	8.15530	0.1478461	0.22632005	2.6667811	20	2 13.9	19.4
153705 2001 UF_{56}	16.7	X	93.05966	89.47711	238.26573	2.69852	0.0779085	0.27146061	2.3622807	20	—	—
153706 2001 UQ_{61}	16.6	X	162.23652	63.09775	216.59139	5.69521	0.2016401	0.27623731	2.3349692	20	—	—
153707 2001 UN_{74}	16.2	X	121.61282	17.65205	87.28673	4.01161	0.1517206	0.23741155	2.5830620	20	5 18.8	20.0
153708 2001 UK_{76}	12.5	X	299.70137	229.54459	65.41280	9.19334	0.1126119	0.08406485	5.1609114	20	5 1.8	19.1
153709 2001 US_{80}	15.9	X	130.12322	359.58340	47.42378	9.01823	0.1350701	0.23220235	2.6215510	20	3 16.9	19.8
153710 2001 UR_{82}	16.6	X	314.42841	165.51132	173.91757	1.78761	0.2197897	0.25195564	2.4826757	20	7 5.7	18.8
153711 2001 UG_{90}	17.1	X	80.06176	97.52662	221.99464	1.53723	0.0943264	0.26924943	2.3751964	20	—	—
153712 2001 UN_{92}	16.4	X	101.93685	47.83119	41.67820	6.51727	0.1357076	0.23238423	2.6201830	20	4 4.8	19.9
153713 2001 US_{95}	16.6	X	174.42012	46.05935	89.14575	3.04109	0.1500277	0.25147183	2.4858590	20	8 20.0	20.4
153714 2001 UM_{96}	17.1	X	3.67583	234.96682	110.77416	2.58673	0.1949740	0.26109600	2.4243905	20	11 15.6	19.5
153715 2001 UT_{96}	16.8	X	156.92578	235.19135	190.22088	1.82300	0.1217206	0.23882729	2.5728438	20	5 2.1	20.5
153716 2001 UE_{97}	15.3	X	240.17850	140.66494	40.93857	13.41295	0.0796659	0.21537765	2.7563581	20	12 30.3	19.2
153717 2001 UV_{100}	16.4	X	145.69401	43.00964	28.16182	14.49092	0.1778214	0.23909061	2.5709543	20	4 29.6	20.6
153718 2001 UD_{104}	16.8	X	196.62396	51.72219	176.94440	2.51121	0.0305780	0.27023688	2.3694068	20	—	—
153719 2001 UW_{104}	16.2	X	235.88602	115.28381	39.71523	8.69115	0.0355055	0.26408178	2.4060820	20	12 8.6	19.2
153720 2001 UL_{105}	16.3	X	135.55497	67.17734	54.97288	6.92981	0.1332523	0.24257407	2.5462818	20	6 22.8	20.1
153721 2001 UO_{109}	15.5	X	151.04956	317.10472	75.53251	5.18440	0.1395571	0.23183013	2.6243563	20	3 19.8	19.5
153722 2001 UQ_{112}	16.5	X	196.96293	221.66807	201.57998	0.63756	0.0355798	0.24427298	2.5344619	20	6 12.9	19.8
153723 2001 UG_{114}	16.7	X	110.27691	46.28304	52.71474	4.48531	0.1002783	0.23585136	2.5944410	20	4 21.5	20.1
153724 2001 UM_{118}	15.7	X	44.05473	270.96568	215.60136	13.95940	0.0644909	0.22918259	2.6445288	20	2 14.4	19.2
153725 2001 UP_{118}	16.2	X	211.02448	308.07887	103.61305	3.07566	0.0725882	0.24367525	2.5386048	20	6 12.3	19.7
153726 2001 UU_{119}	16.0	X	49.19750	164.75796	198.93065	2.37118	0.1644202	0.26755128	2.3852360	20	—	—
153727 2001 UY_{119}	16.3	X	18.65887	275.38015	181.82639	5.23551	0.1809502	0.22127079	2.7071978	20	—	—
153728 2001 UD_{120}	16.7	X	198.51980	307.90785	118.73871	3.07250	0.1451233	0.24450253	2.5328753	20	6 14.4	20.6
153729 2001 UW_{122}	16.3	X	26.49878	238.07888	122.50228	3.21095	0.2098408	0.26404260	2.4063200	20	—	—
153730 2001 UJ_{125}	16.0	X	259.43068	252.94246	120.58897	11.80973	0.0576086	0.24711719	2.5149774	20	6 24.1	19.3
153731 2001 UC_{132}	16.1	X	166.24108	48.34567	62.38451	15.95429	0.0537461	0.24392433	2.5368763	20	7 9.4	19.9
153732 2001 UL_{132}	15.3	X	268.49203	97.47618	238.06516	5.20360	0.2080635	0.18988710	2.9978213	20	4 24.3	19.8
153733 2001 UV_{132}	16.6	X	165.30773	83.26068	172.56568	5.43957	0.1490497	0.27171745	2.3607919	20	—	—
153734 2001 UF_{134}	15.4	X	79.74689	235.39727	227.99655	17.29109	0.2106033	0.23043179	2.6349626	20	3 30.4	19.0
153735 2001 UH_{137}	16.4	X	218.58089	264.29726	185.04944	6.32987	0.0680411	0.25281070	2.4770746	20	8 11.2	19.8
153736 2001 UR_{137}	16.9	X	132.31960	247.87955	41.52005	2.83656	0.1906938	0.27334101	2.3514343	20	—	—
153737 2001 UN_{140}	16.2	X	102.00863	83.81516	58.44933	6.34879	0.1234371	0.24097345	2.5575448	20	6 10.2	19.6
153738 2001 US_{142}	16.8	X	104.65647	289.41522	198.38050	4.29192	0.2131402	0.23708754	2.5854148	20	6 6.1	20.7
153739 2001 UY_{142}	16.4	X	121.46315	285.92308	200.08649	4.49664	0.1181852	0.24057003	2.5604032	20	6 11.5	20.1
153740 2001 UL_{143}	16.7	X	225.30532	268.65253	84.20797	2.93943	0.1363037	0.24000846	2.5643956	20	4 9.1	20.7
153741 2001 UE_{145}	17.1	X	173.67368	127.99515	195.75434	2.13821	0.1858023	0.28190003	2.3035941	20	1 11.6	20.7
153742 2001 UG_{146}	16.2	X	108.80661	228.36700	46.77886	7.78781	0.0895046	0.26303523	2.4124599	20	12 9.0	19.6
153743 2001 UD_{153}	15.9	X	170.54061	349.53999	64.17725	2.38933	0.0716651	0.23712281	2.5851584	20	4 29.5	19.7
153744 2001 UU_{153}	15.9	X	201.31611	194.28485	190.62500	4.81137	0.2246178	0.23936386	2.5689974	20	4 23.5	20.2
153745 2001 UW_{153}	15.9	X	95.66151	109.38429	213.26369	5.58545	0.1400566	0.26779999	2.3837590	20	—	—
153746 2001 UF_{156}	16.4	X	87.51741	250.96002	217.39900	4.01322	0.1272035	0.23218527	2.6216795	20	4 6.9	19.8
153747 2001 UA_{158}	16.6	X	84.77209	31.62930	52.15954	4.08931	0.2216420	0.22784467	2.6548712	20	3 19.4	19.9
153748 2001 UB_{161}	16.1	X	109.21850	189.03630	124.65141	3.32246	0.2124332	0.27007424	2.3703580	20	—	—
153749 2001 UJ_{167}	15.1	X	150.68701	92.87508	2.47358	13.25223	0.1632552	0.23902418	2.5714307	20	6 2.4	19.4
153750 2001 UD_{168}	15.3	X	178.89613	51.93017	358.38563	11.45266	0.2614211	0.23787069	2.5797370	20	5 2.5	20.0
153751 2001 UQ_{168}	15.0	X	347.75723	12.17956	333.70176	9.15785	0.2174858	0.25461290	2.4653719	20	10 8.9	17.0
153752 2001 UZ_{173}	16.3	X	80.17379	256.89486	45.28912	2.64124	0.1953574	0.26553847	2.3972744	20	12 21.9	20.0
153753 2001 UC_{184}	16.3	X	135.68916	37.47611	64.78518	7.34844	0.1048513	0.24211053	2.5495308	20	5 25.5	19.9
153754 2001 UR_{196}	16.0	X	179.19114	248.10413	195.57603	7.24366	0.0508002	0.24344593	2.5401988	20	6 17.9	19.7
153755 2001 UZ_{199}	13.5	X	233.73996	100.02546	249.25114	2.31961	0.1466017	0.08372612	5.1748221	20	4 17.2	20.8
153756 2001 UF_{201}	16.7	X	125.71512	240.98988	215.24600	2.62912	0.1919087	0.23776470	2.5805036	20	5 15.4	20.6
153757 2001 UN_{210}	13.4	X	215.26994	234.40602	138.20416	5.38678	0.1037471	0.08258944	5.2221943	20	5 1.5	20.7
153758 2001 UQ_{214}	12.9	X	310.42444	120.33613	156.90644	4.10518	0.0329029	0.08158905	5.2647950	20	5 3.8	19.7
153759 2001 UX_{216}	16.3	X	270.05831	309.68525	6.44856	2.63044	0.1015342	0.24100246	2.5573396	20	4 12.9	19.6
153760 2001 UH_{221}	16.6	X	133.05613	233.10877	66.75145	3.37726	0.0923773	0.27042116	2.3683303	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153761 2001 UB_{222}	15.6	X	124.40250	155.29753	283.76512	14.56440	0.0878504	0.23355121	2.6114475	20	4 2.2	19.6
153762 2001 VP_{1}	16.4	X	107.29334	312.01416	35.90266	7.18479	0.1273217	0.27383973	2.3485785	20	—	—
153763 2001 VY_{10}	16.0	X	270.38580	180.09497	319.03865	2.79459	0.0364635	0.21293729	2.7773774	20	12 21.7	19.6
153764 2001 VZ_{11}	16.1	X	180.16698	53.69301	351.57992	7.35466	0.1870026	0.23818152	2.5774921	20	4 27.9	20.5
153765 2001 VF_{12}	15.6	X	121.43951	169.68408	303.65184	6.80577	0.1492642	0.23686795	2.5870124	20	5 27.6	19.5
153766 2001 VD_{14}	15.4	X	212.87228	98.52635	297.76257	5.25105	0.1469361	0.24179298	2.5517625	20	5 18.9	19.5
153767 2001 VC_{23}	15.7	X	267.09532	310.69492	33.31786	4.18132	0.1575446	0.24387377	2.5372270	20	5 8.6	19.3
153768 2001 VD_{27}	15.0	X	170.17655	179.07143	246.22246	5.40261	0.1092191	0.23825063	2.5769936	20	5 14.6	18.8
153769 2001 VJ_{29}	16.1	X	67.62784	230.10488	204.47136	3.35960	0.2134351	0.22387150	2.6861907	20	2 4.7	18.9
153770 2001 VO_{29}	16.0	X	160.09287	310.88802	84.96830	4.97070	0.1590469	0.23358676	2.6111826	20	4 2.5	20.1
153771 2001 VV_{33}	15.1	X	131.44867	302.24909	67.59354	15.53599	0.1118210	0.22483346	2.6785233	20	1 28.9	19.1
153772 2001 VQ_{34}	15.5	X	116.98918	286.33600	209.04989	2.81571	0.1684213	0.23736478	2.5834012	20	6 23.7	19.4
153773 2001 VL_{38}	16.5	X	219.04184	73.41822	270.18304	2.31148	0.2191888	0.23779821	2.5802611	20	3 17.0	20.9
153774 2001 VT_{38}	16.3	X	107.95505	309.28842	9.10540	2.45934	0.2015341	0.27030217	2.3690253	20	—	—
153775 2001 VY_{38}	16.6	X	25.80563	358.91733	346.28436	0.84411	0.2238150	0.26210998	2.4181339	20	12 22.1	19.6
153776 2001 VU_{41}	15.2	X	274.33296	227.52838	54.61247	15.01269	0.0721846	0.23312269	2.6146467	20	3 18.6	19.1
153777 2001 VK_{42}	15.2	X	193.98795	114.51050	254.48765	13.84187	0.1271592	0.23405171	2.6077232	20	3 22.7	19.6
153778 2001 VN_{45}	15.1	X	225.77036	145.06880	251.51271	14.37848	0.1094570	0.24096367	2.5576140	20	6 5.9	18.8
153779 2001 VO_{51}	16.6	X	112.40032	348.93808	328.63228	3.06805	0.1537183	0.27250247	2.3562557	20	—	—
153780 2001 VW_{57}	16.3	X	234.65863	26.58197	331.24888	2.56965	0.1750153	0.24228495	2.5483071	20	4 19.3	20.4
153781 2001 VD_{58}	15.9	X	211.56709	20.67320	23.80897	6.42163	0.1009343	0.24346703	2.5400520	20	5 30.9	19.8
153782 2001 VY_{58}	16.0	X	132.42597	48.13991	39.46007	22.71912	0.0919607	0.23698362	2.5861705	20	4 30.8	19.8
153783 2001 VQ_{60}	16.2	X	93.34240	183.59450	272.92442	4.89856	0.1343422	0.23170139	2.6253283	20	3 29.2	19.8
153784 2001 VY_{60}	16.5	X	244.07986	19.77523	353.47609	4.52573	0.1771691	0.24466776	2.5317349	20	5 18.1	20.4
153785 2001 VG_{64}	15.8	X	141.72320	25.62536	39.19930	8.42783	0.0615714	0.23489920	2.6014472	20	4 10.9	19.5
153786 2001 VH_{65}	16.2	X	172.56696	55.39171	344.66433	2.87159	0.1536750	0.23639206	2.5904833	20	4 15.5	20.3
153787 2001 VM_{65}	15.9	X	218.44479	52.12719	345.73265	3.51092	0.1500952	0.24275000	2.5450514	20	5 26.6	19.9
153788 2001 VU_{69}	15.1	X	252.45619	52.25130	320.39119	8.71862	0.1114335	0.19139747	2.9820294	20	6 3.8	19.6
153789 2001 VC_{70}	15.6	X	141.59718	43.75814	0.91265	12.41227	0.1651751	0.23230618	2.6207698	20	3 24.2	19.5
153790 2001 VJ_{71}	15.3	X	178.15275	34.44927	350.45962	11.59351	0.3011996	0.23309849	2.6148277	20	4 3.3	20.1
153791 2001 VZ_{73}	16.3	X	197.91243	68.31700	354.17410	13.01578	0.1304190	0.24349671	2.5398456	20	6 6.7	20.5
153792 2001 VH_{75}	18.2	X	356.06963	244.23135	276.27369	10.61426	0.7416047	0.32375542	2.1005097	20	—	—
153793 2001 VF_{78}	15.8	X	344.24245	195.25372	183.43760	9.88639	0.2262051	0.25929834	2.4355828	20	12 1.6	18.0
153794 2001 VZ_{78}	15.9	X	103.96656	79.52237	22.10190	2.88112	0.0968750	0.23451321	2.6043010	20	4 15.6	19.3
153795 2001 VO_{79}	16.3	X	146.54813	188.61396	181.43925	4.39224	0.2206652	0.22994655	2.6386682	20	2 20.2	20.6
153796 2001 VS_{79}	15.3	X	113.80730	355.79301	70.90451	15.41474	0.0233690	0.23082860	2.6319419	20	3 12.0	19.2
153797 2001 VH_{95}	15.3	X	166.45426	274.65291	126.86712	15.33068	0.1405432	0.23421935	2.6064788	20	4 18.8	19.7
153798 2001 VR_{96}	16.2	X	108.97191	244.59361	146.36421	11.92803	0.1916632	0.22485821	2.6783267	20	2 4.9	19.8
153799 2001 VZ_{96}	15.8	X	349.36660	359.32839	154.77812	15.57749	0.0874627	0.22174976	2.7032981	20	1 4.3	19.4
153800 2001 VT_{97}	15.8	X	96.33493	253.09308	162.60501	12.75455	0.2239338	0.22532752	2.6746064	20	2 25.3	19.3
153801 2001 VV_{106}	16.1	X	303.24657	280.01200	28.34002	2.85987	0.0419513	0.24314144	2.5423191	20	5 27.3	19.3
153802 2001 VY_{109}	16.5	X	18.26865	350.38462	352.86433	0.77411	0.2029503	0.26064377	2.4271940	20	12 5.7	19.4
153803 2001 VO_{110}	15.8	X	172.04622	77.85703	350.86889	3.12463	0.0765481	0.23914378	2.5705733	20	5 19.7	19.6
153804 2001 VO_{113}	16.2	X	60.20557	17.56135	315.79728	1.52647	0.2178206	0.26514477	2.3996469	20	—	—
153805 2001 VO_{114}	16.9	X	144.03439	38.93524	25.81669	2.42409	0.1528463	0.23413328	2.6071176	20	4 19.9	21.0
153806 2001 VC_{116}	16.3	X	39.89808	344.78245	351.60752	1.76590	0.1793234	0.26144755	2.4222167	20	12 21.2	19.5
153807 2001 VJ_{116}	15.8	X	131.12764	123.60409	296.41362	3.27533	0.2187446	0.23158843	2.6261819	20	4 5.8	20.0
153808 2001 VS_{116}	15.7	X	123.29441	13.70397	65.58330	15.73818	0.0482436	0.23266579	2.6180686	20	4 11.8	19.5
153809 2001 VP_{118}	15.3	X	58.94268	33.76013	50.68136	7.27652	0.1620600	0.22243929	2.6977086	20	1 30.8	18.3
153810 2001 VK_{119}	15.8	X	172.85223	64.41805	275.20242	4.38486	0.2203366	0.22916920	2.6446318	20	2 5.9	20.3
153811 2001 VL_{119}	16.0	X	213.88934	32.55213	346.91478	3.13518	0.1594350	0.23941639	2.5686216	20	4 27.9	20.1
153812 2001 VJ_{120}	16.0	X	35.91923	198.43673	260.17846	5.68836	0.1733530	0.22137356	2.7063599	20	1 4.1	18.5
153813 2001 WE	15.9	X	181.66590	238.11487	178.75981	5.75112	0.1401122	0.23984599	2.5655535	20	5 17.4	20.0
153814 2001 WN_{5}	18.2	X	126.35481	44.57016	277.43480	1.91917	0.4670549	0.44007455	1.7117955	20	—	—
153815 2001 WC_{7}	16.1	X	107.21958	33.78215	216.22177	6.26468	0.0776174	0.25795468	2.4440333	20	11 4.7	19.6
153816 2001 WU_{8}	16.7	X	81.80392	200.86755	136.26200	3.17391	0.2162074	0.26928633	2.3749794	20	—	—
153817 2001 WP_{9}	16.2	X	92.81528	159.26466	179.51178	5.85761	0.1476165	0.26928444	2.3749905	20	—	—
153818 2001 WP_{10}	16.8	X	76.74640	338.22033	157.11932	1.54231	0.1393000	0.23389978	2.6088524	20	5 1.6	19.9
153819 2001 WX_{14}	16.3	X	148.48257	77.30117	287.11324	1.00935	0.2199987	0.22875137	2.6478512	20	2 15.8	20.5
153820 2001 WO_{20}	16.7	X	199.39869	207.08954	182.41698	4.22921	0.0697232	0.23849416	2.5752390	20	5 1.2	20.3
153821 2001 WS_{31}	16.5	X	31.02027	263.90407	210.02520	3.31449	0.1780051	0.22364266	2.6880228	20	1 14.8	19.0
153822 2001 WH_{37}	16.1	X	159.72909	354.69817	63.06818	14.43623	0.0710249	0.23717306	2.5847932	20	4 26.2	19.9
153823 2001 WU_{37}	16.9	X	139.36997	223.40295	205.14148	1.74695	0.0998167	0.23527743	2.5986585	20	4 15.2	20.6
153824 2001 WN_{45}	16.5	X	113.15591	107.41854	59.14817	0.97081	0.0465207	0.24558632	2.5254180	20	7 18.5	19.9
153825 2001 WX_{48}	16.6	X	291.23915	35.01727	277.88437	1.63412	0.0331122	0.23961463	2.5672047	20	5 17.8	19.9
153826 2001 WS_{50}	17.2	X	143.12492	302.21739	148.99628	1.17495	0.1274394	0.23824598	2.5770272	20	5 21.3	20.9
153827 2001 WF_{51}	16.2	X	101.85215	257.71506	240.56829	2.64851	0.1816459	0.23898254	2.5717294	20	6 12.7	19.8
153828 2001 WT_{70}	16.5	X	188.97423	212.72016	67.34482	8.08607	0.2019141	0.27727636	2.3291323	20	—	—
153829 2001 WQ_{76}	16.3	X	71.90581	43.80156	67.37108	3.15403	0.0979902	0.23046330	2.6347224	20	3 17.5	19.5
153830 2001 WQ_{79}	16.8	X	117.73054	166.45989	129.32646	2.41990	0.1258668	0.26676453	2.3899235	20	—	—
153831 2001 WC_{80}	16.7	X	122.54344	72.00276	88.36539	3.20517	0.0891858	0.24379157	2.5377973	20	7 26.4	20.3
153832 2001 WW_{100}	16.2	X	172.68755	12.95368	255.56229	1.80190	0.1762864	0.27077568	2.3662626	20	—	—
153833 2001 XB_{4}	15.0	X	8.90313	91.44216	53.26234	24.88861	0.2833706	0.21677945	2.7444626	20	1 2.7	17.8
153834 2001 XD_{6}	16.6	X	206.71554	302.30923	102.96332	2.83357	0.1709621	0.24044695	2.5612769	20	5 24.9	20.6
153835 2001 XD_{10}	15.9	X	183.01665	25.60940	24.41932	4.14679	0.1720285	0.23695193	2.5864011	20	5 8.2	20.2
153836 2001 XB_{12}	15.7	X	18.03134	140.82860	349.49527	11.57046	0.1403432	0.22368392	2.6876923	20	1 17.6	18.7
153837 2001 XD_{13}	15.4	X	40.68801	13.92367	331.43287	11.20887	0.2501692	0.26164780	2.4209807	20	—	—
153838 2001 XG_{17}	15.9	X	122.41256	60.75277	39.39225	4.54691	0.1861431	0.23334123	2.6130140	20	5 15.9	19.9
153839 2001 XS_{20}	15.1	X	10.91067	226.15227	309.88220	12.21657	0.1953007	0.22421555	2.6834421	20	2 27.1	17.7
153840 2001 XZ_{20}	15.3	X	220.30471	16.47002	18.36792	4.75892	0.1529353	0.23941599	2.5686245	20	5 24.3	19.3

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153841 2001 XL_{23}	15.2	X	84.80878	338.19021	62.65636	10.61284	0.2229890	0.22023821	2.7156530	20	1 24.6	18.6
153842 2001 XT_{30}	16.6	X	52.97924	219.35258	139.87077	8.99714	0.5662612	0.21582450	2.7525521	20	—	—
153843 2001 XF_{32}	16.7	X	93.06655	13.99979	281.61279	0.51977	0.1877461	0.26456882	2.4031282	20	12 24.7	20.6
153844 2001 XV_{36}	15.2	X	68.22954	336.07240	52.30209	16.42368	0.1885739	0.21879952	2.7275443	20	—	—
153845 2001 XX_{38}	15.6	X	106.77537	23.88949	19.63724	9.96076	0.1916414	0.22559886	2.6724615	20	2 22.8	19.4
153846 2001 XL_{42}	15.3	X	8.57359	103.31136	349.04354	10.41016	0.0900297	0.21460563	2.7629645	20	—	—
153847 2001 XU_{42}	15.7	X	52.95586	50.65931	59.61133	13.95780	0.1371806	0.22310735	2.6923208	20	2 27.2	19.0
153848 2001 XY_{43}	15.1	X	138.63988	131.32554	300.94945	17.06758	0.1190454	0.17817080	3.1278436	20	4 15.1	20.3
153849 2001 XC_{45}	15.2	X	89.95172	54.40414	324.87851	12.28814	0.2056432	0.21825116	2.7321110	20	1 1.3	18.7
153850 2001 XS_{46}	15.4	X	74.74609	25.42660	3.92172	8.29177	0.1987137	0.21627059	2.7487658	20	—	—
153851 2001 XL_{47}	15.3	X	77.37584	105.52488	76.25052	14.48827	0.1452089	0.23325923	2.6136263	20	7 5.9	18.9
153852 2001 XH_{52}	16.3	X	235.51979	161.58235	208.53993	1.53502	0.1933566	0.24198635	2.5504030	20	5 5.6	20.3
153853 2001 XP_{52}	16.0	X	48.89857	357.64505	78.31654	9.87446	0.1196492	0.22110630	2.7085403	20	—	—
153854 2001 XS_{52}	16.0	X	186.30142	242.49048	185.07063	1.94206	0.1156834	0.24046196	2.5611703	20	6 3.9	19.8
153855 2001 XK_{53}	15.5	X	45.03166	287.76035	249.51035	12.20259	0.1066128	0.23350725	2.6117752	20	5 3.5	18.5
153856 2001 XD_{54}	16.0	X	36.29992	189.76198	172.15101	1.21703	0.1994580	0.26431649	2.4046574	20	—	—
153857 2001 XJ_{62}	15.6	X	27.77543	56.00068	94.94171	14.06469	0.1353462	0.22489056	2.6780698	20	3 8.1	18.7
153858 2001 XE_{64}	15.7	X	142.69930	259.71768	142.57659	2.76717	0.2283635	0.22954140	2.6417722	20	3 29.1	20.0
153859 2001 XB_{65}	15.5	X	33.29391	208.57605	272.64983	9.30805	0.2051184	0.22129706	2.7069836	20	1 29.6	18.1
153860 2001 XE_{65}	15.7	X	217.64727	286.03311	101.98137	3.94033	0.1754934	0.23844009	2.5756283	20	5 13.6	19.7
153861 2001 XL_{69}	15.8	X	170.89332	253.34469	178.18110	3.51368	0.0557824	0.24063049	2.5599743	20	5 23.2	19.3
153862 2001 XK_{71}	15.6	X	196.87825	207.15189	177.69057	6.18795	0.1279337	0.23677580	2.5876836	20	4 21.8	19.6
153863 2001 XV_{71}	16.6	X	53.59810	279.16506	209.53868	1.35004	0.2666858	0.22745931	2.6578690	20	4 4.6	19.0
153864 2001 XT_{72}	15.5	X	299.52420	199.81949	77.06785	16.35878	0.0878726	0.23676921	2.5877316	20	4 11.5	19.2
153865 2001 XX_{74}	16.0	X	127.80710	6.21867	92.43381	5.17562	0.0915762	0.23841228	2.5758286	20	5 11.7	19.6
153866 2001 XQ_{78}	16.0	X	118.16253	353.51522	113.14250	8.87835	0.1496996	0.23538549	2.5978631	20	5 19.0	19.9
153867 2001 XC_{79}	16.5	X	104.69904	242.45749	176.17258	5.77920	0.2645803	0.22835577	2.6509084	20	3 15.7	20.2
153868 2001 XR_{83}	15.9	X	48.38058	212.78901	234.71411	9.34996	0.2262054	0.22128995	2.7070415	20	1 15.9	18.5
153869 2001 XE_{85}	15.4	X	232.55117	238.24099	149.58526	3.90692	0.1918648	0.24094681	2.5577333	20	5 26.2	19.4
153870 2001 XD_{87}	15.3	X	270.02400	115.54857	236.08260	3.57536	0.1831990	0.24195375	2.5506320	20	5 19.4	18.9
153871 2001 XQ_{88}	15.9	X	256.88188	226.57145	140.33632	3.42107	0.1863378	0.24216400	2.5491555	20	5 24.8	19.6
153872 2001 XC_{90}	15.7	X	341.64339	173.89887	60.37462	15.84854	0.0448290	0.23620903	2.5918213	20	4 17.7	19.1
153873 2001 XY_{91}	16.1	X	349.30840	116.09228	56.62443	17.82129	0.1407948	0.22539481	2.6740741	20	1 25.7	19.5
153874 2001 XN_{102}	17.1	X	338.56501	75.96606	93.31657	24.13062	0.0590630	0.38268665	1.8789152	20	—	—
153875 2001 XL_{103}	16.7	X	200.19002	351.40115	265.40898	20.85777	0.0550497	0.37539169	1.9031789	20	—	—
153876 2001 XR_{121}	16.7	X	190.12850	238.45583	195.42561	1.24809	0.0946082	0.24275095	2.5450448	20	6 16.7	20.5
153877 2001 XB_{131}	16.0	X	49.34313	58.16801	119.65528	4.65259	0.1054541	0.23486397	2.6017074	20	5 14.5	19.0
153878 2001 XM_{141}	16.3	X	310.50565	178.66220	147.75376	2.44185	0.1960173	0.24732727	2.5135530	20	6 11.5	18.7
153879 2001 XY_{141}	16.4	X	97.36346	351.52452	81.27759	10.09992	0.0588913	0.22797952	2.6538243	20	2 29.0	20.1
153880 2001 XG_{148}	15.7	X	201.76242	276.88331	134.01898	3.11618	0.0199759	0.23901537	2.5714939	20	6 3.4	19.1
153881 2001 XH_{148}	15.7	X	11.68718	196.19341	128.14192	3.44261	0.1885700	0.25430509	2.4673609	20	10 27.6	18.3
153882 2001 XW_{148}	16.0	X	110.45153	247.89125	124.60775	4.14570	0.0850777	0.22073677	2.7115624	20	—	—
153883 2001 XQ_{153}	16.3	X	168.07415	105.24151	253.73946	1.21795	0.1361796	0.22803196	2.6534173	20	2 21.0	20.3
153884 2001 XO_{158}	15.3	X	142.67815	180.00598	262.02717	8.72381	0.0504015	0.23381588	2.6094764	20	4 29.9	19.1
153885 2001 XN_{163}	15.8	X	216.54557	244.10081	153.28279	2.46462	0.1127534	0.24011074	2.5636673	20	5 28.0	19.6
153886 2001 XR_{171}	15.8	X	353.01707	256.71762	274.66789	2.38867	0.0179901	0.22450408	2.6811425	20	2 6.7	19.3
153887 2001 XC_{172}	15.5	X	230.92067	286.73592	95.71210	4.56516	0.2529563	0.24129597	2.5552653	20	5 13.6	19.7
153888 2001 XU_{178}	16.0	X	37.52552	335.90231	177.75150	1.66335	0.1290279	0.22553068	2.6730000	20	3 22.4	18.6
153889 2001 XJ_{185}	15.6	X	352.83261	18.25140	103.32427	13.84062	0.1049603	0.21587777	2.7520993	20	—	—
153890 2001 XL_{188}	15.2	X	20.33916	301.52606	271.06265	12.48405	0.1223668	0.23037952	2.6353611	20	5 12.3	18.1
153891 2001 XZ_{193}	15.8	X	41.90564	355.70151	108.70968	5.96004	0.0709401	0.21922170	2.7240413	20	1 20.6	19.2
153892 2001 XE_{196}	16.1	X	95.67968	296.10319	115.15970	3.12652	0.1400516	0.22080221	2.7110266	20	2 7.8	19.6
153893 2001 XC_{197}	15.4	X	105.70430	358.72478	116.19450	10.91955	0.0945089	0.22953021	2.6418581	20	5 9.9	19.2
153894 2001 XT_{198}	16.5	X	111.29284	323.18395	132.05277	3.15756	0.1748657	0.22926288	2.6439113	20	4 28.4	20.4
153895 2001 XF_{206}	16.2	X	44.02673	210.34078	131.67985	5.44439	0.1749889	0.26243380	2.4161443	20	—	—
153896 2001 XT_{206}	15.8	X	258.40568	154.36928	195.97829	4.41441	0.2846441	0.24380135	2.5377294	20	4 23.9	19.8
153897 2001 XV_{206}	16.3	X	184.14031	215.91317	180.65069	3.62556	0.1474090	0.23630987	2.5910839	20	4 23.7	20.3
153898 2001 XT_{210}	15.7	X	334.84197	41.65347	107.13493	11.69939	0.2073540	0.21641960	2.7475040	20	—	—
153899 2001 XJ_{215}	15.9	X	99.68128	244.49074	174.38581	4.12715	0.2637117	0.22460409	2.6803465	20	3 10.5	19.7
153900 2001 XZ_{216}	16.1	X	342.38170	143.35496	83.38452	8.66013	0.1438427	0.23110934	2.6298101	20	3 28.4	19.1
153901 2001 XB_{219}	16.4	X	105.23325	137.45240	30.92219	2.21966	0.1390244	0.24238379	2.5476143	20	7 22.3	20.0
153902 2001 XV_{221}	16.6	X	279.31866	104.77638	283.69089	1.14251	0.0640238	0.25025792	2.4938912	20	8 11.5	19.5
153903 2001 XR_{227}	16.3	X	207.90308	338.72291	16.59750	1.60251	0.0281588	0.23328630	2.6134241	20	3 28.3	19.9
153904 2001 XV_{232}	16.2	X	159.96882	56.24258	22.43689	4.04111	0.1170723	0.23732478	2.5836915	20	5 21.0	20.0
153905 2001 XC_{234}	16.5	X	168.62529	38.36195	60.33808	3.77897	0.1256872	0.24062982	2.5599791	20	6 26.2	20.4
153906 2001 XM_{234}	16.2	X	144.39424	62.27116	306.52368	5.20158	0.1087891	0.22626181	2.6672386	20	2 6.8	20.1
153907 2001 XK_{236}	16.3	X	78.32972	294.40003	32.27025	3.80937	0.1953258	0.26490476	2.4010961	20	—	—
153908 2001 XA_{237}	16.2	X	198.24654	297.60682	47.73160	3.20396	0.2131333	0.23256307	2.6188395	20	3 5.8	20.6
153909 2001 XF_{238}	15.5	X	203.97964	73.08240	327.37694	2.50647	0.1621839	0.23848744	2.5752875	20	5 15.3	19.6
153910 2001 XO_{239}	15.5	X	50.45833	103.96232	33.68995	3.95578	0.0909801	0.22669598	2.6638321	20	3 19.6	18.6
153911 2001 XL_{241}	16.2	X	6.56896	174.86825	94.11568	3.85880	0.0490220	0.24460924	2.5321386	20	7 8.8	19.2
153912 2001 XG_{243}	15.9	X	49.89914	286.52654	108.93803	3.20279	0.0787061	0.21203681	2.7852352	20	—	—
153913 2001 XO_{246}	16.3	X	196.80082	53.91327	37.06625	4.49070	0.1295266	0.24412356	2.5354960	20	7 15.9	20.2
153914 2001 XV_{248}	16.1	X	152.57109	269.96209	180.05478	12.00329	0.1232246	0.23827619	2.5768093	20	5 30.8	20.3
153915 2001 XE_{252}	16.1	X	64.35448	275.52628	189.95907	1.53742	0.0524870	0.22420093	2.6835588	20	2 20.7	19.6
153916 2001 XA_{257}	15.9	X	159.12008	254.49524	134.69951	14.23231	0.1783376	0.23286329	2.6165881	20	3 27.7	20.3
153917 2001 YK_{9}	15.4	X	42.91630	131.79796	37.99351	5.49995	0.1588850	0.22887088	2.6469294	20	4 27.6	18.2
153918 2001 YO_{12}	16.3	X	105.11094	45.84411	23.22549	9.40482	0.0803732	0.22817598	2.6523008	20	3 7.4	19.9
153919 2001 YU_{18}	15.9	X	50.81804	95.75863	356.79949	4.55395	0.0821050	0.21954727	2.7213476	20	1 20.1	19.2
153920 2001 YW_{20}	16.8	X	145.98157	4.47997	31.42167	2.60848	0.0732815	0.23160101	2.6260868	20	3 10.5	20.6

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
153921 2001 YZ_{22}	17.0	X	154.18457	22.27776	16.55046	1.09883	0.1218010	0.23285531	2.6166479	20	3 26.5	20.9
153922 2001 YQ_{26}	16.1	X	234.05480	33.00850	2.14970	2.09350	0.0243974	0.24249121	2.5468618	20	6 24.0	19.4
153923 2001 YW_{41}	15.7	X	84.38103	42.63832	71.67067	14.61102	0.1007686	0.23010039	2.6374920	20	4 14.7	19.3
153924 2001 YF_{53}	15.9	X	168.27220	30.28663	37.53404	2.25885	0.0288218	0.23581226	2.5947278	20	5 13.2	19.3
153925 2001 YT_{54}	16.8	X	118.70932	37.84896	4.77531	1.77677	0.2133558	0.22776319	2.6555044	20	3 4.7	20.6
153926 2001 YL_{59}	15.9	X	119.25476	345.57719	67.15436	2.70048	0.0957600	0.22714792	2.6602975	20	3 4.1	19.5
153927 2001 YT_{59}	16.4	X	352.20894	11.46562	12.36874	2.70191	0.2023919	0.25916068	2.4364452	20	12 19.7	18.7
153928 2001 YB_{61}	15.7	X	192.95739	309.44644	73.21069	2.83814	0.1242824	0.23408538	2.6074732	20	4 15.0	19.7
153929 2001 YJ_{63}	15.9	X	63.52881	23.79022	81.75873	4.81542	0.1073631	0.22472594	2.6793776	20	2 28.9	19.1
153930 2001 YG_{66}	15.0	X	86.62259	181.74216	294.92176	7.92792	0.1118819	0.17519518	3.1631608	20	4 14.7	19.5
153931 2001 YA_{68}	15.9	X	102.40507	319.17552	89.82666	3.50602	0.0672795	0.22251956	2.6970599	20	2 3.1	19.4
153932 2001 YJ_{70}	15.2	X	21.13629	231.81742	296.84335	10.46217	0.1368545	0.22516287	2.6759102	20	3 7.9	18.2
153933 2001 YR_{71}	15.8	X	238.09100	23.34419	346.39023	3.23021	0.1444152	0.23810978	2.5780097	20	5 10.8	19.8
153934 2001 YD_{74}	16.1	X	117.40117	31.61110	55.24995	2.71159	0.0965381	0.22939804	2.6428727	20	4 14.0	19.7
153935 2001 YC_{80}	15.7	X	308.66360	56.79242	96.19970	9.65626	0.2533515	0.21109553	2.7935087	20	—	—
153936 2001 YJ_{89}	15.9	X	0.63018	169.98238	68.96664	2.97022	0.0743127	0.23214196	2.6220057	20	5 16.7	18.9
153937 2001 YG_{97}	15.3	X	172.12117	327.06625	79.04848	14.35514	0.1636445	0.23609945	2.5926232	20	4 29.3	19.7
153938 2001 YJ_{105}	16.2	X	48.19438	337.70791	163.07895	1.07516	0.0785209	0.22562582	2.6722485	20	3 17.9	19.4
153939 2001 YW_{110}	16.1	X	262.70804	260.19558	102.83722	0.70391	0.1407497	0.24058252	2.5603146	20	5 31.8	19.4
153940 2001 YD_{118}	15.4	X	309.20164	219.29837	309.34561	7.63515	0.0824917	0.21330700	2.7741673	20	—	—
153941 2001 YM_{121}	15.8	X	101.97985	85.44493	53.57233	15.01846	0.1257274	0.23647377	2.5898865	20	6 4.6	19.5
153942 2001 YD_{122}	15.7	X	52.48434	318.13534	344.38899	6.04764	0.0955365	0.25714497	2.4491612	20	11 7.5	18.9
153943 2001 YH_{127}	15.5	X	221.08360	355.46401	21.11564	5.60004	0.1560155	0.23764333	2.5813821	20	5 1.5	19.4
153944 2001 YN_{127}	16.3	X	196.91270	353.55244	19.84156	4.80425	0.1937478	0.23411261	2.6072710	20	4 5.9	20.6
153945 2001 YP_{127}	15.7	X	189.50321	29.81588	325.86085	5.24578	0.3154260	0.23263343	2.6183114	20	3 9.8	20.7
153946 2001 YS_{129}	15.8	X	148.99324	335.39898	35.39539	6.57316	0.0357791	0.22466845	2.6798346	20	2 9.9	19.6
153947 2001 YG_{131}	15.3	X	234.97947	4.65669	351.08340	14.15903	0.1273037	0.23893759	2.5720519	20	4 16.4	19.4
153948 2001 YX_{134}	16.2	X	261.08022	14.68798	263.44154	2.82650	0.0256567	0.22956729	2.6415736	20	2 22.5	19.7
153949 2001 YY_{148}	15.6	X	291.64018	350.24560	287.09217	11.62714	0.1592856	0.22885653	2.6470400	20	3 6.9	19.5
153950 2001 YL_{156}	16.1	X	91.21865	70.70155	321.81532	13.64558	0.1632564	0.22068584	2.7119795	20	1 14.0	19.5
153951 2002 AC_{3}	18.6	X	106.44708	215.09351	314.44321	15.47186	0.3421236	0.39597892	1.8366286	20	8 18.1	21.6
153952 2002 AZ_{5}	16.4	X	146.96870	77.22275	349.20571	1.26242	0.0988740	0.23216516	2.6218309	20	4 20.6	20.3
153953 2002 AD_{9}	16.8	X	314.94636	9.77668	2.58180	31.01718	0.8088238	0.41733716	1.7734189	20	4 17.9	20.1
153954 2002 AL_{9}	16.5	X	80.89648	334.99800	299.12262	16.86639	0.0669173	0.35734254	1.9667368	20	11 21.9	19.2
153955 2002 AA_{20}	16.1	X	129.03954	234.19129	182.71342	7.42049	0.3129029	0.22938411	2.6429797	20	4 10.9	20.6
153956 2002 AG_{27}	16.1	X	59.97086	297.83850	156.29043	11.83547	0.1554113	0.22381084	2.6866761	20	2 10.3	19.2
153957 2002 AB_{29}	17.8	X	189.57337	73.20176	89.71408	46.53202	0.7585725	0.24461480	2.5321003	20	10 7.2	24.5
153958 2002 AM_{31}	18.3	X	177.39378	197.92795	144.37855	4.64462	0.4514705	0.44345059	1.7030964	20	2 8.6	21.1
153959 2002 AC_{34}	16.9	X	71.18396	125.31442	272.20207	2.18853	0.2001518	0.21719108	2.7409938	20	—	—
153960 2002 AT_{35}	16.4	X	324.70719	47.93561	104.26604	4.43826	0.0691665	0.21504385	2.7592096	20	—	—
153961 2002 AZ_{39}	15.5	X	231.82146	26.70635	141.29235	9.34751	0.1526621	0.20098965	2.8863805	20	11 22.3	19.8
153962 2002 AT_{40}	15.9	X	95.38020	297.21212	166.92249	2.22156	0.1698313	0.22696587	2.6617198	20	4 19.9	19.6
153963 2002 AW_{41}	16.0	X	92.97653	323.17628	154.80630	3.43787	0.1027519	0.22764176	2.6564486	20	4 25.8	19.5
153964 2002 AP_{42}	15.9	X	287.61834	205.27101	142.85613	3.44393	0.3278624	0.24493479	2.5298944	20	5 16.1	19.3
153965 2002 AV_{47}	15.9	X	288.53260	272.81495	293.57913	3.66232	0.0589155	0.21631173	2.7484172	20	—	—
153966 2002 AU_{49}	15.8	X	118.19870	283.20210	116.81383	2.92603	0.1014739	0.22199358	2.7013183	20	2 16.4	19.5
153967 2002 AC_{53}	14.6	X	125.45066	169.26000	280.24722	9.72792	0.0588523	0.17502973	3.1651539	20	4 20.4	19.4
153968 2002 AE_{58}	16.0	X	85.97004	268.39491	139.61237	3.07802	0.2141361	0.21908283	2.7251923	20	2 1.0	19.0
153969 2002 AL_{59}	15.4	X	34.63567	307.82156	135.07270	5.85654	0.1983902	0.21510216	2.7587110	20	—	—
153970 2002 AJ_{79}	16.0	X	184.58901	260.32622	102.38134	4.13716	0.0992633	0.22802764	2.6534509	20	3 13.8	20.0
153971 2002 AT_{80}	15.8	X	101.12382	342.80608	100.55221	15.62703	0.1520374	0.22967097	2.6407785	20	4 5.2	19.8
153972 2002 AD_{81}	15.6	X	44.97644	278.07237	237.36938	11.48756	0.0885789	0.22949858	2.6421008	20	3 29.3	19.0
153973 2002 AH_{82}	15.8	X	130.73288	283.45373	139.25817	6.17092	0.1392837	0.23055563	2.6340189	20	4 5.0	19.7
153974 2002 AV_{87}	15.6	X	77.62356	230.21749	175.17059	3.90333	0.1241694	0.21868283	2.7285144	20	1 2.5	18.8
153975 2002 AV_{93}	16.3	X	163.88685	3.85125	52.98892	2.25144	0.1392556	0.23267604	2.6179918	20	4 29.1	20.4
153976 2002 AX_{101}	16.4	X	331.30058	192.53296	325.00750	3.39892	0.1468155	0.21530944	2.7569401	20	—	—
153977 2002 AG_{106}	16.5	X	183.29733	15.73917	35.03954	1.58111	0.1833796	0.23452835	2.6041889	20	5 9.9	20.9
153978 2002 AE_{111}	15.8	X	333.53371	179.49612	341.72831	4.25290	0.0534692	0.21548904	2.7554081	20	—	—
153979 2002 AQ_{111}	16.0	X	60.32041	349.51164	117.80646	2.82290	0.0386964	0.22101946	2.7092497	20	2 17.6	19.5
153980 2002 AG_{112}	14.6	X	125.37833	110.92692	306.60454	16.17797	0.0787847	0.17033898	3.2229978	20	3 11.0	19.6
153981 2002 AO_{119}	15.7	X	33.46263	344.73226	118.19903	15.16584	0.1677272	0.21718641	2.7410331	20	1 6.9	18.4
153982 2002 AM_{120}	15.5	X	96.82831	88.42748	326.13504	3.67757	0.2734881	0.22232533	2.6986305	20	3 2.9	19.0
153983 2002 AC_{121}	15.8	X	335.08184	106.28251	67.72932	3.27741	0.1397715	0.21624854	2.7489526	20	1 3.7	19.1
153984 2002 AF_{131}	15.7	X	23.58212	331.50444	107.23409	8.68874	0.1752053	0.21302745	2.7765937	20	—	—
153985 2002 AT_{132}	16.4	X	66.16559	330.53056	106.68372	3.54069	0.0767648	0.22047222	2.7137310	20	1 21.4	19.8
153986 2002 AT_{139}	16.5	X	118.94498	313.95277	136.89270	3.72648	0.1873805	0.23367512	2.6105243	20	5 2.5	20.4
153987 2002 AS_{150}	16.2	X	53.87498	65.31111	10.72670	3.23018	0.1778323	0.21694400	2.7430746	20	1 10.9	19.1
153988 2002 AF_{153}	15.3	X	349.04374	53.90494	134.20907	5.74230	0.0812011	0.21963145	2.7206522	20	2 19.2	18.7
153989 2002 AB_{157}	15.9	X	311.90007	63.69707	197.66595	2.98808	0.0269696	0.22682841	2.6627951	20	4 8.2	19.4
153990 2002 AH_{157}	15.8	X	111.18653	106.56120	294.80094	4.99512	0.0550501	0.21917615	2.7244187	20	2 1.9	19.3
153991 2002 AY_{162}	15.4	X	31.35929	340.22332	149.09422	10.20719	0.1002120	0.21889990	2.7267104	20	2 6.1	18.5
153992 2002 AT_{164}	15.5	X	8.10271	187.54928	299.59547	7.78760	0.0461916	0.21427943	2.7657679	20	1 2.6	18.9
153993 2002 AT_{165}	15.8	X	129.33683	188.61459	147.30032	5.81278	0.0433672	0.21094521	2.7948356	20	—	—
153994 2002 AM_{169}	16.1	X	98.56479	133.10418	358.10662	0.74114	0.1525728	0.17753860	3.1352645	20	5 26.6	20.7
153995 2002 AK_{173}	16.3	X	34.85190	36.29175	29.93417	1.63890	0.1443902	0.21333622	2.7739140	20	—	—
153996 2002 AZ_{174}	15.4	X	252.25419	130.93271	114.19274	13.46892	0.1621320	0.21388222	2.7691911	20	—	—
153997 2002 AV_{176}	15.9	X	245.12787	172.77699	326.73210	8.65988	0.1644695	0.19916508	2.9039820	20	10 25.3	20.2
153998 2002 AC_{181}	15.0	X	76.74631	44.82282	41.46783	13.56357	0.1508863	0.22424112	2.6832381	20	3 5.9	18.5
153999 2002 AC_{183}	15.1	X	115.39332	46.26065	2.59735	13.20052	0.1887906	0.22463586	2.6800938	20	3 8.3	19.0
154000 2002 AM_{187}	15.5	X	25.94851	72.53859	17.90457	9.14684	0.2078395	0.21493697	2.7601242	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154001 2002 AY_{187}	15.7	X	167.96597	250.64328	177.87765	15.03184	0.1123970	0.23809629	2.5781071	20	5 19.5	19.9
154002 2002 AD_{193}	15.3	X	53.06873	356.06893	314.50826	7.60100	0.0920455	0.19597942	2.9353669	20	11 4.9	19.6
154003 2002 AL_{197}	16.2	X	141.02852	62.95938	328.88368	1.01945	0.0972507	0.22487482	2.6781948	20	3 1.9	20.2
154004 Haolei	15.3	X	224.87702	301.37458	94.77553	12.86099	0.1847265	0.24644124	2.5195740	20	5 30.9	19.4
154005 Hughharris	15.9	X	209.37117	285.42393	120.97799	15.77638	0.1231003	0.24313255	2.5423811	20	6 3.4	20.0
154006 Suzannehawley	16.2	X	87.98436	309.97517	166.37695	13.35782	0.1200341	0.23268813	2.6179011	20	4 21.4	19.8
154007 2002 BY	17.9	X	105.89693	23.70253	214.27342	2.72449	0.3466065	0.40207936	1.8180041	20	11 17.5	20.8
154008 2002 BU_{7}	15.3	X	335.49690	205.84066	316.09545	12.79443	0.1594718	0.21435076	2.7651543	20	—	—
154009 2002 BE_{16}	15.7	X	289.49354	44.56247	133.91528	10.09729	0.1220484	0.20950655	2.8076156	20	—	—
154010 2002 BZ_{18}	16.1	X	300.02059	89.96092	24.40901	6.32455	0.2099829	0.20495111	2.8490662	20	12 16.3	19.1
154011 2002 BC_{19}	15.8	X	43.89657	34.15458	23.20470	8.41665	0.1905750	0.21358111	2.7717932	20	—	—
154012 2002 BX_{22}	15.6	X	67.38068	95.38063	359.23237	11.27648	0.1636904	0.22338640	2.6900782	20	2 28.5	18.7
154013 2002 BP_{24}	15.4	X	314.10290	153.61058	98.90896	13.98603	0.1498214	0.22406767	2.6846226	20	3 20.1	19.0
154014 2002 BC_{28}	15.6	X	18.36067	349.07102	190.34838	8.95491	0.0799276	0.22444542	2.6816096	20	3 22.8	18.6
154015 2002 BU_{28}	16.2	X	32.15583	81.92568	345.52528	12.39258	0.1948525	0.21406922	2.7675782	20	—	—
154016 2002 BL_{29}	15.5	X	281.38189	127.92758	89.89486	13.17953	0.2198105	0.21202099	2.7853738	20	—	—
154017 2002 BE_{30}	15.8	X	358.80738	66.60024	41.51588	8.63541	0.2337233	0.21114595	2.7930639	20	—	—
154018 2002 BS_{30}	15.7	X	55.23435	95.11247	344.34792	13.90662	0.1948736	0.22062381	2.7124878	20	1 22.9	18.6
154019 2002 CZ_{9}	22.0	X	311.14960	80.82698	142.87888	4.97126	0.3600911	0.64581317	1.3255561	20	—	—
154020 2002 CA_{10}	19.1	X	262.92101	222.16870	145.35644	12.12420	0.5897159	0.51512690	1.5412032	20	4 22.4	22.0
154021 2002 CM_{27}	16.0	X	56.29686	12.11569	57.28360	5.19094	0.1027936	0.21709006	2.7418441	20	—	—
154022 2002 CX_{28}	15.7	X	81.95376	54.36643	345.22560	11.72557	0.2353222	0.21799962	2.7342122	20	1 21.9	19.0
154023 2002 CN_{29}	15.6	X	294.45023	197.87221	43.19094	5.25818	0.0233395	0.22123709	2.7074727	20	2 22.5	19.2
154024 2002 CZ_{31}	15.4	X	3.93569	170.21172	353.32636	8.40838	0.0959200	0.21936772	2.7228324	20	2 10.4	18.7
154025 2002 CJ_{37}	15.5	X	170.91710	164.10718	142.70337	6.84496	0.0650511	0.21072178	2.7968109	20	—	—
154026 2002 CW_{38}	15.5	X	282.12870	142.71546	77.70494	2.81024	0.0522634	0.21419644	2.7664822	20	1 7.3	19.3
154027 2002 CU_{42}	15.2	X	42.36793	351.21326	74.75623	16.58862	0.2500953	0.21551417	2.7551939	20	—	—
154028 2002 CV_{42}	15.3	X	9.51241	340.38112	173.13227	12.35618	0.1382082	0.21721507	2.7407920	20	1 30.2	18.6
154029 2002 CY_{46}	16.4	X	284.04214	319.38979	346.16422	44.19358	0.4626687	0.37931650	1.8900279	20	3 2.6	19.6
154030 2002 CT_{48}	15.6	X	8.51549	336.01834	175.73401	8.41825	0.0851050	0.21864361	2.7288407	20	1 29.5	19.0
154031 2002 CM_{49}	15.5	X	71.26590	172.59765	229.00865	5.60040	0.0109681	0.21173330	2.7878962	20	—	—
154032 2002 CA_{54}	15.9	X	36.28648	328.48179	183.88143	3.23267	0.1190810	0.22106849	2.7088491	20	3 17.9	18.9
154033 2002 CJ_{57}	15.6	X	10.18732	196.65245	279.64177	2.60322	0.0987425	0.21204811	2.7851363	20	—	—
154034 2002 CF_{58}	15.8	X	246.28812	325.11466	343.33162	4.34574	0.1345871	0.22177053	2.7031293	20	3 5.9	19.9
154035 2002 CV_{59}	17.3	X	119.66442	347.12332	13.09895	49.05266	0.5320664	0.74046434	1.2100406	20	—	—
154036 2002 CL_{69}	16.0	X	227.76012	299.34554	318.40534	2.78751	0.0691007	0.21294816	2.7772829	20	—	—
154037 2002 CW_{69}	16.2	X	238.24817	296.70321	59.06546	2.17598	0.0125933	0.23040659	2.6351547	20	5 8.2	19.7
154038 2002 CY_{73}	16.4	X	286.30461	47.53739	29.31611	2.06293	0.0784862	0.19627062	2.9324629	20	10 16.7	20.3
154039 2002 CY_{79}	15.5	X	9.77845	1.70651	25.99229	2.21297	0.1058174	0.20082737	2.8879352	20	12 20.1	19.1
154040 2002 CH_{80}	16.0	X	301.47421	238.81685	357.55227	4.78003	0.0553909	0.21913532	2.7247571	20	2 19.7	19.7
154041 2002 CK_{86}	15.8	X	160.06504	307.32455	11.17451	3.62328	0.0896900	0.21235223	2.7824765	20	—	—
154042 2002 CK_{90}	15.7	X	268.20171	206.90195	23.02069	3.93746	0.0406494	0.21299647	2.7768629	20	1 4.5	19.6
154043 2002 CD_{91}	16.3	X	267.64793	77.01173	69.94509	2.38873	0.1326458	0.20166143	2.8799668	20	12 12.5	19.9
154044 2002 CZ_{93}	15.7	X	214.09206	218.28607	66.01284	3.07220	0.0191694	0.21300063	2.7768268	20	1 9.2	19.6
154045 2002 CD_{98}	15.6	X	347.02749	99.85024	25.00385	1.88275	0.1734758	0.21059783	2.7979082	20	—	—
154046 2002 CX_{104}	15.4	X	206.94477	136.45652	100.95086	3.25319	0.0119319	0.20314638	2.8659151	20	—	—
154047 2002 CG_{116}	15.7	X	42.49088	23.01007	311.39606	0.99719	0.0174992	0.19681759	2.9270273	20	11 13.6	19.7
154048 2002 CL_{119}	15.5	X	259.81107	296.80162	307.53310	8.42857	0.1144868	0.21528589	2.7571411	20	1 5.5	19.6
154049 2002 CQ_{119}	15.8	X	305.64516	70.02887	149.15778	7.87179	0.0192544	0.22041605	2.7141920	20	2 6.7	19.5
154050 2002 CR_{120}	17.1	X	326.01435	251.27288	306.26292	1.46257	0.1508163	0.27167538	2.3610355	20	1 8.5	19.9
154051 2002 CQ_{121}	15.4	X	190.35687	4.51010	297.58420	8.60153	0.1314300	0.21427771	2.7657827	20	1 7.6	19.8
154052 2002 CX_{122}	16.5	X	13.05146	344.45897	160.57170	2.51803	0.1617129	0.21820956	2.7324582	20	1 25.1	19.2
154053 2002 CX_{129}	15.8	X	24.62147	285.00535	167.61220	9.29778	0.1186152	0.21247341	2.7814184	20	—	—
154054 2002 CP_{148}	15.6	X	81.07803	93.84879	156.35525	9.45927	0.0945879	0.18840340	3.0135395	20	9 28.8	19.9
154055 2002 CW_{150}	16.2	X	347.78205	285.28737	154.24029	2.25703	0.1357236	0.20520690	2.8466981	20	—	—
154056 2002 CN_{161}	16.4	X	217.57374	120.03827	352.16223	4.73612	0.0870761	0.24488630	2.5302284	20	9 8.8	19.7
154057 2002 CW_{161}	15.8	X	15.90390	107.10947	344.12670	13.31238	0.1618811	0.21290073	2.7776954	20	—	—
154058 2002 CX_{161}	15.7	X	173.81362	355.69274	69.40111	3.88474	0.1463964	0.23294497	2.6159764	20	5 19.4	19.9
154059 2002 CA_{168}	15.2	X	175.08716	267.76883	355.08450	12.34739	0.0793855	0.20297582	2.8675204	20	—	—
154060 2002 CK_{170}	15.7	X	358.51926	30.06169	79.64631	5.31052	0.1575288	0.20999191	2.8032877	20	—	—
154061 2002 CO_{175}	16.1	X	341.03061	224.34396	36.48622	3.43719	0.0197709	0.23208617	2.6224258	20	5 18.6	19.5
154062 2002 CR_{175}	15.9	X	234.42773	13.99562	350.89074	4.79856	0.2552386	0.23783312	2.5800087	20	4 22.0	20.2
154063 2002 CV_{176}	15.8	X	191.02576	194.62021	119.69423	3.21319	0.0523705	0.21776468	2.7361785	20	1 19.0	19.8
154064 2002 CB_{182}	16.3	X	261.26349	142.84762	336.02362	1.19333	0.0561974	0.19877777	2.9077530	20	11 7.9	20.1
154065 2002 CG_{182}	15.6	X	179.88382	333.68387	111.13673	4.63062	0.0545045	0.18138043	3.0908346	20	6 19.0	20.3
154066 2002 CV_{187}	16.1	X	201.58789	234.37225	54.77719	1.05167	0.0383011	0.21351393	2.7723745	20	—	—
154067 2002 CR_{190}	16.1	X	123.64292	82.07225	317.37564	0.39822	0.1008420	0.22114717	2.7082066	20	2 21.5	19.7
154068 2002 CG_{192}	15.6	X	233.50145	166.69621	122.64201	8.89418	0.0864101	0.21896898	2.7261369	20	2 2.8	19.5
154069 2002 CX_{197}	15.9	X	105.12681	40.32620	319.17601	2.85350	0.1080203	0.21059202	2.7979596	20	—	—
154070 2002 CK_{198}	15.9	X	164.16431	3.45972	333.00884	5.79550	0.1041833	0.21517484	2.7580897	20	1 21.9	20.1
154071 2002 CS_{198}	15.9	X	120.24984	48.01640	345.78787	5.61857	0.0305001	0.21747661	2.7385941	20	2 2.5	19.5
154072 2002 CV_{200}	16.6	X	266.94596	78.15682	64.41680	0.36834	0.0613392	0.20135865	2.8828531	20	12 15.4	20.5
154073 2002 CH_{208}	14.8	X	30.42899	143.98102	150.07950	16.63018	0.2642618	0.18434688	3.0575872	20	10 16.4	18.8
154074 2002 CN_{209}	15.8	X	193.55060	191.25111	56.78167	2.86380	0.0226004	0.20445840	2.8536415	20	—	—
154075 2002 CZ_{212}	15.8	X	230.56327	37.00929	106.39156	3.23570	0.0450450	0.19572938	2.9378664	20	11 2.7	19.9
154076 2002 CG_{222}	15.9	X	27.28302	121.55037	313.35521	4.09034	0.0523807	0.21094645	2.7948247	20	—	—
154077 2002 CV_{222}	15.7	X	180.17729	17.96727	293.76581	4.68926	0.0358947	0.21321494	2.7749657	20	1 3.7	19.5
154078 2002 CO_{223}	15.9	X	359.11309	273.39692	197.41606	3.63596	0.1582718	0.21104793	2.7939287	20	—	—
154079 2002 CJ_{224}	16.1	X	123.86747	38.01268	147.98363	5.90455	0.1842655	0.18344926	3.0675529	20	8 31.7	21.0
154080 2002 CS_{225}	15.5	X	149.49315	254.27998	155.26866	13.60057	0.1694695	0.22968273	2.6406884	20	4 11.5	19.8

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154081 2002 CY_{225}	16.4	X	109.93673	296.86942	166.75375	4.39015	0.0945620	0.22822771	2.6519000	20	4 27.3	20.0
154082 2002 CA_{227}	15.2	X	290.04245	143.01542	149.24909	13.64203	0.1521127	0.22764103	2.6564543	20	4 4.7	18.9
154083 2002 CQ_{227}	15.8	X	239.55305	86.92767	190.60456	7.96843	0.1571288	0.21590476	2.7518699	20	1 20.2	20.4
154084 2002 CD_{233}	16.6	X	336.83880	327.21036	147.10921	3.33348	0.1671050	0.20986632	2.8044060	20	—	—
154085 2002 CD_{237}	15.4	X	94.29815	159.52484	105.82465	2.89255	0.1385477	0.18881809	3.0091256	20	11 4.4	20.0
154086 2002 CL_{237}	15.1	X	63.22934	104.75631	164.48476	10.46547	0.0816234	0.18479299	3.0526643	20	9 28.2	19.3
154087 2002 CC_{241}	15.7	X	337.75587	125.87717	295.15626	2.26969	0.1237876	0.19853794	2.9100942	20	12 14.7	19.1
154088 2002 CE_{248}	14.9	X	290.97851	71.87707	164.94017	9.59348	0.1656183	0.21182758	2.7870690	20	1 21.9	19.2
154089 2002 CD_{279}	16.1	X	314.39966	92.29920	167.15562	5.88525	0.2173610	0.22241214	2.6979282	20	3 12.1	19.2
154090 2002 CE_{284}	15.9	X	164.60531	32.53858	309.61451	1.76532	0.0868137	0.21730036	2.7400748	20	1 26.5	19.9
154091 2002 CK_{285}	16.1	X	198.11396	199.06145	35.57403	0.23645	0.1570381	0.20431218	2.8550029	20	—	—
154092 2002 CP_{285}	15.8	X	109.43429	179.79965	171.93952	2.26449	0.0824009	0.21096479	2.7946627	20	—	—
154093 2002 CB_{289}	15.6	X	167.72590	196.51857	118.67924	2.99858	0.2265583	0.21244181	2.7816942	20	1 7.8	20.3
154094 2002 CS_{299}	15.5	X	126.98975	168.39858	35.82342	5.38989	0.0958335	0.18097631	3.0954341	20	9 21.5	20.2
154095 2002 CS_{309}	16.5	X	163.83424	87.12772	96.89429	0.90747	0.1264957	0.19040240	2.9924100	20	10 3.5	21.2
154096 2002 DE	16.2	X	172.05127	255.35451	355.17313	3.93726	0.0729643	0.20149675	2.8815358	20	—	—
154097 2002 DX_{6}	16.5	X	65.09909	89.84432	272.56808	0.92921	0.0778007	0.20352727	2.8623384	20	—	—
154098 2002 DK_{13}	16.0	X	46.39292	169.02671	252.98643	2.44141	0.0818586	0.21304329	2.7764561	20	—	—
154099 2002 DN_{16}	15.9	X	107.96290	189.19440	177.87319	4.48214	0.0827937	0.21094039	2.7948782	20	—	—
154100 2002 DR_{16}	16.3	X	255.34089	112.38946	30.94512	2.20695	0.0594039	0.19755108	2.9197776	20	11 30.2	20.2
154101 2002 DW_{17}	15.7	X	324.63401	35.84222	326.21384	9.43371	0.1108648	0.18867286	3.0106696	20	8 31.9	19.2
154102 2002 DY_{17}	15.5	X	39.68439	218.11705	158.65755	2.13472	0.1230375	0.20202326	2.8765271	20	—	—
154103 2002 EX_{3}	15.8	X	107.55523	143.83990	170.77595	5.03773	0.1118429	0.19913953	2.9042303	20	—	—
154104 2002 EG_{4}	16.0	X	328.25938	304.74505	163.68039	2.23286	0.0223997	0.20292059	2.8680407	20	—	—
154105 2002 EW_{4}	15.7	X	282.66758	267.22816	165.40560	9.60528	0.0996648	0.19216300	2.9741043	20	10 4.2	19.5
154106 2002 EK_{8}	15.8	X	264.70546	168.14383	71.22700	0.47402	0.0147739	0.21241486	2.7819295	20	1 14.6	19.5
154107 2002 EL_{10}	14.9	X	256.66490	334.90336	141.82090	11.18102	0.0544465	0.19161819	2.9797390	20	11 2.7	19.2
154108 2002 EJ_{16}	15.1	X	222.14354	351.13910	256.97989	7.14217	0.1520373	0.20495897	2.8489933	20	—	—
154109 2002 EW_{23}	16.1	X	18.27177	214.03762	177.60459	1.92402	0.0780936	0.19916507	2.9039821	20	—	—
154110 2002 EP_{24}	16.2	X	244.57674	24.29470	157.22343	1.35617	0.0869865	0.20030347	2.8929687	20	12 30.5	20.0
154111 2002 EH_{31}	15.2	X	67.40526	120.89005	105.95239	3.39389	0.1281780	0.17778180	3.1324046	20	8 15.9	19.6
154112 2002 EA_{34}	15.2	X	296.09062	359.95081	9.25883	8.81956	0.0865360	0.18367612	3.0650266	20	8 3.5	19.3
154113 2002 EW_{34}	15.2	X	139.66868	189.42787	140.81543	11.93759	0.0470405	0.20668691	2.8330923	20	—	—
154114 2002 EN_{39}	15.8	X	19.21806	243.67918	172.02695	2.08539	0.0605158	0.20325255	2.8649170	20	—	—
154115 2002 EE_{40}	15.6	X	192.71452	254.23390	356.86591	1.41586	0.1854870	0.19921570	2.9034900	20	—	—
154116 2002 EJ_{56}	15.9	X	95.54596	115.48836	206.05067	4.87575	0.0178992	0.20138055	2.8826441	20	—	—
154117 2002 EJ_{58}	15.6	X	309.70287	358.41123	169.65712	4.55298	0.0099238	0.20975280	2.8054177	20	—	—
154118 2002 EH_{61}	15.5	X	103.14975	295.80741	335.16226	9.72783	0.0056448	0.19341415	2.9612647	20	11 3.9	19.9
154119 2002 EN_{61}	15.5	X	82.79018	149.46406	172.82451	11.34874	0.0941925	0.19709733	2.9242572	20	12 26.1	20.1
154120 2002 EZ_{67}	15.7	X	121.97987	79.59379	201.75037	1.40889	0.0725892	0.19485609	2.9466377	20	12 16.6	20.2
154121 2002 EL_{72}	15.1	X	213.20067	277.12703	198.65891	9.06858	0.1000419	0.18598283	3.0396306	20	8 28.7	19.9
154122 2002 EO_{77}	16.0	X	19.77790	82.02916	330.66622	1.18059	0.0693228	0.20311498	2.8662105	20	—	—
154123 2002 EA_{82}	15.1	X	352.33473	319.33402	349.30309	15.34011	0.0767144	0.18055530	3.1002441	20	8 11.2	19.1
154124 2002 ER_{82}	15.8	X	35.74451	279.45475	198.23068	2.85647	0.0452136	0.21361182	2.7715275	20	1 27.9	19.4
154125 2002 EW_{82}	16.2	X	123.39751	259.67189	322.37776	1.54430	0.0987390	0.18685743	3.0301384	20	10 7.7	20.9
154126 2002 EG_{84}	15.6	X	35.33251	324.22089	61.67535	2.85012	0.0109516	0.20015612	2.8943883	20	—	—
154127 2002 EW_{84}	15.1	X	358.92250	136.57013	166.18723	5.83115	0.1315406	0.17945592	3.1128929	20	8 9.6	18.6
154128 2002 EJ_{91}	15.4	X	40.75407	246.20297	153.79676	6.51346	0.0712600	0.20394984	2.8583834	20	—	—
154129 2002 EA_{94}	15.7	X	64.54839	272.84609	157.42922	4.15358	0.0815994	0.21335526	2.7737489	20	1 11.3	19.2
154130 2002 EP_{97}	15.2	X	300.28628	295.80877	234.68119	8.16738	0.0971082	0.20901331	2.8120309	20	—	—
154131 2002 EK_{102}	15.3	X	241.11632	273.53950	227.83194	10.53364	0.1348127	0.19607872	2.9343759	20	10 29.7	19.4
154132 2002 EL_{107}	15.6	X	267.76362	21.44055	131.03524	13.06820	0.1998510	0.20072601	2.8889074	20	12 11.7	19.3
154133 2002 EM_{107}	14.9	X	169.29943	304.56125	35.28266	16.82448	0.2349532	0.21137892	2.7910113	20	2 14.4	20.0
154134 2002 ET_{111}	14.5	X	47.03305	203.84966	62.49903	11.61414	0.1859016	0.17841885	3.1249439	20	9 22.9	18.8
154135 2002 EC_{113}	15.3	X	73.27073	304.88727	61.03955	2.77921	0.0815989	0.20263118	2.8707709	20	—	—
154136 2002 ES_{121}	16.4	X	158.53185	186.43067	132.59387	2.07783	0.0685894	0.21031077	2.8004536	20	—	—
154137 2002 ET_{122}	15.0	X	359.62220	288.40276	348.13471	5.52001	0.1185301	0.17570588	3.1570286	20	7 6.9	18.8
154138 2002 EZ_{122}	15.1	X	343.02939	347.59346	318.18884	3.84108	0.1379271	0.17805860	3.1291575	20	7 17.1	18.7
154139 2002 EZ_{138}	15.4	X	265.54314	74.50025	52.11440	2.80959	0.0313284	0.19548965	2.9402676	20	11 25.9	19.5
154140 2002 EY_{151}	15.5	X	267.54377	278.62081	167.54531	9.02705	0.0687382	0.19046797	2.9917232	20	10 4.6	19.5
154141 Kertész	15.9	X	48.42324	75.31850	229.04708	1.33019	0.1591596	0.18687817	3.0299142	20	11 2.3	20.0
154142 2002 FW	15.4	X	107.03090	58.37322	185.86973	14.95649	0.2649720	0.18391054	3.0624215	20	10 31.5	20.7
154143 2002 FJ_{2}	14.6	X	90.27814	248.77441	16.95325	10.52606	0.2871767	0.18266767	3.0762970	20	11 9.3	19.8
154144 2002 FA_{5}	17.4	X	39.45446	126.32642	172.58372	23.62027	0.2963185	0.39689201	1.8338106	20	12 14.7	20.6
154145 2002 FX_{5}	15.1	X	55.34595	147.85718	87.14292	16.79846	0.0992644	0.17433526	3.1735540	20	8 8.3	19.6
154146 2002 FR_{11}	15.2	X	200.71133	105.80738	56.32640	10.65552	0.0433264	0.19095537	2.9866303	20	10 22.5	19.5
154147 2002 FY_{34}	15.1	X	44.13142	57.00356	207.93784	5.01035	0.1395852	0.17826414	3.1267516	20	9 1.8	19.2
154148 2002 FZ_{37}	15.6	X	245.17396	257.42827	38.18669	7.65829	0.1050047	0.21666436	2.7454344	20	2 24.6	19.8
154149 2002 GS_{1}	14.5	X	196.98072	115.43763	162.26429	17.94471	0.3032887	0.19778082	2.9175161	20	—	—
154150 2002 GP_{3}	15.1	X	143.22413	303.92514	201.66076	26.60949	0.1709053	0.17792204	3.1307584	20	7 23.9	20.7
154151 2002 GQ_{3}	15.3	X	57.34923	206.91279	42.39453	15.89465	0.2237678	0.17562175	3.1580367	20	9 21.6	19.9
154152 2002 GX_{3}	14.5	X	47.14608	240.83562	11.16181	26.46112	0.2493784	0.17520182	3.1630809	20	9 16.4	18.9
154153 2002 GS_{4}	16.2	X	37.42560	251.42168	191.20365	21.80245	0.1261958	0.36923717	1.9242689	20	—	—
154154 2002 GB_{11}	17.3	X	126.39574	59.83469	22.92984	19.56040	0.1136613	0.38406399	1.8744204	20	4 12.0	18.8
154155 2002 GS_{11}	14.5	X	81.66117	137.89343	158.39246	13.90825	0.2944751	0.18209253	3.0827713	20	12 11.6	19.9
154156 2002 GY_{12}	14.9	X	37.19394	300.88095	18.09663	9.14618	0.1333400	0.18503661	3.0499844	20	10 31.2	18.9
154157 2002 GW_{21}	15.1	X	116.58027	342.79895	223.19791	21.35596	0.2460775	0.17998696	3.1067671	20	9 15.9	20.7
154158 2002 GO_{35}	15.7	X	97.41122	94.80893	248.02543	0.83304	0.0810911	0.20025360	2.8934490	20	—	—
154159 2002 GB_{39}	14.8	X	135.87943	87.44541	188.87953	9.08966	0.0384150	0.19363474	2.9590152	20	12 23.9	19.3
154160 2002 GG_{46}	15.2	X	189.00135	147.27813	71.33396	6.01319	0.0382049	0.19572589	2.9379012	20	12 14.9	19.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154161 2002 GV_{48}	16.1	X	167.37457	17.71636	246.45769	0.91404	0.0657873	0.19654953	2.9296880	20	—	—
154162 2002 GE_{56}	15.2	X	120.17825	158.41228	347.09062	10.14739	0.1440930	0.17480377	3.1678810	20	7 7.5	20.3
154163 2002 GZ_{56}	15.1	X	252.13187	275.53839	237.67244	10.97089	0.0993454	0.19785530	2.9167839	20	12 3.2	19.0
154164 2002 GV_{60}	15.4	X	106.91202	311.63248	322.52297	6.94882	0.2894362	0.18578554	3.0417821	20	12 2.7	20.9
154165 2002 GR_{65}	15.2	X	143.56911	168.71206	108.05312	3.19646	0.0458628	0.19523931	2.9427805	20	—	—
154166 2002 GC_{66}	15.4	X	231.17989	76.72099	82.39034	3.09884	0.0430723	0.19214430	2.9742973	20	11 21.4	19.5
154167 2002 GD_{66}	15.2	X	228.41585	273.51807	164.80773	5.43627	0.2210815	0.18115410	3.0934085	20	7 19.3	20.4
154168 2002 GH_{67}	14.3	X	103.76521	324.37266	36.79242	15.08319	0.3007993	0.19980244	2.8978030	20	1 15.3	18.7
154169 2002 GQ_{67}	15.8	X	127.61242	94.97681	108.44282	0.49951	0.0867186	0.18300066	3.0725641	20	9 19.2	20.3
154170 2002 GH_{68}	14.5	X	100.79788	111.52078	159.22749	16.59464	0.2090869	0.18201977	3.0835928	20	11 23.5	19.8
154171 2002 GM_{68}	14.9	X	55.89069	191.17137	93.27812	10.95789	0.0763075	0.18044271	3.1015336	20	10 10.9	19.4
154172 2002 GA_{75}	15.3	X	149.53607	201.99653	86.15258	4.47650	0.1810361	0.19571315	2.9380288	20	—	—
154173 2002 GL_{78}	15.2	X	120.50933	269.59976	4.17449	8.33310	0.2061824	0.18815708	3.0161690	20	12 8.9	20.4
154174 2002 GH_{86}	15.1	X	168.24529	338.31835	167.25350	10.65892	0.0296097	0.17988372	3.1079556	20	8 20.1	19.6
154175 2002 GS_{99}	14.9	X	25.90984	123.28694	183.10272	10.56717	0.1021898	0.18366102	3.0651946	20	9 26.4	18.9
154176 2002 GQ_{102}	14.9	X	53.53185	95.68954	176.14143	15.98316	0.2285990	0.17721209	3.1391145	20	10 9.6	19.3
154177 2002 GR_{105}	14.5	X	39.83520	238.00097	32.99164	27.40108	0.1754600	0.17819539	3.1275558	20	9 25.3	19.0
154178 2002 GW_{105}	15.0	X	130.76514	150.18781	112.18828	10.42042	0.0247907	0.19241426	2.9715147	20	12 3.1	19.4
154179 2002 GV_{106}	15.0	X	183.19892	80.76715	67.14538	11.72004	0.0545859	0.18432207	3.0578616	20	9 16.8	19.7
154180 2002 GP_{109}	14.8	X	259.97307	292.39027	112.84901	12.00286	0.0183809	0.17756857	3.1349117	20	8 8.9	19.3
154181 2002 GW_{113}	14.8	X	54.23557	161.85357	61.90429	10.07348	0.0543383	0.17570692	3.1570161	20	7 14.6	19.2
154182 2002 GP_{115}	15.1	X	18.16606	216.39595	84.33417	8.10643	0.1131507	0.17941566	3.1133586	20	9 12.3	19.1
154183 2002 GJ_{117}	15.1	X	226.63615	284.37847	169.18198	16.44817	0.0751483	0.18356290	3.0662868	20	8 19.1	19.6
154184 2002 GN_{117}	15.6	X	215.89538	76.03147	55.96250	10.93939	0.1846897	0.18959727	3.0008756	20	9 21.2	20.5
154185 2002 GL_{121}	14.9	X	191.32437	120.82352	65.21193	20.17150	0.0609025	0.19210975	2.9746540	20	11 9.7	19.3
154186 2002 GV_{121}	14.7	X	250.41659	228.29688	192.85778	16.42773	0.1921987	0.18245874	3.0786449	20	7 20.4	19.6
154187 2002 GC_{122}	15.6	X	53.78755	136.13844	119.18450	2.53043	0.1838821	0.17770963	3.1332526	20	9 12.1	19.8
154188 2002 GL_{123}	16.1	X	312.61289	96.29885	32.95138	6.54657	0.0347516	0.19905720	2.9050311	20	—	—
154189 2002 GE_{124}	15.8	X	266.51780	76.92929	187.85889	4.89974	0.2707274	0.21135542	2.7912182	20	1 21.6	20.7
154190 2002 GP_{124}	15.6	X	257.07559	199.95640	288.91634	3.01614	0.0262823	0.19409038	2.9543824	20	11 17.9	19.6
154191 2002 GP_{129}	16.0	X	284.76282	175.64193	330.71592	1.76938	0.0424950	0.19862927	2.9092020	20	—	—
154192 2002 GT_{140}	15.6	X	144.71613	80.61041	192.95131	4.45086	0.1100125	0.19218164	2.9739121	20	12 29.3	20.3
154193 2002 GV_{145}	14.9	X	287.60393	327.05909	141.51284	11.15910	0.0431982	0.19297034	2.9658032	20	12 2.8	19.0
154194 2002 GZ_{145}	15.0	X	113.47717	131.89355	154.63255	10.34182	0.0669790	0.19030691	2.9934109	20	12 13.6	19.6
154195 2002 GP_{147}	15.1	X	278.87908	275.49385	158.02067	10.64742	0.1045358	0.18888048	3.0084629	20	9 28.9	19.0
154196 2002 GD_{152}	15.3	X	163.65274	359.03110	162.31042	10.46253	0.0638094	0.18439397	3.0570666	20	9 5.1	19.9
154197 2002 GB_{154}	14.9	X	41.51374	99.81483	162.88152	12.58895	0.1285725	0.17466494	3.1695594	20	8 24.9	19.1
154198 2002 GT_{162}	15.0	X	55.41284	67.90379	177.75285	9.16927	0.0574659	0.17777297	3.1325083	20	8 11.2	19.3
154199 2002 GB_{163}	16.4	X	203.70203	12.78722	140.47169	1.93108	0.2885052	0.19121707	2.9839047	20	9 23.9	21.6
154200 2002 GH_{170}	15.1	X	116.07438	281.75440	25.21144	11.99374	0.0393161	0.19361626	2.9592035	20	—	—
154201 2002 GQ_{173}	15.2	X	153.83963	69.71652	71.11065	11.18490	0.0672483	0.17691309	3.1426504	20	8 1.8	20.0
154202 2002 HK_{3}	14.6	X	57.65947	219.69300	35.91938	17.12665	0.1125980	0.17853511	3.1235871	20	9 14.9	19.1
154203 2002 HD_{7}	15.3	X	110.07451	54.83095	193.28442	10.05224	0.2742512	0.18369908	3.0647712	20	11 6.9	20.7
154204 2002 HL_{8}	14.3	X	172.19028	218.53023	50.21223	24.13541	0.2312517	0.19223048	2.9734083	20	—	—
154205 2002 HX_{13}	16.9	X	277.81227	99.61570	178.02779	22.67636	0.0975504	0.37575427	1.9019544	20	2 13.7	19.3
154206 2002 HD_{16}	16.0	X	97.91480	26.77042	176.76990	1.67185	0.1157734	0.17921509	3.1156811	20	8 20.1	20.5
154207 2002 JH_{5}	14.8	X	122.63262	205.48407	35.58264	13.19149	0.0563147	0.18512051	3.0490627	20	10 27.8	19.4
154208 2002 JS_{21}	14.3	X	7.21034	250.15751	63.20869	23.47159	0.1099009	0.17564040	3.1578132	20	9 21.5	18.8
154209 2002 JV_{23}	14.9	X	132.85948	22.49043	200.28252	15.71951	0.0858012	0.18526842	3.0474397	20	10 18.4	19.4
154210 2002 JD_{36}	14.9	X	106.70500	191.69857	74.68324	12.32036	0.0224922	0.18456669	3.0551592	20	11 9.4	19.3
154211 2002 JZ_{36}	14.5	X	55.94731	171.53449	93.97692	24.22695	0.1588471	0.17844308	3.1246610	20	10 6.6	19.4
154212 2002 JL_{37}	14.9	X	96.06526	247.03147	12.73555	10.07974	0.0197599	0.18346711	3.0673541	20	10 15.2	19.3
154213 2002 JO_{39}	15.1	X	123.81623	129.76030	76.82299	17.67093	0.1619712	0.18005029	3.1060385	20	10 2.9	20.4
154214 2002 JV_{39}	14.8	X	76.40617	88.64386	194.11414	10.85084	0.1027726	0.18109676	3.0940614	20	11 1.5	19.3
154215 2002 JN_{41}	14.7	X	117.95522	347.40285	211.02637	16.03334	0.0611987	0.17981661	3.1087289	20	8 25.9	19.6
154216 2002 JR_{55}	14.1	X	109.11961	281.19554	236.24543	24.17985	0.2409926	0.17231317	3.1983334	20	7 11.7	19.7
154217 2002 JR_{60}	14.7	X	204.89406	173.11012	13.10117	10.22109	0.0466200	0.18867162	3.0106827	20	11 19.2	19.1
154218 2002 JL_{61}	14.4	X	53.61623	84.42669	192.79712	15.33463	0.2671820	0.17744881	3.1363220	20	10 20.9	18.8
154219 2002 JL_{62}	15.0	X	91.52232	104.80269	195.91759	10.13560	0.1241765	0.18559527	3.0438607	20	12 10.7	19.8
154220 2002 JG_{63}	14.9	X	107.44333	178.61642	61.04116	11.21624	0.0674200	0.18135570	3.0911156	20	10 14.1	19.6
154221 2002 JS_{64}	14.8	X	100.92754	224.03471	85.90712	7.87534	0.2847743	0.18507498	3.0495628	20	—	—
154222 2002 JG_{73}	14.4	X	60.38281	193.72974	100.86559	13.33889	0.2062475	0.17767698	3.1336364	20	11 13.5	19.2
154223 2002 JQ_{76}	14.9	X	145.56653	239.02837	18.15763	10.99308	0.0939249	0.19219829	2.9737403	20	12 9.9	19.6
154224 2002 JB_{77}	15.0	X	138.68370	334.42768	210.18938	13.35747	0.0923467	0.18242129	3.0790662	20	9 3.8	19.9
154225 2002 JF_{78}	15.0	X	53.11520	249.68058	17.25994	9.56481	0.1340081	0.17850088	3.1239864	20	9 19.9	19.2
154226 2002 JL_{88}	14.8	X	103.72266	9.92748	210.57259	8.26988	0.0594435	0.18037892	3.1022648	20	9 8.3	19.3
154227 2002 JE_{94}	15.3	X	126.66267	303.09080	247.31648	3.93813	0.1111204	0.17792582	3.1307140	20	9 1.2	20.2
154228 2002 JQ_{95}	14.7	X	349.11842	60.51482	254.67691	8.40265	0.1204404	0.17121688	3.2119713	20	8 5.7	18.7
154229 2002 JN_{97}	16.5	X	93.37808	341.63965	67.64708	10.08732	0.7184129	0.39135039	1.8510815	20	4 12.1	19.5
154230 2002 JM_{98}	14.8	X	359.85806	276.52409	44.32174	10.00383	0.0852814	0.17520249	3.1630728	20	9 8.1	19.0
154231 2002 JO_{103}	15.5	X	66.22393	176.26146	79.20751	7.25123	0.1480922	0.17683745	3.1435465	20	9 25.4	20.0
154232 2002 JC_{104}	14.6	X	112.72791	312.12153	229.78860	12.40205	0.0545034	0.17281475	3.1921418	20	7 29.5	19.5
154233 2002 JL_{109}	15.5	X	172.03256	134.59574	28.54281	5.27662	0.1974650	0.18303568	3.0721721	20	9 15.3	20.7
154234 2002 JP_{109}	14.6	X	74.18778	342.09728	251.19249	9.26762	0.0412473	0.17447041	3.1719149	20	8 14.8	19.2
154235 2002 JZ_{118}	15.0	X	154.99902	77.81613	84.05093	15.01055	0.1044711	0.18258542	3.0772207	20	9 3.4	20.0
154236 2002 JM_{122}	15.0	X	84.65568	109.47173	147.25272	17.56671	0.1291201	0.18072573	3.0982947	20	10 17.1	19.9
154237 2002 JA_{123}	15.0	X	37.24190	188.87539	94.23220	10.29457	0.0482215	0.17897824	3.1184292	20	9 9.5	19.4
154238 2002 JF_{123}	14.9	X	74.77728	106.93822	137.35837	11.10331	0.0338079	0.17903938	3.1177192	20	9 3.8	19.3
154239 2002 JW_{133}	15.0	X	25.70250	304.05851	4.38888	4.78279	0.1288024	0.17693833	3.1423515	20	9 30.8	18.9
154240 2002 JW_{139}	14.9	X	336.19457	332.54348	26.86509	10.33574	0.0041320	0.18133570	3.0913429	20	9 21.7	19.2

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154241 2002 JD_{146}	14.6	X	37.77857	101.96252	159.97130	16.59790	0.0744630	0.17225798	3.1990166	20	8 10.3	18.9
154242 2002 KR_{2}	15.7	X	50.89052	73.71090	204.63710	2.09062	0.2778064	0.17718698	3.1394110	20	10 19.5	20.0
154243 2002 KA_{6}	14.9	X	104.49636	64.21219	155.55917	10.36891	0.0324263	0.17752273	3.1354514	20	9 8.2	19.3
154244 2002 KL_{6}	17.5	X	33.75318	98.01905	213.28463	3.24611	0.5488066	0.28138206	2.3064203	20	12 28.3	21.5
154245 2002 KA_{8}	14.7	X	62.11904	93.31451	114.28011	19.14805	0.1057970	0.16961340	3.2321830	20	7 10.5	19.0
154246 2002 KB_{8}	15.0	X	18.90950	150.34958	137.76649	15.69767	0.1399167	0.17231250	3.1983417	20	8 26.6	18.9
154247 2002 KF_{8}	14.6	X	36.56545	98.34448	181.93746	13.65101	0.1124132	0.17454967	3.1709546	20	9 6.6	18.9
154248 2002 KE_{10}	15.2	X	354.37656	211.89001	96.06797	4.72278	0.1857661	0.17191956	3.2032133	20	8 11.5	18.6
154249 2002 KQ_{11}	15.1	X	15.81893	216.90064	89.47304	2.50000	0.1300622	0.17533333	3.1614991	20	9 14.2	18.9
154250 2002 KY_{13}	15.2	X	67.29271	89.89998	189.69742	5.33922	0.1495165	0.17767274	3.1336863	20	10 23.2	19.7
154251 2002 LB_{5}	14.8	X	160.99487	326.21619	260.57096	12.17395	0.1213882	0.18788325	3.0190989	20	11 18.8	19.6
154252 2002 LP_{5}	15.9	X	98.17676	21.33845	233.01793	2.63406	0.0795872	0.18111490	3.0938548	20	10 17.8	20.6
154253 2002 LH_{39}	15.0	X	45.75639	85.22979	172.93975	7.97041	0.1164165	0.17318148	3.1876337	20	8 22.8	19.2
154254 2002 LD_{40}	14.6	X	88.95247	118.07760	201.66277	11.52367	0.1495832	0.18531622	3.0469157	20	12 30.7	19.6
154255 2002 LA_{45}	14.8	X	141.94761	100.85725	125.97346	11.83711	0.0131414	0.18408162	3.0605238	20	11 4.1	19.4
154256 2002 LV_{55}	14.9	X	90.38812	70.51597	179.46608	16.22297	0.1857271	0.17707917	3.1406851	20	10 17.2	19.9
154257 2002 LD_{56}	14.5	X	120.80306	116.73909	137.37790	18.86064	0.3205174	0.18228509	3.0805998	20	11 25.9	20.4
154258 2002 NN_{7}	16.8	X	142.44283	146.94231	155.19323	23.70009	0.0676684	0.35484919	1.9759389	20	—	—
154259 2002 NY_{55}	16.2	X	330.89001	343.71383	317.80082	4.50018	0.2321886	0.27190678	2.3596959	20	6 9.8	18.0
154260 2002 PZ	16.5	X	152.62293	127.58921	184.26002	22.35634	0.0681508	0.35418119	1.9784226	20	—	—
154261 2002 RZ_{8}	16.9	X	233.39415	207.07562	160.46443	2.57855	0.2240134	0.26142993	2.4223256	20	4 28.3	20.8
154262 2002 RW_{12}	14.0	X	103.03593	344.86264	354.05730	5.08925	0.2784967	0.12536551	3.9538240	20	—	—
154263 2002 RM_{39}	14.8	X	75.46907	290.44773	59.38475	1.43876	0.2597837	0.12414929	3.9796043	20	—	—
154264 2002 RP_{42}	14.2	X	94.21453	341.04299	359.81381	8.45193	0.2859258	0.12567696	3.9472892	20	—	—
154265 2002 RX_{91}	17.0	X	81.14887	28.01598	354.43299	3.25972	0.1997218	0.23712116	2.5851704	20	—	—
154266 2002 RQ_{100}	16.2	X	54.32795	194.50338	180.27729	4.46473	0.2563541	0.28688862	2.2768120	20	—	—
154267 2002 RK_{107}	14.9	X	158.98853	171.20839	221.58075	12.64538	0.1925652	0.24556695	2.5255508	20	3 24.4	19.1
154268 2002 RM_{129}	17.9	X	92.98209	357.49937	132.67634	14.57305	0.4649734	0.53051572	1.5112531	20	6 30.4	19.9
154269 2002 SM	17.8	X	44.60228	217.25539	10.89148	14.42649	0.4862325	0.38489137	1.8717332	20	10 1.9	20.4
154270 2002 SG_{5}	17.4	X	131.24920	191.74047	188.20538	3.35279	0.1807527	0.30041851	2.2079281	20	2 4.9	20.2
154271 2002 SZ_{17}	17.4	X	106.25636	61.00114	28.66110	0.65452	0.1102252	0.30601377	2.1809317	20	3 30.2	19.9
154272 2002 SE_{31}	17.0	X	66.72874	319.97707	97.57310	3.17148	0.1853263	0.29473135	2.2362404	20	—	—
154273 2002 SK_{37}	16.7	X	36.35897	209.44710	167.86049	4.98562	0.1486197	0.28460800	2.2889588	20	—	—
154274 2002 SX_{38}	17.0	X	83.92577	10.85041	69.93133	3.22509	0.1311049	0.30106357	2.2047731	20	2 17.2	19.1
154275 2002 SR_{41}	20.1	X	161.39245	258.13731	247.83094	11.57773	0.4907535	0.87412579	1.0833117	20	9 17.9	20.8
154276 2002 SY_{50}	17.6	X	299.54973	99.43505	34.24383	8.74452	0.6897358	0.44310102	1.7039920	20	—	—
154277 2002 SD_{56}	16.3	X	107.87797	215.40776	174.36690	15.01589	0.1034541	0.24168264	2.5525391	20	1 16.1	19.9
154278 2002 TB_{9}	16.4	X	15.80372	322.54320	196.33654	29.70869	0.5912690	0.40658372	1.8045520	20	—	—
154279 2002 TO_{38}	17.5	X	237.15843	137.53482	236.13985	1.29449	0.1268492	0.31400607	2.1437659	20	5 16.5	20.3
154280 2002 TS_{39}	16.3	X	120.63378	338.91877	49.25584	5.69042	0.1542220	0.29606110	2.2295394	20	2 2.7	19.0
154281 2002 TF_{42}	16.7	X	356.97266	81.15054	33.73677	7.65117	0.1748215	0.28933851	2.2639416	20	—	—
154282 2002 TM_{46}	16.6	X	2.50307	32.55026	35.18131	6.47034	0.1617032	0.28395544	2.2924643	20	—	—
154283 2002 TD_{52}	16.8	X	130.60325	308.13682	84.63044	2.82945	0.1999496	0.29905262	2.2146460	20	2 26.3	19.7
154284 2002 TG_{52}	16.5	X	176.25398	328.46585	40.97838	6.21916	0.1111895	0.30252150	2.1976839	20	3 8.7	19.6
154285 2002 TY_{54}	16.6	X	60.97938	355.55032	29.36016	4.85225	0.1904817	0.28674451	2.2775747	20	—	—
154286 2002 TO_{81}	16.4	X	287.95682	256.23897	98.25269	5.90262	0.2131988	0.26784419	2.3834967	20	6 12.3	19.0
154287 2002 TE_{101}	17.3	X	100.35338	157.20498	257.05115	2.17895	0.1402176	0.29987011	2.2106192	20	2 4.2	19.5
154288 2002 TR_{118}	16.9	X	55.91219	90.82799	302.57407	4.60638	0.1723102	0.28959911	2.2625832	20	—	—
154289 2002 TY_{127}	16.7	X	98.20405	79.17983	278.71448	5.76963	0.1363048	0.29295471	2.2452725	20	—	—
154290 2002 TA_{208}	16.3	X	43.21725	39.02377	10.01398	6.53267	0.1516644	0.28807439	2.2705598	20	—	—
154291 2002 TT_{249}	16.7	X	200.74655	335.19365	32.37365	4.09142	0.0737353	0.30707308	2.1759131	20	3 30.4	19.6
154292 2002 TJ_{258}	17.2	X	195.49732	324.86901	58.52309	6.31366	0.1823374	0.30902153	2.1667571	20	4 15.8	20.5
154293 2002 TF_{260}	16.9	X	195.15830	238.26872	154.05315	3.63071	0.1143270	0.30972952	2.1634539	20	4 27.2	19.9
154294 2002 TG_{280}	16.9	X	37.59377	185.30136	264.06527	4.90908	0.1407188	0.29268424	2.2466556	20	—	—
154295 2002 TT_{285}	16.2	X	81.78873	116.28978	268.34034	5.54461	0.1428025	0.29080886	2.2563041	20	—	—
154296 2002 TG_{287}	17.1	X	183.26489	29.66824	325.76553	5.11992	0.2012674	0.30381442	2.1914444	20	2 27.1	20.5
154297 2002 TW_{288}	16.3	X	191.58332	64.92201	309.47907	4.59469	0.1851717	0.30684335	2.1769991	20	3 27.3	19.8
154298 2002 TH_{289}	16.7	X	181.51481	10.94393	338.95020	6.16620	0.2110320	0.30248074	2.1978813	20	2 20.3	20.2
154299 2002 TF_{294}	17.0	X	115.13603	231.18797	168.81718	6.65722	0.0720721	0.29932113	2.2133213	20	1 25.3	19.5
154300 2002 UO	19.2	X	147.06768	184.22923	90.67540	8.29388	0.4725336	0.74113815	1.2093071	20	—	—
154301 2002 UZ_{1}	16.9	X	115.84099	274.34628	134.65816	6.90385	0.1850180	0.29978329	2.2110459	20	2 28.3	19.5
154302 2002 UQ_{3}	17.6	X	251.13330	280.89632	222.79680	28.81740	0.5619117	0.43718304	1.7193350	20	10 24.5	18.2
154303 2002 UW_{20}	15.7	X	101.04559	190.52826	243.81744	5.15038	0.0464630	0.24416327	2.5352210	20	2 24.5	19.0
154304 2002 UG_{32}	16.8	X	107.09333	356.25478	46.43624	4.36510	0.1399850	0.29639655	2.2278569	20	2 1.1	19.2
154305 2002 UM_{32}	16.2	X	99.91083	342.83028	13.70125	3.24923	0.1405680	0.23303140	2.6153295	20	—	—
154306 2002 UV_{32}	17.5	X	145.62395	12.34051	11.17080	1.05796	0.2028610	0.30080785	2.2060225	20	2 29.2	20.7
154307 2002 UX_{48}	16.3	X	84.40328	39.65210	28.78575	12.10537	0.2298106	0.23838181	2.5760481	20	3 2.5	19.6
154308 2002 VC_{2}	16.9	X	287.80952	330.88039	175.41686	2.29941	0.1666564	0.27540547	2.3396686	20	—	—
154309 2002 VZ_{5}	17.1	X	37.01977	235.18422	209.88870	4.75283	0.1491895	0.29098235	2.2554072	20	—	—
154310 2002 VZ_{6}	17.1	X	109.97893	348.13306	39.19645	2.44336	0.1904628	0.29554620	2.2321282	20	1 22.2	19.4
154311 2002 VU_{16}	16.7	X	45.62835	141.22584	255.15765	4.78789	0.1576865	0.28691915	2.2766504	20	—	—
154312 2002 VX_{18}	16.7	X	332.20601	328.67353	227.34403	7.05669	0.0382099	0.29927974	2.2135254	20	1 25.2	19.3
154313 2002 VF_{19}	16.0	X	273.28264	258.15526	9.90718	1.62714	0.0280638	0.24577014	2.5241586	20	2 24.5	19.2
154314 2002 VB_{20}	17.3	X	342.65199	344.82211	100.40067	2.74795	0.2017019	0.28040097	2.3117971	20	—	—
154315 2002 VO_{20}	16.7	X	16.63583	150.45162	305.82955	5.20700	0.0723184	0.29165439	2.2519412	20	—	—
154316 2002 VM_{22}	15.7	X	229.16260	66.36573	241.41802	1.06778	0.1054500	0.24647595	2.5193375	20	2 15.9	19.4
154317 2002 VW_{22}	17.2	X	43.34609	52.35409	22.25487	2.73668	0.1317095	0.29042080	2.2583135	20	—	—
154318 2002 VM_{23}	17.4	X	58.54498	53.17903	354.70065	1.43771	0.2203016	0.28944936	2.2633635	20	—	—
154319 2002 VM_{27}	16.6	X	4.90153	263.12776	8.14905	1.94260	0.0155854	0.31597766	2.1348390	20	7 12.8	18.7
154320 2002 VO_{28}	16.8	X	168.66372	182.69418	205.40633	3.77864	0.1273461	0.30426537	2.1892786	20	3 22.3	19.7

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154321 2002 VE_{34}	16.5	X	19.06418	350.68409	72.82079	6.66606	0.1363235	0.28369015	2.2938933	20	—	—
154322 2002 VF_{45}	16.4	X	103.09896	124.47164	307.07335	0.95972	0.1881178	0.24290666	2.5439570	20	3 18.2	19.8
154323 2002 VP_{47}	16.8	X	41.57350	180.74673	211.39446	3.75693	0.1607344	0.28409787	2.2916980	20	—	—
154324 2002 VS_{48}	15.4	X	338.01271	181.94358	210.36337	5.07391	0.2904048	0.21787396	2.7352635	20	11 26.7	17.4
154325 2002 VW_{63}	17.3	X	103.63425	57.51383	342.88079	3.78721	0.1271306	0.29568779	2.2314156	20	1 20.7	19.7
154326 2002 VP_{64}	17.2	X	78.67479	202.32043	160.63807	3.00257	0.1851082	0.28845965	2.2685377	20	—	—
154327 2002 VP_{65}	16.9	X	52.20808	173.07941	348.58045	5.09372	0.0772304	0.30550430	2.1833557	20	4 13.7	18.9
154328 2002 VM_{80}	16.8	X	108.12683	289.63204	101.41899	7.05405	0.0913130	0.29404796	2.2397039	20	1 7.9	19.2
154329 2002 VA_{92}	16.5	X	173.75827	152.51665	167.30271	7.23354	0.2185979	0.29736315	2.2230264	20	1 6.9	20.0
154330 2002 VX_{94}	18.0	X	194.64519	215.08504	320.16596	7.16184	0.4086729	0.54940123	1.4764190	20	11 16.7	18.9
154331 2002 VF_{95}	17.4	X	264.27943	159.03379	186.33130	4.68316	0.2671425	0.31502703	2.1391316	20	4 22.6	20.3
154332 2002 VO_{97}	17.2	X	128.66510	61.24193	331.32332	1.64598	0.0753655	0.29802165	2.2197506	20	2 4.9	19.7
154333 2002 VW_{97}	17.3	X	163.79899	28.04827	301.67450	1.77561	0.2441064	0.29703097	2.2246835	20	1 13.2	20.5
154334 2002 VW_{101}	15.7	X	110.62290	301.32714	131.78881	3.96359	0.2018304	0.24228434	2.5483114	20	4 2.3	19.3
154335 2002 VH_{105}	16.5	X	165.13144	134.10478	256.38239	6.34453	0.0704934	0.30300964	2.1953230	20	3 14.6	19.4
154336 2002 VA_{112}	17.1	X	18.88646	69.57081	357.89228	2.23445	0.1995713	0.28454701	2.2892859	20	—	—
154337 2002 VV_{121}	15.6	X	156.77129	341.08488	15.13489	13.43652	0.1206460	0.24243424	2.5472608	20	2 9.9	19.6
154338 2002 VJ_{126}	16.5	X	34.81948	149.33041	41.51706	6.61294	0.0490976	0.30611376	2.1804568	20	4 28.5	18.7
154339 2002 WM	15.6	X	248.51322	280.56714	148.31670	21.23616	0.3036222	0.26559784	2.3969171	20	7 22.2	19.4
154340 2002 WN_{1}	16.7	X	306.78925	193.58685	115.88029	3.51108	0.2006534	0.31576330	2.1358051	20	5 8.3	18.7
154341 2002 WQ_{1}	16.8	X	26.35461	281.71997	246.24138	3.58735	0.0504936	0.30147672	2.2027584	20	3 8.1	19.1
154342 2002 WK_{7}	16.6	X	352.36232	86.27085	60.79773	5.37675	0.0983449	0.29156306	2.2524114	20	—	—
154343 2002 WT_{9}	17.0	X	290.28894	26.57737	333.63974	1.75277	0.1130471	0.31853879	2.1233805	20	7 16.4	18.9
154344 2002 WN_{10}	16.7	X	158.07995	238.34589	151.20179	3.96020	0.0739206	0.30130150	2.2036123	20	3 9.4	19.5
154345 2002 WS_{18}	16.7	X	117.90302	176.00656	147.82792	2.97951	0.1925784	0.28726219	2.2748376	20	—	—
154346 2002 XP	17.2	X	161.73024	192.79605	155.72285	6.77699	0.2106446	0.29877989	2.2159934	20	1 30.9	20.6
154347 2002 XK_{4}	16.0	X	7.83549	24.93922	331.65999	17.75190	0.6918276	0.39168844	1.8500163	20	—	—
154348 2002 XB_{14}	16.2	X	282.03105	282.57575	177.75126	5.13339	0.1828475	0.26985124	2.3716637	20	11 18.1	18.2
154349 2002 XH_{17}	16.9	X	63.36075	298.94405	79.53721	6.37444	0.1710932	0.28510858	2.2862788	20	—	—
154350 2002 XX_{18}	16.9	X	41.03250	76.55276	298.71062	1.91284	0.1725780	0.28109130	2.3080105	20	—	—
154351 2002 XG_{24}	17.0	X	23.07588	100.91143	267.04390	1.85490	0.2279968	0.27828548	2.3234982	20	—	—
154352 2002 XB_{26}	16.7	X	27.55512	12.85236	78.26191	4.93391	0.0772059	0.28794099	2.2712610	20	—	—
154353 2002 XF_{26}	16.9	X	351.73486	41.83312	40.93275	2.50349	0.1838396	0.28187431	2.3037343	20	—	—
154354 2002 XP_{26}	16.3	X	224.38896	230.17087	31.65335	7.09665	0.1339973	0.29047901	2.2580118	20	—	—
154355 2002 XU_{32}	15.6	X	34.45895	359.25391	10.88642	3.88570	0.2344248	0.22362193	2.6881889	20	—	—
154356 2002 XE_{36}	17.2	X	70.66031	301.97850	80.51444	1.69253	0.2301041	0.28641459	2.2793235	20	—	—
154357 2002 XO_{44}	15.4	X	156.58884	44.49068	301.91966	11.89310	0.2168045	0.24339122	2.5405794	20	1 30.3	19.5
154358 2002 XM_{47}	16.9	X	96.91227	336.82850	60.88140	4.31262	0.1283236	0.29032316	2.2588199	20	1 7.1	19.1
154359 2002 XZ_{48}	16.8	X	234.68043	200.31227	131.48947	1.41021	0.1367071	0.30549897	2.1833811	20	3 17.3	19.8
154360 2002 XU_{54}	17.1	X	250.45133	323.02783	154.89852	2.40457	0.1608902	0.27005527	2.3704690	20	10 23.3	19.8
154361 2002 XH_{55}	17.2	X	316.33823	265.55376	163.02258	2.99062	0.1673302	0.27443405	2.3451865	20	12 16.1	19.1
154362 2002 XV_{58}	16.3	X	297.45335	168.78999	306.78980	6.40620	0.0835559	0.27637140	2.3342139	20	—	—
154363 2002 XB_{61}	16.8	X	291.29263	280.26277	51.51335	1.88505	0.1732032	0.31383492	2.1445452	20	5 20.9	19.1
154364 2002 XM_{62}	16.9	X	308.60078	117.75375	331.71007	2.27275	0.1391013	0.27512066	2.3412830	20	12 31.2	18.8
154365 2002 XS_{63}	16.1	X	339.27490	115.64539	288.98396	5.06777	0.2506028	0.27519442	2.3408646	20	—	—
154366 2002 XS_{68}	16.4	X	47.56436	255.11874	354.00384	3.53218	0.1236467	0.31753915	2.1278346	20	9 4.1	18.5
154367 2002 XE_{71}	16.4	X	346.38535	160.18857	296.16132	2.27429	0.1829030	0.28113740	2.3077582	20	—	—
154368 2002 XJ_{72}	16.2	X	213.45433	290.53774	59.67815	7.89623	0.0520272	0.30168090	2.2017644	20	3 26.1	19.1
154369 2002 XX_{77}	16.5	X	309.53328	152.04621	348.18665	2.15910	0.1672953	0.28026430	2.3125485	20	—	—
154370 2002 XY_{78}	16.7	X	15.52007	5.91868	36.20498	2.58505	0.1864596	0.27915587	2.3186661	20	—	—
154371 2002 XR_{83}	16.4	X	37.68374	305.73101	122.22825	8.21124	0.1795760	0.28687279	2.2768957	20	—	—
154372 2002 XM_{84}	15.9	X	130.62814	318.25997	39.17144	7.01487	0.2287060	0.29187074	2.2508282	20	1 15.6	18.9
154373 2002 XQ_{84}	17.2	X	127.85484	253.93744	188.25729	3.42736	0.1270382	0.30372277	2.1918853	20	4 20.2	20.1
154374 2002 XK_{85}	16.4	X	10.21303	173.76568	299.47013	6.40907	0.0798905	0.28808688	2.2704942	20	—	—
154375 2002 XO_{86}	16.4	X	343.89039	1.06295	45.68864	5.95368	0.0919339	0.27412012	2.3469767	20	12 27.7	18.9
154376 2002 XC_{110}	17.2	X	5.88786	111.39272	332.96276	2.01597	0.1243749	0.28455041	2.2892677	20	—	—
154377 2002 XC_{113}	16.8	X	354.21664	354.08128	31.81898	2.72199	0.2041974	0.27478116	2.3432111	20	—	—
154378 Hennessy	16.3	X	59.45035	299.26307	357.40081	0.87144	0.1805377	0.25921739	2.4360898	20	11 22.0	19.7
154379 2002 YD_{8}	16.3	X	147.40372	52.84803	140.30028	5.21169	0.0960278	0.25978644	2.4325311	20	10 9.1	19.8
154380 2002 YJ_{17}	17.1	X	35.98973	216.38787	211.75894	1.76466	0.2070818	0.28669330	2.2778460	20	—	—
154381 2002 YN_{26}	16.3	X	351.34705	346.43411	4.41989	1.26620	0.1928076	0.26735407	2.3864089	20	10 30.6	18.1
154382 2002 YS_{26}	17.1	X	283.82383	152.83267	315.20265	1.97723	0.1320386	0.27182427	2.3601733	20	12 8.4	19.1
154383 2002 YA_{27}	16.8	X	4.11599	344.84891	118.61014	3.82383	0.1232913	0.28356502	2.2945681	20	—	—
154384 2002 YG_{29}	16.3	X	168.92753	65.52967	109.44769	5.73154	0.1377167	0.26099386	2.4250230	20	10 8.0	20.0
154385 2003 AS_{6}	16.4	X	290.05369	141.87878	90.75178	7.87986	0.0793355	0.29382023	2.2408610	20	1 15.8	19.1
154386 2003 AU_{9}	16.9	X	330.70881	27.23044	29.63326	0.76576	0.2021089	0.27279395	2.3545770	20	—	—
154387 2003 AQ_{11}	16.9	X	233.49171	172.99830	259.06509	10.09745	0.2852487	0.25905777	2.4370904	20	7 12.8	20.9
154388 2003 AH_{17}	16.1	X	131.63691	285.53918	94.29250	6.77866	0.2061514	0.29337826	2.2431110	20	2 12.5	19.1
154389 2003 AT_{18}	16.3	X	317.04007	326.73160	120.89065	6.51300	0.0891987	0.27577722	2.3375655	20	—	—
154390 2003 AE_{19}	17.1	X	270.39876	282.14127	213.33888	1.83816	0.1741010	0.27151103	2.3619883	20	12 18.7	19.0
154391 2003 AQ_{20}	16.8	X	306.41335	239.41944	174.46486	2.98910	0.1475544	0.26695284	2.3887994	20	10 30.2	18.7
154392 2003 AR_{28}	17.1	X	328.53963	93.88569	331.69944	1.63946	0.1930750	0.27322873	2.3520785	20	—	—
154393 2003 AV_{28}	16.7	X	319.96951	290.73879	147.22018	1.55700	0.1241457	0.27247310	2.3564250	20	—	—
154394 2003 AC_{30}	16.2	X	252.03242	342.64493	99.29299	2.76883	0.1659047	0.26108932	2.4244318	20	9 3.1	19.2
154395 2003 AG_{30}	16.3	X	233.58042	68.48080	128.08426	6.04812	0.1766032	0.27252640	2.3561178	20	—	—
154396 2003 AT_{33}	16.7	X	236.99502	77.76887	37.47699	3.16170	0.1306014	0.26455523	2.4032105	20	10 4.6	19.8
154397 2003 AE_{38}	17.0	X	318.42010	295.38549	161.50909	3.58816	0.1930021	0.27546155	2.3393510	20	—	—
154398 2003 AL_{40}	16.3	X	321.43806	292.78158	176.29390	5.49743	0.1154086	0.27605481	2.3359982	20	—	—
154399 2003 AP_{41}	16.6	X	189.74954	279.01409	219.58474	3.11720	0.1623996	0.25791481	2.4442851	20	9 5.9	20.5
154400 2003 AG_{50}	16.6	X	348.65404	105.66830	342.86944	3.27625	0.1237054	0.27898714	2.3196008	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154401 2003 AP_{52}	16.3	X	110.43457	48.01663	13.68959	4.36958	0.1516471	0.29477311	2.2360292	20	3 5.3	18.8
154402 2003 AB_{53}	16.9	X	225.97442	65.84208	68.54159	3.11993	0.1534542	0.26486800	2.4013183	20	10 13.8	20.1
154403 2003 AM_{54}	16.7	X	267.31261	58.77768	359.92249	1.85207	0.2003949	0.26231296	2.4168863	20	8 16.4	19.6
154404 2003 AU_{56}	16.4	X	263.98741	160.26985	330.25483	3.11179	0.1376219	0.26967441	2.3727003	20	12 3.8	18.9
154405 2003 AK_{57}	16.4	X	231.04356	148.66777	357.70369	5.03611	0.1309252	0.26642543	2.3919509	20	11 5.7	19.6
154406 2003 AX_{58}	16.6	X	224.60010	151.59813	329.97289	4.44684	0.1550860	0.26167228	2.4208297	20	9 21.6	19.9
154407 2003 AB_{59}	16.3	X	248.97090	3.14793	86.13938	4.28385	0.1654088	0.26155037	2.4215819	20	9 10.5	19.4
154408 2003 AJ_{75}	15.4	X	351.06168	22.57815	98.58713	22.55782	0.0502882	0.22585549	2.6704367	20	—	—
154409 2003 AN_{75}	16.3	X	282.02431	109.06245	357.29141	10.43689	0.1666087	0.27103128	2.3647747	20	11 25.0	18.7
154410 2003 AY_{77}	15.9	X	248.32276	51.84758	45.33904	10.82534	0.1240779	0.26251988	2.4156161	20	9 29.9	19.0
154411 2003 AR_{82}	16.4	X	260.70057	254.31106	322.96237	5.49158	0.0862284	0.28172855	2.3045288	20	—	—
154412 2003 AX_{82}	17.0	X	224.34097	5.01892	79.77192	1.65313	0.1756463	0.25597172	2.4566393	20	8 2.1	20.5
154413 2003 BQ_{8}	16.8	X	245.01164	272.99164	187.65940	3.70176	0.1592078	0.26375419	2.4080738	20	9 19.4	19.7
154414 2003 BH_{12}	16.4	X	243.82539	350.84960	101.10727	3.71481	0.1448986	0.25981693	2.4323408	20	9 9.7	19.5
154415 2003 BQ_{19}	16.4	X	292.85575	16.37710	30.12362	5.57972	0.1011745	0.26115222	2.4240425	20	9 27.0	19.0
154416 2003 BF_{21}	16.3	X	64.13336	239.67970	130.34702	5.31593	0.1802119	0.27858060	2.3218570	20	—	—
154417 2003 BO_{25}	12.0	X	258.30607	220.89064	97.19403	31.18095	0.0787574	0.08233023	5.2331499	20	4 29.2	19.4
154418 2003 BR_{26}	16.6	X	204.62678	354.04483	148.83831	2.94194	0.1575733	0.25974097	2.4328149	20	9 29.3	20.0
154419 2003 BH_{27}	16.4	X	237.32927	320.55145	167.77239	7.32551	0.2082308	0.26401466	2.4064897	20	10 12.0	19.5
154420 2003 BB_{31}	16.7	X	235.43283	199.63130	266.68388	1.64174	0.1752929	0.26224571	2.4172995	20	9 11.8	19.9
154421 2003 BO_{33}	15.5	X	161.14606	65.84621	176.46530	7.13736	0.0955447	0.26546183	2.3977358	20	12 24.1	19.1
154422 2003 BO_{36}	16.5	X	284.99007	347.31351	126.88038	2.74244	0.1496973	0.27059060	2.3673415	20	12 18.2	18.4
154423 2003 BW_{40}	16.4	X	65.69521	160.91115	137.67856	8.79272	0.0885480	0.26504324	2.4002597	20	11 24.2	19.8
154424 2003 BM_{42}	16.2	X	211.37108	35.34147	140.38256	6.96369	0.0494012	0.26656945	2.3910893	20	12 4.5	19.4
154425 2003 BQ_{44}	16.8	X	298.29014	48.00332	13.01554	2.14021	0.2013037	0.26646304	2.3917258	20	10 17.1	18.8
154426 2003 BE_{47}	16.3	X	65.97037	11.82766	3.56847	11.59684	0.2003565	0.27923556	2.3182249	20	—	—
154427 2003 BC_{48}	16.7	X	229.12395	287.19973	236.96322	1.75786	0.1217798	0.26726804	2.3869209	20	11 30.4	19.5
154428 2003 BE_{48}	16.9	X	323.43395	273.49747	151.58372	5.29869	0.2048877	0.27083591	2.3659118	20	12 27.8	18.6
154429 2003 BY_{49}	16.3	X	116.60203	220.56851	137.05696	7.57022	0.1347804	0.28476351	2.2881254	20	—	—
154430 2003 BX_{50}	17.0	X	280.12374	0.88811	127.33132	0.68747	0.2027434	0.27169988	2.3608936	20	12 24.4	18.8
154431 2003 BN_{51}	16.3	X	326.91854	348.00026	57.38245	2.15763	0.1774458	0.26832764	2.3806330	20	11 30.8	18.0
154432 2003 BP_{51}	16.6	X	162.67134	92.18906	90.62201	3.32311	0.1538022	0.25902793	2.4372775	20	10 9.8	20.3
154433 2003 BE_{55}	16.2	X	120.20697	191.00552	25.80158	2.47508	0.1625700	0.25745183	2.4472147	20	10 11.4	19.9
154434 2003 BC_{56}	16.6	X	78.82330	281.59879	120.35770	4.89179	0.1699891	0.28574674	2.2828736	20	—	—
154435 2003 BO_{57}	16.6	X	37.48672	287.75509	116.80542	3.73742	0.1446285	0.27947332	2.3169099	20	—	—
154436 2003 BD_{66}	16.3	X	202.36083	0.23383	126.21201	3.32929	0.1465540	0.25778619	2.4450981	20	9 6.4	20.0
154437 2003 BX_{67}	17.3	X	295.78371	163.86657	317.85977	1.63877	0.1527839	0.27294586	2.3537032	20	—	—
154438 2003 BM_{77}	17.1	X	69.72193	25.71385	27.13171	3.01788	0.1443406	0.28540751	2.2846821	20	—	—
154439 2003 BW_{77}	16.1	X	3.84256	215.88540	167.84734	7.51185	0.2271485	0.27085148	2.3658211	20	—	—
154440 2003 BO_{79}	16.5	X	217.80767	122.51490	69.32962	7.94569	0.1589117	0.26910351	2.3760549	20	12 17.0	19.4
154441 2003 BV_{80}	16.6	X	166.92260	67.63568	143.33178	3.88313	0.0914159	0.26467943	2.4024587	20	11 21.9	20.0
154442 2003 BS_{82}	16.6	X	14.32503	27.63083	5.98036	6.12610	0.1177964	0.27392901	2.3480681	20	—	—
154443 2003 BX_{82}	17.0	X	260.02319	216.04298	263.60240	0.55928	0.1342302	0.26635737	2.3923584	20	11 11.8	19.6
154444 2003 BF_{83}	16.2	X	48.15496	134.78901	45.78966	4.73861	0.1538259	0.24057677	2.5603554	20	5 21.4	18.8
154445 2003 BQ_{84}	16.4	X	294.55734	54.43994	20.68825	6.29671	0.0979355	0.26563569	2.3966895	20	11 9.2	18.8
154446 2003 CY_{1}	17.3	X	196.03305	80.48354	141.31606	1.25114	0.1740933	0.26868502	2.3785215	20	12 28.6	20.5
154447 2003 CZ_{1}	16.8	X	168.64422	77.43639	112.87713	3.57099	0.1308253	0.26118993	2.4238092	20	10 26.2	20.5
154448 2003 CT_{4}	16.6	X	29.97667	51.84053	357.69924	3.37274	0.1552210	0.27981514	2.3150226	20	—	—
154449 2003 CY_{5}	16.3	X	198.17763	295.75632	191.70529	11.12456	0.2016459	0.25813893	2.4428702	20	8 26.8	20.4
154450 2003 CE_{6}	16.7	X	306.47388	62.78025	47.34706	2.96882	0.0686712	0.27248077	2.3563808	20	—	—
154451 2003 CN_{9}	16.2	X	174.94836	206.61290	203.17490	5.54069	0.2429895	0.24529614	2.5274093	20	5 3.0	20.5
154452 2003 CO_{10}	16.8	X	202.84295	33.12207	156.43310	2.91516	0.1661473	0.26600502	2.3944705	20	11 26.2	20.3
154453 2003 CJ_{11}	15.2	X	74.76393	356.39393	61.69887	20.79998	0.8349278	0.23741900	2.5830079	20	4 29.9	20.1
154454 2003 CG_{12}	17.2	X	302.76704	55.20536	72.25676	2.23936	0.1316628	0.27445768	2.3450519	20	—	—
154455 2003 CL_{12}	16.5	X	163.33712	86.77382	121.84628	6.88174	0.0813229	0.26346644	2.4098269	20	11 16.6	20.0
154456 2003 CE_{18}	16.5	X	123.38318	62.62302	156.20849	3.04272	0.1195267	0.25787243	2.4445529	20	10 16.2	20.2
154457 2003 CK_{19}	17.3	X	228.35508	165.94323	343.33687	2.24031	0.1390864	0.26481124	2.4016614	20	11 5.5	20.5
154458 2003 CU_{19}	16.6	X	344.50348	216.89195	208.19182	1.73907	0.1779796	0.27266746	2.3553051	20	—	—
154459 2003 DJ_{1}	16.7	X	186.64534	52.54968	154.41987	6.81982	0.0214189	0.26698870	2.3885855	20	12 17.1	19.8
154460 2003 DO_{1}	16.4	X	348.99989	359.33761	67.46780	3.82871	0.1534019	0.27250583	2.3562364	20	—	—
154461 2003 DU_{5}	15.4	X	141.87609	68.37004	38.87471	12.38752	0.1481279	0.24635267	2.5201779	20	6 9.3	19.5
154462 2003 DC_{6}	16.3	X	61.35095	190.84028	352.98709	6.99461	0.1533490	0.24022568	2.5628495	20	6 17.3	19.5
154463 2003 DL_{6}	16.5	X	162.71246	67.78807	165.83327	2.23295	0.1750146	0.26286851	2.4134798	20	12 9.8	20.2
154464 2003 DU_{12}	17.3	X	188.21996	51.87448	139.84206	1.73813	0.1172460	0.26209783	2.4182086	20	11 17.4	20.6
154465 2003 DB_{13}	16.3	X	26.24887	189.24781	63.07557	2.83804	0.1580874	0.24383613	2.5374881	20	7 30.9	18.8
154466 2003 DO_{15}	15.5	X	356.02774	102.08772	150.16559	27.20350	0.2180592	0.23701601	2.5859350	20	6 1.7	18.5
154467 2003 DR_{15}	16.5	X	325.23214	57.20900	39.88314	1.12528	0.1753466	0.27319140	2.3522927	20	—	—
154468 2003 DG_{17}	16.5	X	79.05820	252.26436	164.28261	9.21072	0.1045175	0.22539308	2.6740878	20	1 14.5	19.8
154469 2003 DR_{17}	15.5	X	122.69386	270.53620	0.05184	6.62836	0.1287003	0.26182231	2.4199048	20	12 18.7	19.3
154470 2003 DP_{19}	16.5	X	27.13344	290.56397	280.69982	0.76152	0.0928250	0.24030359	2.5622955	20	5 22.1	19.1
154471 2003 DX_{20}	16.4	X	208.96327	170.97597	346.75825	4.55568	0.1281251	0.26148987	2.4219554	20	10 24.2	19.9
154472 2003 DD_{24}	16.0	X	2.17392	223.92825	13.08447	6.57352	0.1422397	0.23836215	2.5761898	20	5 13.7	18.5
154473 2003 DM_{24}	17.5	X	213.92100	143.53351	5.30116	1.12341	0.1362720	0.26074610	2.4265589	20	10 18.7	20.6
154474 2003 EJ_{2}	16.4	X	186.91147	72.51632	182.46139	1.18481	0.1535674	0.27111891	2.3642651	20	—	—
154475 2003 EU_{2}	16.9	X	207.54364	198.59665	14.32495	1.47270	0.1302529	0.26833501	2.3805894	20	—	—
154476 2003 EX_{3}	16.0	X	171.69009	58.82908	343.63267	13.61688	0.0838179	0.23828308	2.5767596	20	4 10.3	20.1
154477 2003 EW_{5}	16.3	X	178.87082	225.98677	322.29494	1.61512	0.1488662	0.25951995	2.4341960	20	10 30.2	19.9
154478 2003 EJ_{10}	15.9	X	124.66657	155.85875	108.00279	3.39026	0.1995288	0.25971567	2.4329730	20	12 12.8	19.9
154479 2003 ET_{10}	16.3	X	132.77443	294.42353	276.71983	2.27423	0.1319153	0.25511966	2.4621061	20	10 13.7	20.1
154480 2003 ED_{18}	16.0	X	95.35904	129.63748	131.42207	5.55925	0.0841087	0.25847719	2.4407384	20	11 8.1	19.4

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154481 2003 EB_{24}	16.7	X	195.75953	161.19513	27.48857	2.69295	0.1721513	0.26215561	2.4178533	20	11 15.2	20.4
154482 2003 EX_{25}	16.5	X	156.96056	214.94594	34.84200	3.83439	0.0920571	0.26472285	2.4021959	20	12 29.4	19.9
154483 2003 EO_{28}	14.4	X	289.59741	282.51300	12.12356	28.22222	0.3574283	0.22882747	2.6472642	20	3 16.1	18.7
154484 2003 EB_{31}	16.4	X	355.42796	273.39302	358.48030	5.82473	0.1776547	0.24122665	2.5557548	20	6 25.9	18.7
154485 2003 EZ_{32}	16.5	X	161.46055	155.93056	32.31062	1.65320	0.0757207	0.25683895	2.4511062	20	10 16.2	20.0
154486 2003 EJ_{33}	15.3	X	213.19878	338.62586	9.05112	9.82523	0.1415127	0.23282208	2.6168969	20	3 21.7	19.5
154487 2003 EZ_{35}	15.7	X	123.49101	128.14408	151.38083	7.61488	0.1061285	0.26364726	2.4087249	20	12 30.8	19.3
154488 2003 EL_{36}	16.0	X	161.59476	250.90766	157.01042	9.14001	0.0517251	0.23654947	2.5893339	20	4 12.8	19.7
154489 2003 EN_{51}	15.7	X	77.20700	302.69345	173.79714	31.26833	0.2487721	0.23380453	2.6095609	20	4 27.3	19.5
154490 2003 EQ_{60}	15.5	X	337.08345	195.57606	19.92615	11.13566	0.1229718	0.23077847	2.6323231	20	3 5.8	18.6
154491 2003 FM_{2}	16.7	X	90.03986	86.36757	74.11247	5.94069	0.1527545	0.23971270	2.5665045	20	6 24.5	20.2
154492 2003 FD_{4}	15.7	X	114.93697	232.26006	178.09171	26.59605	0.0759557	0.22676160	2.6633181	20	2 18.2	19.7
154493 Portisch	16.1	X	35.50015	212.69024	20.03287	10.94305	0.0863683	0.23953461	2.5677764	20	7 8.1	19.4
154494 2003 FL_{10}	16.2	X	48.34595	316.24591	33.40087	3.30994	0.2003627	0.26160448	2.4212479	20	—	—
154495 2003 FU_{15}	15.9	X	339.70481	285.90040	349.86247	13.69230	0.1768113	0.23545484	2.5973530	20	5 20.8	18.9
154496 2003 FK_{18}	16.2	X	127.26555	47.07063	174.01058	3.42536	0.1380983	0.25434999	2.4670705	20	10 22.8	20.0
154497 2003 FD_{21}	15.9	X	36.74608	77.38749	107.40880	13.73440	0.1188098	0.23589377	2.5941300	20	5 9.2	19.0
154498 2003 FT_{24}	16.4	X	7.84613	89.23166	144.70415	4.25303	0.0995131	0.23837470	2.5760994	20	5 23.1	19.1
154499 2003 FX_{26}	16.5	X	81.63107	262.12367	23.68107	2.35562	0.1918578	0.25527900	2.4610814	20	11 30.9	20.3
154500 2003 FZ_{26}	16.0	X	105.83594	255.76622	188.92806	13.79594	0.0597286	0.23178588	2.6246903	20	3 20.7	19.6
154501 2003 FR_{30}	15.3	X	217.92774	189.69641	88.52720	10.27509	0.1203559	0.21694009	2.7431075	20	1 4.1	19.5
154502 2003 FV_{30}	15.4	X	338.59740	176.97359	9.20097	28.81268	0.1168001	0.22671673	2.6636695	20	2 11.1	19.3
154503 2003 FQ_{35}	15.7	X	198.53682	21.31812	1.26860	2.99152	0.1547648	0.23601574	2.5932362	20	4 18.1	19.9
154504 2003 FF_{40}	16.0	X	31.27799	130.73147	2.42746	13.74402	0.1372008	0.22770542	2.6559535	20	2 16.6	18.9
154505 2003 FM_{41}	15.6	X	73.63464	265.21750	14.10882	14.57992	0.1288746	0.25626120	2.4547889	20	11 4.9	19.3
154506 2003 FC_{42}	15.0	X	280.99591	181.54359	149.90143	34.13324	0.1757796	0.23260102	2.6185547	20	5 16.7	19.4
154507 2003 FT_{47}	16.4	X	107.64561	85.57884	351.65653	4.58365	0.0740711	0.22999616	2.6382888	20	3 16.1	19.9
154508 2003 FC_{49}	16.1	X	31.02945	71.28244	132.16875	12.38048	0.0890007	0.23608014	2.5927645	20	5 21.5	19.4
154509 2003 FT_{54}	15.9	X	103.40578	82.77648	87.91366	8.75113	0.1815848	0.24270363	2.5453755	20	7 28.7	19.8
154510 2003 FZ_{55}	16.5	X	37.61327	52.46033	187.25492	4.61200	0.1611676	0.24299988	2.5433063	20	7 30.5	19.3
154511 2003 FG_{56}	15.7	X	77.46276	210.93862	165.95656	5.40731	0.0489252	0.21728721	2.7401854	20	—	—
154512 2003 FH_{56}	17.0	X	161.78391	54.06266	185.34432	2.26957	0.1385271	0.26325388	2.4111239	20	12 18.1	20.5
154513 2003 FM_{57}	15.2	X	137.07147	288.02148	157.20541	14.50850	0.0602531	0.23679032	2.5875778	20	5 4.7	19.1
154514 2003 FQ_{57}	15.8	X	342.55362	108.41770	167.74263	12.53520	0.1605663	0.23890427	2.5722910	20	6 5.6	18.6
154515 2003 FM_{62}	15.7	X	174.61620	294.02359	162.53394	12.30064	0.1160470	0.24507586	2.5289235	20	6 29.4	19.8
154516 2003 FS_{63}	15.6	X	0.58400	161.27716	71.58560	15.24448	0.1425281	0.23543357	2.5975094	20	5 10.0	18.3
154517 2003 FO_{69}	16.3	X	65.90770	63.42417	136.24849	4.95042	0.1129314	0.24089118	2.5581271	20	7 9.9	19.6
154518 2003 FM_{71}	16.4	X	126.78890	211.02070	61.88503	3.00168	0.1384971	0.26079106	2.4262800	20	12 25.4	20.2
154519 2003 FS_{78}	15.6	X	145.92250	211.68001	12.17450	14.66444	0.0898327	0.25906075	2.4370717	20	11 9.1	19.3
154520 2003 FP_{82}	15.7	X	321.23144	166.86781	58.45661	8.43469	0.1793295	0.22634648	2.6665735	20	2 15.1	19.1
154521 2003 FW_{83}	16.5	X	9.65690	324.07367	239.20979	7.30249	0.1821473	0.23235111	2.6204320	20	4 6.9	19.0
154522 2003 FL_{91}	15.4	X	122.57336	214.03026	49.37165	15.22823	0.0934670	0.25810522	2.4430828	20	12 6.7	19.2
154523 2003 FF_{92}	15.9	X	43.76601	346.00019	175.06206	11.72229	0.0730084	0.23198765	2.6231682	20	4 8.4	19.0
154524 2003 FV_{98}	15.8	X	285.65101	68.43390	159.98086	8.93055	0.0977610	0.22199094	2.7013398	20	1 13.1	19.7
154525 2003 FZ_{106}	15.7	X	356.43169	341.19848	211.27818	14.45900	0.1119065	0.22862152	2.6488537	20	2 27.1	19.0
154526 2003 FO_{107}	15.0	X	20.89660	162.49623	53.78953	14.79112	0.1845220	0.23337959	2.6127276	20	5 24.8	17.3
154527 2003 FO_{109}	16.0	X	359.70031	155.06861	58.86365	20.26717	0.1813243	0.23047562	2.6346285	20	4 14.8	18.8
154528 2003 FN_{114}	15.4	X	172.12947	192.40379	201.61496	14.37930	0.0881923	0.23173055	2.6251081	20	4 5.8	19.3
154529 2003 FW_{114}	16.2	X	45.68602	157.52228	29.70380	12.16356	0.0930790	0.23691678	2.5866569	20	5 15.9	19.3
154530 2003 FH_{115}	15.5	X	12.82219	115.64121	101.41631	13.87824	0.1352618	0.23230948	2.6207449	20	5 12.8	18.4
154531 2003 FD_{117}	15.5	X	308.64996	225.90414	53.74227	10.95909	0.1568880	0.23058036	2.6338306	20	4 12.5	18.8
154532 2003 FV_{120}	16.6	X	111.58616	316.15875	187.34574	9.31464	0.1203537	0.24334272	2.5409170	20	6 23.2	20.4
154533 2003 FC_{121}	15.8	X	2.23283	63.19226	173.98660	12.09383	0.1289270	0.23678130	2.5876435	20	5 19.2	18.7
154534 2003 FS_{127}	16.2	X	24.94556	219.32443	36.64003	3.66149	0.1581234	0.24186880	2.5512292	20	8 3.4	18.8
154535 2003 GH_{1}	16.0	X	42.04970	83.93992	171.50133	12.77139	0.1284447	0.24348025	2.5399601	20	8 23.9	19.1
154536 2003 GC_{7}	16.0	X	304.78510	115.05909	179.50457	7.07091	0.2027649	0.23369043	2.6104103	20	4 16.9	19.2
154537 2003 GV_{7}	16.0	X	340.49630	186.99173	95.45127	5.00921	0.0815468	0.23795052	2.5791599	20	6 14.5	18.8
154538 2003 GY_{8}	16.4	X	133.50669	305.11356	185.79398	5.94492	0.1939893	0.24248237	2.5469237	20	7 5.7	20.6
154539 2003 GM_{10}	15.6	X	262.16952	252.23308	26.56582	13.96923	0.1818153	0.22257693	2.6965964	20	2 16.9	20.0
154540 2003 GF_{13}	16.2	X	351.06498	100.06413	165.05869	3.74038	0.0660116	0.23751387	2.5823200	20	6 8.1	19.3
154541 2003 GU_{14}	15.8	X	304.81701	135.08892	113.88732	16.14703	0.0878767	0.22632542	2.6667389	20	3 10.0	19.5
154542 2003 GX_{26}	15.9	X	280.74023	347.01855	19.53863	4.12317	0.1644667	0.24341467	2.5404162	20	6 26.5	19.1
154543 2003 GZ_{28}	15.6	X	218.65935	189.95506	64.24064	8.24308	0.0413763	0.21460573	2.7629637	20	—	—
154544 2003 GP_{33}	15.9	X	74.63101	58.11525	28.83280	11.60790	0.0528383	0.22368990	2.6876444	20	2 17.1	19.5
154545 2003 GC_{35}	15.5	X	250.32361	250.69926	44.58295	14.06993	0.0777785	0.22575691	2.6712140	20	3 6.3	19.6
154546 2003 GL_{36}	16.7	X	331.04033	286.36477	352.26447	2.38843	0.1162859	0.23573650	2.5952836	20	5 19.2	19.6
154547 2003 GC_{37}	16.2	X	29.04014	135.01271	76.36547	9.61621	0.1289339	0.23825830	2.5769383	20	5 29.9	19.0
154548 2003 GP_{37}	16.5	X	34.99123	243.65398	352.78643	1.82451	0.1611041	0.23906439	2.5711423	20	7 22.5	19.1
154549 2003 GK_{38}	15.6	X	322.64388	137.28725	140.14051	14.14413	0.2398199	0.23162047	2.6259398	20	4 20.5	18.7
154550 2003 GT_{43}	15.7	X	280.98491	155.97609	91.14105	16.94523	0.1812553	0.22146989	2.7055751	20	1 23.0	19.9
154551 2003 GC_{44}	14.8	X	240.45876	245.14262	56.85362	32.72137	0.0422734	0.22485758	2.6783317	20	3 22.0	19.4
154552 2003 GX_{47}	16.4	X	62.68653	126.27504	83.51501	4.38540	0.1999675	0.24094843	2.5577219	20	8 4.3	19.7
154553 2003 GO_{50}	15.6	X	356.83906	345.22818	198.50074	15.01637	0.0760122	0.22475993	2.6791074	20	2 20.2	19.2
154554 Heatherelliott	16.2	X	225.49679	300.88128	12.52169	6.32653	0.0830161	0.22488162	2.6781409	20	2 24.9	20.2
154555 2003 HA	16.7	X	5.18874	277.12079	53.50505	36.82531	0.5803089	0.76474704	1.1842885	20	—	—
154556 2003 HZ_{5}	15.1	X	22.09736	106.09848	142.28322	13.64274	0.1556922	0.23640534	2.5903862	20	7 14.2	17.9
154557 2003 HB_{8}	16.4	X	318.13524	177.12590	17.39507	3.30334	0.1111102	0.22110636	2.7085398	20	1 10.3	20.0
154558 2003 HR_{8}	15.1	X	203.86308	169.68351	107.46132	14.54225	0.1216821	0.21235435	2.7824579	20	—	—
154559 2003 HL_{10}	15.5	X	251.28612	127.15963	130.89882	10.07776	0.1516552	0.21697116	2.7428457	20	1 9.5	19.9
154560 2003 HV_{11}	15.7	X	312.25794	171.31073	91.19144	14.28478	0.1738534	0.22751573	2.6574296	20	3 27.6	19.3

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154561 2003 HS_{16}	15.9	X	264.37768	183.31179	46.99699	6.11233	0.0243935	0.21823992	2.7322048	20	1 1.1	19.8
154562 2003 HD_{19}	16.1	X	270.14142	55.91523	258.13495	1.58611	0.0350003	0.23341648	2.6124523	20	4 20.2	19.7
154563 2003 HS_{27}	16.4	X	97.98072	258.42988	259.55043	2.59610	0.1873096	0.23979361	2.5659271	20	7 5.0	20.1
154564 2003 HR_{28}	15.1	X	232.52954	263.39233	51.20980	9.35609	0.2381371	0.21968198	2.7202350	20	2 28.6	19.9
154565 2003 HO_{30}	15.1	X	111.02608	48.21096	49.00323	14.72502	0.0460007	0.22888073	2.6468534	20	4 16.1	18.7
154566 2003 HR_{30}	15.6	X	355.28374	310.86053	228.51469	12.25298	0.1945679	0.22377004	2.6870026	20	1 29.8	18.8
154567 2003 HC_{31}	16.4	X	48.98917	94.23873	41.21592	13.07193	0.1429027	0.22819305	2.6521684	20	3 24.6	19.4
154568 2003 HG_{32}	15.5	X	274.39701	223.87354	63.44267	13.14212	0.1661038	0.22717371	2.6600962	20	3 12.7	19.7
154569 2003 HF_{33}	15.9	X	195.11416	5.58652	25.07541	7.81051	0.0922131	0.23468551	2.6030262	20	4 25.8	19.8
154570 2003 HC_{38}	15.4	X	269.12222	63.94292	224.79414	13.24262	0.0742324	0.22322559	2.6913700	20	3 7.9	19.5
154571 2003 HR_{40}	15.0	X	280.74640	232.66411	48.93988	13.58092	0.1792378	0.22290564	2.6939447	20	3 11.3	19.2
154572 2003 HV_{40}	15.3	X	158.07457	74.51086	244.72728	3.09297	0.1180968	0.21120262	2.7925643	20	—	—
154573 2003 HF_{41}	15.5	X	88.36714	175.54376	23.61688	7.50231	0.1523356	0.24085627	2.5583743	20	8 17.2	19.2
154574 2003 HM_{44}	16.1	X	139.34202	320.77504	172.65174	6.08796	0.1723030	0.24267354	2.5455859	20	7 13.1	20.2
154575 2003 HD_{49}	15.9	X	15.39833	164.72485	90.72911	6.00651	0.2159471	0.23644448	2.5901004	20	7 20.5	18.0
154576 2003 HV_{50}	15.3	X	327.15520	225.36354	87.64100	15.58660	0.1754308	0.23443031	2.6049149	20	6 26.5	17.8
154577 2003 HD_{54}	16.7	X	102.19371	134.41269	45.26393	3.01826	0.1822928	0.24330005	2.5412141	20	8 8.3	20.6
154578 2003 HL_{54}	16.5	X	42.92471	327.90840	236.79391	2.14769	0.1104990	0.23701339	2.5859540	20	6 10.9	19.2
154579 2003 HF_{55}	16.9	X	81.23020	322.83042	201.73435	1.84940	0.1200745	0.23791702	2.5794021	20	6 13.8	20.2
154580 2003 HT_{55}	17.0	X	146.56323	258.00046	184.79596	1.67286	0.0755580	0.23822816	2.5771557	20	5 10.2	20.7
154581 2003 JX_{3}	15.1	X	325.99894	290.60673	339.17330	11.84736	0.1576667	0.23174615	2.6249903	20	4 16.6	18.3
154582 2003 JX_{7}	15.4	X	289.91375	236.33727	68.27482	15.52599	0.1375980	0.23022173	2.6365651	20	4 24.8	19.0
154583 2003 JC_{12}	16.5	X	338.70926	210.38490	34.54540	2.49706	0.1394625	0.23185748	2.6241499	20	4 12.3	19.1
154584 2003 KB_{9}	15.5	X	115.85785	163.11962	190.41459	8.72177	0.1934312	0.20933707	2.8091308	20	—	—
154585 2003 KW_{14}	15.8	X	37.73485	355.53249	194.79362	12.74603	0.1108936	0.23032517	2.6357757	20	5 14.0	18.9
154586 2003 KB_{16}	15.5	X	190.67113	112.67118	149.30197	12.03744	0.1586620	0.20610492	2.8384232	20	—	—
154587 Ennico	16.7	X	340.54076	310.73769	110.71763	3.11622	0.0476677	0.20372370	2.8604982	20	12 16.6	20.5
154588 2003 KC_{34}	16.0	X	350.79847	31.43959	91.93163	5.66676	0.0200013	0.21210969	2.7845971	20	—	—
154589 2003 MX_{2}	16.6	X	274.60883	300.53937	58.68738	7.18374	0.4589529	0.28453745	2.2893372	20	5 1.0	20.2
154590 2003 MA_{3}	21.7	X	139.69063	228.85945	152.67319	1.41565	0.4021169	0.84833305	1.1051599	20	—	—
154591 2003 MF_{5}	15.5	X	299.39207	152.80247	137.94048	13.25323	0.1760568	0.22337199	2.6901939	20	4 13.1	19.2
154592 2003 NS_{1}	14.8	X	351.42119	238.72988	126.89226	7.22016	0.1748630	0.18082421	3.0971697	20	10 27.9	18.3
154593 2003 NK_{4}	15.6	X	236.08385	152.99089	129.63639	14.38957	0.1937414	0.21023412	2.8011342	20	1 23.5	20.2
154594 2003 OB	15.4	X	102.78264	159.70883	62.59212	18.25373	0.1484333	0.18158996	3.0884565	20	10 1.3	20.5
154595 2003 OZ	15.9	X	288.78292	138.20046	211.93374	23.57398	0.2557720	0.28356016	2.2945943	20	5 30.2	19.0
154596 2003 OP_{9}	15.9	X	49.79728	107.55976	190.57304	5.38567	0.1569384	0.18203663	3.0834023	20	10 26.9	20.2
154597 2003 OD_{16}	15.3	X	42.42680	134.29881	171.65999	16.95529	0.2190578	0.18008649	3.1056222	20	11 7.6	19.8
154598 2003 OY_{26}	15.7	X	105.34591	162.05866	168.33865	2.11033	0.0982299	0.19479926	2.9472107	20	—	—
154599 2003 OY_{29}	15.6	X	64.26439	212.02955	84.38879	2.40584	0.1678785	0.18219143	3.0816555	20	11 11.9	20.1
154600 2003 PJ_{2}	15.2	X	57.71667	195.87988	121.91928	2.24590	0.2358330	0.18584678	3.0411139	20	12 8.9	19.7
154601 2003 PO_{2}	14.7	X	38.93389	316.00209	310.68449	12.90955	0.1289042	0.17667863	3.1454301	20	8 24.3	18.8
154602 2003 PV_{11}	15.0	X	55.27511	113.23886	202.91051	11.52220	0.0974203	0.18456099	3.0552220	20	11 17.1	19.3
154603 2003 QV_{25}	13.9	X	0.03599	225.93562	175.65890	9.01470	0.1997653	0.12545857	3.9518686	20	12 10.5	18.6
154604 2003 QM_{29}	14.6	X	65.57283	329.43774	283.17807	14.12802	0.1497403	0.17779108	3.1322956	20	9 9.6	19.3
154605 2003 QG_{34}	15.8	X	81.47498	326.63039	330.37998	3.80405	0.1657557	0.18605413	3.0388540	20	11 29.4	20.5
154606 2003 QK_{45}	14.9	X	301.32403	354.88690	26.55039	5.87009	0.1231183	0.17192368	3.2031621	20	8 20.6	19.0
154607 2003 QJ_{57}	14.9	X	69.18771	212.74885	122.83783	10.95774	0.0621911	0.18889318	3.0083281	20	12 22.3	19.3
154608 2003 QE_{63}	14.7	X	323.12287	320.89972	34.82814	5.86756	0.1365096	0.16977840	3.2300885	20	8 20.4	18.6
154609 2003 QF_{97}	15.9	X	135.39819	254.83234	329.28743	1.40161	0.0356725	0.18141520	3.0904396	20	10 19.2	20.3
154610 2003 QD_{101}	15.6	X	43.57130	186.45595	135.44201	2.61909	0.1748708	0.18112362	3.0937555	20	11 19.6	19.8
154611 2003 RL_{4}	14.4	X	11.59367	35.40648	255.39152	13.84891	0.1766487	0.17284801	3.1917323	20	8 13.2	18.3
154612 2003 SO_{37}	17.1	X	306.52211	82.72485	222.30049	3.04286	0.1627058	0.28030112	2.3123460	20	5 7.9	19.5
154613 2003 SJ_{56}	14.4	X	18.05103	27.86037	195.08136	13.39869	0.0260340	0.15882512	3.3769393	20	5 22.7	19.2
154614 2003 SN_{58}	14.6	X	94.40188	301.62198	295.52437	15.44604	0.2057341	0.17841795	3.1249544	20	9 27.4	19.9
154615 2003 SG_{59}	14.4	X	104.81640	305.89878	291.39772	15.70877	0.2023387	0.18097828	3.0954116	20	10 7.4	19.8
154616 2003 SX_{137}	14.5	X	41.41529	104.98055	204.88200	7.72609	0.1153304	0.17379883	3.1800808	20	10 22.6	18.7
154617 2003 SU_{155}	15.5	X	104.79312	159.49273	149.92582	1.50928	0.2561563	0.18744748	3.0237762	20	—	—
154618 2003 SZ_{176}	15.3	X	10.74240	187.30297	144.52946	5.47454	0.1665456	0.17464943	3.1697470	20	10 14.1	19.0
154619 2003 SV_{189}	14.8	X	344.53761	303.26332	41.61780	9.95121	0.0850201	0.17438308	3.1729738	20	9 15.3	18.9
154620 2003 ST_{203}	14.8	X	63.52980	89.48493	206.59018	3.43096	0.0584815	0.17662789	3.1460325	20	10 25.8	19.3
154621 2003 SZ_{204}	14.9	X	295.62610	347.87392	2.50739	2.45143	0.2572602	0.16308281	3.3179049	20	6 8.4	19.4
154622 2003 SD_{205}	15.0	X	108.77289	55.55913	184.48346	5.10088	0.1165008	0.17843516	3.1247534	20	10 15.9	19.8
154623 2003 SU_{238}	15.2	X	31.58826	321.11033	327.96421	4.36072	0.1683979	0.17349698	3.1837682	20	9 18.6	19.1
154624 2003 SS_{260}	15.2	X	96.28024	336.50059	268.30305	2.50093	0.1301935	0.17707851	3.1406930	20	10 8.2	19.9
154625 2003 SP_{297}	14.1	X	260.54809	181.47846	198.38335	25.13120	0.0924763	0.16362704	3.3105438	20	6 23.3	19.3
154626 2003 SP_{309}	16.2	X	242.51633	177.67123	207.88136	4.66759	0.1374394	0.21983964	2.7189343	20	6 7.5	20.3
154627 2003 UO_{14}	15.2	X	253.38731	157.33993	40.23388	7.29434	0.1627362	0.18518477	3.0483573	20	—	—
154628 2003 UA_{224}	16.8	X	150.21850	66.34164	272.99821	2.72920	0.1797031	0.31393967	2.1440681	20	1 2.5	19.3
154629 2003 UM_{263}	14.5	X	46.58485	204.95801	175.77048	9.41065	0.1608368	0.12536954	3.9537392	20	—	—
154630 2003 VA_{10}	16.8	X	330.96068	126.59858	22.64014	20.97395	0.0766945	0.36697140	1.9321814	20	—	—
154631 2003 WO_{25}	18.1	X	110.46173	176.01369	357.85793	15.90146	0.4915814	0.50710976	1.5574044	20	9 11.4	20.8
154632 2003 WT_{151}	12.4	X	270.79430	233.21521	74.92055	27.51790	0.0523225	0.08419356	5.1556503	20	4 30.5	19.5
154633 2003 XT	16.8	X	18.83011	176.92641	275.90587	19.55086	0.0550564	0.36378789	1.9434374	20	—	—
154634 2003 XX_{38}	16.8	X	53.10931	46.14696	3.28132	3.95187	0.1387764	0.30357055	2.1926179	20	—	—
154635 2003 YX	16.4	X	66.90481	208.41873	284.67841	19.68639	0.0674024	0.37760391	1.8957384	20	3 1.9	18.6
154636 2003 YB_{4}	16.6	X	260.26137	254.54902	183.21090	6.16497	0.0519336	0.28347159	2.2950722	20	9 30.3	19.0
154637 2003 YD_{26}	16.6	X	56.02171	66.34797	294.81523	16.73730	0.0712021	0.35314192	1.9823022	20	—	—
154638 2003 YT_{79}	16.4	X	103.55741	142.81571	284.20648	17.78820	0.0808494	0.37233560	1.9135787	20	1 30.9	18.2
154639 2003 YJ_{90}	16.8	X	318.38811	341.65604	66.11626	2.26109	0.2129945	0.28608910	2.2810520	20	11 24.2	18.1
154640 2003 YW_{117}	16.2	X	135.47382	39.39052	319.09686	19.19388	0.0991742	0.36621841	1.9348291	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154641 2003 YS_{124}	16.5	X	89.54736	30.79579	318.74456	17.68756	0.0693520	0.35569069	1.9728211	20	—	—
154642 2004 AX_{10}	16.1	X	347.23389	82.88096	26.30578	20.31239	0.0839415	0.35760244	1.9657837	20	—	—
154643 2004 BN_{83}	16.6	X	4.66617	295.38125	166.12766	23.53479	0.0854857	0.35910051	1.9603128	20	—	—
154644 2004 BH_{112}	16.7	X	89.26528	209.90496	138.61506	24.49817	0.0793991	0.35315271	1.9822618	20	—	—
154645 2004 BY_{116}	16.3	X	297.97515	355.36524	65.79714	7.42921	0.1001721	0.28124257	2.3071829	20	11 2.3	18.5
154646 2004 BC_{122}	16.4	X	247.46584	235.23848	46.69950	22.11983	0.0637651	0.36409623	1.9423400	20	1 26.4	19.3
154647 2004 CS_{49}	16.4	X	160.99966	320.12223	279.28672	5.74845	0.1193523	0.28453561	2.2893470	20	12 22.9	19.6
154648 2004 DN_{3}	16.2	X	212.76569	151.88198	173.36896	21.95070	0.0508270	0.36793234	1.9288157	20	2 3.5	18.7
154649 2004 DH_{25}	16.6	X	150.20488	151.48242	177.84817	22.68873	0.0892735	0.35776226	1.9651982	20	—	—
154650 2004 EA_{12}	16.8	X	91.24195	245.53359	167.26010	5.97716	0.0819135	0.30215766	2.1994477	20	1 8.8	19.1
154651 2004 EP_{15}	16.9	X	178.57866	271.71144	277.52567	2.66671	0.0847660	0.27702413	2.3305458	20	11 7.9	20.0
154652 2004 EP_{20}	18.7	X	173.31599	191.32636	159.58451	16.17481	0.4505054	0.90499623	1.0585341	20	—	—
154653 2004 ES_{54}	15.3	X	192.95575	322.36623	289.86374	13.52773	0.0750244	0.22772035	2.6558374	20	—	—
154654 2004 EG_{85}	16.1	X	36.74658	126.64782	21.08151	9.15854	0.0523834	0.24539658	2.5267196	20	3 8.9	19.1
154655 2004 EZ_{110}	16.8	X	201.85964	85.91906	226.12827	1.91968	0.2142682	0.29687701	2.2254526	20	1 21.2	20.5
154656 2004 FE_{3}	16.2	X	169.62897	338.22310	339.09741	22.95192	0.6471621	0.28061443	2.3106245	20	1 31.0	21.6
154657 2004 FE_{11}	16.7	X	334.99304	265.72346	81.98342	3.19643	0.2134207	0.26270179	2.4145008	20	9 17.9	18.3
154658 2004 FA_{18}	19.3	X	268.01467	318.62039	29.60304	19.28640	0.4547201	0.85840215	1.0965005	20	3 27.9	20.0
154659 2004 FT_{20}	16.7	X	239.37380	299.70924	353.36740	6.98094	0.1470433	0.29928636	2.2134927	20	2 2.4	19.9
154660 Kavelaars	17.1	X	109.12998	252.20567	182.44014	22.50891	0.1107073	0.37034817	1.9204187	20	3 1.7	19.1
154661 2004 FL_{32}	15.3	X	145.38604	338.86939	97.04309	28.70905	0.3672145	0.31133541	2.1560080	20	5 25.6	19.6
154662 2004 FO_{46}	16.7	X	309.24426	302.79454	283.23392	1.87972	0.1358871	0.30040212	2.2080084	20	1 21.4	19.5
154663 2004 FP_{65}	16.5	X	155.07978	250.69848	46.91423	7.32926	0.1252885	0.28427862	2.2907266	20	—	—
154664 2004 FM_{67}	16.4	X	125.15112	201.48939	100.88119	4.30226	0.1873814	0.27986864	2.3147276	20	—	—
154665 2004 FS_{70}	16.8	X	136.91736	173.74679	159.59083	5.77774	0.2035116	0.29089187	2.2558748	20	—	—
154666 2004 FQ_{81}	16.1	X	235.65181	164.49332	109.46471	8.92196	0.2421675	0.29086135	2.2560326	20	1 2.9	19.8
154667 2004 FW_{108}	16.4	X	65.78984	130.23992	191.68028	4.53751	0.1349613	0.27390462	2.3482075	20	12 28.7	19.7
154668 2004 FY_{118}	17.1	X	31.83119	12.57363	177.28443	4.36781	0.0617028	0.30825006	2.1703708	20	4 23.6	19.0
154669 2004 FA_{127}	17.0	X	181.62869	329.73128	334.11129	3.08775	0.1582258	0.29122356	2.2541616	20	—	—
154670 2004 FK_{134}	15.5	X	217.11640	247.29740	322.26656	11.61329	0.1114462	0.22180926	2.7028147	20	—	—
154671 2004 FA_{148}	15.7	X	301.93874	244.17165	314.82569	14.07049	0.0960592	0.23316352	2.6143415	20	—	—
154672 2004 GR_{5}	17.5	X	326.19672	187.09150	78.18317	1.23386	0.1674963	0.30714791	2.1755597	20	4 8.9	19.4
154673 2004 GV_{12}	16.2	X	269.60813	202.90405	113.22943	5.53586	0.2269595	0.30288587	2.1959210	20	3 26.9	19.3
154674 2004 GS_{14}	17.3	X	305.89414	286.94295	311.83328	2.75230	0.1644280	0.29917992	2.2140177	20	1 30.6	20.1
154675 2004 GT_{19}	16.0	X	288.85685	7.51834	171.89407	23.49240	0.1802983	0.28869396	2.2673101	20	—	—
154676 2004 GM_{24}	16.8	X	24.64261	343.00394	194.75218	24.72760	0.2050124	0.30426815	2.1892653	20	3 22.6	17.9
154677 2004 GF_{30}	16.8	X	355.94380	140.84713	53.64527	3.19880	0.0714860	0.30225803	2.1989608	20	2 28.5	19.0
154678 2004 GV_{33}	16.6	X	208.05477	210.48376	46.69774	9.38005	0.0949632	0.28515110	2.2860515	20	—	—
154679 2004 GD_{37}	17.3	X	3.85871	255.20494	314.45938	3.09439	0.1074644	0.30672754	2.1775470	20	3 30.3	19.2
154680 2004 GT_{37}	16.4	X	222.09897	270.24204	7.23571	5.21300	0.0829316	0.29160013	2.2522205	20	—	—
154681 2004 GX_{37}	16.9	X	23.46706	92.32129	93.80602	5.23270	0.0438808	0.30497846	2.1858647	20	4 4.9	19.1
154682 2004 GE_{49}	17.1	X	76.44701	12.81593	330.82092	2.11433	0.2302371	0.27764902	2.3270477	20	—	—
154683 2004 GK_{59}	16.8	X	340.28436	135.97677	94.12004	3.28077	0.1022560	0.30449180	2.1881931	20	3 22.7	18.7
154684 2004 GO_{59}	16.8	X	339.94917	87.30071	234.99758	0.87684	0.0954826	0.31697417	2.1303623	20	8 22.9	18.3
154685 2004 GO_{74}	16.7	X	11.21523	59.20429	55.87686	8.92732	0.0647368	0.29395368	2.2401828	20	—	—
154686 2004 GC_{78}	16.6	X	219.42090	345.58678	283.39583	4.45005	0.1340248	0.29057393	2.2575200	20	—	—
154687 2004 HS	16.1	X	218.44777	339.48797	344.62249	7.75270	0.2305299	0.29939877	2.2129387	20	2 19.7	19.8
154688 2004 HV_{1}	16.7	X	256.28074	33.89776	208.92209	7.29323	0.1109259	0.29188683	2.2507455	20	—	—
154689 2004 HF_{2}	16.9	X	260.38588	120.54530	188.28875	3.57764	0.2040448	0.30213541	2.1995557	20	3 7.0	20.1
154690 2004 HA_{6}	16.8	X	356.45245	357.23293	189.67359	3.43491	0.0835051	0.29997082	2.2101244	20	2 13.9	18.9
154691 2004 HF_{18}	16.1	X	311.32392	337.41270	227.99233	3.78037	0.1311630	0.23365882	2.6106457	20	1 8.8	19.6
154692 2004 HL_{26}	17.3	X	304.12792	144.99049	106.99366	2.83295	0.1285299	0.30136968	2.2032799	20	2 21.7	19.7
154693 2004 HR_{44}	16.3	X	281.21692	272.78805	5.55844	5.39087	0.0718031	0.30054080	2.2073291	20	3 7.6	18.9
154694 2004 HW_{48}	17.0	X	328.10074	265.42993	337.07861	4.18493	0.1195241	0.30329587	2.1939415	20	3 14.8	19.0
154695 2004 HD_{50}	16.9	X	151.52431	258.95796	352.90694	1.97806	0.1674167	0.27431224	2.3458807	20	12 24.3	20.6
154696 2004 HX_{61}	16.8	X	357.32223	259.40994	336.11448	4.30432	0.0695691	0.30791803	2.1719307	20	4 30.4	19.0
154697 2004 JY_{1}	17.1	X	230.78911	18.92396	251.90635	5.01827	0.1607074	0.28862147	2.2676897	20	—	—
154698 2004 JQ_{8}	16.8	X	303.02975	224.61301	332.12284	4.39275	0.0801634	0.29262562	2.2469556	20	—	—
154699 2004 JT_{8}	15.1	X	251.20970	290.81112	31.99494	10.15127	0.1351820	0.18075756	3.0979309	20	4 2.5	19.8
154700 2004 JP_{13}	16.9	X	58.25673	291.13781	249.67856	2.62893	0.0248892	0.30981552	2.1630536	20	5 18.1	19.2
154701 2004 JF_{17}	16.7	X	233.32812	247.92820	3.41677	6.32505	0.0929318	0.28897777	2.2658253	20	—	—
154702 2004 JS_{18}	17.0	X	199.92897	110.66786	190.86341	4.15292	0.1866002	0.28949198	2.2631414	20	1 6.7	20.6
154703 2004 JO_{19}	17.3	X	106.56610	81.14679	202.23605	0.87215	0.1739129	0.27001234	2.3707203	20	12 22.1	21.0
154704 2004 JT_{19}	16.2	X	287.24726	139.97257	169.91203	2.10900	0.1857964	0.24179140	2.5517737	20	4 15.1	19.5
154705 2004 JQ_{22}	16.8	X	15.57684	8.92881	280.13177	1.67303	0.1712983	0.25458839	2.4655301	20	9 6.6	19.3
154706 2004 JW_{23}	16.5	X	102.63360	73.23033	247.33836	3.68288	0.1147418	0.27754285	2.3276411	20	—	—
154707 2004 JR_{25}	16.7	X	114.00154	209.06854	64.45193	7.37886	0.1032393	0.27052381	2.3677311	20	12 14.9	20.2
154708 2004 JW_{33}	17.5	X	235.17343	145.96195	142.77931	3.56399	0.2592553	0.29131702	2.2536794	20	1 19.5	21.4
154709 2004 KR	16.3	X	266.37684	5.75027	227.02461	7.30782	0.0872430	0.29039202	2.2584627	20	—	—
154710 2004 KR_{4}	16.4	X	126.08823	265.20206	163.46944	5.93225	0.0488594	0.30239555	2.1982940	20	3 19.0	18.9
154711 2004 KH_{6}	17.2	X	242.44601	5.15873	222.41323	6.54809	0.0963288	0.28542545	2.2845864	20	—	—
154712 2004 KU_{8}	16.6	X	196.19742	47.10172	184.89476	5.90922	0.0840327	0.27971435	2.3155787	20	—	—
154713 2004 LA_{2}	15.9	X	83.71748	348.51656	297.93802	5.45738	0.2002574	0.26094236	2.4253420	20	12 5.1	19.8
154714 de Schepper	16.2	X	0.59803	140.29752	160.32059	8.14843	0.1216030	0.25346115	2.4728349	20	8 19.8	18.5
154715 2004 LB_{6}	18.4	X	232.94346	190.59750	182.77117	4.09844	0.4906697	0.47867044	1.6184961	20	4 16.3	21.2
154716 2004 LV_{9}	16.2	X	29.74193	288.71616	4.24694	5.61232	0.1660107	0.25212665	2.4815530	20	10 5.9	19.1
154717 2004 LX_{9}	15.8	X	37.87776	259.67005	45.19696	6.96035	0.1368112	0.25460677	2.4654115	20	10 31.0	18.7
154718 2004 LG_{18}	15.7	X	296.05442	188.61965	320.59144	25.90377	0.1847234	0.27890561	2.3200529	20	—	—
154719 2004 MV_{4}	16.0	X	78.82279	171.88680	58.64503	9.58995	0.2017470	0.25468072	2.4649342	20	9 26.1	19.7
154720 2004 MJ_{7}	15.5	X	51.86575	357.07921	332.68470	8.03392	0.1965905	0.26241731	2.4162455	20	12 29.1	19.1

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154721 2004 MW_7	16.7	X	144.15133	134.25657	171.56842	5.05690	0.2383612	0.27205051	2.3588646	20	—	—
154722 2004 NA	16.5	X	48.00195	93.80981	256.11408	1.27941	0.2227120	0.26298531	2.4127652	20	—	—
154723 2004 NS	16.7	X	183.47193	120.46172	130.53977	5.85259	0.1909925	0.27484628	2.3428409	20	—	—
154724 2004 NU	16.1	X	278.13648	166.42912	161.09370	3.96954	0.1278367	0.23853670	2.5749329	20	5 6.7	19.5
154725 2004 NC_2	16.1	X	239.30233	260.40025	79.21127	4.29163	0.1792682	0.23251862	2.6191732	20	4 4.3	20.2
154726 2004 NO_2	16.3	X	155.14279	348.22147	291.06869	6.52420	0.1681210	0.27167359	2.3610459	20	—	—
154727 2004 NR_3	16.9	X	80.20089	232.42621	67.94506	4.19855	0.1765954	0.26283275	2.4136987	20	12 17.8	20.4
154728 2004 NM_9	15.9	X	21.43170	204.32833	121.43606	3.51515	0.2053879	0.25554211	2.4593918	20	11 16.9	18.8
154729 2004 NQ_9	15.4	X	49.98151	9.71259	312.29361	5.72631	0.2798002	0.25959482	2.4337280	20	12 25.6	19.2
154730 2004 NW_9	16.7	X	151.43602	158.43233	112.38484	5.01213	0.1754842	0.27120716	2.3637522	20	—	—
154731 2004 NM_{10}	15.5	X	168.70856	358.29548	320.79093	10.45906	0.3067722	0.21561739	2.7543145	20	1 18.4	20.5
154732 2004 NC_{12}	16.1	X	136.89959	352.96023	331.80098	5.22963	0.1205143	0.21307730	2.7761606	20	—	—
154733 2004 NJ_{12}	16.4	X	85.37685	277.74559	20.45282	2.16512	0.2052712	0.26248590	2.4158246	20	12 21.8	20.2
154734 2004 NH_{14}	16.4	X	79.44144	127.86714	173.29452	3.25487	0.1265664	0.26268959	2.4145756	20	12 14.3	19.9
154735 2004 NX_{15}	16.1	X	85.62441	155.27073	143.35920	7.23347	0.1557107	0.26270831	2.4144609	20	12 19.7	19.8
154736 2004 NA_{16}	15.2	X	192.88349	332.25891	331.13683	15.58833	0.1820193	0.21729970	2.7400804	20	1 15.3	19.9
154737 2004 NM_{16}	15.3	X	207.06320	180.54141	138.19010	14.01184	0.1579988	0.22344531	2.6896053	20	2 10.1	19.8
154738 2004 NO_{18}	16.0	X	67.37157	188.51503	156.55819	6.58509	0.1375482	0.26672305	2.3901713	20	—	—
154739 2004 NP_{21}	16.3	X	139.24728	122.83461	148.05439	4.07276	0.2091547	0.26787890	2.3832908	20	—	—
154740 2004 NO_{23}	15.9	X	152.70458	200.55704	155.97266	10.13988	0.2200883	0.21823594	2.7322380	20	2 10.7	20.5
154741 2004 NO_{27}	16.9	X	125.36757	119.31216	161.26003	4.35901	0.1578236	0.26698987	2.3885785	20	—	—
154742 2004 NQ_{30}	17.1	X	102.70106	21.44626	322.53694	0.86426	0.2047655	0.27137938	2.3627521	20	—	—
154743 2004 OJ_2	16.1	X	329.10224	92.67047	233.53800	1.89450	0.1584607	0.24655743	2.5187824	20	7 24.3	18.4
154744 2004 OV_2	16.2	X	251.27751	126.51172	175.09369	2.36338	0.0868245	0.23003801	2.6379687	20	3 6.1	19.9
154745 2004 OT_4	16.3	X	69.30539	27.60988	291.72722	4.22462	0.2203841	0.26266395	2.4147327	20	—	—
154746 2004 OZ_4	16.5	X	51.33351	164.55448	109.68505	3.29749	0.1597769	0.25301764	2.4757238	20	10 12.3	19.6
154747 2004 OM_9	16.9	X	68.88288	305.41839	345.03047	1.89581	0.2138493	0.26007130	2.4307545	20	11 27.4	20.5
154748 2004 OS_9	15.7	X	145.12335	271.13603	68.95644	6.64769	0.0719129	0.21684529	2.7439070	20	1 1.2	19.7
154749 2004 PV_2	16.4	X	144.35406	204.97066	41.08984	2.91388	0.1791388	0.26529366	2.3987490	20	12 8.5	20.1
154750 2004 PF_3	16.8	X	158.82902	168.78582	84.17639	3.20293	0.1325728	0.26866573	2.3786353	20	—	—
154751 2004 PN_3	14.8	X	322.63181	343.06073	326.75148	15.17487	0.0818561	0.17919499	3.1159141	20	6 23.5	19.1
154752 2004 PL_4	15.1	X	280.44283	159.94260	256.47371	12.02709	0.1378300	0.18770629	3.0209961	20	8 26.4	19.4
154753 2004 PF_5	16.6	X	117.57794	50.71757	203.17665	4.52551	0.0765688	0.26059758	2.4274807	20	11 22.1	20.0
154754 2004 PO_9	16.0	X	229.90652	138.75569	149.48567	11.92518	0.1735197	0.22426455	2.6830512	20	1 23.5	20.4
154755 2004 PT_9	15.9	X	114.60884	72.55354	297.64608	3.25763	0.0880154	0.21444189	2.7643708	20	1 4.6	19.5
154756 2004 PW_9	15.7	X	64.95183	176.46661	187.65761	1.76618	0.0829012	0.20486518	2.8498628	20	—	—
154757 2004 PX_9	16.4	X	186.89409	79.25624	277.45543	1.86366	0.1029836	0.22488400	2.6781220	20	3 6.2	20.5
154758 2004 PL_{10}	16.6	X	348.73946	291.67526	336.78495	1.98010	0.1562466	0.24094594	2.5577394	20	6 4.7	18.9
154759 2004 PX_{11}	16.8	X	134.98152	67.66796	161.16927	2.63611	0.1521509	0.26052433	2.4279358	20	11 9.8	20.5
154760 2004 PS_{12}	16.7	X	128.05953	126.61998	166.46365	1.53653	0.1786899	0.26822187	2.3812588	20	—	—
154761 2004 PR_{14}	15.5	X	123.62205	163.20581	349.14795	13.58523	0.1010154	0.23981682	2.5657616	20	7 21.3	19.4
154762 2004 PD_{15}	16.0	X	97.25940	285.79621	36.24675	5.18093	0.1512548	0.26519489	2.3993445	20	—	—
154763 2004 PJ_{15}	15.0	X	309.43505	225.64727	131.13130	9.88895	0.0686722	0.18089247	3.0963905	20	8 5.3	19.0
154764 2004 PP_{15}	16.4	X	125.71217	290.69957	20.65500	1.31922	0.1948250	0.26877023	2.3780187	20	—	—
154765 2004 PQ_{18}	16.2	X	164.24058	126.46211	183.82008	2.30924	0.1676648	0.21350021	2.7724934	20	—	—
154766 2004 PG_{19}	15.7	X	138.36528	16.77164	334.92164	9.35223	0.1863035	0.21348871	2.7725929	20	1 23.1	19.9
154767 2004 PZ_{22}	16.3	X	190.80189	332.70482	326.64133	2.75676	0.1779272	0.21786112	2.7353709	20	1 5.7	20.8
154768 2004 PO_{23}	15.5	X	324.02256	70.39327	322.79691	8.36397	0.0810795	0.19212351	2.9745119	20	10 10.8	19.3
154769 2004 PM_{24}	16.5	X	104.82369	155.45790	99.69960	2.59383	0.1539562	0.25907780	2.4369647	20	11 13.9	20.3
154770 2004 PB_{25}	15.7	X	16.32805	140.91267	161.96442	1.77751	0.1578894	0.18784544	3.0195040	20	9 14.7	19.2
154771 2004 PH_{25}	16.8	X	121.08231	2.28361	278.50508	1.26705	0.1679382	0.26538765	2.3981826	20	12 30.7	20.5
154772 2004 PK_{25}	15.9	X	100.32819	211.29608	148.44449	4.96848	0.0816807	0.20995468	2.8036191	20	—	—
154773 2004 PC_{26}	16.8	X	117.13177	256.01301	49.57399	2.00467	0.1939034	0.26819331	2.3814278	20	—	—
154774 2004 PK_{28}	16.1	X	160.95253	209.03254	149.13411	6.76795	0.0518192	0.22007802	2.7169706	20	2 7.3	20.0
154775 2004 PL_{31}	16.1	X	357.93415	188.76434	121.47348	1.51609	0.1842199	0.18489192	3.0515753	20	8 23.3	19.2
154776 2004 PF_{32}	15.5	X	330.93054	298.13702	90.67520	3.77063	0.1509029	0.18992222	2.9974517	20	10 20.7	18.7
154777 2004 PO_{32}	16.1	X	125.02741	154.59363	115.32361	3.01650	0.1950005	0.26413360	2.4057673	20	12 20.9	20.0
154778 2004 PQ_{33}	15.1	X	249.23118	41.43693	332.58687	15.87094	0.0753564	0.17629801	3.1499556	20	6 5.7	20.0
154779 2004 PQ_{33}	16.3	X	242.48327	47.76478	278.75631	1.48034	0.0809565	0.22865651	2.6485835	20	3 27.8	20.1
154780 2004 PB_{35}	15.9	X	3.10978	29.60103	340.61418	10.31648	0.1517945	0.19181912	2.9776578	20	11 17.4	19.6
154781 2004 PW_{37}	16.3	X	243.28288	349.85666	333.52742	1.89145	0.0617027	0.22756698	2.6570306	20	3 26.8	20.0
154782 2004 PS_{43}	16.1	X	170.51802	312.20853	331.41474	3.05416	0.0664107	0.20982809	2.8047466	20	—	—
154783 2004 PA_{44}	13.6	X	108.44651	72.72509	212.66589	3.28504	0.7602301	0.01838474	14.2177538	20	12 21.8	27.1
154784 2004 PG_{44}	16.9	X	113.90038	343.31372	275.24628	3.50259	0.2017348	0.26261014	2.4150626	20	11 27.7	20.7
154785 2004 PV_{48}	16.3	X	253.97761	276.48510	50.78159	4.12095	0.1673441	0.23291588	2.6161942	20	4 3.6	20.2
154786 2004 PY_{51}	16.4	X	133.07098	205.51548	80.24411	3.19851	0.1682423	0.26731979	2.3866129	20	—	—
154787 2004 PJ_{53}	16.4	X	198.94770	242.77447	23.56013	4.28281	0.1129296	0.27541387	2.3396210	20	—	—
154788 2004 PU_{53}	16.2	X	2.15379	198.75587	85.99296	4.45256	0.1311456	0.24341875	2.5403879	20	7 30.5	18.6
154789 2004 PH_{60}	15.9	X	319.91637	298.35663	62.50160	3.15445	0.1959950	0.18196475	3.0842142	20	8 16.0	19.3
154790 2004 PO_{62}	15.2	X	271.30702	80.61923	302.51201	9.24835	0.1263205	0.18052312	3.1006125	20	7 9.7	19.6
154791 2004 PC_{65}	16.3	X	244.24488	310.37252	326.78082	5.69292	0.1465613	0.22099181	2.7094757	20	1 26.4	20.5
154792 2004 PL_{67}	16.5	X	224.32507	95.40473	199.19282	5.20593	0.1635933	0.28434064	2.2903935	20	1 19.3	20.2
154793 2004 PO_{68}	15.7	X	0.14506	226.67902	169.97837	10.77807	0.1061959	0.19763772	2.9189242	20	12 17.2	19.5
154794 2004 PK_{69}	15.8	X	24.82564	315.58589	59.16503	2.72025	0.0728135	0.19805494	2.9148235	20	12 19.1	19.6
154795 2004 PW_{70}	16.1	X	167.71085	158.37563	166.12886	6.55826	0.1775386	0.28039870	2.3118095	20	1 6.2	19.6
154796 2004 PX_{74}	16.2	X	181.86334	183.34033	166.43106	6.55980	0.0292432	0.22242758	2.6978034	20	2 18.9	20.1
154797 2004 PS_{76}	15.6	X	172.47479	175.52173	155.10426	16.18712	0.1071891	0.21903317	2.7256042	20	1 20.9	20.0
154798 2004 PQ_{80}	15.4	X	179.15361	90.34234	337.00731	21.38754	0.0309684	0.23821324	2.5772633	20	5 19.5	19.5
154799 2004 PN_{82}	16.6	X	339.94442	284.89510	17.11318	1.93585	0.1583875	0.24245036	2.5471479	20	7 9.9	19.0
154800 2004 PZ_{83}	16.4	X	19.67879	143.36651	152.29309	8.68286	0.1189359	0.24679632	2.5171567	20	9 17.0	19.2

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154801 2004 PC_{84}	15.7	X	319.67124	341.02495	354.53707	7.35796	0.2230108	0.17908057	3.1172411	20	7 6.5	19.2
154802 2004 PF_{85}	15.5	X	310.29203	216.20703	152.97813	4.08124	0.2371889	0.17875495	3.1210256	20	7 31.7	18.9
154803 2004 PS_{88}	16.1	X	196.68756	151.72349	179.23557	13.82608	0.2089625	0.22077088	2.7112831	20	2 13.9	20.9
154804 2004 PY_{89}	15.3	X	258.85442	310.64324	3.54231	14.78625	0.1477497	0.22655100	2.6649684	20	3 24.2	19.1
154805 2004 PF_{93}	16.4	X	129.54756	281.42267	31.70772	7.12164	0.1206130	0.27102148	2.3648317	20	—	—
154806 2004 PH_{94}	15.5	X	263.92964	275.43647	155.35372	9.78038	0.1229285	0.18544561	3.0454982	20	8 31.0	19.5
154807 2004 PP_{97}	18.6	X	171.68451	68.65410	15.12746	15.52667	0.3165373	0.54532027	1.4837758	20	6 11.8	20.9
154808 2004 PF_{104}	15.5	X	4.51435	244.06624	33.08143	17.47737	0.1177603	0.24591648	2.5231571	20	7 28.5	18.6
154809 2004 PW_{105}	15.0	X	83.42835	28.59960	167.41306	16.01040	0.1240794	0.23649697	2.5897171	20	7 28.3	18.8
154810 2004 PZ_{106}	16.3	X	330.48695	85.82885	298.83332	1.75165	0.0500969	0.19052862	2.9910883	20	10 12.9	20.2
154811 2004 PK_{107}	16.5	X	352.96771	62.26303	237.89752	3.80759	0.0266264	0.24441074	2.5335094	20	7 30.3	19.6
154812 2004 PO_{114}	15.9	X	357.03885	177.93708	148.28703	9.78821	0.0915278	0.18638967	3.0352059	20	9 8.7	19.6
154813 2004 QA	16.8	X	90.61996	115.38767	178.67133	2.46367	0.1203844	0.25995766	2.4314628	20	12 15.8	20.5
154814 2004 QM_{2}	16.0	X	290.32237	119.33787	173.09351	15.08318	0.1785408	0.23156186	2.6263828	20	3 29.6	19.6
154815 2004 QE_{4}	15.6	X	172.72430	227.41377	83.12145	4.60055	0.0810227	0.21031274	2.8004361	20	—	—
154816 2004 QR_{7}	16.5	X	102.08016	141.83033	161.97695	2.25359	0.0779207	0.19908855	2.9047262	20	12 23.6	20.9
154817 2004 QX_{8}	14.8	X	184.42067	71.76080	30.50083	16.28905	0.0435410	0.17260890	3.1946793	20	7 19.8	19.8
154818 2004 QA_{9}	15.2	X	276.53964	254.59490	134.70910	5.99251	0.1401264	0.17536293	3.1611433	20	7 21.1	19.4
154819 2004 QN_{9}	16.0	X	69.80119	304.55655	10.40791	5.76055	0.1989105	0.26025369	2.4296187	20	12 27.6	19.8
154820 2004 QU_{10}	15.0	X	334.28504	333.88941	67.05152	10.60659	0.0273633	0.19309127	2.9645649	20	11 10.8	18.9
154821 2004 QN_{12}	16.7	X	214.29720	282.25371	22.26971	10.37063	0.2468262	0.28403704	2.2920253	20	1 27.5	20.8
154822 2004 QC_{21}	15.6	X	80.25128	97.40428	209.40063	1.13992	0.0667877	0.19737402	2.9215236	20	12 2.3	19.8
154823 2004 QX_{25}	14.3	X	311.88457	165.92763	189.49966	27.35393	0.1282976	0.17814800	3.1281104	20	7 26.6	18.8
154824 2004 RL_{4}	14.8	X	138.63846	100.82217	12.77019	25.93647	0.1416987	0.16871289	3.2436741	20	6 9.4	20.4
154825 2004 RL_{6}	15.8	X	235.96948	140.07311	136.50238	14.71651	0.2076179	0.22068261	2.7120060	20	1 14.6	20.4
154826 2004 RO_{6}	16.3	X	141.06203	284.66281	32.65905	7.17083	0.2121968	0.27204212	2.3589132	20	—	—
154827 2004 RM_{7}	14.0	X	234.17637	19.62362	11.29993	30.96183	0.1292254	0.17195668	3.2027522	20	5 24.9	19.5
154828 2004 RT_{8}	15.6	X	222.37256	152.54325	184.83207	12.91964	0.1814572	0.22609889	2.6685198	20	3 14.8	19.9
154829 2004 RA_{9}	15.6	X	149.95641	150.90831	175.22926	4.27821	0.1031165	0.20948551	2.8078036	20	—	—
154830 2004 RT_{12}	15.6	X	148.63096	356.54866	355.80752	14.92135	0.3062861	0.21619538	2.7494033	20	2 14.1	20.5
154831 2004 RY_{13}	15.9	X	81.05449	261.36011	163.62967	4.90629	0.0822242	0.21550705	2.7552546	20	1 27.4	19.4
154832 2004 RE_{16}	15.4	X	267.68627	29.08518	313.97183	4.48315	0.1811203	0.17171828	3.2057158	20	5 5.7	20.2
154833 2004 RK_{18}	15.9	X	52.46726	305.66752	69.56165	3.08622	0.0813924	0.20205834	2.8761941	20	—	—
154834 2004 RB_{26}	16.4	X	6.18930	226.58063	86.49858	4.57576	0.0959299	0.24600685	2.5225392	20	9 17.6	19.3
154835 2004 RT_{27}	14.8	X	211.18734	35.39743	340.77659	6.84962	0.0602975	0.16782402	3.2551172	20	4 26.7	19.8
154836 2004 RS_{29}	16.1	X	171.98299	223.12103	142.39900	5.16769	0.1577971	0.22193636	2.7017826	20	3 6.7	20.4
154837 2004 RW_{29}	16.1	X	107.66157	237.02653	20.02904	4.93379	0.0509662	0.25776092	2.4452579	20	11 11.3	19.4
154838 2004 RR_{30}	16.0	X	53.66184	356.50150	318.97339	0.20186	0.1545205	0.19494794	2.9457120	20	11 23.1	20.2
154839 2004 RC_{35}	15.4	X	14.13284	21.01202	5.82105	9.29644	0.1119115	0.19609866	2.9341770	20	12 24.9	19.4
154840 2004 RW_{35}	15.5	X	193.99252	283.07296	34.57692	5.21939	0.1178520	0.21754211	2.7380444	20	1 29.8	19.8
154841 2004 RC_{36}	15.2	X	271.52335	214.56183	136.90913	9.47707	0.0894462	0.17254428	3.1954768	20	6 5.5	19.8
154842 2004 RA_{42}	15.8	X	204.36747	271.14404	200.35212	2.30755	0.0664679	0.17606504	3.1527338	20	8 17.3	20.6
154843 2004 RK_{43}	15.1	X	248.14587	63.81214	336.02908	15.32324	0.1269631	0.17564879	3.1577127	20	7 4.9	20.0
154844 2004 RU_{44}	15.3	X	190.38168	63.29437	350.47879	8.23430	0.0842733	0.16871633	3.2436300	20	5 19.9	20.5
154845 2004 RS_{46}	16.5	X	227.94990	321.21806	351.27846	3.04813	0.1639682	0.22324357	2.6912254	20	2 21.2	20.7
154846 2004 RX_{47}	15.7	X	286.57738	258.94500	145.57834	2.16572	0.1846116	0.18144120	3.0901444	20	8 18.1	19.8
154847 2004 RJ_{49}	16.1	X	194.52385	186.72313	154.59875	5.45575	0.0517528	0.22067349	2.7120807	20	2 24.7	19.9
154848 2004 RS_{51}	15.5	X	80.58291	280.91905	69.83595	3.07329	0.0984046	0.20200070	2.8767412	20	—	—
154849 2004 RU_{51}	16.2	X	70.54399	278.86400	42.16312	3.08261	0.1915901	0.25963287	2.4334902	20	—	—
154850 2004 RH_{53}	15.2	X	315.73524	284.58856	88.78254	3.54225	0.1179910	0.18283313	3.0744407	20	9 3.2	18.9
154851 2004 RR_{53}	15.8	X	110.26883	354.25717	33.26887	6.76590	0.0384918	0.21301086	2.7767379	20	1 15.1	19.6
154852 2004 RE_{61}	14.8	X	225.33396	88.98281	335.53959	6.57177	0.1455215	0.17333441	3.1857585	20	7 7.4	19.8
154853 2004 RF_{61}	15.6	X	233.29999	291.47130	343.77505	11.19620	0.1434236	0.21800831	2.7341396	20	1 16.4	20.1
154854 2004 RT_{65}	14.8	X	279.14219	10.25555	357.23692	7.99589	0.0854283	0.17480380	3.1678805	20	7 6.2	19.3
154855 2004 RK_{66}	15.9	X	107.76913	143.34001	173.59319	1.67764	0.1142516	0.20100418	2.8862414	20	—	—
154856 2004 RD_{68}	16.5	X	155.58516	153.72783	145.54083	2.45450	0.2284778	0.27132007	2.3630964	20	—	—
154857 2004 RG_{68}	15.4	X	125.79582	330.54969	24.38530	4.88608	0.2077424	0.20972643	2.8056529	20	1 16.5	19.6
154858 2004 RK_{69}	15.7	X	230.34855	351.43038	11.43383	13.35877	0.1478712	0.22884149	2.6471560	20	4 21.9	19.8
154859 2004 RN_{69}	15.9	X	106.58637	289.26343	35.86585	2.46456	0.0630095	0.20299259	2.8673624	20	—	—
154860 2004 RO_{74}	15.0	X	98.08391	208.52616	75.76908	7.50708	0.0950072	0.19307353	2.9647465	20	11 26.9	19.6
154861 2004 RF_{82}	16.3	X	40.40382	134.15894	248.82927	1.07458	0.0791494	0.20217916	2.8750482	20	—	—
154862 2004 RG_{82}	17.0	X	174.29309	288.01437	328.16402	0.79881	0.1563881	0.27017990	2.3697400	20	—	—
154863 2004 RY_{82}	15.2	X	218.71633	273.09770	168.56429	14.12761	0.0226085	0.17790352	3.1309757	20	7 30.7	19.8
154864 2004 RM_{83}	15.8	X	88.74369	255.37458	46.32068	2.43935	0.0543345	0.19559347	2.9392271	20	12 3.7	20.1
154865 Stefanheutz	15.3	X	77.00546	192.82014	199.82069	15.15487	0.1366232	0.20522708	2.8465115	20	—	—
154866 2004 RE_{92}	16.0	X	178.14602	10.28940	301.02956	3.48546	0.0579719	0.21411006	2.7672263	20	1 2.3	19.8
154867 2004 RM_{94}	16.2	X	133.54110	99.01473	195.30299	8.16669	0.1485407	0.26746950	2.3857222	20	—	—
154868 2004 RF_{101}	15.7	X	185.56422	108.62174	218.10358	4.20586	0.1156659	0.21693199	2.7431759	20	1 29.5	20.1
154869 2004 RO_{102}	15.3	X	332.38863	9.23339	299.77442	3.91734	0.1295059	0.17708961	3.1405617	20	7 2.5	18.9
154870 2004 RV_{103}	14.6	X	170.75478	121.36813	330.87747	12.24472	0.1313678	0.16798548	3.2530312	20	6 19.0	20.0
154871 2004 RZ_{105}	14.9	X	17.98888	314.88188	358.46570	22.26034	0.0689336	0.18298531	3.0727359	20	9 20.2	18.8
154872 2004 RC_{106}	15.7	X	270.69407	325.10594	326.19561	6.44211	0.1639586	0.22527755	2.6750020	20	3 5.4	19.6
154873 2004 RQ_{106}	14.8	X	355.00183	310.45880	3.79855	10.49052	0.0791787	0.17737725	3.1371655	20	8 21.3	18.8
154874 2004 RN_{108}	15.4	X	184.22772	46.41237	240.32652	6.03766	0.0324432	0.21009133	2.8024033	20	—	—
154875 2004 RW_{114}	15.6	X	178.91253	253.67412	82.65187	4.70768	0.2192028	0.21818758	2.7326418	20	2 10.5	20.3
154876 2004 RN_{117}	16.3	X	226.91916	304.57473	216.27571	1.21754	0.0245144	0.19551646	2.9399988	20	11 21.3	20.3
154877 2004 RA_{118}	15.4	X	243.58710	227.50451	19.01149	13.10343	0.0922133	0.21364424	2.7712472	20	—	—
154878 2004 RH_{135}	15.7	X	202.23421	337.32179	97.28187	2.65130	0.1345911	0.17215318	3.2003146	20	6 26.9	20.8
154879 2004 RD_{140}	15.8	X	114.21205	328.76983	41.47432	4.07506	0.1050197	0.20997104	2.8034735	20	1 7.7	19.6
154880 2004 RL_{143}	15.4	X	224.00864	251.59662	26.24338	14.68685	0.1586429	0.21524912	2.7574552	20	1 10.9	20.2

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154881 2004 RT_{143}	15.0	X	264.56217	22.67074	22.26738	11.34484	0.0689652	0.17688260	3.1430115	20	8 10.5	19.6
154882 2004 RR_{144}	15.2	X	249.03793	239.20045	143.58936	5.81722	0.2076143	0.17456737	3.1707403	20	6 3.6	20.2
154883 2004 RM_{147}	15.4	X	238.31460	138.40727	354.69837	8.41945	0.0367500	0.19039663	2.9924705	20	10 26.4	19.8
154884 2004 RN_{148}	15.4	X	320.03868	251.66970	16.45423	14.27708	0.1403112	0.23084707	2.6318015	20	4 11.7	18.3
154885 2004 RJ_{149}	15.5	X	46.29772	251.84494	89.07646	2.89528	0.0907910	0.19230896	2.9725993	20	12 6.1	19.7
154886 2004 RH_{156}	15.6	X	212.44631	327.61484	327.26022	8.49620	0.1382783	0.21713802	2.7414403	20	1 19.8	20.1
154887 2004 RN_{163}	14.6	X	330.40192	269.50158	89.19683	22.59283	0.2385122	0.18419829	3.0592313	20	9 12.3	18.1
154888 2004 RC_{165}	15.2	X	278.52680	107.89011	352.72181	8.29536	0.0524544	0.19037512	2.9926959	20	11 3.9	19.4
154889 2004 RB_{166}	15.6	X	258.49290	193.95728	218.51920	2.45936	0.0563341	0.18164154	3.0878718	20	8 8.8	20.0
154890 2004 RH_{174}	15.1	X	199.60748	157.30831	249.79987	4.80035	0.0397904	0.17109462	3.2135012	20	5 25.3	19.8
154891 2004 RS_{176}	15.1	X	14.33388	70.13294	281.17146	7.89172	0.0392233	0.19109342	2.9851917	20	10 28.6	19.2
154892 2004 RH_{179}	15.5	X	8.35743	272.46981	321.17285	10.63635	0.1311209	0.23418447	2.6067377	20	5 19.8	18.5
154893 2004 RV_{191}	14.9	X	154.90570	180.25691	341.12957	8.44054	0.0152774	0.17959472	3.1112888	20	8 25.8	19.3
154894 2004 RK_{217}	14.6	X	279.17301	97.23350	280.84970	9.62990	0.1299625	0.17417198	3.1755370	20	7 11.5	18.8
154895 2004 RO_{223}	15.4	X	15.57167	212.22556	148.81611	3.01405	0.0768727	0.18856861	3.0117791	20	11 18.9	19.3
154896 2004 RD_{230}	15.5	X	313.94022	0.71601	7.99663	8.29594	0.1983133	0.17884263	3.1200054	20	8 16.5	19.1
154897 2004 RN_{232}	15.6	X	297.89698	66.77269	15.83079	7.75584	0.0156545	0.18884267	3.0088645	20	11 11.3	19.8
154898 2004 RS_{233}	15.3	X	313.54452	58.18299	20.07147	10.00787	0.0530816	0.19044733	2.9919394	20	11 24.4	19.4
154899 2004 RR_{239}	15.8	X	223.49437	168.18332	316.75842	1.99218	0.0403618	0.18674569	3.0313471	20	9 29.2	20.0
154900 2004 RM_{241}	15.7	X	142.39118	301.22404	189.33352	0.48231	0.1138082	0.17145297	3.2090221	20	7 7.2	20.7
154901 2004 RP_{246}	15.1	X	264.78759	235.72189	193.22409	9.20607	0.0726993	0.18012035	3.1052330	20	9 3.4	19.5
154902 Davidtoth	15.0	X	283.00704	209.14054	173.22795	8.61538	0.1113506	0.17716499	3.1396708	20	7 24.1	19.3
154903 2004 RY_{249}	16.1	X	123.47045	94.85637	206.27721	3.98248	0.1889244	0.26536898	2.3982951	20	—	—
154904 2004 RA_{306}	15.2	X	230.05771	201.53507	136.79062	3.30650	0.2699258	0.16224541	3.3293115	20	3 23.5	20.9
154905 2004 RB_{306}	15.4	X	281.41717	239.52274	134.42410	3.70069	0.1342367	0.17351280	3.1835746	20	7 8.7	19.8
154906 2004 RH_{306}	15.2	X	235.22825	232.27498	111.83973	2.76278	0.2141233	0.16319552	3.3163770	20	4 6.4	20.6
154907 2004 RE_{316}	16.5	X	58.10137	213.74126	83.45381	0.66406	0.0845376	0.19000467	2.9965845	20	10 26.7	20.7
154908 2004 RE_{324}	14.7	X	357.92353	76.92780	309.28849	8.86076	0.1035254	0.18881358	3.0091736	20	11 25.7	18.7
154909 2004 RL_{326}	16.0	X	169.40702	107.06049	243.62825	4.59493	0.0334707	0.21635106	2.7480842	20	2 5.5	19.9
154910 2004 RA_{337}	14.8	X	258.46901	353.25948	14.94631	14.64454	0.0181146	0.16834226	3.2484332	20	6 17.8	19.7
154911 2004 RK_{343}	14.8	X	45.99552	199.11306	119.02045	11.39113	0.0948155	0.18807217	3.0170768	20	11 11.6	19.1
154912 2004 SQ_4	15.7	X	237.72474	110.93332	189.56013	8.18291	0.1442086	0.21825449	2.7320832	20	2 14.7	20.1
154913 2004 SF_6	15.9	X	306.96727	206.72282	221.18779	1.38292	0.0898119	0.18962590	3.0005735	20	11 1.9	19.6
154914 2004 ST_8	15.6	X	328.70307	185.81939	233.22243	1.87981	0.0822571	0.19201475	2.9756350	20	11 24.5	19.3
154915 2004 SB_{14}	14.1	X	214.04682	328.57167	27.41552	15.30403	0.0640973	0.15814904	3.3865566	20	4 9.8	19.2
154916 2004 SJ_{21}	16.6	X	147.32946	85.81942	222.70673	3.26098	0.0718947	0.20899830	2.8121656	20	—	—
154917 2004 SP_{22}	15.5	X	229.13115	75.55073	223.20959	4.09279	0.1452977	0.21722663	2.7406948	20	2 5.3	19.9
154918 2004 SF_{24}	15.6	X	217.80637	297.10088	143.36511	2.42637	0.0805973	0.17221003	3.1996103	20	7 23.7	20.3
154919 2004 SY_{29}	15.3	X	318.76830	178.36111	187.61802	4.98050	0.1664731	0.18058550	3.0998984	20	8 21.1	18.8
154920 2004 SQ_{32}	15.4	X	209.88634	288.21166	31.87849	7.53386	0.1129123	0.21725372	2.7404670	20	2 18.4	19.8
154921 2004 ST_{32}	16.0	X	326.27317	264.06421	47.84117	4.22818	0.1290064	0.23650644	2.5896480	20	6 28.9	18.8
154922 2004 SW_{32}	15.4	X	313.17417	230.98561	132.35571	4.08460	0.1161673	0.17776229	3.1326338	20	8 14.4	19.2
154923 2004 SK_{39}	15.5	X	353.61539	197.44378	135.47926	1.98366	0.3286697	0.18308655	3.0716031	20	9 28.5	17.6
154924 2004 SD_{40}	16.1	X	161.75247	229.25165	143.48195	2.55497	0.0854624	0.21697438	2.7428186	20	2 29.9	20.2
154925 2004 SK_{41}	15.6	X	99.81121	220.65821	151.53181	2.65365	0.0777501	0.20469236	2.8514667	20	—	—
154926 2004 SV_{47}	14.8	X	49.52774	11.24951	289.84445	5.94007	0.1243262	0.18444482	3.0565047	20	10 22.6	19.1
154927 2004 SK_{54}	14.9	X	289.31480	359.38351	45.85261	13.28776	0.2014627	0.17788317	3.1312145	20	8 27.3	19.1
154928 2004 SD_{57}	15.4	X	59.91103	250.57404	105.91488	1.79885	0.0814179	0.19846849	2.9107730	20	—	—
154929 2004 SK_{61}	15.1	X	35.01722	216.26220	71.52504	3.02890	0.0812196	0.18090693	3.0962255	20	9 13.9	19.2
154930 2004 TJ_1	15.5	X	221.40396	221.21766	120.73577	6.35034	0.1266877	0.22218479	2.6997684	20	3 25.7	19.7
154931 2004 TQ_1	15.5	X	66.98675	141.27669	186.33527	10.37704	0.0580711	0.19353612	2.9600204	20	12 10.9	19.9
154932 Sviderskiene	15.1	X	333.23009	101.67549	318.95997	1.62107	0.2476827	0.12486320	3.9644208	20	11 11.8	19.3
154933 2004 TP_{23}	15.8	X	77.58729	237.10038	318.34151	3.28220	0.1275366	0.17133392	3.2105085	20	7 18.7	20.4
154934 2004 TO_{29}	15.6	X	223.24520	239.70567	28.70606	5.13755	0.1187212	0.21225892	2.7832918	20	—	—
154935 2004 TF_{36}	16.1	X	199.82181	85.80327	242.77294	1.81794	0.1790043	0.21806349	2.7336783	20	2 15.1	20.6
154936 2004 TM_{38}	16.2	X	91.77076	102.68372	164.64882	0.86486	0.1805826	0.18855206	3.0119553	20	11 7.3	20.8
154937 2004 TO_{48}	14.9	X	242.20024	67.74518	33.37296	10.43181	0.0720376	0.18014145	3.1049906	20	9 21.8	19.4
154938 Besserman	16.3	X	327.20665	194.27203	166.41537	0.59043	0.1786847	0.18075710	3.0979362	20	8 30.3	19.4
154939 2004 TJ_{53}	15.7	X	277.89515	113.67982	206.48442	2.69513	0.1687773	0.22782082	2.6550565	20	4 19.7	19.5
154940 2004 TF_{54}	15.5	X	253.18262	38.76555	56.74722	3.57143	0.0535128	0.17980971	3.1088084	20	9 28.5	19.8
154941 2004 TP_{54}	14.8	X	213.99979	0.67711	76.90141	2.15919	0.1256689	0.16804682	3.2522395	20	7 12.7	19.8
154942 2004 TH_{58}	16.8	X	24.46916	280.90398	17.73357	2.99684	0.1669970	0.24607714	2.5220588	20	10 5.3	19.6
154943 2004 TR_{60}	14.8	X	140.16871	295.95397	183.84265	9.80250	0.1033314	0.16705733	3.2650690	20	6 20.9	19.9
154944 2004 TZ_{61}	16.1	X	260.15022	274.35326	40.05767	3.47208	0.1952847	0.22830859	2.6512736	20	3 22.1	20.1
154945 2004 TM_{64}	15.8	X	345.60037	278.96427	168.22570	2.36978	0.0071391	0.19764391	2.9188633	20	—	—
154946 2004 TD_{65}	14.6	X	146.78343	45.74576	97.73868	8.92183	0.0423569	0.17338768	3.1851061	20	7 24.9	19.2
154947 2004 TH_{69}	16.0	X	305.61887	240.52358	125.10953	4.33827	0.1811560	0.17739136	3.1369992	20	7 27.3	19.8
154948 2004 TC_{76}	15.6	X	257.56201	357.43004	21.66340	2.06704	0.1108148	0.17006038	3.2265170	20	6 18.7	20.4
154949 2004 TF_{78}	15.4	X	328.74822	140.59561	162.70996	1.64140	0.1462028	0.17340749	3.1848634	20	6 16.5	19.2
154950 2004 TX_{87}	16.2	X	20.98807	289.82744	44.55697	0.94811	0.0416384	0.18615466	3.0377599	20	10 18.5	20.1
154951 2004 TR_{92}	16.3	X	339.29832	297.85019	12.61781	3.59066	0.1929028	0.23893072	2.5721012	20	7 20.9	18.4
154952 2004 TX_{99}	16.1	X	53.90060	178.42233	159.65050	2.87055	0.1908199	0.19262249	2.9693728	20	12 24.6	20.5
154953 2004 TP_{106}	15.7	X	232.48138	152.78752	112.15478	6.15522	0.1197486	0.21347528	2.7727092	20	1 2.5	19.9
154954 2004 TN_{118}	14.8	X	196.08095	136.97729	356.75690	16.36534	0.0364305	0.18065403	3.0991144	20	9 10.2	19.2
154955 2004 TN_{120}	14.8	X	260.03086	165.95838	253.11529	3.81258	0.1496992	0.17483056	3.1675573	20	8 4.8	19.4
154956 2004 TH_{125}	16.8	X	142.62032	181.59838	116.57169	3.52171	0.2308000	0.26832288	2.3806611	20	—	—
154957 2004 TK_{125}	15.7	X	349.05081	291.37386	145.37262	2.81615	0.1104332	0.19698915	2.9253277	20	—	—
154958 2004 TX_{135}	14.5	X	141.61711	239.73009	252.90860	8.52094	0.0768098	0.16714671	3.2639048	20	7 5.7	19.5
154959 2004 TR_{137}	15.5	X	11.35066	216.40745	117.75810	2.29094	0.1732173	0.18383981	3.0632069	20	10 20.2	19.0
154960 2004 TK_{186}	14.5	X	274.16381	119.95161	356.01914	2.32023	0.1466225	0.12465175	3.9689028	20	10 24.7	19.9

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
154961 2004 TC_{214}	15.3	X	100.13439	222.68777	8.13331	5.78652	0.0229316	0.17949421	3.1124502	20	9 16.0	19.7
154962 2004 TR_{216}	15.9	X	87.13142	247.52496	100.14062	3.19026	0.0920999	0.20270623	2.8700623	20	—	—
154963 2004 TG_{220}	14.8	X	296.23027	280.34921	105.83253	12.38434	0.0680796	0.17922774	3.1155344	20	8 28.3	19.1
154964 2004 TB_{232}	15.0	X	105.34709	208.30593	23.07648	10.90166	0.0615036	0.17981564	3.1087400	20	9 28.6	19.5
154965 2004 TB_{238}	15.2	X	217.78496	254.67904	187.28694	5.18347	0.1286860	0.17106129	3.2139187	20	7 20.5	20.2
154966 2004 TF_{239}	14.7	X	81.83651	48.25810	31.41151	10.28573	0.0551946	0.14737395	3.5496775	20	2 27.0	19.7
154967 2004 TK_{252}	14.6	X	218.33698	46.57424	6.19136	21.91349	0.1602996	0.17224637	3.1991602	20	6 10.8	20.1
154968 2004 TV_{265}	15.1	X	135.78508	338.82825	220.09524	2.56393	0.0974868	0.17852369	3.1237204	20	9 21.1	19.9
154969 2004 TO_{272}	14.7	X	96.05709	354.51547	234.83209	16.28545	0.1551437	0.17568066	3.1573308	20	9 17.2	19.9
154970 2004 TB_{280}	16.0	X	90.86181	224.80061	42.56830	2.03555	0.0509502	0.18347874	3.0672244	20	10 23.3	20.4
154971 2004 TL_{282}	14.4	X	315.94861	3.77906	78.09972	3.27282	0.1724169	0.12607553	3.9389656	20	11 11.6	19.1
154972 2004 TS_{343}	15.4	X	329.14482	230.46759	130.60341	1.85232	0.1946556	0.17918040	3.1160832	20	9 2.9	18.6
154973 2004 TC_{344}	14.9	X	126.51719	347.89803	207.76479	9.91351	0.1464063	0.17695954	3.1421005	20	9 8.8	20.0
154974 2004 TA_{345}	14.8	X	351.26986	293.41250	60.53456	6.76834	0.1859553	0.18094709	3.0957674	20	10 12.1	18.1
154975 2004 TM_{359}	15.3	X	199.44352	109.28758	2.98896	8.11674	0.0371086	0.17701265	3.1414719	20	8 18.4	19.9
154976 2004 UA_{1}	14.7	X	67.74716	311.59606	307.38348	10.20460	0.0524059	0.17895822	3.1186618	20	9 10.1	19.2
154977 2004 UG_{1}	15.2	X	245.85773	303.53555	212.76138	9.68216	0.0428569	0.19005952	2.9960080	20	12 5.5	19.5
154978 2004 UN_{3}	15.7	X	240.11613	274.24572	54.82456	3.93026	0.3105888	0.22351365	2.6890571	20	3 15.5	20.5
154979 2004 UG_{6}	15.5	X	190.96692	272.65991	63.23013	5.67613	0.1289349	0.21309626	2.7759960	20	2 19.1	20.0
154980 2004 UN_{7}	15.0	X	297.23886	86.48750	8.28052	9.94952	0.0876412	0.18757476	3.0224082	20	11 18.4	18.9
154981 2004 VC_{4}	14.7	X	196.62937	37.31591	47.42122	10.13291	0.0371912	0.16760161	3.2579964	20	7 9.0	19.6
154982 2004 VA_{28}	15.6	X	295.44135	39.72857	11.77889	8.48263	0.1178476	0.18015912	3.1047875	20	9 20.7	19.4
154983 2004 VL_{32}	14.9	X	266.43544	244.10072	212.05844	10.01005	0.0751435	0.18070176	3.0985687	20	10 10.6	19.1
154984 2004 VP_{46}	15.4	X	44.92815	227.98837	131.99176	2.92763	0.2247332	0.19131010	2.9829372	20	—	—
154985 2004 VZ_{51}	15.1	X	297.90304	319.23403	110.19692	3.30161	0.0666327	0.18290836	3.0735976	20	10 23.7	19.1
154986 2004 VR_{66}	16.0	X	285.27211	175.50807	150.94916	2.68688	0.2146949	0.22890762	2.6466461	20	5 1.4	19.5
154987 2004 WJ_{4}	15.4	X	72.02553	277.45333	68.51573	3.15270	0.0784115	0.19183806	2.9774618	20	—	—
154988 2004 XN_{35}	18.3	X	164.33972	189.95940	132.98530	9.81701	0.6800226	0.53343961	1.5057257	20	1 17.9	20.5
154989 2005 AG_{4}	12.8	X	30.22672	225.92216	341.56999	8.57524	0.1230963	0.08381599	5.1711220	20	5 24.5	19.2
154990 2005 AA_{66}	12.8	X	302.10788	158.22842	127.26674	12.94828	0.0836388	0.08239736	5.2303071	20	4 30.9	19.7
154991 Vinciguerra	18.4	X	348.72872	269.41849	245.56678	5.63432	0.3225894	0.44277286	1.7048338	20	—	—
154992 2005 CV_{68}	12.4	X	294.23943	162.46851	143.38105	9.56530	0.0785350	0.08131641	5.2765564	20	5 13.1	19.3
154993 2005 EA_{94}	17.8	X	79.94373	308.99021	104.11616	10.32847	0.6635833	0.52785305	1.5163310	20	3 21.3	17.1
154994 2005 EW_{291}	16.1	X	51.32262	65.08062	172.55346	42.45451	0.1143289	0.21432756	2.7653538	20	8 8.9	20.4
154995 2005 MD_{41}	16.9	X	9.41909	217.73325	178.18872	2.29007	0.2099464	0.27896472	2.3197251	20	—	—
154996 2005 MY_{42}	17.5	X	253.46919	58.91623	244.05222	2.15735	0.1291231	0.31108626	2.1571591	20	2 26.4	20.5
154997 2005 NF_{1}	16.4	X	292.48387	116.26587	10.37205	20.75235	0.0328114	0.35247266	1.9848107	20	—	—
154998 2005 NN_{1}	16.7	X	40.30280	212.92223	122.68432	3.18458	0.2345028	0.27419057	2.3465746	20	12 30.6	19.9
154999 2005 NV_{28}	16.7	X	85.08698	178.10116	163.43449	5.71930	0.1896864	0.28517203	2.2859397	20	—	—
155000 2005 NJ_{29}	15.5	X	102.33329	219.81392	165.93769	14.22857	0.2989214	0.22407774	2.6845422	20	2 4.6	19.3
155001 2005 NT_{62}	16.8	X	30.32151	102.50004	307.80060	6.69893	0.0993223	0.28776913	2.2721652	20	—	—
155002 2005 NN_{102}	16.2	X	347.17344	191.94634	150.93487	2.70107	0.3470603	0.26365537	2.4086755	20	11 3.0	17.3
155003 2005 NX_{102}	14.8	X	240.71576	44.24164	310.19749	26.90087	0.2415517	0.17645706	3.1480625	20	4 3.5	20.6
155004 2005 OY_{9}	16.3	X	115.32099	250.98540	127.53370	13.15670	0.1797627	0.22853899	2.6494914	20	1 26.2	19.9
155005 2005 OP_{14}	16.4	X	144.06988	182.02038	131.67816	3.69943	0.2411554	0.28963959	2.2623724	20	—	—
155006 2005 OU_{14}	16.3	X	50.49732	197.36541	156.76545	7.48087	0.2218140	0.27654696	2.3332259	20	—	—
155007 2005 OB_{15}	16.0	X	80.30393	223.33496	85.96379	11.38659	0.1012060	0.21450982	2.7637871	20	12 12.8	20.1
155008 2005 OM_{16}	16.8	X	55.47970	202.69305	173.25786	2.92439	0.1823208	0.28323373	2.2963570	20	—	—
155009 2005 OA_{19}	16.7	X	243.84527	269.60330	155.78695	6.13630	0.0947509	0.26126141	2.4233671	20	8 8.8	20.0
155010 2005 PR_{9}	17.5	X	328.42972	58.05592	329.84778	1.51621	0.2207323	0.26821995	2.3812701	20	11 8.4	18.8
155011 2005 PR_{17}	15.0	X	215.81232	312.32824	41.80180	15.88885	0.0889893	0.17979419	3.1089873	20	4 9.9	19.9
155012 2005 QM_{4}	16.6	X	299.14546	199.64455	194.62604	0.78824	0.1770644	0.26233465	2.4167530	20	9 8.1	18.5
155013 2005 QK_{7}	17.1	X	271.03692	273.79768	138.38417	3.01776	0.1742652	0.25994317	2.4315532	20	8 16.3	20.0
155014 2005 QG_{12}	16.6	X	241.90576	254.81504	167.41521	10.85841	0.2495000	0.25615603	2.4554607	20	7 11.9	20.5
155015 2005 QF_{17}	16.4	X	46.97160	47.78009	1.95112	6.66678	0.1192908	0.28507472	2.2864598	20	—	—
155016 2005 QS_{19}	16.7	X	169.50400	81.06066	348.68695	0.92975	0.1773460	0.24518593	2.5281666	20	5 21.3	20.6
155017 2005 QK_{26}	16.4	X	115.30787	273.99671	164.50968	11.70509	0.1709246	0.23355773	2.6113989	20	4 12.1	20.3
155018 2005 QK_{28}	16.9	X	55.26398	75.71092	328.84308	5.54896	0.1902036	0.28742872	2.2739589	20	—	—
155019 2005 QY_{31}	16.9	X	8.89947	207.42870	160.02340	2.70507	0.2369184	0.27278676	2.3546183	20	—	—
155020 2005 QC_{38}	16.4	X	138.92489	82.61776	348.24101	16.90230	0.1774726	0.23697917	2.5862029	20	4 17.2	20.7
155021 2005 QD_{45}	16.5	X	358.18504	59.27334	317.12688	1.76766	0.2117959	0.27126665	2.3634066	20	12 25.6	18.9
155022 2005 QP_{47}	17.0	X	326.11556	99.57062	27.54822	4.41126	0.1198919	0.28540282	2.2847071	20	—	—
155023 2005 QK_{54}	16.9	X	74.51594	194.31073	170.21240	3.62590	0.2190748	0.28366540	2.2940267	20	—	—
155024 2005 QD_{67}	17.3	X	0.44937	289.79281	106.69230	1.67923	0.2133094	0.27432488	2.3458087	20	—	—
155025 2005 QM_{71}	15.5	X	100.65491	257.72369	174.18793	14.72018	0.1932139	0.22837626	2.6507498	20	3 18.5	19.1
155026 2005 QC_{73}	15.3	X	108.43194	351.40478	17.21308	12.96488	0.1607682	0.21929678	2.7234195	20	1 6.0	19.2
155027 2005 QF_{75}	16.1	X	67.12164	81.95538	336.46145	14.39352	0.2319447	0.22241167	2.6979321	20	1 20.8	19.0
155028 2005 QR_{82}	15.2	X	155.80037	343.03819	18.67024	15.04173	0.2239542	0.22876743	2.6477273	20	2 25.9	19.7
155029 2005 QY_{82}	15.9	X	97.21061	68.47698	314.69704	4.97610	0.0757918	0.22408129	2.6845139	20	—	—
155030 2005 QF_{84}	15.8	X	153.69673	214.61277	190.63567	3.33995	0.2695948	0.16784140	3.2548925	20	4 14.6	21.4
155031 2005 QW_{94}	15.6	X	252.13181	8.38247	347.63778	10.88120	0.0809326	0.18397097	3.0617509	20	5 14.4	20.2
155032 2005 QP_{95}	16.7	X	86.14989	26.73882	352.86359	6.58062	0.1704598	0.28900989	2.2656574	20	—	—
155033 2005 QY_{116}	17.1	X	245.18315	74.49953	345.58560	1.59989	0.1897650	0.25649911	2.4532707	20	7 21.4	20.4
155034 2005 QJ_{127}	16.3	X	38.05363	134.28187	343.91461	11.71665	0.2220846	0.22881363	2.6473709	20	2 10.2	18.6
155035 2005 QV_{129}	17.0	X	43.27007	324.56745	61.22833	3.12883	0.1849072	0.28048977	2.3113091	20	—	—
155036 2005 QH_{133}	17.0	X	223.07406	102.36494	339.80059	0.88112	0.1447137	0.25733266	2.4479701	20	7 31.3	20.3
155037 2005 QP_{157}	16.5	X	53.14626	223.37821	157.40933	11.77711	0.2026414	0.27921720	2.3183265	20	—	—
155038 2005 QR_{160}	16.6	X	354.04474	342.63606	50.42023	4.18889	0.1768787	0.27136343	2.3628446	20	—	—
155039 2005 QY_{165}	15.3	X	311.02520	222.65924	153.26393	10.95383	0.1185209	0.19205735	2.9751950	20	8 29.6	18.7
155040 2005 QX_{171}	16.4	X	37.31348	135.25124	240.04277	4.50948	0.1110772	0.27722343	2.3294287	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155041 2005 QZ_{172}	17.3	X	152.68059	134.73612	274.27555	2.59820	0.0413915	0.30441232	2.1885740	20	3 23.6	19.8
155042 2005 RQ_{5}	16.6	X	7.81990	87.66109	290.76236	1.82008	0.1233627	0.27134211	2.3629684	20	12 28.9	19.1
155043 2005 RR_{5}	16.6	X	355.63334	106.33119	290.81805	1.97887	0.2091672	0.27182432	2.3601730	20	—	—
155044 2005 RE_{8}	16.1	X	241.70076	230.18449	159.69039	4.10351	0.2184882	0.18136476	3.0910126	20	6 3.9	21.1
155045 2005 RF_{8}	16.3	X	11.51460	311.40138	21.42290	2.66884	0.2250840	0.26664164	2.3906577	20	11 15.8	18.8
155046 2005 RB_{10}	15.9	X	156.00965	89.13734	341.74431	12.40034	0.1474490	0.23797159	2.5790077	20	5 3.9	20.2
155047 2005 RO_{10}	16.9	X	19.38453	50.05089	296.38372	1.28593	0.2273138	0.26964896	2.3728496	20	12 17.9	19.5
155048 2005 RH_{24}	15.1	X	137.18606	57.69436	6.48020	9.62513	0.1964269	0.23105612	2.6302139	20	4 14.5	19.3
155049 2005 RJ_{27}	15.2	X	287.75244	45.68887	313.12092	8.90811	0.1913402	0.18459513	3.0548453	20	6 19.8	19.5
155050 2005 RU_{27}	16.5	X	93.48511	7.10147	322.62412	6.07028	0.1253765	0.27826920	2.3235889	20	—	—
155051 2005 RY_{30}	15.4	X	127.05996	67.78051	325.88695	13.82126	0.1322738	0.22754139	2.6572298	20	2 20.6	19.3
155052 2005 SA_{3}	16.8	X	29.40596	37.96762	294.01434	0.53318	0.2011851	0.26949716	2.3737406	20	12 7.8	19.5
155053 2005 SV_{9}	15.5	X	115.70466	43.31747	30.01440	13.66092	0.1699144	0.22987058	2.6392495	20	4 5.7	19.3
155054 2005 SN_{19}	17.2	X	1.34929	330.67762	64.64708	0.74004	0.1538467	0.27098185	2.3650622	20	—	—
155055 2005 SO_{23}	16.2	X	81.87219	90.39847	349.38247	12.77668	0.1471960	0.22960234	2.6413047	20	2 26.9	19.4
155056 2005 SB_{24}	16.4	X	350.38884	287.73600	97.56248	3.15433	0.1820334	0.26927394	2.3750522	20	12 19.1	18.5
155057 2005 SG_{24}	15.9	X	82.79657	24.28460	29.59426	12.00445	0.2282786	0.22303256	2.6929226	20	2 11.4	19.4
155058 2005 SU_{24}	16.3	X	76.39616	293.81428	49.29498	7.74382	0.1457547	0.27987664	2.3146835	20	—	—
155059 2005 SF_{28}	17.2	X	307.61402	27.43054	252.93056	3.77509	0.0231325	0.30939356	2.1650198	20	4 22.9	19.4
155060 2005 SG_{28}	16.5	X	89.19882	0.39870	341.64810	6.63635	0.1122544	0.28073239	2.3099772	20	—	—
155061 2005 ST_{30}	16.2	X	297.71807	136.94322	338.83949	6.67112	0.0506678	0.27596513	2.3365042	20	—	—
155062 2005 SL_{32}	15.9	X	18.09912	263.85401	159.49682	4.80003	0.0612118	0.21220149	2.7837940	20	—	—
155063 2005 SP_{35}	16.3	X	77.42626	178.52661	179.65592	9.80202	0.1391492	0.28072988	2.3099910	20	—	—
155064 2005 SQ_{39}	17.0	X	287.50771	23.34808	186.23001	6.74492	0.0226846	0.29221315	2.2490695	20	—	—
155065 2005 SL_{40}	16.7	X	163.15306	126.55877	187.42675	21.95862	0.0708740	0.35688987	1.9683995	20	—	—
155066 2005 SR_{54}	15.6	X	61.44058	198.37865	191.75371	3.63757	0.1025039	0.21472943	2.7619025	20	—	—
155067 2005 SH_{58}	17.1	X	300.52700	26.71025	30.17513	3.61647	0.1752380	0.26234688	2.4166779	20	10 17.8	19.2
155068 2005 SC_{59}	16.5	X	163.24838	154.85330	195.85096	3.47084	0.1765216	0.29614738	2.2291063	20	2 1.3	19.7
155069 2005 SA_{65}	16.7	X	128.59407	174.36520	202.26493	5.96834	0.1457708	0.29450448	2.2373887	20	1 23.3	19.5
155070 2005 SB_{69}	16.4	X	270.26775	229.54058	202.74434	5.83623	0.0901056	0.26159227	2.4213233	20	9 26.4	19.3
155071 2005 SS_{71}	17.7	X	16.13583	97.06994	248.39296	1.09133	0.1971162	0.26936091	2.3745410	20	12 7.2	20.1
155072 2005 SS_{73}	16.3	X	142.68678	245.98561	122.43484	2.97120	0.0981404	0.22616344	2.6680120	20	2 3.9	20.0
155073 2005 SP_{77}	17.4	X	258.28732	275.36837	146.09421	1.65487	0.1725702	0.25662675	2.4524572	20	8 10.9	20.4
155074 2005 SH_{90}	16.6	X	158.70049	149.17243	212.25046	1.59035	0.1515502	0.22847647	2.6499747	20	2 15.9	20.7
155075 2005 SZ_{96}	17.3	X	26.71565	272.77049	188.40431	4.72923	0.1656508	0.28813286	2.2702526	20	—	—
155076 2005 SH_{103}	16.5	X	79.57948	115.12703	207.90044	1.26794	0.2015278	0.27689293	2.3312820	20	—	—
155077 2005 SX_{103}	15.5	X	91.27412	49.79354	1.85303	13.78395	0.2197681	0.22203132	2.7010122	20	2 18.7	19.1
155078 2005 SG_{104}	15.9	X	249.54461	343.38055	51.70881	0.28057	0.2035685	0.18204801	3.0832738	20	6 18.8	20.7
155079 2005 SM_{112}	16.1	X	60.84543	96.39517	324.63144	7.94385	0.1998036	0.21955953	2.7212463	20	1 5.6	18.8
155080 2005 SC_{130}	16.7	X	204.02469	167.23459	193.84664	5.64745	0.1591030	0.30525258	2.1845558	20	3 23.4	19.8
155081 2005 SH_{130}	16.5	X	341.05226	11.49748	48.09146	2.90159	0.1702183	0.27076316	2.3663356	20	—	—
155082 2005 SF_{131}	15.7	X	196.75330	42.16590	341.07823	11.77664	0.1933718	0.23706585	2.5855725	20	4 12.6	20.2
155083 Banneker	16.3	X	345.28255	205.95812	183.60786	1.43192	0.0959042	0.19967272	2.8990579	20	11 14.8	19.8
155084 2005 ST_{137}	16.2	X	287.00929	233.94385	181.03692	2.57474	0.1675364	0.19164313	2.9794805	20	9 5.2	20.0
155085 2005 SW_{147}	16.6	X	100.84529	274.84362	177.66396	3.37500	0.0391745	0.23288321	2.6164389	20	3 22.1	19.8
155086 2005 SE_{148}	16.7	X	127.96724	143.68926	180.13391	2.94062	0.1768693	0.28506962	2.2864871	20	—	—
155087 2005 SL_{149}	16.3	X	244.75134	329.94550	102.13588	2.67159	0.1545340	0.18642908	3.0347781	20	8 5.5	20.8
155088 2005 ST_{158}	15.3	X	93.90803	203.28755	214.79479	11.34183	0.1745054	0.22437906	2.6821383	20	2 14.1	19.0
155089 2005 SK_{159}	15.9	X	48.31226	43.14722	351.72415	4.00887	0.0813426	0.21261804	2.7801569	20	—	—
155090 2005 SJ_{164}	16.7	X	42.21895	218.70901	147.94191	6.43236	0.1139095	0.27427318	2.3461034	20	—	—
155091 2005 SX_{164}	15.9	X	184.20595	203.74794	164.30725	8.94830	0.1549074	0.23311331	2.6147169	20	3 19.9	20.1
155092 2005 SX_{169}	17.2	X	189.56122	62.78008	353.14849	7.82932	0.1352585	0.24345981	2.5401022	20	5 20.3	21.4
155093 2005 SP_{183}	17.4	X	91.82373	9.98050	244.84421	1.89623	0.1472132	0.26574685	2.3960211	20	10 31.4	20.9
155094 2005 SB_{192}	16.6	X	36.34980	125.18858	34.62084	5.61654	0.1194524	0.23135123	2.6279767	20	3 29.3	19.4
155095 2005 SJ_{193}	17.1	X	115.22015	127.08297	287.88007	1.10810	0.1637968	0.29471064	2.2363452	20	3 2.3	19.6
155096 2005 SW_{203}	15.5	X	69.37726	49.45387	20.10910	22.00193	0.0731815	0.22412943	2.6841295	20	1 22.1	19.4
155097 2005 SE_{211}	16.9	X	323.48874	159.34439	207.21818	1.36353	0.2138179	0.26116702	2.4239510	20	9 15.7	18.6
155098 2005 SF_{214}	15.2	X	227.11349	110.80200	319.19366	3.68834	0.2402275	0.18011637	3.1052788	20	7 7.6	20.4
155099 2005 SP_{214}	16.2	X	297.58845	302.15330	238.65092	7.03743	0.0569927	0.28550201	2.2841779	20	—	—
155100 2005 SX_{214}	15.1	X	162.58988	219.95048	230.46646	12.83562	0.2510158	0.17193708	3.2029957	20	6 11.4	20.7
155101 2005 SM_{218}	16.5	X	115.25348	158.08079	175.24412	5.10000	0.1882515	0.28326802	2.2961716	20	—	—
155102 2005 SB_{219}	15.2	X	153.30754	150.98745	227.17440	10.58093	0.2060891	0.22642829	2.6659311	20	3 2.7	19.7
155103 2005 SC_{225}	16.8	X	338.30353	214.80384	157.55659	8.63162	0.1031457	0.26405353	2.4062536	20	10 30.8	19.3
155104 2005 SO_{225}	15.3	X	131.13419	57.66430	34.72072	14.23086	0.1421839	0.23266945	2.6180412	20	5 9.2	19.3
155105 2005 SH_{227}	17.1	X	314.93559	69.32333	100.05714	1.88709	0.0484999	0.28909950	2.2651892	20	—	—
155106 2005 SX_{231}	17.3	X	278.64938	89.32439	204.98196	1.44948	0.0565818	0.30465896	2.1873926	20	3 27.3	19.8
155107 2005 SZ_{237}	15.4	X	265.59606	102.86049	260.97474	2.13556	0.2219933	0.18096227	3.0955942	20	5 25.4	20.0
155108 2005 SW_{242}	17.2	X	194.00984	230.15525	16.90745	1.10242	0.1026506	0.28110757	2.3079214	20	—	—
155109 2005 SM_{244}	17.3	X	319.99453	180.78146	7.54620	3.45667	0.0531024	0.29393071	2.2402995	20	—	—
155110 2005 TB	17.5	X	167.19487	44.76687	226.19022	30.38292	0.3484637	0.69572263	1.2613781	20	—	—
155111 2005 TP_{5}	16.1	X	23.43479	67.87824	344.67082	10.04398	0.2531210	0.21022429	2.8012215	20	—	—
155112 2005 TU_{25}	16.8	X	273.58293	101.32786	64.89000	0.88652	0.0718487	0.27678542	2.3318856	20	—	—
155113 2005 TO_{42}	16.2	X	106.41674	16.69750	350.21142	4.23797	0.1746799	0.21817661	2.7327334	20	1 2.3	19.8
155114 2005 TY_{42}	16.6	X	119.43492	353.30876	338.55532	6.68975	0.1361492	0.28162923	2.3050706	20	—	—
155115 2005 TR_{46}	15.5	X	294.71813	208.44744	162.67140	1.80451	0.2044522	0.18679793	3.0307819	20	7 13.8	19.2
155116 Verkhivnya	15.6	X	209.54721	68.35949	342.01288	8.95709	0.2330819	0.17580383	3.1558558	20	5 28.9	21.2
155117 2005 TE_{50}	17.0	X	24.04119	198.31288	179.33441	1.90888	0.2351727	0.27276641	2.3547354	20	—	—
155118 2005 TK_{53}	15.9	X	92.18883	356.34826	5.75094	4.81580	0.1278832	0.21404236	2.7678097	20	—	—
155119 2005 TR_{55}	16.0	X	316.75399	89.04871	30.78570	9.11327	0.1477963	0.21055861	2.7982556	20	—	—
155120 2005 TW_{64}	16.7	X	240.26991	171.87592	333.92540	5.20111	0.1355183	0.27318477	2.3523308	20	11 18.4	19.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155121 2005 TE_{68}	15.9	X	169.58024	333.44106	93.87008	8.63923	0.4111482	0.17044350	3.2216801	20	5 24.2	22.1
155122 2005 TZ_{72}	15.7	X	285.01327	242.75875	140.13106	10.92630	0.1351214	0.18651386	3.0338585	20	7 25.7	19.7
155123 2005 TX_{78}	15.8	X	232.97708	187.81204	166.05148	12.76480	0.2469061	0.24102609	2.5571724	20	4 12.0	20.2
155124 2005 TD_{99}	16.6	X	21.74435	206.39602	229.63980	6.26066	0.0910597	0.28490896	2.2873466	20	—	—
155125 2005 TN_{107}	14.6	X	318.28655	233.45553	208.37862	2.26740	0.1809462	0.12450614	3.9719967	20	11 14.0	19.3
155126 2005 TY_{109}	17.5	X	306.29998	228.29351	282.39428	1.82065	0.1036185	0.28344701	2.2952049	20	—	—
155127 2005 TX_{110}	17.1	X	102.89428	271.94309	218.85502	6.22650	0.2006100	0.23962159	2.5671550	20	6 6.5	20.9
155128 2005 TM_{117}	17.2	X	240.70134	301.11298	245.74328	1.50321	0.1476154	0.27792118	2.3255282	20	—	—
155129 2005 TT_{123}	16.1	X	36.69625	91.83898	26.78679	12.45551	0.1458204	0.22409633	2.6843938	20	2 7.9	19.2
155130 2005 TH_{126}	17.8	X	207.11261	31.38830	166.19018	1.57578	0.1316372	0.27254138	2.3560314	20	12 16.5	21.0
155131 2005 TQ_{127}	16.0	X	2.85936	270.35792	209.35799	5.57201	0.0880538	0.21897809	2.7260613	20	—	—
155132 2005 TV_{132}	17.0	X	249.39750	116.03432	43.33620	1.98894	0.1290057	0.27134027	2.3629791	20	12 23.2	19.6
155133 2005 TW_{140}	17.3	X	212.27298	223.01218	111.74104	2.14741	0.0889695	0.30167391	2.2017984	20	2 28.4	20.3
155134 2005 TX_{152}	16.4	X	75.43189	268.03536	110.41646	4.75755	0.2509914	0.28029387	2.3123859	20	—	—
155135 2005 TC_{165}	15.5	X	209.45407	201.47554	233.44414	3.56107	0.1820761	0.17842474	3.1248751	20	7 1.3	20.5
155136 2005 TS_{166}	16.8	X	21.30830	296.21252	357.01399	1.80276	0.0264893	0.25546830	2.4598655	20	9 3.8	19.7
155137 2005 TZ_{166}	16.6	X	132.23492	152.66373	227.26622	1.33670	0.1101672	0.22549561	2.6732771	20	2 7.3	20.4
155138 Pucinskas	15.9	X	301.59090	147.51977	9.65255	4.91344	0.1008611	0.21346329	2.7728130	20	—	—
155139 2005 TF_{173}	16.6	X	81.92649	351.95839	23.86143	6.69934	0.1353059	0.28190143	2.3035865	20	—	—
155140 2005 UD	17.4	X	90.79044	207.59702	19.72474	28.66771	0.8723155	0.68481366	1.2747385	20	11 4.5	20.8
155141 2005 UY	16.7	X	100.19417	171.77280	198.78365	4.33300	0.1378563	0.28708215	2.2757886	20	—	—
155142 Tenagra	16.5	X	106.29217	49.59170	316.93486	0.07672	0.0847467	0.21465062	2.7625785	20	—	—
155143 2005 UB_{10}	16.9	X	249.52166	187.88493	160.02157	4.65659	0.1956749	0.24385929	2.5373274	20	4 22.1	20.7
155144 2005 UG_{14}	15.9	X	116.91849	272.69986	54.18303	0.87940	0.0695792	0.21282409	2.7783621	20	—	—
155145 2005 UR_{18}	16.8	X	69.70973	127.32014	202.57269	4.95047	0.2055737	0.27290411	2.3539433	20	—	—
155146 2005 UF_{29}	16.8	X	289.54713	229.14081	216.28800	1.32978	0.1450240	0.26294493	2.4130122	20	11 11.6	19.0
155147 2005 UZ_{29}	16.7	X	115.96845	20.34075	36.69159	6.98562	0.0484989	0.29469857	2.2364063	20	2 21.3	19.4
155148 2005 UC_{57}	17.0	X	62.66389	184.22888	181.68518	2.87295	0.1161827	0.27747535	2.3280186	20	—	—
155149 2005 UE_{61}	16.4	X	166.26851	160.07257	217.64826	1.42356	0.0928714	0.22923814	2.6441015	20	3 10.4	20.4
155150 2005 UL_{67}	15.8	X	74.46384	232.57096	148.28381	13.39877	0.1299637	0.21477393	2.7615210	20	—	—
155151 2005 UH_{69}	16.1	X	48.65227	82.99913	328.58667	2.49479	0.0895334	0.21392334	2.7688362	20	—	—
155152 2005 UE_{78}	16.8	X	85.68157	288.86564	225.47818	1.60533	0.0952996	0.23954261	2.5677192	20	6 1.8	20.0
155153 2005 UV_{78}	15.8	X	349.96657	238.78312	129.53126	3.35096	0.1107799	0.19474315	2.9477768	20	10 26.3	19.3
155154 2005 UW_{78}	15.2	X	131.38700	321.88628	58.99194	15.25803	0.1090484	0.22341770	2.6898269	20	2 14.5	19.4
155155 2005 UD_{79}	14.9	X	272.76267	312.36288	72.03047	13.19334	0.0586432	0.18104663	3.0946325	20	7 24.7	19.3
155156 2005 UR_{79}	15.4	X	358.92714	37.52943	77.10154	12.76587	0.1110353	0.21326710	2.7745133	20	—	—
155157 2005 UF_{80}	15.6	X	219.36899	289.23764	175.64054	5.03403	0.1587242	0.18330757	3.0691335	20	8 17.6	20.5
155158 2005 UL_{80}	16.1	X	70.72691	234.77099	125.56882	6.73743	0.1691605	0.20851143	2.8165414	20	—	—
155159 2005 UK_{83}	16.5	X	191.35794	349.88982	207.18168	4.49717	0.1471895	0.26771800	2.3842457	20	11 25.7	20.0
155160 2005 US_{96}	16.8	X	84.46694	155.34916	131.94007	2.99062	0.0893549	0.26603896	2.3942668	20	11 29.9	20.0
155161 2005 UQ_{104}	15.6	X	7.46563	298.24950	218.79885	13.86914	0.0533106	0.22281379	2.6946850	20	2 1.6	19.3
155162 2005 UZ_{104}	16.2	X	69.96251	193.38285	84.39418	5.95207	0.0938422	0.26018694	2.4300342	20	11 1.5	19.5
155163 2005 UJ_{124}	15.3	X	136.56217	142.28409	39.35270	12.02392	0.1071178	0.18474215	3.0532243	20	9 8.8	20.2
155164 2005 UN_{141}	17.0	X	83.63245	205.80459	142.87453	3.42641	0.1396189	0.27808776	2.3245995	20	—	—
155165 2005 UU_{147}	15.6	X	312.72683	133.15577	19.90881	3.99109	0.0424139	0.21334143	2.7738688	20	—	—
155166 2005 UU_{151}	15.7	X	311.70647	154.49343	232.63889	2.95401	0.0227893	0.18976930	2.9990618	20	9 20.9	19.7
155167 2005 UG_{172}	16.5	X	104.05393	203.93896	219.55837	1.89671	0.0926677	0.22511238	2.6763103	20	2 25.4	20.0
155168 2005 UC_{175}	15.9	X	68.46857	349.74108	22.24765	4.54667	0.1151240	0.20955732	2.8071621	20	—	—
155169 2005 UF_{186}	16.2	X	161.45839	72.09763	78.34291	2.31146	0.1096346	0.18150941	3.0893702	20	8 21.2	20.9
155170 2005 UK_{191}	16.0	X	44.28135	45.05586	313.29740	1.09040	0.0777291	0.20330126	2.8644594	20	12 25.6	20.0
155171 2005 UX_{205}	17.1	X	177.95279	285.86611	192.63930	1.62195	0.0934933	0.24718496	2.5145176	20	8 1.3	20.7
155172 2005 UJ_{214}	15.3	X	336.57179	345.92480	108.01014	16.46281	0.1024138	0.20533068	2.8455539	20	—	—
155173 2005 US_{216}	16.0	X	217.60783	314.33864	62.96651	3.57927	0.2088832	0.23862829	2.5742740	20	4 28.1	20.3
155174 2005 UA_{220}	16.6	X	254.04035	241.98630	5.31049	6.35569	0.0797679	0.29012729	2.2598364	20	—	—
155175 2005 UP_{247}	16.3	X	36.11618	236.04067	177.89065	2.41131	0.2059806	0.27837487	2.3230008	20	—	—
155176 2005 UH_{248}	17.4	X	23.39883	57.33881	173.07929	1.25269	0.1420350	0.30944454	2.1647820	20	6 21.1	18.8
155177 2005 UR_{272}	15.9	X	264.40402	311.74021	149.61932	2.41150	0.1296496	0.19245602	2.9710848	20	10 10.5	19.8
155178 2005 UX_{274}	16.6	X	86.85068	47.74446	346.98742	1.44830	0.1689250	0.28425572	2.2908496	20	—	—
155179 2005 UH_{277}	17.1	X	182.45190	46.03541	207.62267	0.06618	0.0981885	0.27785717	2.3258854	20	—	—
155180 2005 UF_{289}	15.2	X	241.99115	53.99319	303.00549	4.35731	0.0483683	0.17174538	3.2053786	20	5 10.2	20.0
155181 2005 UY_{315}	16.0	X	221.37745	135.97648	145.47626	2.07078	0.0108819	0.22116222	2.7080837	20	1 12.7	19.5
155182 2005 UL_{317}	17.0	X	110.24493	211.18717	223.81890	2.44831	0.0836773	0.23358361	2.6112060	20	3 16.9	20.5
155183 2005 UB_{327}	16.1	X	261.86304	181.66322	271.89779	1.34091	0.2055800	0.19125598	2.9835000	20	9 14.2	20.3
155184 2005 UW_{329}	15.2	X	248.35113	104.81906	340.78306	20.89935	0.1519775	0.18820844	3.0156203	20	8 28.5	19.7
155185 2005 UX_{330}	16.0	X	285.50122	235.49196	121.78666	2.32034	0.1025274	0.17935018	3.1141163	20	6 27.8	20.3
155186 2005 UY_{334}	17.5	X	147.90730	216.05422	117.00353	2.45938	0.1632117	0.28569340	2.2831577	20	—	—
155187 2005 UC_{335}	16.5	X	122.72544	215.36331	109.26823	3.00855	0.0536019	0.20879547	2.8139865	20	—	—
155188 2005 UM_{349}	16.4	X	231.15307	228.34669	97.98881	6.97102	0.1888469	0.30299022	2.1954168	20	3 7.1	19.9
155189 2005 UN_{355}	15.1	X	213.38740	320.01463	37.53917	15.67189	0.1482358	0.23453419	2.6041456	20	4 6.1	19.3
155190 2005 UV_{355}	15.9	X	80.81671	140.98873	159.13576	2.33085	0.0777007	0.19710985	2.9241332	20	11 26.5	20.2
155191 2005 UZ_{365}	16.3	X	85.25015	202.03518	163.06096	4.50226	0.0817761	0.21192948	2.7861755	20	—	—
155192 2005 UV_{371}	16.5	X	216.73079	313.89312	25.86936	2.68344	0.2365568	0.23419101	2.6066891	20	3 12.4	20.9
155193 2005 UH_{377}	16.5	X	151.63007	295.47413	173.55076	4.17609	0.0916189	0.24160865	2.5530602	20	6 20.6	20.2
155194 2005 UK_{381}	16.2	X	4.53393	147.85192	235.97901	1.18901	0.0789403	0.20045661	2.8914951	20	12 4.5	19.9
155195 2005 UG_{396}	16.0	X	3.81953	333.52720	163.40151	3.07630	0.0428117	0.22059391	2.7127329	20	1 7.3	19.5
155196 2005 UM_{419}	16.1	X	127.44870	147.85346	63.44084	7.17343	0.0903730	0.25842829	2.4410463	20	10 11.7	19.6
155197 2005 UO_{429}	16.1	X	13.60684	42.32477	281.79977	2.29988	0.0853150	0.19058277	2.9905217	20	9 29.2	19.8
155198 2005 UO_{432}	17.1	X	145.46574	77.58120	133.16693	1.99335	0.1250022	0.25829433	2.4418902	20	10 28.0	20.7
155199 2005 UU_{433}	15.6	X	295.52179	150.82509	210.40375	1.72090	0.1461319	0.18198750	3.0839573	20	7 10.6	19.4
155200 2005 UC_{438}	16.7	X	129.01922	72.28965	142.30110	3.49477	0.1371721	0.25696783	2.4502865	20	10 17.3	20.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155201 2005 UL_{440}	17.5	X	196.30226	10.72483	108.81058	1.58906	0.1039997	0.25430368	2.4673700	20	8 24.3	21.0
155202 2005 UU_{444}	16.6	X	201.71724	26.14941	325.02840	1.74153	0.1901786	0.29937237	2.2130687	20	3 9.1	20.1
155203 2005 UV_{444}	14.8	X	238.06385	207.55777	251.10102	10.95632	0.1513526	0.18536755	3.0463531	20	8 25.9	19.6
155204 2005 UX_{445}	17.0	X	123.52936	200.62746	127.62911	1.50909	0.2338774	0.28218902	2.3020211	20	—	—
155205 2005 UV_{449}	14.7	X	171.06964	308.16859	50.05281	13.92981	0.2776538	0.22486482	2.6782742	20	3 8.3	19.7
155206 2005 UP_{457}	16.2	X	209.85937	299.07190	122.45796	15.53597	0.0988783	0.24566033	2.5249107	20	6 23.2	20.0
155207 2005 UO_{460}	16.7	X	282.17140	260.34203	23.05976	2.94967	0.0591024	0.29911927	2.2143170	20	3 17.8	19.3
155208 2005 UV_{460}	16.3	X	282.58116	206.31035	36.54142	2.96486	0.0480671	0.22250354	2.6971893	20	2 4.9	19.9
155209 2005 UV_{481}	15.4	X	114.55416	338.31321	114.86600	22.88407	0.0458716	0.23302272	2.6153945	20	4 22.5	19.5
155210 2005 UG_{483}	16.9	X	195.88556	303.05428	202.25961	5.00304	0.0894480	0.25912618	2.4366614	20	9 27.6	20.4
155211 2005 UP_{485}	16.3	X	253.60197	317.05553	96.77512	6.92714	0.0538314	0.25237400	2.4799313	20	8 14.3	19.5
155212 2005 UQ_{489}	15.0	X	125.91224	114.98340	357.30154	12.29637	0.1273311	0.16998106	3.2275206	20	5 26.9	20.2
155213 2005 UU_{494}	14.9	X	239.83995	292.93205	119.32603	10.09436	0.0838447	0.18053754	3.1004474	20	7 13.6	19.4
155214 2005 UK_{508}	16.2	X	157.00226	40.98790	324.30403	5.32475	0.0347318	0.22278540	2.6949139	20	2 10.2	20.0
155215 2005 VU_{2}	16.7	X	265.15797	330.93044	78.48518	3.85494	0.1708703	0.25625213	2.4548468	20	8 4.9	19.7
155216 2005 VV_{2}	15.5	X	15.35399	342.75451	55.24990	7.11449	0.0629239	0.20345818	2.8629863	20	—	—
155217 2005 VH_{5}	16.4	X	174.33763	45.79831	326.90787	2.00107	0.0547963	0.22621161	2.6676333	20	3 11.2	20.3
155218 2005 VL_{7}	14.7	X	221.82694	92.18240	303.92785	18.47775	0.1940170	0.24231211	2.5481167	20	5 23.0	19.2
155219 2005 VX_{23}	16.1	X	131.87960	289.86280	356.94652	1.61663	0.0346707	0.20532881	2.8455712	20	—	—
155220 2005 VM_{25}	15.7	X	23.40085	195.86493	251.18116	7.70132	0.1209708	0.21442055	2.7645543	20	—	—
155221 2005 VT_{38}	15.6	X	272.31764	231.62372	125.85117	3.83189	0.1198650	0.17699780	3.1416476	20	6 8.5	20.1
155222 2005 VY_{52}	16.2	X	80.02980	233.76399	155.40090	4.01370	0.1022780	0.21428346	2.7657332	20	—	—
155223 2005 VH_{53}	16.3	X	1.22984	176.68667	168.78427	5.68714	0.1386073	0.25891579	2.4379813	20	11 2.5	18.8
155224 2005 VW_{60}	17.1	X	226.87788	188.38766	345.46434	0.70423	0.1250057	0.26700752	2.3884733	20	12 9.7	19.9
155225 2005 VR_{63}	17.4	X	223.88267	53.49189	150.09497	2.63396	0.1662441	0.27498690	2.3420422	20	—	—
155226 2005 VV_{70}	16.5	X	142.61321	269.81506	154.77711	2.60580	0.0791093	0.23098254	2.6307724	20	4 12.9	20.1
155227 2005 VD_{71}	15.9	X	126.61583	334.16134	92.08177	4.49863	0.0161676	0.22821620	2.6519891	20	3 20.7	19.5
155228 2005 VB_{98}	16.0	X	155.72479	81.87037	272.53049	1.63634	0.1230137	0.22369404	2.6876112	20	2 2.9	19.9
155229 2005 VD_{118}	16.3	X	191.41065	224.48256	136.16311	4.92614	0.2103758	0.29906624	2.2145787	20	3 14.3	19.8
155230 2005 VQ_{118}	14.7	X	202.02658	356.81167	83.74867	12.94819	0.1815085	0.17494869	3.1661312	20	7 1.7	19.9
155231 2005 WV_{2}	15.1	X	248.07513	239.71702	137.46907	10.06724	0.0947969	0.17534776	3.1613257	20	6 8.9	19.9
155232 2005 WL_{5}	15.0	X	231.12464	121.69866	229.08983	13.10925	0.1159863	0.23520789	2.5991706	20	4 10.4	19.1
155233 2005 WO_{8}	16.4	X	56.60936	351.14701	56.85195	1.39710	0.0589579	0.21239290	2.7821213	20	—	—
155234 2005 WK_{16}	16.2	X	329.29702	222.58914	68.04001	2.30564	0.1527206	0.24197940	2.5504518	20	5 30.3	18.8
155235 2005 WX_{17}	15.7	X	359.66983	101.52296	71.96115	9.90627	0.0893190	0.22108925	2.7086796	20	2 19.0	19.1
155236 2005 WO_{18}	15.9	X	242.42619	205.25513	72.15426	3.16051	0.0474025	0.22030673	2.7150899	20	1 31.7	19.9
155237 2005 WP_{18}	16.4	X	106.46937	266.63165	89.95422	0.60701	0.0811069	0.21081955	2.7959461	20	—	—
155238 2005 WY_{18}	15.9	X	300.66110	307.18948	257.32125	1.09764	0.0807682	0.21518159	2.7580320	20	1 5.6	19.6
155239 2005 WB_{19}	15.8	X	224.65451	75.61022	82.41949	3.09043	0.0793939	0.19208754	2.9748832	20	11 7.9	19.9
155240 2005 WO_{21}	16.3	X	310.75796	74.13612	297.59333	1.61264	0.1121259	0.18580945	3.0415213	20	8 22.6	20.0
155241 2005 WO_{22}	15.9	X	352.80441	274.74247	290.13071	2.32507	0.1691526	0.22622416	2.6675346	20	3 7.6	18.6
155242 2005 WQ_{24}	15.1	X	127.25049	209.90759	283.04669	3.84420	0.1028213	0.16992377	3.2282461	20	6 23.7	19.9
155243 2005 WW_{25}	15.9	X	271.62107	62.53766	350.94963	2.19566	0.1432216	0.18459010	3.0549008	20	8 16.0	20.1
155244 2005 WH_{29}	16.3	X	49.05673	293.19744	317.24382	1.41841	0.0384730	0.17956192	3.1116677	20	8 8.3	20.6
155245 2005 WJ_{38}	15.5	X	180.32437	329.90056	117.67006	3.18503	0.1067999	0.17110109	3.2134203	20	6 22.2	20.4
155246 2005 WE_{44}	16.0	X	226.49837	83.89669	314.42140	1.07227	0.0713145	0.24009500	2.5637793	20	6 12.8	19.5
155247 2005 WK_{46}	16.1	X	352.69106	251.30383	290.67665	0.68269	0.0274330	0.22312394	2.6921872	20	2 19.8	19.7
155248 2005 WN_{46}	15.1	X	249.64389	309.27907	152.05388	13.17560	0.1347204	0.18776303	3.0203874	20	9 21.7	19.4
155249 2005 WU_{48}	16.4	X	87.80254	337.76707	55.39440	2.11741	0.0688168	0.21341018	2.7732730	20	—	—
155250 2005 WW_{57}	16.3	X	250.61003	178.99924	165.70034	4.67233	0.2201251	0.24054648	2.5605703	20	4 16.7	20.3
155251 2005 WC_{59}	15.8	X	280.16234	108.79832	284.80849	0.76487	0.0974598	0.18255938	3.0775134	20	8 7.8	20.0
155252 2005 WU_{60}	16.8	X	6.84709	117.60111	24.98683	2.65718	0.0730124	0.29539627	2.2328834	20	—	—
155253 2005 WX_{66}	16.4	X	29.11699	190.93589	210.63979	1.23111	0.0941253	0.20588528	2.8404415	20	—	—
155254 2005 WB_{68}	16.0	X	4.26559	199.93606	199.69610	1.44607	0.0754387	0.19949637	2.9007662	20	12 23.3	19.7
155255 2005 WO_{73}	15.7	X	184.43803	187.41509	166.44670	14.82589	0.2659457	0.22882140	2.6473110	20	3 4.7	20.3
155256 2005 WH_{76}	16.7	X	177.20771	204.66101	18.95429	2.09939	0.1588531	0.26465220	2.4026235	20	12 12.2	20.3
155257 2005 WL_{81}	15.7	X	310.59190	159.52926	266.80581	1.67211	0.0772976	0.19286212	2.9669127	20	11 6.5	19.5
155258 2005 WP_{86}	16.2	X	235.47395	21.08602	237.93861	5.07439	0.1424458	0.28530836	2.2852114	20	—	—
155259 2005 WQ_{86}	16.5	X	144.48913	315.46037	95.90822	2.34356	0.0409654	0.22864596	2.6486650	20	3 25.7	20.1
155260 2005 WH_{89}	16.0	X	125.19074	291.99596	71.74750	4.06513	0.1016184	0.21716048	2.7412513	20	1 11.1	19.9
155261 2005 WE_{95}	16.5	X	73.78951	120.25920	108.17536	1.80078	0.1104291	0.24558234	2.5254453	20	8 30.8	19.7
155262 2005 WL_{95}	14.9	X	148.09710	243.34071	246.58811	10.50999	0.0792520	0.17234248	3.1979708	20	7 8.9	19.9
155263 2005 WM_{98}	16.8	X	212.10617	183.46713	167.87170	1.51057	0.0711265	0.23506653	2.6002126	20	3 26.6	20.5
155264 2005 WN_{99}	15.4	X	162.38199	216.76415	239.54035	4.16865	0.1285233	0.16944624	3.2343083	20	6 15.6	20.5
155265 2005 WM_{103}	16.0	X	121.20231	277.43909	83.35956	7.16567	0.0692966	0.21668904	2.7452259	20	—	—
155266 2005 WP_{105}	15.5	X	218.78200	153.65148	325.48737	0.62740	0.1366142	0.18357353	3.0661684	20	9 6.4	20.3
155267 2005 WE_{106}	15.8	X	19.79182	219.14836	179.42565	2.04014	0.1024676	0.20172630	2.8793494	20	—	—
155268 2005 WE_{108}	16.0	X	142.93525	135.46738	228.84396	5.55892	0.0333528	0.21939642	2.7225949	20	1 21.7	19.9
155269 2005 WC_{113}	15.9	X	141.57273	224.90718	148.09407	9.10176	0.2618071	0.22410279	2.6843421	20	2 24.5	20.2
155270 Dianawheeler	15.2	X	306.57524	325.61510	91.48580	15.13723	0.0980224	0.19291844	2.9663351	20	10 26.1	19.2
155271 2005 WJ_{114}	16.1	X	248.18875	13.48392	323.90359	3.62189	0.1950453	0.23750023	2.5824189	20	4 4.7	20.2
155272 2005 WT_{118}	15.3	X	185.56034	282.55893	151.81902	1.52726	0.1685050	0.17338858	3.1850950	20	6 10.5	20.4
155273 2005 WR_{119}	16.2	X	180.40588	198.64004	160.16570	2.05097	0.1046297	0.22695778	2.6617831	20	3 3.1	20.1
155274 2005 WM_{146}	16.5	X	66.27555	60.15903	14.47271	2.10740	0.0438774	0.21749735	2.7384201	20	1 15.8	19.9
155275 2005 WJ_{154}	16.2	X	138.71454	281.84372	284.87761	4.15514	0.0624439	0.25796621	2.4439604	20	10 12.3	19.7
155276 2005 WV_{155}	16.8	X	136.81958	196.88503	149.09524	7.57288	0.1468735	0.28564429	2.2834194	20	—	—
155277 2005 WJ_{159}	16.0	X	57.65035	35.61556	51.52440	5.98984	0.0175935	0.21900300	2.7258545	20	1 18.4	19.7
155278 2005 WR_{168}	16.2	X	199.23711	195.87545	170.77093	1.77488	0.1784957	0.23194870	2.6234618	20	3 31.0	20.6
155279 2005 WW_{173}	16.5	X	112.02971	46.64220	111.06499	2.82548	0.0672582	0.23956657	2.5675480	20	7 6.8	20.0
155280 2005 WR_{181}	16.1	X	61.88435	222.71554	146.12163	5.43023	0.1097730	0.20713062	2.8290449	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155281 2005 WX_{184}	16.9	X	142.65776	56.41081	327.88033	1.28497	0.1480365	0.22516457	2.6758967	20	2 28.4	21.0
155282 2005 WC_{186}	15.2	X	212.88586	331.51519	158.78537	5.42416	0.1327725	0.18386566	3.0629199	20	9 15.1	19.9
155283 2005 WS_{187}	15.2	X	275.33422	357.28029	86.56120	23.74163	0.0410266	0.19246284	2.9710147	20	10 27.2	19.7
155284 2005 WC_{190}	15.4	X	154.16527	104.53860	343.49599	14.56863	0.0632340	0.23791127	2.5794436	20	5 20.1	19.5
155285 2005 WH_{191}	16.0	X	131.99361	315.00955	164.51644	5.21133	0.0728201	0.23654357	2.5893770	20	6 10.8	19.7
155286 2005 WU_{192}	15.5	X	211.00950	176.74082	301.52077	12.45673	0.1045547	0.25147313	2.4858504	20	9 2.1	19.2
155287 2005 XK_{1}	16.9	X	318.28953	178.29271	166.85932	2.34367	0.2688860	0.32057317	2.1143876	20	7 26.8	17.5
155288 2005 XY_{5}	15.4	X	217.73200	304.13228	106.83312	4.05874	0.1508479	0.17200602	3.2021398	20	6 12.1	20.4
155289 2005 XE_{26}	15.6	X	333.80244	350.43366	111.30396	5.07079	0.0451738	0.20329805	2.8644895	20	—	—
155290 Anniegrauer	14.7	X	198.13528	336.77057	90.54521	14.23025	0.0526052	0.16805296	3.2521602	20	6 17.5	19.6
155291 2005 XO_{56}	16.0	X	55.60984	353.29816	351.70393	1.38764	0.0786094	0.19914549	2.9041725	20	12 21.9	20.1
155292 2005 XT_{64}	15.9	X	207.80580	197.69530	176.15984	4.40005	0.2102601	0.23531454	2.5983853	20	4 15.9	20.2
155293 2005 XO_{65}	15.9	X	167.64399	67.50098	292.74248	5.72844	0.0155612	0.22205106	2.7008521	20	2 13.4	19.6
155294 2005 XY_{65}	15.1	X	296.60160	242.47598	133.27362	11.89283	0.0783547	0.18158362	3.0885284	20	8 10.7	19.0
155295 2005 XN_{77}	15.6	X	302.56795	217.24850	87.08634	16.20837	0.1368409	0.23402584	2.6079155	20	5 12.1	19.0
155296 2005 YJ	14.5	X	235.38217	40.70912	6.17260	27.20621	0.1790250	0.17367084	3.1816430	20	6 20.6	20.0
155297 2005 YS_{9}	16.5	X	237.25557	293.60779	40.44996	2.35923	0.1053329	0.23309827	2.6148294	20	3 30.6	20.4
155298 2005 YG_{19}	16.7	X	187.71078	185.08848	64.10484	2.81929	0.0946815	0.27111259	2.3643019	20	—	—
155299 2005 YD_{25}	15.5	X	120.56108	60.97218	160.17087	0.60830	0.1298998	0.17760793	3.1344486	20	10 5.4	20.4
155300 2005 YG_{40}	15.1	X	141.48277	341.94581	161.99196	1.27453	0.0814034	0.16800216	3.2528159	20	7 20.6	19.9
155301 2005 YU_{43}	16.3	X	146.01551	247.32184	130.91628	3.23108	0.0814725	0.22192999	2.7018344	20	2 18.8	20.2
155302 2005 YS_{46}	14.2	X	337.33024	123.15998	92.51111	10.90984	0.0249453	0.15198231	3.4775551	20	3 26.7	19.2
155303 2005 YU_{53}	16.0	X	247.25483	31.65886	262.65621	2.39885	0.1737181	0.21682567	2.7440725	20	2 15.4	20.4
155304 2005 YE_{57}	16.6	X	255.76222	62.50078	330.29452	3.42732	0.0880607	0.24203260	2.5500780	20	7 11.1	19.8
155305 2005 YU_{73}	15.0	X	117.38860	133.70593	318.17042	2.98807	0.0389030	0.15764745	3.3937363	20	4 14.8	19.9
155306 2005 YA_{75}	15.7	X	215.69927	226.57394	175.93562	13.76723	0.1745639	0.24005668	2.5640521	20	5 31.1	20.0
155307 2005 YB_{133}	15.9	X	271.83559	306.10207	332.83870	4.93432	0.1159191	0.22176783	2.7031513	20	2 27.3	19.8
155308 2005 YA_{137}	15.6	X	160.41613	292.07906	289.12427	3.56639	0.1080176	0.18590146	3.0405176	20	11 11.5	20.4
155309 2005 YS_{141}	16.0	X	97.49640	269.14326	69.36541	2.54630	0.0851623	0.19977244	2.8980931	20	—	—
155310 2005 YF_{156}	15.9	X	288.61684	350.27643	40.38713	0.68951	0.2112548	0.18313239	3.0710904	20	7 29.9	19.9
155311 2005 YW_{159}	16.1	X	53.05175	231.01576	203.24953	3.35591	0.0820744	0.21048003	2.7989520	20	—	—
155312 2005 YC_{168}	15.4	X	93.09240	346.62561	261.79561	4.29207	0.0962688	0.17862151	3.1225798	20	10 5.0	20.1
155313 2005 YZ_{170}	15.8	X	173.72887	49.85997	184.77949	3.63923	0.0915644	0.19090811	2.9871232	20	12 12.9	20.4
155314 2005 YW_{206}	15.5	X	290.98686	308.89016	85.78892	1.23845	0.0589745	0.17735920	3.1373784	20	8 29.8	19.6
155315 2005 YM_{219}	16.1	X	23.09081	121.22516	291.38481	1.29934	0.1093459	0.20364937	2.8611942	20	—	—
155316 2005 YP_{275}	15.9	X	318.50670	297.33864	33.95279	1.51570	0.1923266	0.18159922	3.0883516	20	7 1.5	19.3
155317 2005 YU_{283}	16.9	X	197.12749	252.68538	47.98982	3.24516	0.0908543	0.28689972	2.2767533	20	—	—
155318 2006 AP_{18}	14.9	X	106.49106	147.31565	96.40141	10.68292	0.0473329	0.17948553	3.1125506	20	10 16.6	19.6
155319 2006 AC_{31}	16.0	X	181.52290	270.43072	86.57322	6.46192	0.0836598	0.22328273	2.6909107	20	3 4.6	20.1
155320 2006 AC_{32}	15.6	X	205.94926	208.06930	43.30836	2.57828	0.0484243	0.20101104	2.8861758	20	—	—
155321 2006 AA_{55}	15.4	X	36.77710	118.08835	173.03949	3.73456	0.0275295	0.17680224	3.1439639	20	9 11.3	19.6
155322 2006 AR_{56}	15.3	X	120.09082	173.92375	21.69652	1.02903	0.1173918	0.17491498	3.1665381	20	9 3.3	20.1
155323 2006 AD_{70}	16.0	X	91.02882	133.64974	216.57956	1.29620	0.0843581	0.19887324	2.9068223	20	—	—
155324 2006 AY_{81}	16.0	X	114.80968	325.23224	62.24521	3.00013	0.0835688	0.21281483	2.7784427	20	1 26.6	19.8
155325 2006 AG_{86}	14.8	X	282.47065	116.29668	228.55341	14.08925	0.1402701	0.24200362	2.5502816	20	6 2.2	18.1
155326 2006 AN_{97}	12.6	X	118.25722	352.77519	94.83022	20.89148	0.0182871	0.08293741	5.2075773	20	4 23.3	19.8
155327 2006 AV_{99}	13.3	X	11.01164	52.61656	159.00262	7.90999	0.0553099	0.08206357	5.2444800	20	5 3.7	20.0
155328 2006 BG_{13}	16.1	X	163.29176	134.83585	270.20545	5.22026	0.1309782	0.22955855	2.6416406	20	4 10.8	20.4
155329 2006 BJ_{43}	15.6	X	224.44479	300.80720	89.91301	6.02182	0.3442277	0.23581927	2.5946764	20	5 13.9	20.3
155330 2006 BN_{61}	14.8	X	327.87592	345.99155	346.99897	18.91299	0.1189993	0.17159656	3.2072317	20	8 3.6	19.0
155331 2006 BD_{104}	14.7	X	336.72857	264.01367	106.86294	24.30061	0.1664819	0.18796823	3.0181889	20	10 18.6	18.7
155332 2006 BA_{157}	13.1	X	283.68809	186.54834	127.98559	5.16174	0.1334629	0.08102329	5.2892748	20	5 2.5	20.0
155333 2006 BK_{196}	15.8	X	100.47068	167.80520	167.14661	6.15617	0.1668052	0.19215172	2.9742207	20	—	—
155334 2006 DZ_{169}	17.1	X	255.93199	275.93298	14.82923	6.61580	0.4089301	0.33969858	2.0342621	20	1 29.3	21.0
155335 2006 EV	14.6	X	78.43840	124.51624	74.65548	27.43951	0.2064007	0.17157823	3.2074601	20	8 9.8	19.8
155336 2006 GA_{1}	18.3	X	254.83975	355.28217	64.37785	4.19522	0.7375852	0.31909021	2.1209335	20	6 9.4	22.9
155337 2006 KH_{89}	12.6	X	295.91429	305.61657	353.83440	17.01897	0.0903371	0.08242772	5.2290226	20	4 26.9	19.6
155338 2006 MZ_{1}	20.5	X	358.98817	138.61012	226.63786	2.08190	0.4824108	0.50138356	1.5692398	20	—	—
155339 2006 RD_{83}	17.4	X	205.50952	213.07910	189.30900	4.89982	0.1035656	0.26294570	2.4130075	20	5 23.3	20.9
155340 2006 SK_{198}	16.3	X	267.91644	352.56192	260.56501	9.23855	0.4666182	0.32214869	2.1074881	20	—	—
155341 2006 SA_{218}	18.2	X	197.10970	278.01909	144.38134	18.52055	0.2415495	0.54874776	1.4775909	20	6 9.9	20.3
155342 2006 XD_{40}	15.8	X	291.41352	55.20033	264.97228	0.86822	0.0675789	0.18580734	3.0415443	20	5 23.7	19.8
155343 2006 YU_{6}	15.8	X	20.23017	302.63505	105.34236	10.38851	0.1531007	0.22086074	2.7105476	20	—	—
155344 2007 AP_{14}	16.6	X	258.97153	53.51296	18.14478	2.56922	0.1623730	0.26484860	2.4014355	20	8 29.9	19.3
155345 2007 AR_{14}	16.8	X	9.72735	338.26105	128.00860	5.64056	0.1077939	0.29333079	2.2433530	20	—	—
155346 2007 AH_{23}	17.4	X	173.25989	30.97379	145.40043	3.97378	0.1143557	0.26632856	2.3925309	20	10 14.7	20.9
155347 2007 BU_{31}	16.1	X	70.72452	299.73642	146.74074	6.99750	0.2154509	0.22738351	2.6584597	20	2 28.1	19.0
155348 2007 BE_{44}	16.6	X	191.60784	189.05337	311.64476	0.50603	0.1320546	0.26111423	2.4242777	20	9 14.0	20.2
155349 2007 CL_{17}	16.9	X	145.98701	183.20767	30.87245	2.78658	0.1280846	0.26418143	2.4054769	20	11 1.5	20.5
155350 2007 CN_{21}	15.6	X	153.29521	223.10005	144.74526	15.50039	0.1539895	0.23018476	2.6368474	20	2 19.5	19.7
155351 2007 CY_{24}	15.7	X	61.36473	310.86173	150.05137	14.72926	0.0625118	0.22814024	2.6525777	20	2 10.8	19.1
155352 2007 CA_{25}	16.4	X	128.18662	288.76747	302.86200	7.81084	0.1629271	0.26347206	2.4097926	20	11 3.8	20.4
155353 2007 CM_{25}	16.7	X	167.78900	329.52943	251.66681	1.50690	0.1477935	0.26711092	2.3878568	20	12 1.4	20.2
155354 2007 CE_{27}	15.2	X	187.44654	292.77017	158.19678	16.77973	0.1993003	0.17804194	3.1293526	20	7 1.6	20.7
155355 2007 DU_{2}	16.9	X	125.51150	163.98906	53.19560	2.46261	0.1444051	0.25954818	2.4340195	20	10 16.9	20.7
155356 2707 P–L	16.2	X	136.65071	339.30484	17.25932	5.42144	0.1706016	0.22060046	2.7126792	20	1 24.3	20.3
155357 6096 P–L	15.7	X	182.53608	350.66823	0.47791	11.79506	0.1909827	0.22287189	2.6942167	20	3 1.5	20.3
155358 6231 P–L	14.9	X	9.76679	346.86898	334.98320	8.39701	0.0761764	0.18069418	3.0986554	20	9 17.3	19.0
155359 6292 P–L	16.2	X	307.29731	34.51546	358.42424	6.86209	0.1108904	0.26292495	2.4131344	20	9 29.5	18.4
155360 1031 T–2	16.6	X	121.47412	181.54569	181.37303	6.83800	0.1264213	0.28168328	2.3047757	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155361 1096 T–2	15.1	X	58.70750	158.12149	191.24387	9.58790	0.1045674	0.19281005	2.9674468	20	12 31.7	19.5
155362 3127 T–3	16.4	X	180.15661	302.44525	36.97658	5.27162	0.1388685	0.28700529	2.2761949	20	2 5.2	19.7
155363 3207 T–3	15.9	X	210.95201	147.83347	193.70011	2.00735	0.1160360	0.21975016	2.7196723	20	3 12.4	19.9
155364 3402 T–3	16.1	X	191.06474	298.89561	40.33859	3.07566	0.1994469	0.21872991	2.7281230	20	2 22.7	20.6
155365 4308 T–3	15.9	X	178.08259	279.99874	76.70854	5.86865	0.1262622	0.21843352	2.7305902	20	3 2.7	20.2
155366 4557 T–3	16.2	X	297.33615	225.47745	111.22465	3.37345	0.0447524	0.24753857	2.5121224	20	6 28.1	19.3
155367 5095 T–3	15.5	X	248.64164	219.57996	68.84594	9.80652	0.1470714	0.21921195	2.7241220	20	2 16.2	19.9
155368 5120 T–3	14.8	X	184.20358	26.34279	37.52282	29.73046	0.2130569	0.17514209	3.1638000	20	5 19.9	20.5
155369 1981 EH_{15}	16.2	X	273.13919	248.90657	219.92427	4.61857	0.1604846	0.26681041	2.3896495	20	11 14.9	18.6
155370 1988 TX	16.3	X	283.55865	137.05085	207.05064	4.78882	0.3152467	0.30343098	2.1932902	20	5 5.6	19.1
155371 1990 SB_8	17.0	X	97.19267	285.08296	77.00183	3.32960	0.2314082	0.27467648	2.3438064	20	—	—
155372 1991 TM_{15}	15.4	X	278.51655	281.83978	45.50985	15.46096	0.2102812	0.22870047	2.6482441	20	4 25.8	19.1
155373 1991 TV_{16}	16.7	X	281.35481	352.38723	134.16044	3.21121	0.1309581	0.27520086	2.3408281	20	—	—
155374 1991 VZ_{10}	16.0	X	318.07671	265.56496	75.46996	4.37475	0.2262419	0.23349083	2.6118977	20	7 14.7	18.3
155375 1992 DP_3	17.3	X	239.14940	145.11722	47.87355	2.10588	0.1254908	0.27044284	2.3682037	20	—	—
155376 1992 RL_5	15.4	X	260.62132	331.53425	6.82133	6.02958	0.2657989	0.23869093	2.5738236	20	4 11.6	19.4
155377 1992 SW_9	16.5	X	159.61527	56.95528	5.41783	7.20550	0.1110403	0.23437641	2.6053143	20	4 28.1	20.5
155378 1993 FF_9	16.8	X	323.41187	120.49957	82.96674	3.14672	0.1451735	0.21520292	2.7578498	20	1 24.7	20.2
155379 1993 FP_{50}	17.1	X	287.19891	201.87733	351.35956	3.44760	0.0982441	0.28334568	2.2957521	20	—	—
155380 1993 FU_{56}	16.9	X	325.41487	33.46311	130.81527	5.87578	0.1303928	0.28479791	2.2879412	20	—	—
155381 1993 FY_{64}	15.8	X	157.15216	24.03130	288.60447	3.29229	0.0539237	0.20929257	2.8095289	20	—	—
155382 1993 TZ_{15}	15.6	X	25.28471	201.13319	153.03675	1.22036	0.1568793	0.18548279	3.0450912	20	12 3.1	19.5
155383 1993 TC_{18}	16.8	X	87.06229	219.41565	124.34586	1.52559	0.2324045	0.26572807	2.3961339	20	—	—
155384 1993 TZ_{19}	16.2	X	355.17385	316.87040	58.61191	3.46152	0.2030521	0.25831096	2.4417854	20	12 12.8	18.5
155385 1993 UO_6	16.6	X	316.49017	347.71787	61.66635	7.84358	0.1673917	0.25617782	2.4553215	20	11 9.8	18.5
155386 1994 AF_6	16.5	X	54.99950	281.13750	281.56334	0.77426	0.0906433	0.23792941	2.5793125	20	6 24.4	19.5
155387 1994 AC_9	15.8	X	323.34085	244.55092	133.73948	1.86124	0.1692666	0.17421881	3.1749681	20	9 16.3	19.4
155388 1994 AR_{10}	15.5	X	217.43352	52.50548	355.93729	3.47953	0.1998212	0.24103305	2.5571232	20	6 5.4	19.7
155389 1994 CY_3	15.8	X	8.97120	156.65931	150.28926	13.82569	0.1628344	0.24265146	2.5457403	20	9 21.3	18.4
155390 1994 PP_{29}	16.8	X	229.61233	118.68509	197.03772	4.03853	0.2920469	0.29115472	2.2545169	20	2 14.9	20.8
155391 1994 PG_{30}	16.4	X	252.94420	111.18382	169.71186	7.37356	0.1771657	0.29053393	2.2577273	20	1 27.0	19.9
155392 1994 SE_3	17.1	X	315.30740	138.00499	317.25135	0.94159	0.0421957	0.19648379	2.9303414	20	12 22.2	20.9
155393 1995 BN_5	16.9	X	107.84009	256.78925	113.31014	3.45177	0.2413192	0.27504200	2.3417294	20	1 6.9	19.5
155394 1995 CQ_6	15.7	X	75.49472	32.27700	221.70271	1.62606	0.1470941	0.17496678	3.1659131	20	9 29.5	20.2
155395 1995 SA_5	15.4	X	10.56681	228.59733	191.59326	14.90271	0.1329066	0.20466988	2.8516754	20	—	—
155396 1995 SS_{14}	16.1	X	222.21716	209.33785	177.27346	12.10589	0.1726020	0.22693737	2.6619427	20	5 17.8	20.5
155397 1995 SA_{19}	16.4	X	244.03136	267.55872	8.21621	3.44774	0.1726280	0.21789601	2.7350789	20	1 23.6	20.8
155398 1995 SS_{31}	16.1	X	182.77392	257.35992	159.51849	5.97638	0.0475031	0.22718137	2.6600363	20	5 18.9	20.0
155399 1995 SB_{47}	16.4	X	302.83200	329.15957	14.83362	7.04383	0.1488720	0.27135567	2.3628897	20	7 4.3	18.9
155400 1995 UD_1	17.3	X	120.08067	13.15703	5.63179	8.50428	0.1427985	0.29304740	2.2447990	20	1 19.1	20.1
155401 1995 UM_{14}	16.1	X	188.59132	22.16352	291.90900	2.03903	0.1698138	0.21422863	2.7662051	20	1 20.8	20.7
155402 1995 UZ_{17}	16.4	X	93.24507	23.34108	353.23855	5.39461	0.0242988	0.21097214	2.7945978	20	—	—
155403 1995 UC_{19}	16.6	X	261.13902	280.79816	57.53851	3.53775	0.1283401	0.22613546	2.6682321	20	4 29.5	20.5
155404 1995 UX_{38}	16.0	X	174.50808	351.05727	28.97966	3.43344	0.1110282	0.21929537	2.7234312	20	3 24.8	20.1
155405 1995 VH_9	16.1	X	171.78459	226.56670	66.37632	2.99080	0.0358607	0.20651461	2.8346680	20	—	—
155406 1995 VS_9	17.3	X	333.55381	160.30295	21.65139	2.31651	0.0366552	0.29435159	2.2381634	20	1 11.7	19.9
155407 1995 XB_4	15.9	X	270.48828	70.03250	216.52448	8.08964	0.1461456	0.21750964	2.7383169	20	2 29.4	20.2
155408 1995 YF_7	16.2	X	249.38957	207.36489	143.05687	3.27664	0.2509547	0.22394687	2.6855880	20	4 20.6	20.7
155409 1995 YN_7	15.9	X	145.48497	181.79272	159.08557	3.46738	0.0596799	0.20872035	2.8146616	20	1 2.2	19.8
155410 1996 CE_2	17.0	X	263.70044	66.92294	96.30017	5.19957	0.1803255	0.27443169	2.3452000	20	—	—
155411 1996 DG_3	16.9	X	146.76898	200.53267	157.28889	6.60977	0.1578219	0.28450816	2.2894943	20	1 23.9	20.0
155412 1996 FO_{10}	16.8	X	17.63891	307.91190	132.99995	3.09810	0.1057369	0.27659383	2.3329623	20	—	—
155413 1996 HS_{19}	15.3	X	90.81391	128.09444	130.31026	1.61507	0.1788531	0.17682633	3.1436783	20	10 25.5	20.2
155414 1996 HQ_{24}	16.7	X	154.13072	59.83054	191.36205	3.11705	0.1631513	0.26513239	2.3997216	20	12 24.2	20.5
155415 1996 JZ_5	13.2	X	252.65365	239.47790	109.96757	3.87344	0.1398489	0.08206267	5.2445183	20	5 7.5	20.4
155416 1996 KJ_2	15.3	X	143.77741	69.06890	75.10388	17.74002	0.1989046	0.17309547	3.1886896	20	8 1.3	20.8
155417 1996 RC_7	16.4	X	180.81272	39.24983	352.42987	7.28568	0.1938685	0.23182527	2.6243929	20	4 12.5	20.8
155418 1996 SQ_2	16.9	X	123.84979	306.85402	197.24329	1.15438	0.0710714	0.23871017	2.5736852	20	7 3.3	20.4
155419 1996 TG_{34}	16.3	X	16.49772	272.06518	27.73926	6.82004	0.2021545	0.24386037	2.5373199	20	9 30.1	18.8
155420 1996 VJ_{10}	15.2	X	77.06687	231.06185	349.05005	12.53445	0.1187028	0.24193120	2.5507905	20	8 26.3	18.7
155421 1996 VT_{22}	16.7	X	308.45852	142.72892	205.53660	12.94050	0.1856490	0.23950991	2.5679529	20	7 9.4	19.8
155422 1996 XR_{16}	16.1	X	354.63749	191.97877	55.09349	3.26551	0.0394221	0.23065354	2.6332735	20	5 19.0	19.4
155423 1997 AZ_{19}	16.5	X	58.94702	237.73988	184.14717	1.82026	0.0216804	0.21015428	2.8018436	20	—	—
155424 1997 BL_5	15.7	X	125.67474	248.06063	147.63598	6.90984	0.0785195	0.21526643	2.7573073	20	2 17.0	19.6
155425 1997 ER_6	15.8	X	270.31691	42.99244	216.35285	7.55879	0.0610632	0.21285446	2.7780979	20	2 6.5	19.9
155426 1997 GU_{13}	17.2	X	16.17126	353.05137	209.31866	3.19880	0.0979674	0.30058033	2.2071356	20	4 14.9	19.0
155427 1997 LO_5	13.5	X	281.87242	122.40121	186.06831	12.78179	0.0718979	0.08351783	5.1834220	20	5 1.5	20.4
155428 1997 MU_2	14.7	X	52.28035	210.49869	98.52087	19.14384	0.1191686	0.18078331	3.0976368	20	11 13.1	19.3
155429 1997 MB_8	16.5	X	21.62520	154.51436	266.67485	1.88419	0.1562201	0.27257301	2.3558491	20	—	—
155430 1997 NS_5	17.0	X	124.40908	156.97402	175.39110	2.25222	0.1753612	0.27567703	2.3381318	20	—	—
155431 1997 QL_2	14.3	X	26.40193	358.28805	316.58213	22.55033	0.2003515	0.17530095	3.1618884	20	10 6.2	18.8
155432 1997 SS_2	16.9	X	56.01360	348.87863	10.69334	2.14163	0.2266611	0.26590066	2.3950970	20	—	—
155433 1997 UQ_4	15.9	X	31.18092	294.67421	74.34543	2.86650	0.2028305	0.26458753	2.4030149	20	—	—
155434 1997 VQ_8	16.2	X	15.65264	327.66716	35.84962	7.58614	0.1875543	0.26033952	2.4290846	20	12 26.9	19.2
155435 1997 WN_6	16.1	X	5.65845	302.85808	78.33412	4.73287	0.2284254	0.26051251	2.4280092	20	—	—
155436 1997 WZ_{24}	16.5	X	145.97236	83.53644	224.29995	5.86824	0.1317471	0.26997300	2.3709505	20	—	—
155437 1998 DE	15.8	X	74.40683	158.51364	349.83031	3.29855	0.2299080	0.23050697	2.6343896	20	5 29.6	19.3
155438 Velásquez	15.4	X	131.06720	146.06534	338.23055	4.39167	0.2112009	0.23762576	2.5815094	20	6 27.0	19.6
155439 1998 DF_{24}	15.6	X	5.64717	176.07344	22.02799	4.29504	0.1389356	0.22455049	2.6807730	20	3 27.3	18.3
155440 1998 FN_8	16.5	X	61.51209	106.63801	28.42666	6.01374	0.2066694	0.22574193	2.6713321	20	4 18.4	19.5

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155441 1998 FP_{10}	15.5	X	315.43788	276.36991	356.87033	12.63145	0.2119051	0.22450544	2.6811316	20	3 30.3	18.8
155442 1998 HN_{9}	15.7	X	29.15305	339.61364	136.80811	9.96359	0.0991995	0.21478248	2.7614476	20	1 17.3	18.9
155443 1998 HX_{14}	16.2	X	323.11071	122.91979	114.17339	3.11310	0.0228224	0.22306114	2.6926925	20	3 24.8	19.6
155444 1998 HJ_{35}	15.6	X	41.15484	40.73912	105.43788	4.88194	0.1659384	0.22310155	2.6923674	20	3 25.2	18.4
155445 1998 HL_{35}	15.6	X	338.92487	156.19146	37.42447	14.96602	0.1420228	0.21957329	2.7211327	20	2 9.9	19.2
155446 1998 HK_{40}	15.4	X	267.45430	214.49828	32.92661	13.12308	0.1007330	0.21593313	2.7516289	20	1 20.9	19.7
155447 1998 HN_{41}	15.8	X	3.54246	116.17525	49.86928	13.14956	0.1169002	0.21919010	2.7243031	20	2 15.7	19.2
155448 1998 HB_{43}	16.0	X	198.92196	193.26166	148.05835	5.45425	0.0212969	0.21914242	2.7246983	20	3 1.2	19.9
155449 1998 HV_{94}	15.4	X	339.56800	5.21126	212.48086	12.70135	0.1337100	0.22050171	2.7134890	20	3 3.9	18.7
155450 1998 HT_{119}	15.9	X	271.80080	95.58387	166.35393	7.17627	0.3231822	0.21476972	2.7615570	20	1 18.2	20.8
155451 1998 HV_{134}	14.9	X	314.36225	132.69467	165.71991	12.83321	0.1835716	0.22761762	2.6566364	20	5 13.4	18.2
155452 1998 HN_{150}	15.6	X	17.35832	101.96317	102.11438	3.76350	0.1317480	0.22554576	2.6728809	20	4 28.6	18.4
155453 1998 HS_{154}	15.7	X	313.41564	201.47053	352.60354	11.48755	0.0831856	0.21692561	2.7432296	20	1 10.3	19.6
155454 1998 MU_{18}	15.2	X	241.54674	134.75284	159.09224	9.13253	0.1890565	0.21245640	2.7815669	20	2 9.4	19.9
155455 1998 ML_{24}	16.7	X	313.26670	221.25375	98.03518	6.93519	0.2875046	0.31076269	2.1586562	20	5 20.1	18.5
155456 1998 QQ_{62}	16.3	X	50.98278	60.33030	196.35526	4.91564	0.1295236	0.31565343	2.1363007	20	9 19.9	18.5
155457 1998 QK_{103}	16.3	X	187.68980	257.03362	119.01107	4.13194	0.1954979	0.29790903	2.2203100	20	3 30.9	19.9
155458 1998 QL_{111}	17.2	X	122.00510	141.66050	223.96798	1.70517	0.2348508	0.28982368	2.2614143	20	1 15.5	19.9
155459 1998 RS_{6}	15.0	X	153.88775	279.12879	343.75585	9.97552	0.0919490	0.19227236	2.9729765	20	12 27.1	19.7
155460 1998 RB_{14}	15.7	X	253.75868	71.23229	305.96709	1.22527	0.1214822	0.17114459	3.2128758	20	6 10.5	20.3
155461 1998 RV_{37}	16.3	X	26.61431	303.48154	324.68438	4.79956	0.1957523	0.31331720	2.1469069	20	9 9.7	18.1
155462 1998 RG_{42}	16.7	X	119.11026	68.83071	315.77596	4.17703	0.1459814	0.29040462	2.2583974	20	1 24.5	19.2
155463 1998 RM_{53}	15.0	X	309.88461	172.00045	186.71928	9.36840	0.0865535	0.17480330	3.1678866	20	8 3.5	19.2
155464 1998 RU_{70}	16.6	X	221.82510	279.22726	35.26051	6.85831	0.1598781	0.29640363	2.2278214	20	2 13.8	20.1
155465 1998 RE_{79}	14.7	X	19.65247	311.65174	21.86122	17.32465	0.1690095	0.18093387	3.0959181	20	10 27.5	18.6
155466 1998 SJ_{9}	16.6	X	280.06397	353.73155	5.78786	1.85105	0.2267493	0.30740432	2.1743498	20	6 5.5	19.0
155467 1998 SO_{20}	16.6	X	32.04335	55.43694	351.91000	4.35336	0.1868984	0.28128126	2.3069713	20	—	—
155468 1998 SM_{65}	16.7	X	175.07058	283.71149	104.69666	4.33901	0.1635250	0.29604094	2.2296406	20	4 3.8	20.0
155469 1998 SB_{81}	14.8	X	38.53748	129.16843	193.01197	9.60930	0.0935138	0.18243033	3.0789645	20	11 2.8	19.0
155470 1998 SH_{88}	16.9	X	66.70926	287.35323	118.56659	2.88595	0.2269212	0.28524752	2.2855363	20	—	—
155471 1998 SC_{97}	15.3	X	282.29694	258.06160	164.48644	6.84024	0.1651211	0.17744794	3.1363323	20	9 6.8	19.5
155472 1998 SY_{98}	14.9	X	56.67989	303.67422	8.17951	8.69124	0.1391995	0.18321668	3.0701485	20	11 15.5	19.4
155473 1998 SW_{104}	16.9	X	50.29456	16.00863	63.65117	5.02308	0.1255728	0.28687720	2.2768724	20	—	—
155474 1998 SO_{124}	14.9	X	28.79447	167.96912	187.91211	10.16668	0.2850516	0.18344819	3.0675649	20	12 27.3	19.2
155475 1998 SP_{131}	14.9	X	263.15049	203.65078	218.49261	13.17153	0.1911942	0.17256939	3.1951668	20	8 3.2	19.8
155476 1998 SX_{141}	15.3	X	8.23140	158.43137	180.34307	15.65303	0.1827468	0.17895947	3.1186472	20	10 22.1	19.0
155477 1998 SG_{149}	15.5	X	166.43591	296.18012	353.11487	10.53897	0.2846607	0.19635967	2.9315762	20	—	—
155478 1998 SY_{162}	16.7	X	239.90052	328.85808	21.64001	2.95882	0.1671913	0.30085386	2.2057976	20	4 14.1	19.8
155479 1998 TG_{2}	17.0	X	49.83331	24.36443	334.99957	2.69298	0.2017236	0.27742332	2.3283096	20	—	—
155480 1998 TK_{2}	16.5	X	11.22833	213.64212	238.32487	4.29418	0.0848644	0.28178655	2.3042126	20	—	—
155481 1998 TJ_{25}	17.1	X	296.77087	288.83000	182.82299	1.56699	0.1918775	0.27453913	2.3445881	20	—	—
155482 1998 TF_{38}	14.6	X	273.90165	200.36339	218.28337	18.34317	0.1445541	0.17334515	3.1856270	20	8 17.2	19.4
155483 1998 UC_{27}	15.3	X	5.51726	222.51342	115.34100	5.39285	0.3055820	0.17834457	3.1258116	20	11 1.9	18.4
155484 1998 US_{34}	14.9	X	232.50513	21.33124	42.18747	5.46388	0.1379706	0.16894094	3.2407544	20	7 13.9	19.9
155485 1998 VY_{11}	16.8	X	42.61929	251.92436	151.53091	4.18002	0.2389932	0.28005498	2.3137007	20	—	—
155486 1998 VT_{56}	16.5	X	359.88192	273.07828	139.97629	3.79570	0.2046137	0.27422940	2.3463531	20	—	—
155487 1998 WP_{8}	16.4	X	62.31311	327.55640	67.16233	7.05475	0.1221026	0.27995611	2.3142455	20	—	—
155488 1998 WJ_{35}	15.4	X	134.39219	11.57095	228.29697	0.71357	0.0360911	0.17966532	3.1104738	20	11 6.3	20.0
155489 1998 XA_{8}	15.9	X	20.09566	149.65883	173.22386	1.10229	0.1758812	0.17731155	3.1379404	20	10 17.8	19.8
155490 1998 XF_{27}	15.4	X	94.99415	316.49416	89.69135	24.82112	0.2127250	0.28427404	2.2907512	20	2 3.6	18.3
155491 1998 YR_{7}	16.5	X	150.87752	56.96173	38.63929	25.87794	0.0813968	0.38723323	1.8641791	20	5 24.4	18.8
155492 1999 AD_{15}	17.0	X	27.25288	72.53362	284.57238	2.83027	0.0301974	0.26478095	2.4018445	20	12 10.9	19.9
155493 1999 BZ_{26}	16.4	X	190.52419	159.46724	117.99864	3.53541	0.1564797	0.27413512	2.3468911	20	—	—
155494 1999 CY_{16}	14.5	X	164.96316	337.03354	51.39330	9.04721	0.2559369	0.24421578	2.5348576	20	4 2.7	18.9
155495 1999 CW_{33}	16.5	X	89.98512	163.28181	326.60286	4.21675	0.0796758	0.24146959	2.5540404	20	4 30.4	19.9
155496 1999 CF_{34}	15.9	X	158.17868	280.32515	332.62805	4.61575	0.0934943	0.26423819	2.4051324	20	—	—
155497 1999 CL_{91}	17.1	X	196.94327	27.12832	149.97571	1.09028	0.1498885	0.26022064	2.4298244	20	11 4.5	20.7
155498 1999 CO_{102}	15.7	X	106.51160	345.70133	147.87282	9.14513	0.1823784	0.24536991	2.5269027	20	6 12.8	19.5
155499 1999 EU_{6}	17.5	X	215.76263	273.03542	206.20798	0.97873	0.1411024	0.25499434	2.4629127	20	9 10.3	20.9
155500 1999 EN_{12}	14.4	X	272.88199	333.84865	24.95552	14.75609	0.1271205	0.24406027	2.5359343	20	6 7.4	18.0
155501 1999 JX_{96}	15.6	X	107.47093	14.54289	186.61442	10.07967	0.1270704	0.24451098	2.5328170	20	9 2.7	19.4
155502 1999 JP_{97}	15.1	X	94.87807	80.75320	132.90598	10.38834	0.1160309	0.24409972	2.5356610	20	9 8.0	18.7
155503 1999 LP_{5}	17.0	X	248.45477	97.91103	219.00607	20.05765	0.0843741	0.36873621	1.9260114	20	3 2.8	19.7
155504 1999 LC_{7}	15.9	X	279.25920	213.50769	94.98630	14.15404	0.1579697	0.23052474	2.6342543	20	4 15.2	19.9
155505 1999 NR_{32}	15.2	X	325.82031	208.24902	115.65557	13.54363	0.1729599	0.23372444	2.6101570	20	7 11.3	17.5
155506 1999 NM_{40}	15.4	X	339.87271	346.65825	311.89927	12.44682	0.2607088	0.23302754	2.6153584	20	6 26.7	17.5
155507 1999 RE_{5}	16.6	X	241.04712	153.84894	279.66650	0.73073	0.2120415	0.18166753	3.0875773	20	7 26.9	21.4
155508 1999 RF_{22}	15.9	X	359.01025	16.39848	2.02628	3.00931	0.2629883	0.19126198	2.9834375	20	12 8.9	18.9
155509 1999 RP_{73}	15.5	X	192.93422	141.76914	209.25793	6.03434	0.0349818	0.21612541	2.7499966	20	3 4.2	19.4
155510 1999 RR_{73}	15.5	X	332.43341	214.65093	176.49587	10.76301	0.1086935	0.19114724	2.9846314	20	10 27.4	19.1
155511 1999 RU_{143}	15.9	X	171.46056	168.92615	203.29179	4.36780	0.1352010	0.21501383	2.7594665	20	3 11.8	20.4
155512 1999 RH_{162}	15.4	X	192.66928	211.99086	138.67995	7.04720	0.0399268	0.21655812	2.7463322	20	3 6.9	19.3
155513 1999 RB_{172}	15.6	X	222.64542	284.83786	42.66932	3.78473	0.0794787	0.21755384	2.7379460	20	3 10.7	19.7
155514 1999 RT_{172}	15.7	X	228.23432	199.26304	134.52121	8.19075	0.1791683	0.21937255	2.7227924	20	3 19.5	20.2
155515 1999 RZ_{190}	15.8	X	319.56560	250.52517	68.32314	3.07146	0.3337215	0.23131806	2.6282279	20	5 22.9	18.0
155516 1999 RG_{204}	15.4	X	98.08473	178.46713	210.85391	16.59374	0.0897663	0.20640121	2.8357061	20	1 5.9	19.5
155517 1999 RH_{213}	16.7	X	22.12907	53.78657	342.83057	1.22879	0.0870871	0.19785649	2.9167722	20	—	—
155518 1999 RS_{217}	16.0	X	343.56125	21.06717	339.47538	8.04705	0.1176856	0.18944416	3.0024923	20	9 30.1	19.5
155519 1999 RS_{251}	16.5	X	165.10196	329.07221	358.59115	3.02877	0.0752452	0.20953103	2.8073969	20	1 10.2	20.7
155520 1999 TH_{10}	14.7	X	271.55471	248.75593	182.98117	8.17776	0.1935056	0.18412083	3.0600893	20	8 29.8	18.8

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155521 1999 TM_{26}	17.2	X	147.06783	101.18108	341.53708	2.14412	0.0965154	0.31290447	2.1487944	20	5 9.3	20.0
155522 1999 TF_{28}	15.3	X	265.86673	287.60190	29.51708	9.49149	0.2599737	0.22000497	2.7175719	20	3 26.3	19.6
155523 1999 TJ_{36}	14.9	X	295.45220	59.85762	247.96074	11.61459	0.3214016	0.22542910	2.6738030	20	3 29.6	19.0
155524 1999 TL_{57}	16.1	X	239.26378	28.77498	55.19192	1.50827	0.0560591	0.18165359	3.0877352	20	8 26.7	20.5
155525 1999 TR_{61}	15.6	X	324.45446	95.54284	331.98416	2.24151	0.0945110	0.19377105	2.9576274	20	11 28.8	19.1
155526 1999 TV_{64}	16.5	X	76.59743	352.45358	354.56742	5.77334	0.0727550	0.19966896	2.8990943	20	—	—
155527 1999 TU_{72}	16.0	X	111.81806	220.55017	102.69247	3.26696	0.0964729	0.19627933	2.9323761	20	—	—
155528 1999 TX_{85}	15.6	X	3.87521	204.15578	215.06670	8.71100	0.0632523	0.19336924	2.9617231	20	—	—
155529 1999 TZ_{119}	14.8	X	214.73723	70.47724	353.82703	11.45556	0.2733514	0.17410564	3.1763438	20	6 18.1	20.5
155530 1999 TS_{121}	15.4	X	255.06710	270.06744	208.58143	8.23479	0.0511215	0.18973175	2.9994575	20	10 30.5	19.4
155531 1999 TB_{129}	15.7	X	36.02758	139.33301	281.40337	0.94841	0.0589423	0.20268278	2.8702837	20	—	—
155532 1999 TR_{133}	16.0	X	234.14895	21.30376	269.64958	1.14232	0.2301655	0.21400726	2.7681124	20	1 29.6	20.8
155533 1999 TU_{135}	15.6	X	323.93461	219.79875	204.39227	9.71040	0.0820591	0.19140324	2.9819695	20	11 24.6	19.4
155534 1999 TY_{145}	15.7	X	232.44061	242.17804	178.28440	8.62900	0.1933231	0.17695739	3.1421259	20	7 3.5	20.8
155535 1999 TR_{177}	15.9	X	266.31121	143.34773	194.17746	4.44055	0.3070248	0.22249574	2.6972524	20	4 13.5	20.1
155536 1999 TO_{196}	15.5	X	249.02102	23.10502	29.57788	10.76705	0.2120499	0.17593344	3.1543058	20	7 10.5	20.5
155537 1999 TL_{204}	15.2	X	307.46966	23.96695	26.15980	16.21818	0.0211054	0.18664463	3.0324412	20	10 16.0	19.4
155538 1999 TC_{207}	16.0	X	354.56844	112.65123	338.72819	24.09190	0.2184239	0.29247689	2.2477173	20	—	—
155539 1999 TU_{221}	15.9	X	267.24665	107.41535	214.11075	11.74421	0.2829252	0.22382187	2.6865878	20	3 25.7	20.3
155540 1999 TN_{224}	15.9	X	125.27696	38.41139	311.48680	1.07152	0.0812511	0.20478698	2.8505883	20	—	—
155541 1999 TJ_{250}	15.3	X	218.94108	331.97410	337.66152	8.59370	0.1420906	0.21344061	2.7730094	20	2 12.1	19.6
155542 1999 TE_{260}	15.7	X	351.60638	56.21381	339.92753	1.85263	0.1072737	0.19369563	2.9583951	20	12 1.7	19.3
155543 1999 TC_{264}	16.0	X	286.72296	261.16975	200.61806	2.23364	0.1533512	0.18940758	3.0028788	20	11 7.7	19.4
155544 1999 TX_{284}	15.2	X	125.44572	143.01152	175.25527	8.35056	0.1925634	0.20033796	2.8926367	20	—	—
155545 1999 TH_{306}	16.3	X	300.37543	200.00248	236.70988	1.80539	0.1118709	0.19156695	2.9802704	20	11 1.5	19.9
155546 1999 TP_{310}	16.4	X	242.14152	76.59647	253.68733	0.39203	0.2121146	0.22258441	2.6965360	20	3 22.4	20.6
155547 1999 UZ_{14}	15.4	X	35.81987	336.22009	54.28383	5.76676	0.1077576	0.19590620	2.9360983	20	—	—
155548 1999 UU_{21}	16.4	X	236.94680	197.56962	41.90301	2.50804	0.0187094	0.20268881	2.8702267	20	—	—
155549 1999 UC_{29}	16.5	X	24.88888	312.99466	70.42336	2.54393	0.0791803	0.19513645	2.9438146	20	12 30.1	20.4
155550 1999 UK_{31}	15.4	X	58.84041	329.74993	31.72955	9.52654	0.1212956	0.19597853	2.9353759	20	—	—
155551 1999 UL_{47}	15.8	X	253.40033	164.90477	257.90717	2.55952	0.1390324	0.17889424	3.1194054	20	8 3.9	20.3
155552 1999 UA_{48}	15.2	X	103.12655	32.57881	312.45515	4.52967	0.1835237	0.20085850	2.8876369	20	—	—
155553 1999 UY_{56}	16.1	X	178.90459	167.88973	41.04164	10.32963	0.0379321	0.18966813	3.0001281	20	11 19.6	20.4
155554 1999 VW_{57}	15.2	X	266.12660	170.23759	221.45434	4.66088	0.1911332	0.17629780	3.1499582	20	7 3.5	19.8
155555 1999 VM_{59}	15.2	X	217.14480	75.00629	230.92392	12.58985	0.1625247	0.20957558	2.8069991	20	1 31.6	20.1
155556 1999 VP_{80}	15.1	X	222.43378	231.82312	213.74726	14.11298	0.1587531	0.17619340	3.1512023	20	7 24.4	20.3
155557 1999 VW_{96}	15.3	X	268.47600	57.43748	40.52404	14.10484	0.1398561	0.18610581	3.0382914	20	10 12.0	19.4
155558 1999 VO_{127}	15.9	X	341.30083	311.74722	74.69167	2.49191	0.0498717	0.18958318	3.0010243	20	10 31.8	19.7
155559 1999 VB_{147}	16.0	X	194.91715	56.18402	34.34902	1.33506	0.1287276	0.17321075	3.1872746	20	7 9.8	21.1
155560 1999 VD_{159}	15.3	X	187.99942	95.21491	23.68847	7.58709	0.2411124	0.17621611	3.1509315	20	8 6.1	20.8
155561 1999 VL_{161}	14.7	X	31.93754	250.96869	46.18749	14.43402	0.0470760	0.18142821	3.0902919	20	9 23.2	19.1
155562 1999 VD_{183}	15.0	X	333.27580	354.43133	71.00493	8.88446	0.0484557	0.18836670	3.0139309	20	12 7.3	18.8
155563 1999 VR_{197}	14.5	X	69.62995	265.28322	59.83835	11.52864	0.0916983	0.19301709	2.9653244	20	12 13.5	18.9
155564 1999 VD_{204}	14.9	X	261.47695	38.90037	275.54329	10.76626	0.1630810	0.22170896	2.7036298	20	3 20.2	19.3
155565 1999 VX_{209}	15.6	X	312.51964	45.66517	43.77326	5.62704	0.0882077	0.19105164	2.9856269	20	12 7.7	19.2
155566 1999 VY_{209}	16.1	X	209.34651	211.86616	207.36653	0.93710	0.1881751	0.17219261	3.1998261	20	6 12.2	21.3
155567 1999 WX_{15}	16.2	X	304.67658	348.49523	68.31016	2.87981	0.1532521	0.18559321	3.0438833	20	10 9.2	19.6
155568 1999 WN_{17}	15.6	X	224.76035	278.70287	21.94361	7.45434	0.2613113	0.21410704	2.7672522	20	2 4.7	20.6
155569 1999 WU_{17}	15.5	X	250.28676	235.31862	32.80987	9.52081	0.1195891	0.21089691	2.7952623	20	1 26.7	19.9
155570 1999 WE_{24}	15.1	X	175.63963	143.35904	54.05972	20.03886	0.1771849	0.18608828	3.0384822	20	10 31.3	20.2
155571 1999 XC_{29}	14.6	X	296.50857	173.67242	231.08589	10.54033	0.1018010	0.18164123	3.0878754	20	9 9.8	18.7
155572 1999 XX_{47}	15.2	X	223.81399	245.26356	236.59780	9.03679	0.0919667	0.18152637	3.0891778	20	9 15.9	20.0
155573 1999 XG_{66}	15.2	X	209.80407	11.09113	71.63137	6.02297	0.1277216	0.17223208	3.1993373	20	7 15.2	20.2
155574 1999 XX_{73}	14.8	X	273.32601	188.97311	241.33957	2.24863	0.2938546	0.18065769	3.0990726	20	8 15.4	19.2
155575 1999 XL_{78}	14.6	X	146.36184	249.17865	253.68052	12.03265	0.1599138	0.17119419	3.2122552	20	7 24.9	20.0
155576 1999 XY_{128}	16.9	X	158.90027	359.57613	28.42927	6.48113	0.1936116	0.30615289	2.1802710	20	3 19.6	20.2
155577 1999 XT_{135}	16.8	X	344.39590	287.07678	225.36178	4.60860	0.1186611	0.29509218	2.2344171	20	—	—
155578 1999 XE_{145}	14.9	X	61.23139	100.09578	230.41836	8.84605	0.0797053	0.19088804	2.9873326	20	12 9.4	19.1
155579 1999 XG_{219}	15.6	X	312.04255	328.84764	47.83058	0.99728	0.1761841	0.17636151	3.1491995	20	8 23.6	19.2
155580 1999 XE_{232}	15.6	X	236.56927	66.35142	42.65724	2.39648	0.1615031	0.18158590	3.0885026	20	9 10.9	20.1
155581 1999 YN_{2}	17.0	X	184.92460	273.06536	108.51187	6.57421	0.0384810	0.30341284	2.1933776	20	4 1.7	19.8
155582 1999 YN_{15}	15.7	X	323.99641	209.19784	196.39278	2.88321	0.0630372	0.18553511	3.0445187	20	10 30.4	19.5
155583 2000 AY_{148}	14.3	X	146.10690	261.91330	238.62497	22.37958	0.0852697	0.17065358	3.2190356	20	7 15.2	19.6
155584 2000 AF_{157}	15.9	X	202.05253	109.90619	331.06290	2.02254	0.0543906	0.31466332	2.1407797	20	7 16.8	18.4
155585 2000 AJ_{166}	14.9	X	248.70944	231.22006	234.65596	10.91637	0.0683370	0.17795934	3.1303209	20	9 28.2	19.4
155586 2000 AU_{182}	16.4	X	1.16492	354.71881	216.69540	6.29766	0.0955972	0.30134027	2.2034233	20	3 29.4	18.5
155587 2000 AN_{205}	16.5	X	354.73774	131.87216	106.18100	3.42171	0.0788672	0.30322265	2.1942947	20	5 3.3	18.4
155588 2000 AQ_{209}	15.0	X	147.72176	123.64278	78.62890	11.96219	0.0610651	0.18204510	3.0833066	20	10 13.6	19.8
155589 2000 AJ_{249}	14.7	X	38.46959	173.29045	130.07098	6.89765	0.1917352	0.17343649	3.1845084	20	10 24.4	19.0
155590 2000 BZ_{9}	17.2	X	168.71853	74.57855	303.51059	1.14517	0.0676261	0.29907817	2.2145198	20	3 5.3	19.9
155591 2000 BK_{34}	16.9	X	143.91736	106.34794	357.87972	2.51336	0.0891659	0.30659237	2.1781870	20	6 5.2	19.7
155592 2000 CK	16.9	X	71.63157	331.40719	132.51669	6.70818	0.1038798	0.29659757	2.2268501	20	2 27.1	19.0
155593 2000 CK_{15}	14.9	X	236.23572	319.12206	97.19372	6.40073	0.1736418	0.16836386	3.2481554	20	7 4.4	19.9
155594 2000 CP_{22}	16.7	X	117.11725	252.65378	167.58123	4.34993	0.1106882	0.29820137	2.2188586	20	3 3.9	19.1
155595 2000 CL_{31}	16.4	X	47.33736	9.40646	162.20563	5.52939	0.0614680	0.30160369	2.2021401	20	4 23.4	18.6
155596 2000 CB_{42}	16.7	X	90.36548	218.66323	231.71654	3.86287	0.1093028	0.29836970	2.2180240	20	3 5.9	19.1
155597 2000 CE_{61}	16.4	X	311.54705	8.58032	154.38349	7.68929	0.0768074	0.28608148	2.2810924	20	—	—
155598 2000 CR_{69}	15.8	X	349.22468	47.86916	299.72931	1.00315	0.1304510	0.17370239	3.1812577	20	9 21.8	19.5
155599 2000 CL_{74}	14.6	X	47.41139	154.77146	130.51591	13.93575	0.1118708	0.17264368	3.1942501	20	10 4.3	19.1
155600 2000 CC_{81}	16.9	X	136.35092	247.84896	147.83006	4.51820	0.1434098	0.29826856	2.2185254	20	2 28.8	19.8

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155601 2000 CY_{97}	16.5	X	324.59894	317.31242	316.04510	4.44663	0.0343774	0.30587186	2.1816062	20	5 6.9	18.9
155602 2000 CS_{111}	16.6	X	82.69550	100.64255	354.00092	5.50210	0.0897049	0.29652263	2.2272253	20	2 29.2	18.9
155603 2000 CB_{138}	17.1	X	183.48321	225.79972	142.16857	2.26955	0.1418190	0.29801581	2.2197795	20	3 13.7	20.2
155604 2000 DP_{20}	16.6	X	69.08178	164.83108	299.78290	4.04668	0.0374921	0.29585778	2.2305607	20	2 13.5	18.9
155605 2000 DO_{40}	16.7	X	55.81342	126.19391	326.40544	5.25747	0.1135367	0.29234706	2.2483827	20	1 13.5	18.6
155606 2000 DW_{44}	16.0	X	217.07915	337.26598	331.43098	6.42112	0.1847923	0.29143597	2.2530662	20	1 31.6	19.7
155607 2000 DG_{55}	16.1	X	264.95524	310.50850	349.31884	6.35937	0.2231231	0.29546083	2.2325581	20	2 29.0	19.5
155608 2000 DN_{75}	16.7	X	25.99255	8.54131	149.12908	5.00867	0.0859839	0.29493941	2.2351886	20	2 24.2	18.6
155609 2000 DJ_{83}	16.2	X	284.08727	272.45006	346.53861	6.74322	0.1121061	0.29460965	2.2368562	20	2 9.4	19.1
155610 2000 DQ_{87}	16.9	X	4.57836	168.22401	28.70576	5.24614	0.0409152	0.29806988	2.2195111	20	3 20.4	19.2
155611 2000 DA_{107}	16.5	X	74.73339	16.85339	112.50794	5.31496	0.0904075	0.29793704	2.2201708	20	4 10.2	18.9
155612 2000 DW_{109}	17.4	X	331.69755	261.64843	227.59421	1.96537	0.0955016	0.28474963	2.2881998	20	—	—
155613 2000 EW_{13}	16.3	X	114.57981	308.46236	125.22719	4.50585	0.1348726	0.29820447	2.2188432	20	3 25.5	18.9
155614 2000 EO_{23}	16.7	X	168.21053	183.74766	165.16955	4.25589	0.1444587	0.29149168	2.2527791	20	2 2.2	19.8
155615 2000 ED_{60}	17.0	X	262.83653	54.98850	172.40078	4.33013	0.1608422	0.28425568	2.2908498	20	—	—
155616 2000 EU_{66}	17.0	X	33.02841	104.23750	25.42697	2.60745	0.0651190	0.29086608	2.2560082	20	1 27.5	19.2
155617 2000 EH_{68}	16.4	X	275.98639	131.35840	162.33652	4.11776	0.1029605	0.29500261	2.2348694	20	3 17.7	19.2
155618 2000 EJ_{75}	15.7	X	5.85291	305.28128	189.36965	23.43926	0.2391222	0.28953989	2.2628917	20	—	—
155619 2000 EF_{100}	15.9	X	241.46096	341.85661	341.70112	5.66674	0.1968150	0.29490141	2.2353806	20	3 9.4	19.4
155620 2000 ER_{100}	16.9	X	326.03521	284.39441	283.81384	0.89029	0.0489600	0.29205081	2.2499029	20	2 4.4	19.3
155621 2000 EV_{101}	17.3	X	3.90705	226.56845	243.69381	1.04892	0.1842852	0.28688113	2.2768516	20	—	—
155622 2000 EE_{145}	16.2	X	24.76158	273.27195	207.62840	5.81212	0.1159040	0.28930997	2.2640905	20	—	—
155623 2000 EY_{149}	16.6	X	357.54346	24.33761	88.24602	6.62928	0.1050552	0.28550567	2.2841584	20	—	—
155624 2000 EO_{180}	15.9	X	228.97661	344.88242	60.08912	6.61342	0.1057077	0.30942011	2.1648959	20	6 22.8	18.6
155625 2000 FO_{2}	16.2	X	198.17908	56.99790	199.50190	6.21710	0.0864196	0.27864663	2.3214902	20	—	—
155626 2000 FX_{14}	15.9	X	12.84538	94.86379	33.63256	23.37020	0.2527716	0.28995373	2.2607381	20	—	—
155627 2000 FY_{17}	16.5	X	298.06151	110.76491	92.87395	8.02910	0.1037371	0.28675499	2.2775193	20	—	—
155628 2000 FG_{29}	16.0	X	157.51624	286.17624	0.61956	6.43668	0.1167655	0.27638645	2.3341292	20	—	—
155629 2000 FP_{40}	15.9	X	45.41376	5.56713	79.50574	7.11485	0.1889203	0.28737513	2.2742416	20	—	—
155630 2000 FS_{46}	16.6	X	265.82424	183.08262	82.44969	6.85838	0.1592948	0.28811859	2.2703276	20	1 24.1	19.9
155631 2000 FH_{72}	17.0	X	53.22248	68.43011	15.34308	1.40976	0.1174260	0.28914876	2.2649319	20	—	—
155632 2000 FQ_{73}	18.2	X	225.44633	69.95157	185.03399	2.39831	0.1843089	0.28209367	2.3025399	20	—	—
155633 2000 GE	16.4	X	61.12091	9.51610	17.56042	7.30547	0.1500109	0.27978313	2.3151992	20	—	—
155634 2000 GJ_{2}	17.1	X	200.84560	272.77597	2.39699	1.45828	0.2247873	0.27787538	2.3257838	20	—	—
155635 2000 GL_{4}	16.2	X	258.71511	29.48441	189.48329	22.83345	0.2036106	0.28152100	2.3056614	20	—	—
155636 2000 GP_{10}	17.6	X	191.85485	225.81512	359.73278	1.12047	0.2234213	0.27380034	2.3488037	20	12 24.8	21.2
155637 2000 GZ_{21}	16.3	X	102.67141	182.47087	183.94282	7.35965	0.1779066	0.28150627	2.3057417	20	—	—
155638 2000 GD_{23}	16.6	X	155.05150	318.89419	25.43969	3.50520	0.2123978	0.28395968	2.2924415	20	1 23.1	19.9
155639 2000 GU_{38}	16.7	X	323.10061	76.10440	27.91459	3.50748	0.1115804	0.27744970	2.3281621	20	—	—
155640 2000 GJ_{39}	16.9	X	293.28262	13.23243	191.41391	5.68143	0.0898631	0.28502045	2.2867501	20	—	—
155641 2000 GT_{40}	17.0	X	305.64089	182.47107	6.50743	1.63517	0.1752729	0.28502304	2.2867362	20	—	—
155642 2000 GQ_{46}	16.8	X	347.96417	293.25191	205.67187	5.84456	0.0495231	0.28404593	2.2919774	20	—	—
155643 2000 GZ_{47}	17.2	X	250.96099	179.29813	32.24788	3.11265	0.1729552	0.27956300	2.3164144	20	—	—
155644 2000 GY_{48}	17.0	X	158.39701	261.18961	300.86510	0.80937	0.1321839	0.26615216	2.3935879	20	10 29.6	20.5
155645 2000 GM_{52}	16.7	X	263.19908	301.89201	199.55492	5.24354	0.1610604	0.27423515	2.3463203	20	12 17.0	18.9
155646 2000 GT_{57}	16.9	X	358.12522	294.64931	218.98235	4.71870	0.0925158	0.28736718	2.2742835	20	1 1.1	19.4
155647 2000 GW_{63}	17.2	X	189.09465	66.90508	210.07113	2.01770	0.1836622	0.27736818	2.3286182	20	—	—
155648 2000 GN_{80}	16.7	X	208.48840	237.42069	36.01555	10.11685	0.2484857	0.28021351	2.3128280	20	—	—
155649 2000 GL_{88}	16.8	X	248.37842	118.23818	60.51739	6.38604	0.1596792	0.27612959	2.3355764	20	—	—
155650 2000 GK_{92}	15.9	X	245.80045	138.37284	174.39475	7.60012	0.1588011	0.29421279	2.2388673	20	3 1.9	19.4
155651 2000 GO_{98}	16.4	X	285.79359	15.58167	226.92503	5.69032	0.1686842	0.28791784	2.2713828	20	1 12.2	19.6
155652 2000 GK_{131}	17.6	X	321.21499	292.43866	207.81244	1.36382	0.1489410	0.28128645	2.3069429	20	—	—
155653 2000 GD_{132}	16.5	X	52.44694	0.85723	86.70654	8.77757	0.0899408	0.28393960	2.2925496	20	—	—
155654 2000 GT_{143}	16.5	X	214.38376	169.48936	60.61303	11.99370	0.0980433	0.27639780	2.3340653	20	—	—
155655 2000 GG_{144}	17.4	X	198.72235	162.89150	350.32382	0.96980	0.1170677	0.26613945	2.3936641	20	10 10.1	20.6
155656 2000 GY_{147}	16.4	X	133.23893	288.13253	347.44108	6.63402	0.1141990	0.27349047	2.3505775	20	—	—
155657 2000 GA_{152}	17.8	X	282.67223	178.49012	349.52816	2.08089	0.1773071	0.28153889	2.3055637	20	—	—
155658 2000 GQ_{159}	16.7	X	278.80670	316.72656	263.78987	3.54119	0.1299018	0.28493623	2.2872007	20	—	—
155659 2000 GE_{173}	16.4	X	5.64650	60.02804	57.21191	7.69415	0.0622510	0.28556798	2.2838262	20	—	—
155660 2000 HL_{3}	16.5	X	114.36146	141.59332	206.03437	3.10317	0.1613265	0.27601946	2.3361976	20	—	—
155661 2000 HE_{5}	15.7	X	214.79355	91.17035	224.24575	22.23169	0.2395828	0.28385719	2.2929933	20	1 29.9	20.2
155662 2000 HE_{7}	17.5	X	320.55868	128.95111	26.77896	2.66463	0.0829475	0.28301426	2.2975440	20	—	—
155663 2000 HM_{8}	17.1	X	188.22808	56.83666	196.22810	1.91099	0.1766122	0.27412896	2.3469262	20	—	—
155664 2000 HA_{16}	16.7	X	261.23212	119.15463	39.39609	5.46547	0.1101532	0.27424985	2.3462365	20	—	—
155665 2000 HP_{23}	16.9	X	194.01584	140.54748	132.17128	2.69238	0.1749905	0.27723279	2.3293763	20	—	—
155666 2000 HW_{26}	17.0	X	211.74660	73.73564	204.02891	3.73969	0.1384070	0.28071830	2.3100545	20	—	—
155667 2000 HQ_{28}	15.1	X	9.57041	53.42279	74.20013	23.81497	0.2158249	0.28762647	2.2729165	20	—	—
155668 2000 HC_{43}	17.0	X	149.65823	182.09072	81.75331	1.99967	0.1717959	0.27029303	2.3690787	20	—	—
155669 2000 HJ_{48}	17.2	X	137.78249	232.70780	354.45078	0.99510	0.1426969	0.26462385	2.4027951	20	11 9.8	20.8
155670 2000 HS_{53}	17.1	X	253.03174	169.88737	67.50373	3.78784	0.1221692	0.28070766	2.3101129	20	—	—
155671 2000 HU_{54}	16.8	X	207.26889	191.41068	70.24587	3.17254	0.1847124	0.27648779	2.3335588	20	—	—
155672 2000 HF_{60}	16.7	X	161.53613	248.38992	28.32549	8.61234	0.1143159	0.27398468	2.3477501	20	—	—
155673 2000 HL_{60}	16.5	X	184.29044	288.21474	34.06901	7.96730	0.1446673	0.28260963	2.2997365	20	1 19.5	20.1
155674 2000 HY_{64}	17.1	X	218.94054	210.80903	26.48115	3.40328	0.1384752	0.27730307	2.3289827	20	—	—
155675 2000 HO_{66}	16.0	X	68.65151	114.22063	219.55557	4.63375	0.2066829	0.26740890	2.3860826	20	—	—
155676 2000 HL_{94}	16.9	X	183.87527	173.72207	72.11640	3.31990	0.1134681	0.27236711	2.3570363	20	—	—
155677 2000 JE_{2}	16.4	X	157.12021	259.13100	67.59557	3.39530	0.2347553	0.27595860	2.3365411	20	1 5.5	19.9
155678 2000 JK_{2}	15.6	X	204.00260	149.28609	170.05350	24.55089	0.2607741	0.28105127	2.3082296	20	2 1.5	19.9
155679 2000 JP_{2}	16.1	X	164.06309	169.36664	131.10229	7.56954	0.2624380	0.27454806	2.3445372	20	—	—
155680 2000 JU_{10}	16.6	X	189.40095	181.44768	52.42806	6.97586	0.0653731	0.27274907	2.3548353	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155681 2000 JN_{21}	16.4	X	139.04063	276.17527	4.20604	4.98445	0.1317114	0.27091070	2.3654764	20	—	—
155682 2000 JM_{46}	16.8	X	161.46202	205.45997	57.72918	6.59380	0.1925322	0.26998330	2.3708902	20	—	—
155683 2000 JG_{53}	16.8	X	123.79734	228.56546	15.64208	2.30897	0.1727059	0.26350453	2.4095946	20	11 18.0	20.5
155684 2000 JT_{54}	16.9	X	166.89446	105.41303	199.80681	4.37330	0.3362623	0.27409918	2.3470962	20	—	—
155685 2000 JF_{94}	16.4	X	225.34970	169.69175	86.24269	25.78736	0.1688965	0.27832785	2.3232625	20	—	—
155686 2000 KH_{26}	16.7	X	127.16773	237.56940	72.64370	3.38696	0.2388482	0.26929486	2.3749293	20	—	—
155687 2000 KB_{38}	16.3	X	268.21354	312.83708	90.57416	7.25417	0.1304970	0.25521649	2.4614833	20	8 8.1	19.4
155688 2000 KP_{49}	18.2	X	264.80345	137.03086	53.98405	3.05033	0.1490063	0.27795187	2.3253571	20	—	—
155689 2000 LV_{2}	16.0	X	32.46912	172.97299	130.28054	5.24468	0.1968671	0.25561979	2.4588936	20	11 1.9	19.0
155690 2000 OO_{14}	16.4	X	88.92125	71.13803	248.89594	1.68022	0.2347205	0.26200311	2.4187914	20	—	—
155691 2000 OS_{22}	15.0	X	245.71536	354.38837	12.54536	15.03164	0.3239985	0.23431696	2.6057549	20	4 26.5	19.7
155692 2000 OV_{28}	16.2	X	98.71925	128.08810	222.60563	4.54629	0.2573291	0.26568168	2.3964129	20	—	—
155693 2000 OY_{45}	15.4	X	50.32833	181.06815	169.58399	25.28057	0.2152868	0.25716481	2.4490351	20	—	—
155694 2000 PA_{18}	16.4	X	142.45033	185.71974	104.28669	5.67119	0.2325703	0.26640457	2.3920758	20	—	—
155695 2000 PP_{19}	15.6	X	90.43629	36.31176	1.68458	7.32682	0.2696643	0.21801255	2.7341041	20	2 5.9	19.1
155696 2000 QH_{24}	16.5	X	119.01036	138.31736	159.38292	2.14338	0.2044588	0.26149236	2.4219400	20	—	—
155697 2000 QP_{24}	15.9	X	219.24494	350.03791	338.12164	12.59374	0.2685938	0.22845501	2.6501406	20	2 28.3	20.7
155698 2000 QS_{41}	15.7	X	99.18098	13.00400	324.12968	8.66470	0.1596228	0.21377291	2.7701350	20	—	—
155699 2000 QR_{42}	16.6	X	257.07349	209.82677	172.96127	1.81591	0.2097610	0.23966451	2.5668485	20	6 11.4	20.2
155700 2000 QE_{67}	16.0	X	262.22003	301.67145	53.35779	4.65694	0.2494702	0.23701964	2.5859085	20	5 7.0	19.9
155701 2000 QS_{67}	16.0	X	265.51033	324.85947	17.58381	10.31505	0.1704422	0.23616284	2.5921592	20	5 1.3	19.7
155702 2000 QJ_{69}	15.4	X	141.26751	198.88124	273.45920	12.52315	0.0987855	0.23899611	2.5716320	20	6 13.9	19.1
155703 2000 QY_{77}	15.7	X	134.47855	123.61624	164.48251	6.29513	0.1780254	0.26264901	2.4148243	20	—	—
155704 2000 QJ_{89}	16.1	X	55.04959	95.66213	225.81946	5.28445	0.1224027	0.25511422	2.4621411	20	12 10.9	19.4
155705 2000 QZ_{104}	16.0	X	323.54484	278.79281	75.07278	6.99100	0.1711000	0.24393096	2.5368304	20	8 28.9	18.4
155706 2000 QF_{122}	15.7	X	234.27284	155.75481	190.63559	7.88320	0.1928929	0.23139279	2.6276620	20	4 5.4	19.9
155707 2000 QP_{123}	16.1	X	238.66698	334.45103	353.15706	14.79784	0.2932924	0.23031171	2.6358784	20	3 11.8	20.9
155708 2000 QD_{138}	16.3	X	295.08669	317.20308	41.60736	2.69513	0.2154944	0.24094204	2.5577671	20	6 28.8	19.3
155709 2000 QN_{147}	15.5	X	355.69444	156.24896	146.28263	18.16520	0.1577442	0.24457788	2.5323550	20	8 14.6	17.8
155710 2000 QW_{150}	15.3	X	252.07345	160.08148	209.16248	13.82827	0.2027600	0.23437137	2.6053516	20	5 20.9	19.4
155711 2000 QP_{160}	16.5	X	123.02977	115.98234	206.43120	6.86247	0.2617357	0.26523526	2.3991010	20	—	—
155712 2000 QA_{175}	16.0	X	57.49528	341.27682	309.40816	5.32027	0.1056931	0.25252475	2.4789442	20	10 29.7	19.3
155713 2000 QS_{185}	16.3	X	260.90695	319.28915	22.66807	4.43998	0.1949262	0.23683405	2.5872593	20	4 24.4	20.1
155714 2000 QK_{187}	15.3	X	169.03562	21.16670	359.90397	13.89935	0.2616471	0.22716774	2.6601428	20	3 24.8	19.9
155715 2000 QK_{191}	16.4	X	323.59408	280.82059	61.38298	5.10091	0.1928372	0.24465963	2.5317909	20	8 6.3	18.6
155716 2000 QE_{196}	15.4	X	148.60317	274.99503	150.73134	14.42214	0.1677483	0.22878749	2.6475725	20	5 1.7	19.9
155717 2000 QQ_{210}	16.7	X	89.90370	120.50358	183.31913	5.56929	0.2289547	0.25804372	2.4434710	20	—	—
155718 2000 QT_{210}	15.7	X	249.99090	170.16134	171.43427	11.12197	0.2080056	0.23439832	2.6051519	20	4 14.5	19.8
155719 2000 QD_{214}	16.3	X	249.41648	7.76116	16.93859	5.07818	0.1636961	0.23785632	2.5798409	20	6 10.3	20.0
155720 2000 QF_{214}	15.8	X	355.85784	134.20365	156.44829	15.39016	0.1304491	0.24267312	2.5455889	20	7 24.2	18.6
155721 2000 QQ_{214}	16.2	X	333.81672	238.15735	65.45279	1.06990	0.1777510	0.24148872	2.5539054	20	6 26.7	18.5
155722 2000 QS_{222}	15.6	X	277.61972	338.08844	7.91428	15.12909	0.1498329	0.23951103	2.5679449	20	5 21.4	19.3
155723 2000 QK_{229}	16.3	X	52.93971	43.96666	354.41099	7.50609	0.2754327	0.21144760	2.7904070	20	—	—
155724 2000 QD_{244}	16.7	X	125.34727	174.96615	125.92067	3.09193	0.1747548	0.26371325	2.4083231	20	—	—
155725 2000 RO_{8}	16.9	X	325.41721	234.47575	180.14697	17.93402	0.3439340	0.34922917	1.9970811	20	—	—
155726 2000 RL_{35}	16.5	X	82.21456	115.20771	202.76202	10.42450	0.2358671	0.25799056	2.4438066	20	—	—
155727 2000 RN_{40}	15.9	X	327.45970	145.11275	215.49534	9.69107	0.2294908	0.24531531	2.5272776	20	9 6.9	18.0
155728 2000 RP_{47}	15.3	X	8.96655	331.06082	350.14107	15.08233	0.1503426	0.24522228	2.5279167	20	10 3.4	18.1
155729 2000 RU_{63}	16.1	X	131.14281	213.92137	188.51583	13.18980	0.1315773	0.22370439	2.6875283	20	3 6.4	20.1
155730 2000 RQ_{64}	15.4	X	165.49864	224.62802	207.76429	12.70325	0.1673557	0.23276738	2.6173068	20	5 22.1	19.7
155731 2000 RH_{81}	14.9	X	149.41754	121.59203	312.07195	21.59285	0.0475584	0.23177683	2.6247586	20	4 16.9	19.2
155732 2000 RZ_{86}	16.1	X	240.95339	199.90879	201.80171	4.20324	0.1614219	0.23743900	2.5828629	20	6 24.0	19.9
155733 2000 RN_{89}	15.7	X	278.31719	141.61511	198.35381	11.85557	0.0354581	0.23675835	2.5878107	20	6 6.9	19.3
155734 2000 RJ_{97}	15.6	X	2.15100	57.52438	229.14156	14.36240	0.1143402	0.24312789	2.5424136	20	7 25.4	18.7
155735 2000 RZ_{101}	15.2	X	354.51736	82.00877	230.44156	14.12785	0.1521292	0.24347301	2.5400104	20	8 19.9	18.1
155736 2000 RN_{103}	15.1	X	180.25500	215.04060	215.68579	21.50670	0.0445176	0.23393914	2.6085598	20	6 1.4	19.0
155737 2000 SK_{6}	15.6	X	320.06237	328.80134	40.17483	17.85587	0.1997080	0.24529224	2.5274360	20	9 20.4	18.1
155738 2000 SB_{16}	15.3	X	190.99434	213.15342	204.97958	21.57755	0.0778361	0.23374919	2.6099727	20	5 28.6	19.4
155739 2000 SY_{30}	17.2	X	66.29805	281.91914	33.66084	1.61021	0.1920441	0.25574213	2.4581094	20	12 23.3	20.9
155740 2000 SF_{46}	14.9	X	18.00892	5.70009	304.48773	13.34020	0.1920241	0.24571278	2.5245514	20	10 6.3	18.0
155741 2000 SK_{56}	16.2	X	138.47666	188.68825	228.52589	0.77438	0.1786871	0.22529425	2.6748698	20	4 7.5	20.4
155742 2000 SH_{59}	16.6	X	306.74958	129.55004	197.12951	6.85853	0.1511024	0.23919301	2.5702206	20	6 12.5	19.5
155743 2000 SO_{60}	16.3	X	197.21838	164.19215	179.12886	6.34301	0.0784548	0.22542815	2.6738105	20	2 28.9	20.4
155744 2000 SC_{61}	16.3	X	19.74795	106.46440	171.93919	3.70167	0.1813374	0.24401928	2.5362182	20	8 29.5	18.6
155745 2000 SO_{67}	15.9	X	4.92454	291.70628	17.26484	4.86512	0.0918694	0.24410816	2.5356026	20	9 7.6	18.8
155746 2000 SX_{67}	16.5	X	288.16681	170.93923	161.30223	4.59113	0.1908996	0.23726131	2.5841523	20	5 16.8	19.8
155747 2000 SV_{93}	16.0	X	269.64116	183.84418	209.10433	10.33988	0.1279434	0.24142410	2.5543611	20	7 20.6	19.5
155748 2000 SV_{95}	15.6	X	101.14597	101.66530	337.68981	8.26533	0.0830631	0.22382434	2.6865680	20	3 11.4	19.3
155749 2000 SR_{97}	15.9	X	76.25118	71.17064	230.21305	5.77512	0.0920566	0.25360554	2.4718962	20	12 5.8	19.4
155750 2000 SK_{102}	15.9	X	322.83854	284.23224	0.20180	11.24950	0.1868140	0.23655263	2.5893109	20	4 29.0	18.9
155751 2000 SY_{102}	16.5	X	219.94231	33.22857	358.31433	2.37308	0.2014687	0.23309234	2.6148737	20	5 17.1	20.8
155752 2000 SP_{110}	15.9	X	316.85256	135.46978	193.06380	8.12898	0.1798387	0.23990593	2.5651261	20	6 28.6	18.7
155753 2000 SJ_{112}	16.3	X	63.15443	209.75541	204.08983	0.55181	0.2426530	0.21250863	2.7811111	20	1 6.7	18.9
155754 2000 SB_{118}	15.8	X	138.28172	32.43011	28.04063	8.75380	0.1825779	0.22370728	2.6875052	20	4 12.5	19.9
155755 2000 SK_{124}	15.5	X	211.65990	167.96230	197.31024	15.79590	0.1626409	0.22795851	2.6539873	20	4 9.8	19.9
155756 2000 SY_{127}	16.1	X	312.16093	129.56230	190.86209	9.22159	0.2189927	0.23824363	2.5770441	20	6 2.2	18.9
155757 2000 SY_{132}	16.0	X	342.88538	130.92007	218.69129	13.84791	0.0817790	0.24721483	2.5143151	20	9 23.2	19.0
155758 2000 SJ_{139}	16.1	X	267.18105	172.57115	210.04928	14.14216	0.1361035	0.23835171	2.5762650	20	7 1.9	19.8
155759 2000 SG_{140}	16.1	X	292.83172	83.27239	279.82286	2.71307	0.1419165	0.23988640	2.5652653	20	7 13.7	19.0
155760 2000 SP_{147}	16.7	X	284.75231	353.51119	8.57055	0.90305	0.1853865	0.23835444	2.5762453	20	6 22.2	19.7

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155761 2000 SN_{161}	15.9	X	224.66193	216.62125	140.36364	9.89609	0.0834607	0.23205607	2.6226525	20	4 20.1	19.9
155762 2000 SC_{164}	17.0	X	288.96598	129.62700	203.35403	21.72100	0.0154717	0.38441387	1.8732828	20	6 16.7	19.3
155763 2000 SJ_{178}	15.7	X	276.49289	147.36531	226.33123	13.24297	0.2509518	0.23760909	2.5816301	20	6 15.7	19.3
155764 2000 SS_{178}	15.6	X	122.30042	2.62839	14.86752	14.02447	0.1905304	0.21629539	2.7485557	20	2 10.8	19.9
155765 2000 SM_{189}	15.8	X	52.64074	87.95108	336.26267	8.24756	0.1372484	0.21288503	2.7778320	20	—	—
155766 2000 SO_{223}	16.5	X	173.59975	307.23524	68.73195	0.66560	0.1746945	0.22506606	2.6766775	20	3 20.5	20.9
155767 2000 SZ_{228}	15.8	X	146.49353	359.48850	18.23679	5.19795	0.0658380	0.22021483	2.7158452	20	2 18.8	19.7
155768 2000 SC_{232}	17.2	X	226.69801	312.43371	30.31285	22.10881	0.0760019	0.37809851	1.8940848	20	3 29.2	19.5
155769 2000 ST_{232}	16.9	X	290.19098	286.75023	8.25633	21.82231	0.0253853	0.37947701	1.8894949	20	4 9.1	18.7
155770 2000 SF_{238}	16.0	X	327.34977	286.32563	61.32840	11.48693	0.2209204	0.24309216	2.5426627	20	8 27.5	18.3
155771 2000 SK_{238}	16.4	X	219.62538	333.99453	357.40062	4.67939	0.0953113	0.22694142	2.6619111	20	3 9.5	20.4
155772 2000 SM_{240}	16.9	X	297.97223	341.02019	335.80882	17.79017	0.1168858	0.38472885	1.8722602	20	5 6.5	19.1
155773 2000 ST_{240}	16.8	X	75.48530	94.90630	344.12825	19.67047	0.0994087	0.36799447	1.9285986	20	1 15.1	18.6
155774 2000 SS_{244}	16.1	X	256.60389	325.92936	353.06412	13.35262	0.1307711	0.23229574	2.6208483	20	3 26.9	20.0
155775 2000 SZ_{247}	16.0	X	259.00619	286.41695	63.23499	3.40988	0.1076716	0.23559702	2.5963079	20	5 13.9	19.5
155776 2000 SD_{275}	15.8	X	226.21836	164.10266	199.43814	14.56623	0.1307753	0.22908421	2.6452858	20	4 23.9	19.8
155777 2000 SY_{282}	15.5	X	23.91860	270.16056	326.04579	13.93703	0.0694773	0.23599524	2.5933863	20	6 21.3	18.8
155778 2000 SF_{287}	15.0	X	2.61830	319.64712	336.36905	13.87489	0.1804311	0.23981048	2.5658068	20	8 22.5	17.2
155779 2000 SQ_{290}	15.8	X	271.76609	103.92244	200.95701	11.36217	0.0754885	0.23056449	2.6339514	20	4 4.6	19.3
155780 2000 SM_{304}	15.1	X	30.54596	116.06759	346.38119	13.25325	0.1058953	0.21468688	2.7622674	20	1 3.8	18.5
155781 2000 SX_{311}	14.8	X	164.62162	168.76064	226.06715	23.66945	0.0737768	0.22672269	2.6636228	20	3 24.8	19.1
155782 2000 SG_{334}	16.3	X	283.27381	130.47379	149.03772	3.76452	0.2189937	0.23220616	2.6215223	20	2 27.5	20.2
155783 2000 SH_{338}	14.9	X	46.68726	8.70334	86.80811	11.53219	0.2318407	0.21616869	2.7496296	20	1 30.9	17.5
155784 Ercol	16.7	X	122.69975	109.51777	189.58986	6.23623	0.1740230	0.26311807	2.4119535	20	—	—
155785 2000 SS_{351}	16.2	X	81.20538	232.89268	103.67943	11.61064	0.3458190	0.25965544	2.4333492	20	—	—
155786 2000 SD_{358}	12.3	X	264.02045	229.54506	98.98817	23.50460	0.1081271	0.08126472	5.2787937	20	5 7.5	19.6
155787 2000 SL_{365}	16.8	X	314.08233	191.54288	156.90614	8.46783	0.1732730	0.24305781	2.5429022	20	7 24.9	19.4
155788 2000 SR_{366}	16.1	X	8.84319	115.53778	164.36602	10.90832	0.1160595	0.24198886	2.5503853	20	7 31.7	18.9
155789 2000 TD_{9}	12.8	X	296.26133	113.49155	183.05280	7.91087	0.1702145	0.08309595	5.2009514	20	4 21.3	19.4
155790 2000 TC_{10}	16.9	X	343.06760	142.03103	187.41061	2.37937	0.1839013	0.24384424	2.5374318	20	8 29.9	18.8
155791 2000 TC_{15}	15.6	X	45.44693	71.56594	24.59478	3.78217	0.1264913	0.21525807	2.7573787	20	1 19.8	18.7
155792 2000 TL_{26}	16.3	X	256.92987	306.03533	28.55238	6.13645	0.1236382	0.23262271	2.6183919	20	4 19.5	20.1
155793 2000 TM_{37}	16.1	X	232.09330	279.19465	95.12233	6.94635	0.2554666	0.23463919	2.6033687	20	5 5.6	20.5
155794 2000 TZ_{52}	16.4	X	204.83219	359.83738	5.44638	2.43042	0.0906279	0.22725146	2.6594894	20	4 4.8	20.3
155795 2000 UG_{10}	15.1	X	239.10294	313.90337	48.23042	9.64517	0.2661076	0.23050559	2.6344001	20	4 24.8	19.5
155796 2000 UQ_{13}	16.5	X	354.25016	166.86263	169.48695	3.34628	0.2108178	0.24506036	2.5290301	20	10 11.0	18.5
155797 2000 UM_{39}	16.0	X	11.04514	4.84026	51.77707	8.92720	0.2969755	0.20431760	2.8549523	20	—	—
155798 2000 UU_{40}	15.8	X	53.52747	350.79225	69.79788	7.96531	0.2122448	0.21029445	2.8005985	20	—	—
155799 2000 UO_{45}	15.4	X	194.93573	300.25780	53.54186	15.13154	0.2086182	0.22372776	2.6873411	20	3 20.1	20.2
155800 2000 UT_{54}	15.7	X	282.56464	249.38855	86.85375	6.25210	0.3515605	0.23589265	2.5941382	20	4 23.7	19.6
155801 2000 UT_{61}	16.5	X	336.22903	23.42835	329.06706	3.37062	0.2464083	0.24448735	2.5329802	20	9 21.2	18.0
155802 2000 UK_{65}	15.8	X	5.76296	93.50272	13.98518	10.71184	0.1680952	0.21029488	2.8005947	20	—	—
155803 2000 UL_{108}	16.1	X	200.50632	274.99466	114.90018	6.95582	0.1743695	0.22807602	2.6530757	20	5 2.4	20.5
155804 2000 VA_{14}	15.5	X	83.80657	204.57384	222.57520	5.57568	0.0445585	0.21561069	2.7543716	20	1 27.9	19.2
155805 2000 VD_{26}	15.9	X	143.06266	135.01343	239.78896	3.97857	0.1267352	0.21786023	2.7353784	20	2 14.3	20.0
155806 2000 VE_{28}	15.3	X	142.70665	188.92771	219.46855	9.07993	0.2259649	0.22083805	2.7107333	20	4 3.2	19.8
155807 2000 VU_{29}	15.2	X	300.26399	142.99347	225.64450	10.39411	0.2364411	0.23837187	2.5761198	20	7 15.6	18.2
155808 2000 VF_{54}	15.5	X	293.70058	20.75615	24.07725	10.40553	0.2064633	0.19098246	2.9863478	20	9 1.5	19.2
155809 2000 VE_{58}	15.8	X	267.64202	334.02031	26.41543	5.78630	0.2871794	0.23513849	2.5996821	20	5 13.8	19.7
155810 2000 VA_{60}	15.6	X	10.70904	247.84447	226.60689	7.71733	0.0881969	0.21119043	2.7926718	20	—	—
155811 2000 WL_{20}	16.1	X	220.31362	275.40325	52.22746	2.75894	0.0984092	0.22253097	2.6969677	20	3 6.8	20.1
155812 2000 WS_{20}	15.4	X	175.79005	161.23366	200.33740	5.94979	0.0455236	0.21910690	2.7249927	20	2 26.8	19.4
155813 2000 WZ_{26}	16.5	X	36.10213	192.51538	211.45291	1.32625	0.0682636	0.20322497	2.8651762	20	—	—
155814 2000 WY_{31}	16.1	X	254.80071	197.78223	155.09328	5.18425	0.2660642	0.23158122	2.6262365	20	4 27.3	20.4
155815 2000 WU_{41}	15.5	X	82.64775	205.48125	222.50533	7.41350	0.2080617	0.21131260	2.7915952	20	2 19.4	19.2
155816 2000 WK_{67}	16.6	X	194.39213	182.23866	83.22729	23.65773	0.0316538	0.35817936	1.9636723	20	—	—
155817 2000 WR_{74}	16.1	X	2.27385	320.71903	352.77253	4.03593	0.2987256	0.24350927	2.5397583	20	10 5.3	18.0
155818 2000 WK_{89}	15.9	X	299.05628	281.57732	56.75589	12.30385	0.2679974	0.23616654	2.5921321	20	5 26.2	19.0
155819 2000 WS_{90}	15.5	X	261.10358	105.60794	250.14392	4.46667	0.2315029	0.23195987	2.6233776	20	5 8.2	19.5
155820 2000 WA_{95}	15.2	X	309.68599	267.64356	77.04301	15.47431	0.1711632	0.23547750	2.5971863	20	7 11.5	18.1
155821 2000 WM_{126}	15.8	X	2.52859	195.87874	166.79713	2.66806	0.1178602	0.19663558	2.9288332	20	11 8.5	19.2
155822 2000 WP_{130}	15.9	X	283.08092	247.14649	67.23780	7.74514	0.0244428	0.22783782	2.6549245	20	5 11.5	19.3
155823 2000 WA_{151}	16.2	X	222.28232	231.46444	52.48670	24.51444	0.0861446	0.36582691	1.9362092	20	—	—
155824 2000 WP_{158}	15.7	X	236.37762	359.94790	91.52743	10.94383	0.3641317	0.18784473	3.0195116	20	8 1.5	21.0
155825 2000 WW_{161}	15.6	X	325.94359	120.14786	207.05770	15.71269	0.2533553	0.23883907	2.5727592	20	7 3.7	18.2
155826 2000 WL_{172}	15.7	X	250.00421	235.02209	114.00532	15.49712	0.1501220	0.22956517	2.6415899	20	5 4.4	19.9
155827 2000 WA_{178}	15.5	X	263.60481	277.67650	82.06643	14.19960	0.2210184	0.23230069	2.6208111	20	5 20.3	19.5
155828 2000 XO_{2}	16.4	X	27.43973	38.34737	24.65583	20.68311	0.1054453	0.35855510	1.9623002	20	—	—
155829 2000 XV_{21}	15.2	X	141.10832	2.13676	24.00291	9.77724	0.1882415	0.21769331	2.7367765	20	3 8.3	19.6
155830 2000 XL_{23}	14.8	X	342.97607	1.25263	322.67153	11.50028	0.2376985	0.24003899	2.5641781	20	8 20.5	16.3
155831 2000 XE_{47}	15.2	X	166.50519	113.77580	34.18024	27.17804	0.1756227	0.18189987	3.0849476	20	9 7.2	20.8
155832 2000 XB_{52}	14.9	X	245.74327	267.80518	62.90660	15.77852	0.1285285	0.22263323	2.6961417	20	4 9.8	19.2
155833 2000 YB	16.0	X	181.62134	120.22414	257.96557	3.77073	0.1276639	0.22292402	2.6937966	20	3 27.2	20.3
155834 2000 YG_{3}	16.5	X	234.12642	75.04748	52.24444	1.01319	0.1927897	0.19018514	2.9946885	20	9 27.4	21.1
155835 2000 YA_{8}	15.3	X	190.93375	281.80816	75.80566	11.54004	0.1947686	0.21924141	2.7238781	20	3 19.9	20.1
155836 2000 YC_{22}	15.4	X	250.04579	48.68578	69.93748	2.80560	0.2180252	0.18925032	3.0045421	20	10 1.6	19.7
155837 2000 YG_{26}	15.3	X	255.18115	47.63595	58.63238	3.42699	0.1232759	0.18875208	3.0098271	20	10 5.6	19.5
155838 2000 YV_{48}	15.9	X	226.52808	60.24971	91.81952	4.47516	0.2146089	0.18965674	3.0002483	20	10 18.9	20.5
155839 2000 YZ_{50}	14.8	X	328.02930	297.14108	118.62354	12.12438	0.1070813	0.19221519	2.9735659	20	11 23.0	18.6
155840 2000 YA_{60}	15.2	X	332.78549	315.45747	89.41314	3.84498	0.0797842	0.19155710	2.9803724	20	11 13.3	18.9

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155841 2000 YU_{69}	15.6	X	118.37865	357.91797	69.14890	12.65964	0.0984861	0.21899379	2.7259309	20	3 28.1	19.7
155842 2000 YC_{87}	15.4	X	29.54555	296.68632	125.08330	6.65881	0.0595290	0.20245870	2.8724011	20	—	—
155843 2000 YL_{100}	15.7	X	241.32547	280.70108	180.81175	14.43884	0.1504248	0.18501300	3.0502438	20	9 6.1	20.3
155844 2000 YZ_{112}	14.9	X	121.62418	246.44940	104.38519	16.01601	0.1650766	0.20511893	2.8475119	20	1 1.4	19.0
155845 2001 AG_{3}	16.2	X	209.52364	249.71795	40.08852	21.92226	0.0448915	0.35866111	1.9619135	20	—	—
155846 2001 AM_{27}	14.6	X	176.36986	78.45300	77.91226	14.49642	0.2112647	0.18262349	3.0767931	20	9 16.2	20.1
155847 2001 AD_{31}	15.4	X	171.17711	208.83880	289.29571	11.96630	0.2481906	0.18048076	3.1010976	20	8 10.6	20.9
155848 2001 AO_{44}	14.2	X	147.47600	280.69814	323.23456	14.93586	0.1855712	0.18561508	3.0436442	20	11 23.5	19.6
155849 2001 AK_{46}	15.1	X	176.56636	104.59443	51.62497	27.30287	0.1941922	0.18196799	3.0841776	20	9 25.5	20.7
155850 2001 AY_{46}	16.3	X	345.97181	60.22483	52.06334	21.88742	0.1057095	0.35299347	1.9828579	20	—	—
155851 2001 BP_{10}	16.4	X	39.97501	306.35513	120.44219	25.08060	0.0979434	0.35693306	1.9682407	20	—	—
155852 2001 BB_{19}	15.1	X	177.89605	59.84822	108.89082	12.21604	0.1517276	0.18367865	3.0649985	20	10 2.1	20.3
155853 2001 BA_{25}	15.0	X	201.05895	35.66392	128.78992	18.47738	0.1748621	0.18587368	3.0408205	20	10 18.2	20.2
155854 2001 BJ_{35}	14.6	X	140.55634	287.31470	313.60012	4.85886	0.1742365	0.18376394	3.0640500	20	11 15.9	19.8
155855 2001 BV_{38}	15.9	X	220.82134	317.45850	124.08736	2.19264	0.0935897	0.17797817	3.1301001	20	7 27.8	20.6
155856 2001 BD_{48}	14.8	X	219.50326	222.29936	271.45520	15.29009	0.1647228	0.18500355	3.0503476	20	9 14.2	19.9
155857 2001 BJ_{49}	15.3	X	191.46861	23.40249	162.76489	18.06396	0.2667937	0.18441815	3.0567994	20	10 26.7	20.8
155858 2001 BT_{51}	15.4	X	260.84752	203.80128	209.63616	6.63734	0.2343474	0.18181159	3.0859461	20	7 18.4	20.2
155859 2001 BY_{71}	15.7	X	280.34920	321.10811	163.35266	1.50272	0.1931427	0.19234444	2.9722338	20	11 22.2	19.2
155860 2001 BT_{77}	15.1	X	216.80717	127.39304	354.30859	10.98846	0.0814231	0.18323047	3.0699944	20	9 13.5	19.6
155861 2001 CA_{33}	14.9	X	177.65383	104.43613	52.11738	15.70775	0.1895436	0.18142892	3.0902839	20	9 18.7	20.3
155862 2001 CP_{33}	14.6	X	242.57036	14.54412	54.55844	19.30361	0.1292553	0.17918700	3.1160067	20	8 8.0	19.6
155863 2001 CQ_{34}	14.7	X	198.62009	41.35482	79.01755	18.05561	0.1735749	0.17881879	3.1202827	20	8 22.9	20.1
155864 2001 CE_{40}	14.4	X	140.56002	112.46002	99.87464	9.07349	0.1739880	0.18055827	3.1002100	20	10 19.2	19.6
155865 2001 DK	15.1	X	179.65280	7.06630	146.77932	4.70572	0.1329537	0.17908529	3.1171864	20	9 11.1	20.0
155866 2001 DW_{10}	15.3	X	119.44907	13.96598	149.00731	7.22932	0.2724891	0.17322093	3.1871498	20	8 4.5	20.7
155867 2001 DO_{18}	14.6	X	176.33858	358.63650	141.35483	23.86032	0.1381799	0.17668673	3.1453339	20	8 21.7	19.6
155868 2001 DD_{26}	14.6	X	49.29392	273.80125	357.53756	10.76167	0.0616021	0.17710524	3.1403769	20	9 8.9	18.8
155869 2001 DK_{27}	15.6	X	188.24464	100.91932	46.29054	3.77412	0.1494911	0.18045249	3.1014215	20	9 11.5	20.5
155870 2001 DL_{27}	15.0	X	271.84000	25.61135	112.15424	6.02349	0.0342360	0.19008404	2.9957503	20	12 16.5	19.2
155871 2001 DG_{40}	15.2	X	182.19479	322.03458	224.92573	3.75464	0.1735206	0.18478215	3.0527837	20	10 20.3	20.1
155872 2001 DM_{57}	16.0	X	113.40153	309.39889	24.46443	2.01502	0.0886347	0.19467309	2.9484839	20	—	—
155873 2001 DB_{59}	14.6	X	120.52896	98.69522	116.23998	26.16221	0.2584465	0.17389282	3.1789348	20	10 15.6	20.5
155874 2001 DQ_{82}	15.0	X	293.56403	339.93601	357.38920	3.67384	0.0459884	0.16818724	3.2504290	20	6 20.7	19.4
155875 2001 DR_{91}	14.9	X	247.80735	278.43415	194.24986	14.47436	0.0975589	0.18514520	3.0487916	20	10 6.1	19.3
155876 2001 DS_{96}	15.1	X	213.55531	23.45693	183.13400	11.52051	0.0671305	0.19196561	2.9761427	20	12 24.2	19.6
155877 2001 DF_{106}	15.1	X	123.55022	275.82704	357.84252	0.84891	0.1538628	0.18350119	3.0669742	20	12 9.8	20.0
155878 2001 ED_{4}	14.8	X	110.96545	41.24993	150.20925	11.37338	0.1376585	0.17287399	3.1914125	20	8 21.0	19.6
155879 2001 EK_{4}	14.7	X	177.77449	31.12157	152.56870	10.91351	0.1234963	0.18134384	3.0912503	20	10 17.9	19.7
155880 2001 ED_{7}	14.9	X	159.61665	46.02372	153.78487	10.44526	0.0176010	0.18004816	3.1060630	20	10 20.9	19.4
155881 2001 EF_{19}	15.0	X	191.44615	309.57463	187.91784	11.86042	0.1322249	0.18058811	3.0998686	20	8 30.8	20.0
155882 2001 FJ_{26}	15.1	X	197.98430	290.57375	199.37908	13.11033	0.2493499	0.17826636	3.1267257	20	8 20.3	20.6
155883 2001 FU_{38}	14.7	X	187.01461	287.57121	226.37863	5.76446	0.1509139	0.17890544	3.1192751	20	9 14.3	19.8
155884 2001 FC_{39}	14.3	X	80.86467	286.37707	352.14940	12.87595	0.2830309	0.17548103	3.1597248	20	11 13.3	19.7
155885 2001 FZ_{64}	15.0	X	149.36742	36.00802	156.99108	11.85471	0.0633266	0.17699978	3.1416242	20	9 29.9	19.7
155886 2001 FP_{67}	14.6	X	144.44750	27.23814	163.50139	7.76752	0.0830056	0.17554290	3.1589823	20	9 20.8	19.3
155887 2001 FU_{68}	14.2	X	65.06843	260.20906	22.19742	18.54453	0.1640532	0.17412427	3.1761171	20	10 22.9	18.8
155888 2001 FY_{83}	15.7	X	110.01121	242.46327	39.10214	1.54837	0.1599800	0.18199909	3.0838262	20	12 7.1	20.5
155889 2001 FK_{84}	15.0	X	17.83974	333.12179	7.00940	9.58383	0.0977112	0.17931126	3.1145670	20	10 24.0	19.1
155890 2001 FY_{84}	14.4	X	10.37216	274.95786	4.42124	23.64116	0.1783609	0.16698002	3.2660767	20	8 13.6	18.6
155891 2001 FU_{87}	14.7	X	92.66802	217.99395	30.75745	15.53120	0.1864752	0.17328844	3.1863219	20	10 16.9	19.7
155892 2001 FP_{93}	14.8	X	211.90778	10.90037	121.85904	11.39138	0.0683692	0.17939662	3.1135789	20	9 26.6	19.5
155893 2001 FL_{100}	15.1	X	90.39933	290.95897	293.91484	11.82028	0.1878850	0.17323884	3.1869301	20	9 9.3	20.2
155894 2001 FZ_{106}	15.2	X	93.99066	163.42948	33.91444	5.38056	0.1121167	0.17066728	3.2188633	20	8 9.3	19.9
155895 2001 FR_{108}	14.9	X	85.49686	97.65339	172.12788	12.07331	0.0350916	0.17850406	3.1239494	20	10 19.3	19.4
155896 2001 FT_{108}	14.5	X	31.47863	113.88894	174.99856	21.79438	0.1030762	0.17225600	3.1990410	20	9 9.4	18.6
155897 2001 FD_{116}	15.2	X	268.41097	354.93409	121.25093	4.60978	0.0578201	0.18455143	3.0553275	20	11 12.7	19.4
155898 2001 FZ_{116}	14.8	X	172.42808	6.94220	156.66140	14.63018	0.0878464	0.17666928	3.1455410	20	9 17.6	19.7
155899 2001 FW_{135}	15.5	X	234.36558	300.81686	176.20376	7.45930	0.1546802	0.18262137	3.0768169	20	9 18.2	19.9
155900 2001 FJ_{142}	14.9	X	118.17875	62.78414	192.65402	11.73352	0.1243097	0.17820209	3.1274775	20	11 13.5	19.9
155901 2001 FK_{179}	14.8	X	230.39922	69.27265	45.90598	16.17378	0.0790750	0.17911078	3.1168907	20	9 28.0	19.5
155902 2001 FA_{184}	15.0	X	208.72927	126.59881	22.77089	4.88896	0.0787908	0.17852337	3.1237240	20	10 8.1	19.5
155903 2001 FN_{184}	14.8	X	327.14105	27.16467	11.97436	9.69783	0.0940147	0.18206319	3.0831024	20	10 23.1	18.6
155904 2001 HA_{14}	15.0	X	4.62317	151.02223	182.50573	9.07579	0.0791551	0.17487428	3.1670293	20	9 25.9	19.1
155905 2001 HV_{66}	14.3	X	93.34981	238.86391	37.97075	27.37574	0.2235933	0.17578774	3.1560484	20	11 15.9	19.6
155906 2001 MR_{7}	14.8	X	80.94116	176.70481	90.32011	10.02887	0.1569007	0.17286516	3.1915212	20	10 26.6	19.7
155907 2001 MV_{23}	16.5	X	327.70414	99.63031	189.62780	2.54092	0.1486944	0.30572905	2.1822856	20	5 25.5	18.1
155908 2001 NG_{4}	16.8	X	330.52394	244.33669	356.02835	4.31904	0.0708950	0.30182068	2.2010845	20	3 23.9	18.8
155909 2001 NF_{15}	16.5	X	330.20567	258.74124	341.30693	5.34549	0.1201600	0.30216811	2.1993970	20	3 14.7	18.5
155910 2001 OH	16.7	X	330.06503	69.87016	210.84722	7.55208	0.1972832	0.30679844	2.1772115	20	5 7.9	18.2
155911 2001 OQ_{38}	16.2	X	351.70924	2.87128	31.18048	8.59873	0.2518404	0.26802818	2.3824058	20	—	—
155912 2001 OW_{40}	16.2	X	58.30663	314.63668	46.26968	7.97442	0.1777358	0.27346896	2.3507008	20	—	—
155913 2001 OR_{43}	16.2	X	103.56597	143.42286	220.60111	4.18729	0.2077082	0.27867744	2.3213191	20	—	—
155914 2001 OG_{55}	16.3	X	184.13908	218.37114	71.61206	7.57850	0.1228790	0.28527366	2.2853967	20	—	—
155915 2001 OQ_{55}	16.4	X	90.61549	140.35506	249.27796	3.56063	0.1794869	0.27958662	2.3162839	20	—	—
155916 2001 ON_{68}	16.8	X	358.24362	298.46996	298.77308	4.80437	0.1497353	0.30376987	2.1916587	20	5 1.2	18.3
155917 2001 OH_{73}	16.1	X	126.44595	352.57710	343.04049	6.47406	0.2103007	0.27974860	2.3153897	20	—	—
155918 2001 OF_{86}	16.9	X	67.19052	192.88392	169.13711	2.72573	0.2347115	0.27634884	2.3343409	20	—	—
155919 2001 ON_{95}	16.6	X	285.74181	211.53580	103.14062	5.84123	0.1743942	0.30428370	2.1891907	20	4 20.3	19.3
155920 2001 OG_{104}	17.1	X	264.68826	228.95246	77.19865	2.68787	0.2273239	0.29924766	2.2136836	20	3 7.9	20.4

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 TT

Planet	H	G	M	ω	Ω	i	e	μ	a	TE	Oppos.	V
	m		°	°	°	°		°				
155921 2001 OJ_{105}	15.6	X	197.32606	86.75996	243.78999	5.47070	0.2007861	0.28906303	2.2653798	20	2 7.9	19.4
155922 2001 PT_{5}	16.6	X	23.68670	146.38037	114.62731	6.43234	0.2082190	0.31086624	2.1581767	20	8 29.0	18.3
155923 2001 PB_{14}	16.2	X	338.86995	102.55217	160.70452	5.50294	0.1543888	0.30437355	2.1887598	20	5 6.1	17.9
155924 2001 PG_{25}	16.7	X	1.75847	89.18408	199.94998	4.08516	0.1788434	0.31021710	2.1611864	20	8 18.6	18.2
155925 2001 PW_{27}	17.3	X	305.26565	231.51552	105.69482	4.87003	0.1905377	0.30851565	2.1691250	20	6 21.4	18.8
155926 2001 PE_{29}	16.4	X	57.17065	255.02561	138.62270	2.63194	0.2178127	0.27700710	2.3306413	20	—	—
155927 2001 PN_{43}	16.4	X	236.38258	245.79629	85.96287	6.97910	0.1585924	0.29714976	2.2240905	20	3 21.7	19.8
155928 2001 PO_{43}	16.5	X	215.52882	283.92146	49.17983	4.84744	0.3063365	0.29416011	2.2391346	20	2 29.2	20.6
155929 2001 PG_{53}	17.1	X	21.21526	174.67520	198.49474	2.06006	0.2059740	0.27048881	2.3679354	20	—	—
155930 2001 PJ_{54}	17.0	X	6.61504	203.03904	197.22017	0.66866	0.1872289	0.27176441	2.3605199	20	—	—
155931 2001 PV_{58}	16.9	X	270.06159	153.18484	139.73990	4.33458	0.1676634	0.29723984	2.2236411	20	3 1.6	20.1
155932 2001 QD_{1}	17.0	X	68.64877	148.89253	208.76174	2.18969	0.1704739	0.27511209	2.3413316	20	—	—
155933 2001 QB_{2}	16.3	X	182.89362	44.28603	338.70681	12.75547	0.2324687	0.23993556	2.5649149	20	4 1.3	20.8
155934 2001 QB_{13}	16.5	X	60.51987	65.67564	302.22565	1.44197	0.2335956	0.27393433	2.3480378	20	—	—
155935 2001 QN_{15}	16.5	X	194.37511	291.74126	30.96144	4.39416	0.1528121	0.29014107	2.2597648	20	1 28.6	19.9
155936 2001 QG_{17}	16.8	X	170.85914	263.64149	108.42320	1.82247	0.2393758	0.29087107	2.2559823	20	3 12.5	20.3
155937 2001 QP_{28}	15.7	X	12.91381	345.28550	44.63281	3.50221	0.1752585	0.26675346	2.3899896	20	—	—
155938 2001 QR_{32}	17.2	X	301.60718	94.92057	226.85741	3.54836	0.2110792	0.30648209	2.1787094	20	5 15.7	19.2
155939 2001 QY_{35}	16.8	X	94.08608	262.14319	105.13238	2.41157	0.2066266	0.28115506	2.3076616	20	—	—
155940 2001 QX_{41}	16.9	X	166.14856	166.84835	132.40641	3.21951	0.1820988	0.28451370	2.2894645	20	—	—
155941 2001 QL_{43}	16.7	X	80.47758	37.61463	345.71260	1.30088	0.2078315	0.28076616	2.3097920	20	—	—
155942 2001 QS_{54}	16.7	X	242.41543	171.13696	120.38589	6.35613	0.1651904	0.29354553	2.2422588	20	2 1.5	19.9
155943 2001 QR_{55}	16.5	X	120.31544	258.65038	121.14578	6.53804	0.1489235	0.28499853	2.2868673	20	1 20.6	19.3
155944 2001 QW_{55}	16.6	X	22.41976	325.16503	65.83719	3.17145	0.2125598	0.27261558	2.3556039	20	—	—
155945 2001 QD_{56}	16.8	X	94.71063	290.08951	67.12403	3.46896	0.1806334	0.27930353	2.3178488	20	—	—
155946 2001 QK_{65}	16.6	X	17.68636	109.12258	259.93592	2.31216	0.2185179	0.26902803	2.3764993	20	—	—
155947 2001 QB_{69}	15.8	X	42.77869	194.04905	204.92105	9.50297	0.2163125	0.27457775	2.3443682	20	—	—
155948 Maquet	16.9	X	253.84506	103.08810	161.11326	4.43919	0.1002603	0.29138333	2.2533375	20	1 12.3	19.9
155949 2001 QC_{75}	15.6	X	308.28309	215.01612	201.40188	5.55388	0.1220939	0.25932257	2.4354310	20	11 5.6	18.0
155950 2001 QP_{79}	15.7	X	350.83267	220.22689	190.39235	5.87797	0.1407572	0.26441791	2.4040425	20	—	—
155951 2001 QD_{89}	16.4	X	64.81199	208.58518	164.23600	6.94583	0.1315501	0.27352581	2.3503751	20	—	—
155952 2001 QU_{91}	16.5	X	28.08189	247.73268	10.34261	2.75716	0.1448412	0.31237522	2.1512209	20	8 19.6	18.2
155953 2001 QG_{93}	15.8	X	191.90044	26.19188	328.34675	7.35407	0.2408512	0.23655411	2.5893001	20	3 8.7	20.4
155954 2001 QR_{95}	14.5	X	102.30042	223.48749	146.90973	2.93388	0.2481747	0.12281519	4.0083717	20	1 25.5	20.3
155955 2001 QS_{97}	15.8	X	62.91750	164.74960	213.14962	7.54713	0.1519188	0.27366537	2.3495759	20	—	—
155956 2001 QX_{98}	16.1	X	172.54807	90.10270	249.26100	4.15004	0.1719347	0.28520903	2.2857420	20	1 27.8	19.6
155957 2001 QU_{99}	16.7	X	292.26938	177.77367	114.71364	1.01006	0.1761589	0.30005837	2.2096944	20	3 25.8	19.2
155958 2001 QL_{106}	15.8	X	325.76687	300.65267	23.77327	22.60022	0.3318623	0.30633594	2.1794023	20	6 15.0	17.6
155959 2001 QF_{127}	14.3	X	122.93313	138.02975	209.23887	7.75354	0.2572901	0.12416938	3.9791749	20	1 18.1	20.6
155960 2001 QV_{143}	17.2	X	213.77574	91.40127	175.03604	2.62413	0.1475125	0.28496008	2.2870730	20	—	—
155961 2001 QE_{145}	17.4	X	140.31445	115.48083	188.13278	3.46484	0.0669185	0.27758749	2.3273916	20	—	—
155962 2001 QK_{145}	16.7	X	247.22576	7.52266	175.60117	8.84501	0.1361205	0.27503098	2.3417919	20	—	—
155963 2001 QJ_{158}	16.7	X	53.34597	166.20621	211.53917	0.83106	0.1796853	0.27470159	2.3436636	20	—	—
155964 2001 QL_{181}	15.9	X	3.29623	311.25995	65.71478	7.43486	0.0908809	0.26576248	2.3959271	20	12 13.1	18.6
155965 2001 QU_{198}	16.0	X	11.13410	11.15725	27.41352	5.96596	0.2272666	0.26615198	2.3935890	20	—	—
155966 2001 QF_{205}	16.5	X	351.03502	34.41046	203.96886	6.12685	0.1645308	0.30209802	2.1997372	20	4 17.6	18.0
155967 2001 QA_{215}	16.1	X	309.26863	298.78474	120.83486	1.13620	0.2071933	0.26304297	2.4124126	20	11 9.9	17.6
155968 2001 QC_{219}	17.2	X	108.00465	130.06359	216.41723	0.99738	0.1738293	0.27908189	2.3190758	20	—	—
155969 2001 QJ_{219}	16.6	X	32.85432	244.94717	169.79767	2.83213	0.1501127	0.27691854	2.3311382	20	—	—
155970 2001 QL_{220}	16.8	X	331.20678	203.51203	224.20871	1.30032	0.1616159	0.26755184	2.3852327	20	—	—
155971 2001 QK_{224}	17.4	X	284.87397	166.46152	141.75655	2.67348	0.1643739	0.30345715	2.1931641	20	4 9.6	20.1
155972 2001 QW_{227}	16.2	X	291.81267	221.53795	203.64804	10.89664	0.2119098	0.26173058	2.4204702	20	10 5.3	18.4
155973 2001 QJ_{235}	16.6	X	200.02010	116.11456	208.01643	4.54938	0.2472568	0.29000577	2.2604676	20	2 3.8	20.5
155974 2001 QN_{236}	16.2	X	351.15918	37.86111	337.39909	2.45360	0.2008755	0.26402911	2.4064019	20	12 6.4	18.5
155975 2001 QS_{238}	16.6	X	166.13254	150.65372	181.41492	6.95642	0.1420028	0.28464392	2.2887663	20	1 9.9	20.0
155976 2001 QP_{239}	15.9	X	341.80258	251.04471	160.96777	6.87807	0.1001180	0.26916959	2.3756660	20	12 30.6	18.5
155977 2001 QB_{240}	16.3	X	242.87385	4.99766	301.68020	3.98980	0.1672651	0.29310919	2.2444835	20	2 19.6	19.8
155978 2001 QF_{242}	17.0	X	203.56360	344.45861	326.03724	2.95741	0.1257649	0.28758226	2.2731494	20	1 20.5	20.4
155979 2001 QQ_{242}	16.9	X	84.96728	175.39138	161.11745	4.01170	0.1708116	0.27344391	2.3508444	20	—	—
155980 2001 QR_{246}	15.9	X	35.20704	177.18675	202.63479	2.27023	0.1983936	0.26958001	2.3732542	20	—	—
155981 2001 QC_{247}	16.3	X	336.01376	41.94500	1.64132	2.48379	0.1737875	0.26305449	2.4123422	20	12 14.8	18.5
155982 2001 QE_{247}	16.9	X	190.72295	183.76115	147.01763	2.15074	0.2389822	0.28784971	2.2717412	20	2 6.1	20.7
155983 2001 QM_{250}	16.7	X	266.75174	178.61757	108.04848	8.55175	0.2108118	0.29644719	2.2276031	20	2 16.3	20.1
155984 2001 QD_{256}	16.6	X	149.06415	306.17595	27.56028	3.80212	0.2057993	0.28311928	2.2969758	20	1 2.6	19.8
155985 2001 QM_{256}	16.3	X	58.89635	338.39928	33.80971	5.60888	0.2039583	0.27348816	2.3505908	20	—	—
155986 2001 QK_{258}	16.5	X	135.84826	251.04219	123.13811	4.99528	0.1724560	0.28505674	2.2865560	20	2 4.9	19.5
155987 2001 QX_{258}	16.6	X	99.55681	152.62272	221.50492	6.39924	0.1170384	0.27991967	2.3144463	20	—	—
155988 2001 QJ_{260}	16.3	X	327.85929	20.27077	232.91370	5.39964	0.1842876	0.29905732	2.2146228	20	3 18.3	18.5
155989 2001 QF_{267}	16.6	X	131.99045	150.54024	225.87338	3.06195	0.2079310	0.28592476	2.2819259	20	2 6.3	19.7
155990 2001 QX_{283}	16.3	X	181.40805	296.45476	52.14605	5.93679	0.1998583	0.28833686	2.2691817	20	2 21.7	19.9
155991 2001 QB_{284}	15.8	X	322.01156	352.45730	44.08322	11.09906	0.2026393	0.26314914	2.4117637	20	11 4.2	17.5
155992 2001 QN_{296}	16.4	X	198.11662	320.22174	30.31471	6.15422	0.1976564	0.29010242	2.2599655	20	3 8.8	20.1
155993 2001 RE_{1}	16.5	X	283.05291	79.63658	345.59446	1.85848	0.1941141	0.26042306	2.4285651	20	9 21.2	18.8
155994 2001 RJ_{2}	16.8	X	120.05157	127.01724	212.87226	1.95593	0.2617989	0.27760417	2.3272983	20	—	—
155995 2001 RX_{5}	16.9	X	216.03305	336.74377	324.48725	2.32804	0.1495561	0.28909835	2.2651952	20	1 20.9	20.4
155996 2001 RD_{11}	16.5	X	110.46607	164.24777	186.48766	3.32323	0.2032710	0.27811985	2.3244207	20	—	—
155997 2001 RP_{16}	15.9	X	312.20121	230.50575	184.61499	10.85428	0.1333528	0.26287763	2.4134240	20	11 13.6	18.3
155998 2001 RQ_{21}	16.8	X	264.80247	136.76598	141.10760	1.33813	0.1171743	0.29427685	2.2385424	20	2 9.9	19.9
155999 2001 RV_{26}	17.6	X	254.98025	332.91873	11.79722	1.06381	0.2047522	0.30040952	2.2079721	20	4 18.4	20.8
156000 2001 RR_{27}	16.8	X	197.85083	166.04570	167.32886	1.85713	0.1452321	0.29042819	2.2582752	20	2 12.3	20.0