

# ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

## TABLE 4 (EXTENDED VERSION)

### PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW – ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

ΔT = 66.7 s

Universal Time	Central Line		Diameter Ratio	Eclipse Obscur.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Umbra Veloc. km/s	Central Durat.
	Latitude	Longitude									
22:09.0	21°09.2' N	108°42.2' E	0.9309	0.8666	0.0	68.3	324.3	-	258.6	-	04m22.7s
22:10	23°47.2' N	115°20.8' E	0.9326	0.8698	6.9	70.9	318.3	2115.0	251.6	6.207	04m29.4s
22:11	24°56.2' N	118°02.3' E	0.9334	0.8712	9.8	72.2	315.4	1470.3	248.7	4.256	04m32.4s
22:12	25°49.9' N	120°03.3' E	0.9339	0.8722	12.0	73.2	313.0	1189.3	246.5	3.408	04m34.8s
22:13	26°35.6' N	121°43.7' E	0.9344	0.8731	13.9	74.1	310.8	1023.2	244.6	2.907	04m36.9s
22:14	27°16.3' N	123°11.1' E	0.9348	0.8739	15.5	74.9	308.9	910.5	243.0	2.569	04m38.8s
22:15	27°53.3' N	124°29.3' E	0.9352	0.8746	17.0	75.7	307.0	827.7	241.5	2.320	04m40.6s
22:16	28°27.5' N	125°40.5' E	0.9355	0.8752	18.4	76.5	305.3	763.6	240.2	2.129	04m42.2s
22:17	28°59.5' N	126°46.4' E	0.9358	0.8758	19.7	77.2	303.6	712.2	238.9	1.975	04m43.8s
22:18	29°29.8' N	127°47.8' E	0.9361	0.8763	20.9	77.9	302.0	669.7	237.8	1.848	04m45.3s
22:19	29°58.5' N	128°45.6' E	0.9364	0.8768	22.0	78.6	300.4	633.9	236.7	1.742	04m46.7s
22:20	30°25.9' N	129°40.4' E	0.9366	0.8773	23.1	79.3	298.9	603.2	235.7	1.651	04m48.1s
22:21	30°52.2' N	130°32.4' E	0.9369	0.8777	24.1	80.0	297.4	576.6	234.7	1.572	04m49.4s
22:22	31°17.5' N	131°22.2' E	0.9371	0.8782	25.1	80.7	296.0	553.1	233.8	1.503	04m50.7s
22:23	31°41.9' N	132°10.0' E	0.9373	0.8786	26.0	81.3	294.6	532.3	233.0	1.442	04m52.0s
22:24	32°05.5' N	132°56.0' E	0.9375	0.8790	26.9	82.0	293.2	513.7	232.1	1.387	04m53.2s
22:25	32°28.3' N	133°40.3' E	0.9377	0.8794	27.8	82.7	291.9	496.9	231.3	1.338	04m54.4s
22:26	32°50.5' N	134°23.3' E	0.9379	0.8797	28.6	83.3	290.6	481.7	230.5	1.293	04m55.5s
22:27	33°12.1' N	135°04.9' E	0.9381	0.8801	29.5	84.0	289.3	467.8	229.8	1.253	04m56.7s
22:28	33°33.1' N	135°45.4' E	0.9383	0.8804	30.3	84.7	288.0	455.1	229.1	1.216	04m57.8s
22:29	33°53.6' N	136°24.8' E	0.9385	0.8807	31.1	85.3	286.8	443.4	228.4	1.181	04m58.9s
22:30	34°13.6' N	137°03.3' E	0.9386	0.8811	31.8	86.0	285.5	432.6	227.7	1.150	05m00.0s
22:31	34°33.1' N	137°40.8' E	0.9388	0.8814	32.6	86.7	284.3	422.5	227.1	1.121	05m01.0s
22:32	34°52.2' N	138°17.6' E	0.9390	0.8817	33.3	87.4	283.2	413.2	226.5	1.094	05m02.1s
22:33	35°10.9' N	138°53.5' E	0.9391	0.8819	34.0	88.0	282.0	404.5	225.9	1.069	05m03.1s
22:34	35°29.3' N	139°28.8' E	0.9393	0.8822	34.7	88.7	280.9	396.4	225.3	1.045	05m04.1s
22:35	35°47.2' N	140°03.4' E	0.9394	0.8825	35.4	89.4	279.7	388.7	224.7	1.023	05m05.1s
22:36	36°04.8' N	140°37.5' E	0.9396	0.8828	36.0	90.1	278.6	381.6	224.2	1.003	05m06.1s
22:37	36°22.1' N	141°10.9' E	0.9397	0.8830	36.7	90.8	277.6	374.8	223.6	0.983	05m07.1s
22:38	36°39.1' N	141°43.9' E	0.9398	0.8833	37.3	91.5	276.5	368.5	223.1	0.965	05m08.0s
22:39	36°55.7' N	142°16.3' E	0.9399	0.8835	37.9	92.2	275.4	362.4	222.6	0.948	05m09.0s
22:40	37°12.1' N	142°48.3' E	0.9401	0.8837	38.5	92.9	274.4	356.8	222.1	0.932	05m09.9s
22:41	37°28.2' N	143°19.9' E	0.9402	0.8840	39.1	93.6	273.4	351.4	221.6	0.916	05m10.8s
22:42	37°44.0' N	143°51.1' E	0.9403	0.8842	39.7	94.3	272.4	346.2	221.1	0.902	05m11.7s
22:43	37°59.6' N	144°21.9' E	0.9404	0.8844	40.3	95.0	271.4	341.4	220.7	0.888	05m12.6s
22:44	38°14.9' N	144°52.4' E	0.9405	0.8846	40.9	95.8	270.5	336.8	220.2	0.875	05m13.5s
22:45	38°30.0' N	145°22.6' E	0.9407	0.8848	41.4	96.5	269.5	332.4	219.8	0.862	05m14.3s
22:46	38°44.8' N	145°52.4' E	0.9408	0.8850	42.0	97.3	268.6	328.2	219.4	0.850	05m15.2s
22:47	38°59.4' N	146°22.0' E	0.9409	0.8852	42.5	98.0	267.7	324.1	219.0	0.839	05m16.0s
22:48	39°13.8' N	146°51.3' E	0.9410	0.8854	43.1	98.8	266.8	320.3	218.6	0.828	05m16.8s
22:49	39°28.0' N	147°20.4' E	0.9411	0.8856	43.6	99.6	265.9	316.7	218.2	0.818	05m17.7s

# ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

## TABLE 4 (EXTENDED VERSION)

### PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW – ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

$\Delta T = 66.7 \text{ s}$

Universal Time	Central Line		Diameter Ratio	Eclipse Obscur.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Umbra Veloc. km/s	Central Durat.
	Latitude	Longitude									
22:50	39°42.0'N	147°49.2'E	0.9412	0.8858	44.1	100.3	265.0	313.2	217.8	0.808	05m18.5s
22:51	39°55.7'N	148°17.8'E	0.9413	0.8860	44.6	101.1	264.2	309.8	217.4	0.799	05m19.3s
22:52	40°09.3'N	148°46.2'E	0.9414	0.8861	45.1	101.9	263.3	306.6	217.1	0.790	05m20.1s
22:53	40°22.7'N	149°14.4'E	0.9414	0.8863	45.6	102.7	262.5	303.5	216.7	0.781	05m20.8s
22:54	40°35.8'N	149°42.5'E	0.9415	0.8865	46.1	103.5	261.7	300.6	216.4	0.773	05m21.6s
22:55	40°48.8'N	150°10.4'E	0.9416	0.8866	46.6	104.4	260.9	297.7	216.0	0.765	05m22.4s
22:56	41°01.7'N	150°38.1'E	0.9417	0.8868	47.0	105.2	260.2	295.0	215.7	0.757	05m23.1s
22:57	41°14.3'N	151°05.7'E	0.9418	0.8870	47.5	106.0	259.4	292.4	215.4	0.750	05m23.8s
22:58	41°26.8'N	151°33.2'E	0.9419	0.8871	47.9	106.9	258.6	289.9	215.1	0.743	05m24.5s
22:59	41°39.0'N	152°00.5'E	0.9419	0.8872	48.4	107.7	257.9	287.5	214.8	0.736	05m25.3s
23:00	41°51.2'N	152°27.7'E	0.9420	0.8874	48.8	108.6	257.2	285.1	214.5	0.729	05m26.0s
23:01	42°03.1'N	152°54.9'E	0.9421	0.8875	49.2	109.5	256.5	282.9	214.2	0.723	05m26.6s
23:02	42°14.9'N	153°21.9'E	0.9422	0.8877	49.7	110.4	255.8	280.7	213.9	0.717	05m27.3s
23:03	42°26.5'N	153°48.9'E	0.9422	0.8878	50.1	111.3	255.1	278.7	213.6	0.711	05m28.0s
23:04	42°38.0'N	154°15.7'E	0.9423	0.8879	50.5	112.2	254.4	276.7	213.3	0.706	05m28.7s
23:05	42°49.3'N	154°42.5'E	0.9424	0.8881	50.9	113.1	253.8	274.8	213.1	0.701	05m29.3s
23:06	43°00.5'N	155°09.3'E	0.9424	0.8882	51.3	114.1	253.2	272.9	212.8	0.695	05m29.9s
23:07	43°11.5'N	155°35.9'E	0.9425	0.8883	51.7	115.0	252.5	271.1	212.6	0.690	05m30.6s
23:08	43°22.3'N	156°02.6'E	0.9426	0.8884	52.0	116.0	251.9	269.4	212.3	0.686	05m31.2s
23:09	43°33.0'N	156°29.2'E	0.9426	0.8885	52.4	117.0	251.3	267.8	212.1	0.681	05m31.8s
23:10	43°43.6'N	156°55.7'E	0.9427	0.8886	52.8	117.9	250.7	266.2	211.9	0.677	05m32.4s
23:11	43°54.0'N	157°22.2'E	0.9427	0.8887	53.1	118.9	250.2	264.6	211.6	0.672	05m32.9s
23:12	44°04.3'N	157°48.7'E	0.9428	0.8889	53.5	119.9	249.6	263.2	211.4	0.668	05m33.5s
23:13	44°14.4'N	158°15.2'E	0.9428	0.8890	53.8	121.0	249.1	261.8	211.2	0.664	05m34.1s
23:14	44°24.4'N	158°41.6'E	0.9429	0.8891	54.2	122.0	248.5	260.4	211.0	0.661	05m34.6s
23:15	44°34.2'N	159°08.1'E	0.9429	0.8891	54.5	123.0	248.0	259.1	210.8	0.657	05m35.2s
23:16	44°43.9'N	159°34.5'E	0.9430	0.8892	54.8	124.1	247.5	257.8	210.6	0.654	05m35.7s
23:17	44°53.4'N	160°01.0'E	0.9430	0.8893	55.1	125.2	247.0	256.6	210.4	0.650	05m36.2s
23:18	45°02.8'N	160°27.4'E	0.9431	0.8894	55.4	126.3	246.5	255.4	210.2	0.647	05m36.7s
23:19	45°12.1'N	160°53.9'E	0.9431	0.8895	55.7	127.4	246.0	254.3	210.1	0.644	05m37.2s
23:20	45°21.2'N	161°20.3'E	0.9432	0.8896	56.0	128.5	245.6	253.2	209.9	0.641	05m37.7s
23:21	45°30.2'N	161°46.8'E	0.9432	0.8897	56.3	129.6	245.1	252.2	209.7	0.638	05m38.1s
23:22	45°39.1'N	162°13.3'E	0.9433	0.8897	56.6	130.7	244.7	251.2	209.6	0.635	05m38.6s
23:23	45°47.8'N	162°39.9'E	0.9433	0.8898	56.8	131.9	244.3	250.2	209.4	0.633	05m39.0s
23:24	45°56.4'N	163°06.4'E	0.9433	0.8899	57.1	133.0	243.9	249.3	209.3	0.630	05m39.4s
23:25	46°04.8'N	163°33.0'E	0.9434	0.8900	57.3	134.2	243.5	248.4	209.1	0.628	05m39.9s
23:26	46°13.2'N	163°59.7'E	0.9434	0.8900	57.6	135.4	243.1	247.6	209.0	0.626	05m40.3s
23:27	46°21.3'N	164°26.3'E	0.9434	0.8901	57.8	136.6	242.7	246.8	208.8	0.623	05m40.7s
23:28	46°29.4'N	164°53.0'E	0.9435	0.8902	58.1	137.8	242.3	246.0	208.7	0.621	05m41.0s
23:29	46°37.3'N	165°19.8'E	0.9435	0.8902	58.3	139.0	242.0	245.3	208.6	0.619	05m41.4s

# ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

## TABLE 4 (EXTENDED VERSION)

### PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW – ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

ΔT = 66.7 s

Universal Time	Central Line		Diameter Ratio	Eclipse Obscur.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Umbra Veloc. km/s	Central Durat.
	Latitude	Longitude									
23:30	46°45.1'N	165°46.6'E	0.9435	0.8903	58.5	140.2	241.6	244.6	208.5	0.617	05m41.8s
23:31	46°52.7'N	166°13.5'E	0.9436	0.8903	58.7	141.5	241.3	243.9	208.4	0.616	05m42.1s
23:32	47°00.2'N	166°40.4'E	0.9436	0.8904	58.9	142.8	241.0	243.3	208.3	0.614	05m42.4s
23:33	47°07.6'N	167°07.4'E	0.9436	0.8904	59.1	144.0	240.7	242.7	208.1	0.612	05m42.8s
23:34	47°14.8'N	167°34.4'E	0.9436	0.8905	59.2	145.3	240.4	242.1	208.1	0.611	05m43.1s
23:35	47°21.9'N	168°01.5'E	0.9437	0.8905	59.4	146.6	240.1	241.6	208.0	0.609	05m43.4s
23:36	47°28.9'N	168°28.7'E	0.9437	0.8906	59.6	147.9	239.8	241.1	207.9	0.608	05m43.6s
23:37	47°35.8'N	168°55.9'E	0.9437	0.8906	59.7	149.2	239.6	240.6	207.8	0.607	05m43.9s
23:38	47°42.5'N	169°23.2'E	0.9437	0.8906	59.9	150.5	239.3	240.2	207.7	0.606	05m44.1s
23:39	47°49.0'N	169°50.6'E	0.9438	0.8907	60.0	151.9	239.1	239.8	207.6	0.605	05m44.4s
23:40	47°55.5'N	170°18.0'E	0.9438	0.8907	60.1	153.2	238.8	239.4	207.6	0.604	05m44.6s
23:41	48°01.8'N	170°45.6'E	0.9438	0.8907	60.2	154.6	238.6	239.1	207.5	0.603	05m44.8s
23:42	48°07.9'N	171°13.2'E	0.9438	0.8908	60.3	155.9	238.4	238.7	207.4	0.602	05m45.0s
23:43	48°14.0'N	171°40.9'E	0.9438	0.8908	60.4	157.3	238.2	238.5	207.4	0.601	05m45.2s
23:44	48°19.9'N	172°08.7'E	0.9438	0.8908	60.5	158.7	238.0	238.2	207.3	0.601	05m45.4s
23:45	48°25.6'N	172°36.5'E	0.9438	0.8908	60.6	160.0	237.9	238.0	207.3	0.600	05m45.5s
23:46	48°31.2'N	173°04.5'E	0.9439	0.8909	60.7	161.4	237.7	237.8	207.3	0.600	05m45.7s
23:47	48°36.7'N	173°32.5'E	0.9439	0.8909	60.7	162.8	237.6	237.6	207.2	0.599	05m45.8s
23:48	48°42.1'N	174°00.7'E	0.9439	0.8909	60.8	164.2	237.4	237.4	207.2	0.599	05m45.9s
23:49	48°47.3'N	174°28.9'E	0.9439	0.8909	60.8	165.6	237.3	237.3	207.2	0.599	05m46.0s
23:50	48°52.3'N	174°57.2'E	0.9439	0.8909	60.8	167.0	237.2	237.2	207.1	0.599	05m46.1s
23:51	48°57.3'N	175°25.7'E	0.9439	0.8909	60.9	168.4	237.1	237.1	207.1	0.598	05m46.2s
23:52	49°02.0'N	175°54.2'E	0.9439	0.8909	60.9	169.9	237.0	237.1	207.1	0.598	05m46.3s
23:53	49°06.7'N	176°22.8'E	0.9439	0.8909	60.9	171.3	236.9	237.1	207.1	0.599	05m46.3s
23:54	49°11.2'N	176°51.5'E	0.9439	0.8909	60.9	172.7	236.8	237.1	207.1	0.599	05m46.3s
23:55	49°15.6'N	177°20.4'E	0.9439	0.8909	60.9	174.1	236.7	237.1	207.1	0.599	05m46.4s
23:56	49°19.8'N	177°49.3'E	0.9439	0.8909	60.8	175.5	236.7	237.2	207.1	0.599	05m46.4s
23:57	49°23.9'N	178°18.4'E	0.9439	0.8909	60.8	176.9	236.7	237.3	207.1	0.600	05m46.4s
23:58	49°27.8'N	178°47.5'E	0.9439	0.8909	60.7	178.4	236.6	237.4	207.1	0.600	05m46.3s
23:59	49°31.6'N	179°16.8'E	0.9439	0.8909	60.7	179.8	236.6	237.6	207.2	0.601	05m46.3s
00:00	49°35.2'N	179°46.2'E	0.9439	0.8909	60.6	181.2	236.6	237.8	207.2	0.601	05m46.3s
00:01	49°38.7'N	179°44.3'W	0.9439	0.8909	60.6	182.6	236.6	238.0	207.2	0.602	05m46.2s
00:02	49°42.1'N	179°14.7'W	0.9439	0.8909	60.5	184.0	236.6	238.2	207.3	0.603	05m46.1s
00:03	49°45.3'N	178°45.0'W	0.9438	0.8908	60.4	185.4	236.6	238.5	207.3	0.604	05m46.0s
00:04	49°48.3'N	178°15.2'W	0.9438	0.8908	60.3	186.8	236.7	238.8	207.3	0.605	05m45.9s
00:05	49°51.2'N	177°45.2'W	0.9438	0.8908	60.2	188.2	236.7	239.1	207.4	0.606	05m45.8s
00:06	49°54.0'N	177°15.2'W	0.9438	0.8908	60.0	189.6	236.8	239.4	207.4	0.607	05m45.6s
00:07	49°56.6'N	176°45.0'W	0.9438	0.8907	59.9	191.0	236.8	239.8	207.5	0.608	05m45.5s
00:08	49°59.0'N	176°14.7'W	0.9438	0.8907	59.8	192.4	236.9	240.2	207.6	0.609	05m45.3s
00:09	50°01.3'N	175°44.2'W	0.9438	0.8907	59.6	193.8	237.0	240.7	207.6	0.611	05m45.1s

# ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

## TABLE 4 (EXTENDED VERSION)

### PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW – ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

$\Delta T = 66.7 \text{ s}$

Universal Time	Central Line		Diameter Ratio	Eclipse Obscur.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Umbra Veloc. km/s	Central Durat.
	Latitude	Longitude									
00:10	50°03.5'N	175°13.7'W	0.9437	0.8906	59.5	195.1	237.1	241.1	207.7	0.612	05m44.9s
00:11	50°05.5'N	174°43.0'W	0.9437	0.8906	59.3	196.5	237.2	241.7	207.8	0.614	05m44.7s
00:12	50°07.3'N	174°12.2'W	0.9437	0.8906	59.1	197.9	237.3	242.2	207.9	0.616	05m44.5s
00:13	50°09.0'N	173°41.2'W	0.9437	0.8905	59.0	199.2	237.5	242.8	208.0	0.617	05m44.3s
00:14	50°10.5'N	173°10.2'W	0.9436	0.8905	58.8	200.6	237.6	243.4	208.1	0.619	05m44.0s
00:15	50°11.8'N	172°39.0'W	0.9436	0.8904	58.6	201.9	237.8	244.0	208.1	0.621	05m43.8s
00:16	50°13.0'N	172°07.6'W	0.9436	0.8904	58.4	203.2	237.9	244.6	208.3	0.623	05m43.5s
00:17	50°14.0'N	171°36.2'W	0.9436	0.8903	58.1	204.5	238.1	245.3	208.4	0.626	05m43.2s
00:18	50°14.9'N	171°04.6'W	0.9435	0.8903	57.9	205.8	238.3	246.1	208.5	0.628	05m42.9s
00:19	50°15.6'N	170°32.8'W	0.9435	0.8902	57.7	207.1	238.5	246.9	208.6	0.630	05m42.5s
00:20	50°16.1'N	170°01.0'W	0.9435	0.8902	57.4	208.4	238.7	247.7	208.7	0.633	05m42.2s
00:21	50°16.4'N	169°28.9'W	0.9434	0.8901	57.2	209.7	239.0	248.5	208.8	0.635	05m41.9s
00:22	50°16.6'N	168°56.8'W	0.9434	0.8900	56.9	211.0	239.2	249.4	209.0	0.638	05m41.5s
00:23	50°16.6'N	168°24.5'W	0.9434	0.8900	56.7	212.2	239.5	250.3	209.1	0.641	05m41.1s
00:24	50°16.5'N	167°52.1'W	0.9433	0.8899	56.4	213.5	239.7	251.3	209.3	0.644	05m40.7s
00:25	50°16.1'N	167°19.5'W	0.9433	0.8898	56.1	214.7	240.0	252.3	209.4	0.647	05m40.3s
00:26	50°15.6'N	166°46.7'W	0.9433	0.8897	55.8	216.0	240.3	253.3	209.6	0.650	05m39.9s
00:27	50°14.9'N	166°13.9'W	0.9432	0.8897	55.5	217.2	240.6	254.4	209.7	0.653	05m39.4s
00:28	50°14.1'N	165°40.8'W	0.9432	0.8896	55.2	218.4	240.9	255.5	209.9	0.657	05m39.0s
00:29	50°13.0'N	165°07.6'W	0.9431	0.8895	54.9	219.6	241.2	256.7	210.1	0.660	05m38.5s
00:30	50°11.8'N	164°34.3'W	0.9431	0.8894	54.6	220.8	241.6	258.0	210.3	0.664	05m38.0s
00:31	50°10.4'N	164°00.8'W	0.9430	0.8893	54.3	222.0	241.9	259.2	210.4	0.668	05m37.6s
00:32	50°08.8'N	163°27.2'W	0.9430	0.8892	54.0	223.2	242.3	260.6	210.6	0.672	05m37.0s
00:33	50°07.0'N	162°53.3'W	0.9429	0.8891	53.6	224.3	242.7	261.9	210.8	0.676	05m36.5s
00:34	50°05.0'N	162°19.3'W	0.9429	0.8890	53.3	225.5	243.1	263.4	211.0	0.681	05m36.0s
00:35	50°02.8'N	161°45.2'W	0.9428	0.8889	52.9	226.6	243.5	264.9	211.2	0.685	05m35.4s
00:36	50°00.4'N	161°10.9'W	0.9428	0.8888	52.6	227.8	243.9	266.4	211.5	0.690	05m34.9s
00:37	49°57.8'N	160°36.4'W	0.9427	0.8887	52.2	228.9	244.3	268.0	211.7	0.695	05m34.3s
00:38	49°55.0'N	160°01.7'W	0.9427	0.8886	51.8	230.0	244.8	269.7	211.9	0.700	05m33.7s
00:39	49°52.0'N	159°26.8'W	0.9426	0.8885	51.4	231.1	245.2	271.4	212.1	0.705	05m33.1s
00:40	49°48.9'N	158°51.7'W	0.9425	0.8884	51.0	232.3	245.7	273.2	212.4	0.710	05m32.5s
00:41	49°45.5'N	158°16.5'W	0.9425	0.8883	50.6	233.4	246.2	275.1	212.6	0.716	05m31.9s
00:42	49°41.8'N	157°41.1'W	0.9424	0.8881	50.2	234.4	246.7	277.0	212.9	0.722	05m31.2s
00:43	49°38.0'N	157°05.4'W	0.9424	0.8880	49.8	235.5	247.2	279.0	213.1	0.728	05m30.6s
00:44	49°34.0'N	156°29.6'W	0.9423	0.8879	49.4	236.6	247.8	281.1	213.4	0.734	05m29.9s
00:45	49°29.7'N	155°53.5'W	0.9422	0.8878	49.0	237.7	248.3	283.3	213.7	0.741	05m29.2s
00:46	49°25.2'N	155°17.2'W	0.9421	0.8876	48.6	238.7	248.9	285.5	214.0	0.747	05m28.5s
00:47	49°20.5'N	154°40.7'W	0.9421	0.8875	48.1	239.8	249.5	287.9	214.3	0.754	05m27.8s
00:48	49°15.5'N	154°04.0'W	0.9420	0.8873	47.7	240.8	250.1	290.3	214.6	0.762	05m27.1s
00:49	49°10.3'N	153°27.0'W	0.9419	0.8872	47.2	241.8	250.7	292.9	214.9	0.769	05m26.3s
00:50	49°04.9'N	152°49.8'W	0.9418	0.8870	46.8	242.9	251.3	295.5	215.2	0.777	05m25.6s
00:51	48°59.2'N	152°12.4'W	0.9418	0.8869	46.3	243.9	252.0	298.3	215.5	0.785	05m24.8s
00:52	48°53.3'N	151°34.6'W	0.9417	0.8867	45.8	244.9	252.6	301.2	215.8	0.794	05m24.0s
00:53	48°47.1'N	150°56.6'W	0.9416	0.8866	45.3	245.9	253.3	304.2	216.2	0.803	05m23.2s
00:54	48°40.7'N	150°18.4'W	0.9415	0.8864	44.8	246.9	254.0	307.3	216.5	0.812	05m22.4s

# ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

## TABLE 4 (EXTENDED VERSION)

### PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW – ANNULAR SOLAR ECLIPSE OF 2012 MAY 20

ΔT = 66.7 s

Universal Time	Central Line		Diameter Ratio	Eclipse Obscur.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Umbra Veloc. km/s	Central Durat.
	Latitude	Longitude									
00:55	48°34.0'N	149°39.8'W	0.9414	0.8862	44.3	247.9	254.7	310.6	216.9	0.822	05m21.6s
00:56	48°27.0'N	149°00.9'W	0.9413	0.8861	43.8	248.9	255.5	314.0	217.2	0.832	05m20.8s
00:57	48°19.7'N	148°21.7'W	0.9412	0.8859	43.3	249.9	256.2	317.5	217.6	0.843	05m19.9s
00:58	48°12.2'N	147°42.2'W	0.9411	0.8857	42.8	250.9	257.0	321.2	218.0	0.854	05m19.1s
00:59	48°04.4'N	147°02.3'W	0.9410	0.8855	42.2	251.8	257.8	325.1	218.4	0.866	05m18.2s
01:00	47°56.2'N	146°22.1'W	0.9409	0.8853	41.7	252.8	258.6	329.2	218.8	0.878	05m17.3s
01:01	47°47.8'N	145°41.5'W	0.9408	0.8851	41.1	253.8	259.5	333.5	219.2	0.891	05m16.4s
01:02	47°39.0'N	145°00.5'W	0.9407	0.8849	40.6	254.7	260.3	338.0	219.6	0.904	05m15.5s
01:03	47°30.0'N	144°19.0'W	0.9406	0.8847	40.0	255.7	261.2	342.7	220.1	0.918	05m14.5s
01:04	47°20.6'N	143°37.2'W	0.9405	0.8845	39.4	256.6	262.1	347.7	220.5	0.933	05m13.6s
01:05	47°10.8'N	142°54.8'W	0.9404	0.8843	38.8	257.6	263.0	352.9	221.0	0.948	05m12.6s
01:06	47°00.7'N	142°12.0'W	0.9402	0.8840	38.2	258.5	264.0	358.4	221.5	0.965	05m11.7s
01:07	46°50.2'N	141°28.7'W	0.9401	0.8838	37.6	259.5	265.0	364.2	222.0	0.982	05m10.7s
01:08	46°39.4'N	140°44.8'W	0.9400	0.8836	37.0	260.4	266.0	370.4	222.5	1.000	05m09.7s
01:09	46°28.1'N	140°00.3'W	0.9399	0.8833	36.3	261.3	267.0	376.9	223.0	1.020	05m08.6s
01:10	46°16.5'N	139°15.3'W	0.9397	0.8831	35.7	262.3	268.1	383.8	223.5	1.040	05m07.6s
01:11	46°04.4'N	138°29.5'W	0.9396	0.8828	35.0	263.2	269.2	391.2	224.1	1.062	05m06.5s
01:12	45°51.8'N	137°43.1'W	0.9394	0.8825	34.3	264.1	270.3	399.1	224.6	1.086	05m05.4s
01:13	45°38.8'N	136°55.9'W	0.9393	0.8823	33.6	265.1	271.4	407.4	225.2	1.111	05m04.3s
01:14	45°25.3'N	136°07.9'W	0.9391	0.8820	32.9	266.0	272.6	416.4	225.8	1.138	05m03.2s
01:15	45°11.3'N	135°19.0'W	0.9390	0.8817	32.2	266.9	273.8	426.1	226.4	1.166	05m02.1s
01:16	44°56.7'N	134°29.1'W	0.9388	0.8814	31.4	267.9	275.0	436.4	227.1	1.197	05m00.9s
01:17	44°41.5'N	133°38.3'W	0.9386	0.8811	30.6	268.8	276.3	447.6	227.7	1.231	04m59.8s
01:18	44°25.7'N	132°46.3'W	0.9385	0.8807	29.8	269.8	277.7	459.8	228.4	1.267	04m58.6s
01:19	44°09.3'N	131°53.1'W	0.9383	0.8804	29.0	270.7	279.0	473.1	229.1	1.307	04m57.3s
01:20	43°52.2'N	130°58.6'W	0.9381	0.8800	28.2	271.7	280.4	487.6	229.9	1.350	04m56.1s
01:21	43°34.2'N	130°02.6'W	0.9379	0.8797	27.3	272.6	281.9	503.5	230.7	1.398	04m54.8s
01:22	43°15.5'N	129°05.0'W	0.9377	0.8793	26.4	273.6	283.4	521.1	231.5	1.450	04m53.5s
01:23	42°55.8'N	128°05.5'W	0.9375	0.8789	25.5	274.6	284.9	540.8	232.3	1.509	04m52.1s
01:24	42°35.2'N	127°04.0'W	0.9373	0.8785	24.5	275.6	286.5	562.8	233.2	1.575	04m50.8s
01:25	42°13.4'N	126°00.1'W	0.9370	0.8780	23.5	276.6	288.2	587.8	234.1	1.650	04m49.3s
01:26	41°50.4'N	124°53.6'W	0.9368	0.8776	22.5	277.6	289.9	616.3	235.1	1.736	04m47.9s
01:27	41°25.9'N	123°44.0'W	0.9365	0.8771	21.4	278.6	291.8	649.4	236.1	1.835	04m46.4s
01:28	40°59.9'N	122°30.8'W	0.9363	0.8766	20.2	279.7	293.7	688.3	237.2	1.952	04m44.8s
01:29	40°31.9'N	121°13.2'W	0.9360	0.8760	19.0	280.8	295.7	735.0	238.4	2.093	04m43.1s
01:30	40°01.7'N	119°50.4'W	0.9356	0.8754	17.7	281.9	297.8	792.3	239.7	2.266	04m41.4s
01:31	39°28.7'N	118°21.0'W	0.9353	0.8748	16.2	283.1	300.1	865.0	241.1	2.485	04m39.6s
01:32	38°52.0'N	116°43.0'W	0.9349	0.8740	14.7	284.4	302.6	961.3	242.6	2.777	04m37.6s
01:33	38°10.6'N	114°53.1'W	0.9345	0.8732	12.9	285.7	305.3	1097.4	244.3	3.189	04m35.4s
01:34	37°22.0'N	112°45.5'W	0.9340	0.8723	10.9	287.2	308.3	1310.7	246.3	3.836	04m33.0s
01:35	36°21.4'N	110°07.4'W	0.9333	0.8711	8.4	289.0	312.0	1719.1	248.9	5.076	04m30.1s
01:36	34°51.0'N	106°12.6'W	0.9324	0.8694	4.7	291.4	317.1	3132.5	252.6	9.378	04m26.1s
01:36.5	32°55.0'N	101°10.0'W	0.9312	0.8671	0.0	294.3	323.1	-	257.4	-	04m21.3s