

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	40°44.4'	184°06.4'	S 14°30.2'	215°43.6'	S 0°25.3'		107°55.0'	S 22°14.0'		102°26.9'	S 21°14.2'		24°59.2'	N 4°49.3'				
1	55°46.8'	199°06.4'	S 14°31.0'	230°43.2'	S 0°26.4'		122°57.1'	S 22°13.9'		117°29.2'	S 21°14.2'		40°02.1'	N 4°49.3'				
2	70°49.3'	214°06.4'	S 14°31.8'	245°42.9'	S 0°27.6'		137°59.2'	S 22°13.9'		132°31.5'	S 21°14.2'		55°05.0'	N 4°49.3'				
3	85°51.8'	229°06.5'	S 14°32.6'	260°42.5'	S 0°28.7'		153°01.3'	S 22°13.8'		147°33.8'	S 21°14.2'		70°08.0'	N 4°49.3'				
4	100°54.2'	244°06.5'	S 14°33.4'	275°42.2'	S 0°29.9'		168°03.4'	S 22°13.8'		162°36.2'	S 21°14.1'		85°10.9'	N 4°49.3'				
5	115°56.7'	259°06.5'	S 14°34.2'	290°41.8'	S 0°31.0'		183°05.4'	S 22°13.7'		177°38.5'	S 21°14.1'		100°13.8'	N 4°49.3'				
6	130°59.2'	274°06.5'	S 14°34.9'	305°41.5'	S 0°32.2'		198°07.5'	S 22°13.7'		192°40.8'	S 21°14.1'		115°16.7'	N 4°49.3'				
7	146°01.6'	289°06.5'	S 14°35.7'	320°41.1'	S 0°33.3'		213°09.6'	S 22°13.6'		207°43.1'	S 21°14.1'		130°19.7'	N 4°49.3'				
8	161°04.1'	304°06.5'	S 14°36.5'	335°40.8'	S 0°34.5'		228°11.7'	S 22°13.6'		222°45.5'	S 21°14.0'		145°22.6'	N 4°49.3'				
9	176°06.5'	319°06.5'	S 14°37.3'	350°40.4'	S 0°35.7'		243°13.8'	S 22°13.5'		237°47.8'	S 21°14.0'		160°25.5'	N 4°49.3'				
10	191°09.0'	334°06.6'	S 14°38.1'	5°40.1'	S 0°36.8'		258°15.9'	S 22°13.5'		252°50.1'	S 21°14.0'		175°28.4'	N 4°49.3'				
11	206°11.5'	349°06.6'	S 14°38.9'	20°39.7'	S 0°38.0'		273°18.0'	S 22°13.4'		267°52.4'	S 21°14.0'		190°31.3'	N 4°49.3'				
12	221°13.9'	4°06.6'	S 14°39.7'	35°39.4'	S 0°39.1'		288°20.1'	S 22°13.3'		282°54.8'	S 21°13.9'		205°34.2'	N 4°49.3'				
13	236°16.4'	19°06.6'	S 14°40.5'	50°39.0'	S 0°40.3'		303°22.1'	S 22°13.3'		297°57.1'	S 21°13.9'		220°37.2'	N 4°49.3'				
14	251°18.9'	34°06.6'	S 14°41.3'	65°38.7'	S 0°41.4'		318°24.2'	S 22°13.2'		312°59.4'	S 21°13.9'		235°40.1'	N 4°49.3'				
15	266°21.3'	49°06.6'	S 14°42.1'	80°38.3'	S 0°42.6'		333°26.3'	S 22°13.2'		328°01.7'	S 21°13.9'		250°43.0'	N 4°49.3'				
16	281°23.8'	64°06.6'	S 14°42.9'	95°38.0'	S 0°43.7'		348°28.4'	S 22°13.1'		343°04.0'	S 21°13.9'		265°45.9'	N 4°49.3'				
17	296°26.3'	79°06.6'	S 14°43.7'	110°37.6'	S 0°44.9'		3°30.5'	S 22°13.1'		358°06.4'	S 21°13.8'		280°48.8'	N 4°49.3'				
18	311°28.7'	94°06.6'	S 14°44.5'	125°37.3'	S 0°46.0'		18°32.6'	S 22°13.0'		13°08.7'	S 21°13.8'		295°51.7'	N 4°49.3'				
19	326°31.2'	109°06.7'	S 14°45.3'	140°36.9'	S 0°47.2'		33°34.7'	S 22°13.0'		28°11.0'	S 21°13.8'		310°54.6'	N 4°49.3'				
20	341°33.7'	124°06.7'	S 14°46.0'	155°36.6'	S 0°48.4'		48°36.7'	S 22°12.9'		43°13.3'	S 21°13.8'		325°57.5'	N 4°49.3'				
21	356°36.1'	139°06.7'	S 14°46.8'	170°36.2'	S 0°49.5'		63°38.8'	S 22°12.9'		58°15.7'	S 21°13.7'		341°00.4'	N 4°49.3'				
22	11°38.6'	154°06.7'	S 14°47.6'	185°35.9'	S 0°50.7'		78°40.9'	S 22°12.8'		73°18.0'	S 21°13.7'		356°03.3'	N 4°49.3'				
23	26°41.0'	169°06.7'	S 14°48.4'	200°35.5'	S 0°51.8'		93°43.0'	S 22°12.8'		88°20.3'	S 21°13.7'		11°06.2'	N 4°49.3'				
		SD 16.1' d -0.8'		v -0.3' d -1.2'			v 2.1' d 0.1'			v 2.3' d 0.0'			v 2.9' d 0.0'					
Mer. pass.		11 h 43 m 34 s		9 h 37 m			16 h 46 m			17 h 8 m			22 h 16 m					

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Mars	+Fomalhaut	+Achernar	+Altair
0	359°03.1'	N 12°48.3'	15.1'	10.8'	54.0'	46°53.9'	46°02.9'	42°29.8'	26°55.8'	26°49.0'	69°19.3'	71°21.2'	101°12.8'
1	13°37.2'	N 12°59.1'	15.1'	10.8'	54.0'	46°26.7'	45°37.8'	42°10.4'	26°26.6'	27°18.9'	69°47.7'	71°36.5'	101°37.6'
2	28°11.3'	N 13°09.9'	15.0'	10.7'	54.0'	45°59.5'	45°12.9'	41°51.2'	25°57.4'	27°48.9'	70°16.0'	71°51.9'	102°02.4'
3	42°45.3'	N 13°20.6'	15.0'	10.7'	54.0'	45°32.3'	44°47.9'	41°32.1'	25°28.2'	28°18.8'	70°44.4'	72°07.4'	102°27.1'
4	57°19.3'	N 13°31.2'	14.9'	10.6'	54.0'	45°05.2'	44°23.1'	41°13.3'	24°59.0'	28°48.8'	71°12.7'	72°23.0'	102°51.9'
5	71°53.2'	N 13°41.8'	14.9'	10.5'	54.0'	44°38.1'	43°58.4'	40°54.6'	24°29.9'	29°18.7'	71°41.1'	72°38.6'	103°16.6'
6	86°27.1'	N 13°52.4'	14.8'	10.5'	54.0'	44°11.0'	43°33.7'	40°36.1'	24°00.7'	29°48.7'	72°09.5'	72°54.2'	103°41.3'
7	101°01.0'	N 14°02.9'	14.8'	10.4'	54.0'	43°44.0'	43°09.1'	40°17.7'	23°31.6'	30°18.7'	72°37.9'	73°09.9'	104°06.0'
8	115°34.7'	N 14°13.3'	14.7'	10.4'	54.0'	43°17.0'	42°44.5'	39°59.6'	23°02.5'	30°48.6'	73°06.3'	73°25.7'	104°30.6'
9	130°08.5'	N 14°23.7'	14.7'	10.3'	54.0'	42°50.0'	42°20.1'	39°41.6'	22°33.4'	31°18.6'	73°34.7'	73°41.6'	104°55.3'
10	144°42.2'	N 14°34.0'	14.6'	10.3'	54.0'	42°23.1'	41°55.8'	39°23.8'	22°04.4'	31°48.6'	74°03.1'	73°57.4'	105°19.9'
11	159°15.8'	N 14°44.3'	14.6'	10.2'	54.0'	41°56.3'	41°31.5'	39°06.2'	21°35.3'	32°18.6'	74°31.6'	74°13.4'	105°44.6'
12	173°49.4'	N 14°54.5'	14.5'	10.2'	54.0'	41°29.5'	41°07.3'	38°48.9'	21°06.3'	32°48.6'	75°00.1'	74°29.4'	106°09.2'
13	188°22.9'	N 15°04.7'	14.5'	10.1'	54.0'	41°02.7'	40°43.3'	38°31.7'	20°37.3'	33°18.7'	75°28.5'	74°45.5'	106°33.7'
14	202°56.4'	N 15°14.8'	14.4'	10.0'	54.0'	40°36.1'	40°19.3'	38°14.8'	20°08.3'	33°48.7'	75°57.0'	75°01.6'	106°58.3'
15	217°29.9'	N 15°24.8'	14.4'	10.0'	54.0'	40°09.4'	39°55.4'	37°58.0'	19°39.4'	34°18.7'	76°25.5'	75°17.7'	107°22.9'
16	232°03.2'	N 15°34.8'	14.3'	9.9'	54.0'	39°42.8'	39°31.7'	37°41.5'	19°10.5'	34°48.8'	76°54.0'	75°33.9'	107°47.4'
17	246°36.6'	N 15°44.7'	14.3'	9.9'	54.1'	39°16.3'	39°08.0'	37°25.3'	18°41.6'	35°18.8'	77°22.5'	75°50.2'	108°11.9'
18	261°09.8'	N 15°54.6'	14.2'	9.8'	54.1'	38°49.8'	38°44.5'	37°09.2'	18°12.8'	35°48.9'	77°51.0'	76°06.5'	108°36.4'
19	275°43.1'	N 16°04.4'	14.2'	9.7'	54.1'	38°23.4'	38°21.0'	36°53.4'	17°44.0'	36°18.9'	78°19.6'	76°22.9'	109°00.8'
20	290°16.2'	N 16°14.1'	14.1'	9.7'	54.1'	37°57.1'	37°57.7'	36°37.9'	17°15.3'	36°49.0'	78°48.1'	76°39.3'	109°25.2'
21	304°49.3'	N 16°23.7'	14.1'	9.6'	54.1'	37°30.8'	37°34.5'	36°22.6'	16°46.6'	37°19.1'	79°16.7'	76°55.8'	109°49.7'
22	319°22.4'	N 16°33.3'	14.0'	9.5'	54.1'	37°04.6'	37°11.5'		16°18.0'	37°49.2'	79°45.3'	77°12.3'	110°14.0'
23	333°55.4'	N 16°42.9'	13.9'	9.5'	54.1'	36°38.4'	36°48.6'		15°49.4'	38°19.3'	80°13.8'	77°28.8'	110°38.4'
Mer. pass.		0 h 4 m SD 14.7'	phase 100%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.6'	N 7°24.7'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.4'	S 63°12.5'	Capella	+0.1	280°26.6'	N 46°00.9'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.5'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.4'	Polaris	+2.0	315°06.1'	N 89°21.0'
Rigel Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.4'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.7'	Sirius	-1.4	258°29.1'	S 16°44.5'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.6'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	41°43.5'	184°06.7' S	14°49.2'	215°35.2' S	0°53.0'	108°45.1' S	22°12.7'	103°22.6' S	21°13.7'	26°09.1' N	4°49.3'	
1	56°46.0'	199°06.7' S	14°50.0'	230°34.8' S	0°54.1'	123°47.2' S	22°12.6'	118°24.9' S	21°13.6'	41°12.0' N	4°49.3'	
2	71°48.4'	214°06.7' S	14°50.8'	245°34.5' S	0°55.3'	138°49.3' S	22°12.6'	133°27.3' S	21°13.6'	56°14.9' N	4°49.3'	
3	86°50.9'	229°06.7' S	14°51.6'	260°34.1' S	0°56.4'	153°51.3' S	22°12.5'	148°29.6' S	21°13.6'	71°17.8' N	4°49.3'	
4	101°53.4'	244°06.7' S	14°52.3'	275°33.8' S	0°57.6'	168°53.4' S	22°12.5'	163°31.9' S	21°13.6'	86°20.7' N	4°49.3'	
5	116°55.8'	259°06.7' S	14°53.1'	290°33.4' S	0°58.8'	183°55.5' S	22°12.4'	178°34.2' S	21°13.5'	101°23.6' N	4°49.4'	
6	131°58.3'	274°06.7' S	14°53.9'	305°33.1' S	0°59.9'	198°57.6' S	22°12.4'	193°36.5' S	21°13.5'	116°26.5' N	4°49.4'	
7	147°00.8'	289°06.8' S	14°54.7'	320°32.7' S	1°01.1'	213°59.7' S	22°12.3'	208°38.9' S	21°13.5'	131°29.4' N	4°49.4'	
8	162°03.2'	304°06.8' S	14°55.5'	335°32.4' S	1°02.2'	229°01.7' S	22°12.3'	223°41.2' S	21°13.5'	146°32.3' N	4°49.4'	
9	177°05.7'	319°06.8' S	14°56.3'	350°32.0' S	1°03.4'	244°03.8' S	22°12.2'	238°43.5' S	21°13.5'	161°35.2' N	4°49.4'	
10	192°08.1'	334°06.8' S	14°57.1'	5°31.7' S	1°04.5'	259°05.9' S	22°12.2'	253°45.8' S	21°13.4'	176°38.1' N	4°49.4'	
11	207°10.6'	349°06.8' S	14°57.8'	20°31.3' S	1°05.7'	274°08.0' S	22°12.1'	268°48.1' S	21°13.4'	191°40.9' N	4°49.4'	
12	222°13.1'	4°06.8' S	14°58.6'	35°31.0' S	1°06.9'	289°10.1' S	22°12.0'	283°50.5' S	21°13.4'	206°43.8' N	4°49.4'	
13	237°15.5'	19°06.8' S	14°59.4'	50°30.6' S	1°08.0'	304°12.2' S	22°12.0'	298°52.8' S	21°13.4'	221°46.7' N	4°49.4'	
14	252°18.0'	34°06.8' S	15°00.2'	65°30.3' S	1°09.2'	319°14.2' S	22°11.9'	313°55.1' S	21°13.3'	236°49.6' N	4°49.5'	
15	267°20.5'	49°06.8' S	15°01.0'	80°29.9' S	1°10.3'	334°16.3' S	22°11.9'	328°57.4' S	21°13.3'	251°52.5' N	4°49.5'	
16	282°22.9'	64°06.8' S	15°01.8'	95°29.6' S	1°11.5'	349°18.4' S	22°11.8'	343°59.7' S	21°13.3'	266°55.4' N	4°49.5'	
17	297°25.4'	79°06.8' S	15°02.5'	110°29.2' S	1°12.6'	4°20.5' S	22°11.8'	359°02.1' S	21°13.3'	281°58.2' N	4°49.5'	
18	312°27.9'	94°06.8' S	15°03.3'	125°28.9' S	1°13.8'	19°22.6' S	22°11.7'	14°04.4' S	21°13.2'	297°01.1' N	4°49.5'	
19	327°30.3'	109°06.8' S	15°04.1'	140°28.5' S	1°14.9'	34°24.6' S	22°11.7'	29°06.7' S	21°13.2'	312°04.0' N	4°49.5'	
20	342°32.8'	124°06.8' S	15°04.9'	155°28.2' S	1°16.1'	49°26.7' S	22°11.6'	44°09.0' S	21°13.2'	327°06.9' N	4°49.5'	
21	357°35.3'	139°06.8' S	15°05.7'	170°27.8' S	1°17.3'	64°28.8' S	22°11.6'	59°11.3' S	21°13.2'	342°09.7' N	4°49.6'	
22	12°37.7'	154°06.8' S	15°06.4'	185°27.4' S	1°18.4'	79°30.9' S	22°11.5'	74°13.6' S	21°13.1'	357°12.6' N	4°49.6'	
23	27°40.2'	169°06.8' S	15°07.2'	200°27.1' S	1°19.6'	94°33.0' S	22°11.4'	89°16.0' S	21°13.1'	12°15.5' N	4°49.6'	
		SD 16.1' d -0.8'		v -0.4' d -1.2'		v 2.1' d 0.1'		v 2.3' d 0.0'		v 2.9' d 0.0'		
Mer. pass.		11 h 43 m 34 s		9 h 38 m		16 h 43 m		17 h 4 m		22 h 11 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sirius	-Capella	-Betelgeuse	-Aldebaran	+Mars	+Achernar	+Fomalhaut	+Altair
0	348°28.3'	N 16°52.3'	13.9'	9.4'	54.1'	58°14.1'	36°25.8'	36°12.4'	15°20.9'	38°49.4'	77°45.4'	80°42.4'	111°02.7'
1	3°01.2'	N 17°01.7'	13.8'	9.3'	54.1'	57°55.5'	36°03.1'	35°46.4'	14°52.5'	39°19.5'	78°02.0'	81°11.0'	111°27.0'
2	17°34.1'	N 17°11.1'	13.8'	9.3'	54.1'	57°36.9'	35°40.6'	35°20.5'	14°24.2'	39°49.6'	78°18.7'	81°39.6'	111°51.3'
3	32°06.8'	N 17°20.3'	13.7'	9.2'	54.1'	57°18.5'	35°18.3'	34°54.6'	13°56.0'	40°19.7'	78°35.4'	82°08.3'	112°15.6'
4	46°39.5'	N 17°29.5'	13.7'	9.1'	54.1'	57°00.2'	34°56.1'	34°28.9'	13°27.8'	40°49.9'	78°52.2'	82°36.9'	112°39.8'
5	61°12.2'	N 17°38.6'	13.6'	9.0'	54.1'	56°42.0'	34°34.0'	34°03.3'	12°59.8'	41°20.0'	79°09.0'	83°05.5'	113°04.0'
6	75°44.8'	N 17°47.7'	13.5'	9.0'	54.2'	56°23.9'	34°12.2'	33°37.7'	12°31.9'	41°50.2'	79°25.8'	83°34.2'	113°28.1'
7	90°17.4'	N 17°56.6'	13.5'	8.9'	54.2'	56°05.9'	33°50.5'	33°12.3'	12°04.2'	42°20.3'	79°42.7'	84°02.8'	113°52.2'
8	104°49.8'	N 18°05.5'	13.4'	8.8'	54.2'	55°48.0'	33°29.0'	32°46.9'	11°36.6'	42°50.5'	79°59.6'	84°31.5'	114°16.3'
9	119°22.3'	N 18°14.4'	13.4'	8.7'	54.2'	55°30.2'	33°07.6'	32°21.7'	11°09.2'	43°20.7'	80°16.6'	85°00.2'	114°40.4'
10	133°54.6'	N 18°23.1'	13.3'	8.7'	54.2'	55°12.5'	32°46.5'	31°56.6'	10°42.1'	43°50.8'	80°33.5'	85°28.9'	115°04.4'
11	148°26.9'	N 18°31.8'	13.2'	8.6'	54.2'	54°54.9'	32°25.5'	31°31.5'	10°15.1'	44°21.0'	80°50.6'	85°57.6'	115°28.4'
12	162°59.2'	N 18°40.4'	13.2'	8.5'	54.2'	54°37.5'	32°04.8'	31°06.6'	9°48.5'	44°51.2'	81°07.6'	86°26.3'	115°52.3'
13	177°31.4'	N 18°48.9'	13.1'	8.4'	54.2'	54°20.1'	31°44.3'	30°41.9'	9°22.1'	45°21.4'	81°24.7'	86°55.0'	116°16.2'
14	192°03.5'	N 18°57.3'	13.1'	8.4'	54.2'	54°02.9'	31°24.0'	30°17.3'	8°56.1'	45°51.7'	81°41.8'	87°23.8'	116°40.1'
15	206°35.6'	N 19°05.7'	13.0'	8.3'	54.2'	53°45.8'	31°03.9'	29°52.8'	8°30.6'	46°21.9'	81°58.9'	87°52.5'	117°03.9'
16	221°07.6'	N 19°14.0'	12.9'	8.2'	54.2'	53°28.8'	30°44.0'	29°28.4'	8°05.5'	46°52.1'	82°16.1'	88°21.2'	117°27.7'
17	235°39.5'	N 19°22.2'	12.9'	8.1'	54.3'	53°12.0'	30°24.4'	29°04.2'	7°41.0'	47°22.4'	82°33.3'	88°50.0'	117°51.5'
18	250°11.4'	N 19°30.3'	12.8'	8.0'	54.3'	52°55.3'	30°05.1'	28°40.2'	7°17.2'	47°52.6'	82°50.6'	89°18.8'	118°15.2'
19	264°43.2'	N 19°38.3'	12.8'	7.9'	54.3'	52°38.7'	29°45.9'	28°16.3'		48°22.9'	83°07.8'	89°47.6'	118°38.8'
20	279°15.0'	N 19°46.3'	12.7'	7.9'	54.3'	52°22.2'	29°27.1'	27°52.6'		48°53.2'	83°25.1'	90°16.4'	119°02.4'
21	293°46.7'	N 19°54.1'	12.6'	7.8'	54.3'	52°05.9'	29°08.6'	27°29.1'		49°23.4'	83°42.4'	90°45.1'	119°26.0'
22	308°18.3'	N 20°01.9'	12.6'	7.7'	54.3'	51°49.7'	28°50.3'	27°05.7'		49°53.7'	83°59.8'	91°14.0'	119°49.5'
23	322°49.9'	N 20°09.6'	12.5'	7.6'	54.3'	51°33.7'	28°32.3'	26°42.6'		50°24.0'	84°17.1'	91°42.8'	
Mer. pass.		0 h 48 m SD 14.8'		phase 98%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.6'	N 7°24.7'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.4'	S 63°12.5'	Capella	+0.1	280°26.6'	N 46°00.9'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.5'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.4'	Polaris	+2.0	315°05.9'	N 89°21.0'
Rigil Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.4'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.7'	Sirius	-1.4	258°29.1'	S 16°44.5'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.6'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	42°42.6'	184°06.8'	S 15°08.0'	215°26.7'	S 1°20.7'	109°35.0'	S 22°11.4'	104°18.3'	S 21°13.1'	27°18.4'	N 4°49.6'	
1	57°45.1'	199°06.8'	S 15°08.8'	230°26.4'	S 1°21.9'	124°37.1'	S 22°11.3'	119°20.6'	S 21°13.1'	42°21.2'	N 4°49.6'	
2	72°47.6'	214°06.8'	S 15°09.5'	245°26.0'	S 1°23.0'	139°39.2'	S 22°11.3'	134°22.9'	S 21°13.0'	57°24.1'	N 4°49.6'	
3	87°50.0'	229°06.8'	S 15°10.3'	260°25.7'	S 1°24.2'	154°41.3'	S 22°11.2'	149°25.2'	S 21°13.0'	72°27.0'	N 4°49.7'	
4	102°52.5'	244°06.8'	S 15°11.1'	275°25.3'	S 1°25.4'	169°43.3'	S 22°11.2'	164°27.5'	S 21°13.0'	87°29.8'	N 4°49.7'	
5	117°55.0'	259°06.8'	S 15°11.9'	290°25.0'	S 1°26.5'	184°45.4'	S 22°11.1'	179°29.9'	S 21°13.0'	102°32.7'	N 4°49.7'	
6	132°57.4'	274°06.8'	S 15°12.7'	305°24.6'	S 1°27.7'	199°47.5'	S 22°11.1'	194°32.2'	S 21°12.9'	117°35.5'	N 4°49.7'	
7	147°59.9'	289°06.8'	S 15°13.4'	320°24.3'	S 1°28.8'	214°49.6'	S 22°11.0'	209°34.5'	S 21°12.9'	132°38.4'	N 4°49.7'	
8	163°02.4'	304°06.8'	S 15°14.2'	335°23.9'	S 1°30.0'	229°51.6'	S 22°10.9'	224°36.8'	S 21°12.9'	147°41.3'	N 4°49.8'	
9	178°04.8'	319°06.8'	S 15°15.0'	350°23.6'	S 1°31.2'	244°53.7'	S 22°10.9'	239°39.1'	S 21°12.9'	162°44.1'	N 4°49.8'	
10	193°07.3'	334°06.8'	S 15°15.7'	5°23.2'	S 1°32.3'	259°55.8'	S 22°10.8'	254°41.4'	S 21°12.8'	177°47.0'	N 4°49.8'	
11	208°09.8'	349°06.8'	S 15°16.5'	20°22.8'	S 1°33.5'	274°57.9'	S 22°10.8'	269°43.8'	S 21°12.8'	192°49.8'	N 4°49.8'	
12	223°12.2'	4°06.8'	S 15°17.3'	35°22.5'	S 1°34.6'	289°59.9'	S 22°10.7'	284°46.1'	S 21°12.8'	207°52.7'	N 4°49.8'	
13	238°14.7'	19°06.8'	S 15°18.1'	50°22.1'	S 1°35.8'	305°02.0'	S 22°10.7'	299°48.4'	S 21°12.8'	222°55.5'	N 4°49.9'	
14	253°17.1'	34°06.8'	S 15°18.8'	65°21.8'	S 1°36.9'	320°04.1'	S 22°10.6'	314°50.7'	S 21°12.7'	237°58.4'	N 4°49.9'	
15	268°19.6'	49°06.8'	S 15°19.6'	80°21.4'	S 1°38.1'	335°06.2'	S 22°10.5'	329°53.0'	S 21°12.7'	253°01.3'	N 4°49.9'	
16	283°22.1'	64°06.8'	S 15°20.4'	95°21.1'	S 1°39.3'	350°08.2'	S 22°10.5'	344°55.3'	S 21°12.7'	268°04.1'	N 4°49.9'	
17	298°24.5'	79°06.7'	S 15°21.2'	110°20.7'	S 1°40.4'	5°10.3'	S 22°10.4'	359°57.6'	S 21°12.7'	283°06.9'	N 4°50.0'	
18	313°27.0'	94°06.7'	S 15°21.9'	125°20.4'	S 1°41.6'	20°12.4'	S 22°10.4'	14°60.0'	S 21°12.6'	298°09.8'	N 4°50.0'	
19	328°29.5'	109°06.7'	S 15°22.7'	140°20.0'	S 1°42.7'	35°14.5'	S 22°10.3'	30°02.3'	S 21°12.6'	313°12.6'	N 4°50.0'	
20	343°31.9'	124°06.7'	S 15°23.5'	155°19.6'	S 1°43.9'	50°16.5'	S 22°10.3'	45°04.6'	S 21°12.6'	328°15.5'	N 4°50.0'	
21	358°34.4'	139°06.7'	S 15°24.2'	170°19.3'	S 1°45.0'	65°18.6'	S 22°10.2'	60°06.9'	S 21°12.6'	343°18.3'	N 4°50.1'	
22	13°36.9'	154°06.7'	S 15°25.0'	185°18.9'	S 1°46.2'	80°20.7'	S 22°10.2'	75°09.2'	S 21°12.5'	358°21.0'	N 4°50.1'	
23	28°39.3'	169°06.7'	S 15°25.8'	200°18.6'	S 1°47.4'	95°22.8'	S 22°10.1'	90°11.5'	S 21°12.5'	13°24.0'	N 4°50.1'	
		SD 16.1'	d -0.8'	v -0.4'	d -1.2'	v 2.1'	d 0.1'	v 2.3'	d 0.0'	v 2.9'	d 0.0'	
Mer. pass.		11 h 43 m 34 s		9 h 38 m		16 h 39 m		17 h 0 m		22 h 7 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Venus	-Pollux	-Capella	-Betelgeuse	-Aldebaran	+Mars	+Achernar	+Fomalhaut
0	337°21.4'	N 20°17.2'	12.5'	7.5'	54.3'		47°06.2'	28°14.6'	26°19.6'		50°54.4'	84°34.5'	92°11.6'
1	351°52.9'	N 20°24.7'	12.4'	7.4'	54.3'	119°48.3'	46°36.3'	27°57.3'	25°56.9'		51°24.7'	84°51.9'	92°40.4'
2	6°24.3'	N 20°32.1'	12.3'	7.3'	54.4'	119°21.4'	46°06.4'	27°40.2'	25°34.4'		51°55.0'	85°09.4'	93°09.3'
3	20°55.6'	N 20°39.5'	12.3'	7.2'	54.4'	118°54.4'	45°36.4'	27°23.6'	25°12.2'		52°25.4'	85°26.8'	93°38.1'
4	35°26.9'	N 20°46.7'	12.2'	7.2'	54.4'	118°27.5'	45°06.5'	27°07.2'	24°50.2'		52°55.7'	85°44.3'	94°07.0'
5	49°58.1'	N 20°53.9'	12.2'	7.1'	54.4'	118°00.5'	44°36.6'	26°51.2'	24°28.4'		53°26.1'	86°01.8'	94°35.9'
6	64°29.3'	N 21°01.0'	12.1'	7.0'	54.4'	117°33.6'	44°06.6'	26°35.6'	24°06.9'		53°56.4'	86°19.3'	95°04.8'
7	79°00.4'	N 21°07.9'	12.0'	6.9'	54.4'	117°06.6'	43°36.7'		23°45.7'		54°26.8'	86°36.8'	95°33.7'
8	93°31.4'	N 21°14.8'	12.0'	6.8'	54.4'	116°39.6'	43°06.7'		23°24.8'		54°57.2'	86°54.4'	96°02.6'
9	108°02.4'	N 21°21.6'	11.9'	6.7'	54.4'	116°12.6'	42°36.8'		23°04.3'		55°27.6'	87°11.9'	96°31.5'
10	122°33.3'	N 21°28.3'	11.8'	6.6'	54.5'	115°45.5'	42°06.8'		22°44.0'		55°58.0'	87°29.5'	97°00.4'
11	137°04.1'	N 21°34.9'	11.8'	6.5'	54.5'	115°18.5'	41°36.8'		22°24.1'		56°28.5'	87°47.1'	97°29.3'
12	151°34.9'	N 21°41.4'	11.7'	6.4'	54.5'	114°51.5'	41°06.8'		22°04.5'		56°58.9'	88°04.7'	97°58.3'
13	166°05.6'	N 21°47.8'	11.7'	6.3'	54.5'	114°24.4'	40°36.8'		21°45.3'		57°29.4'	88°22.4'	98°27.2'
14	180°36.3'	N 21°54.1'	11.6'	6.2'	54.5'	113°57.3'	40°06.8'		21°26.6'		57°59.8'	88°40.0'	98°56.2'
15	195°06.9'	N 22°00.3'	11.5'	6.1'	54.5'	113°30.3'	39°36.7'		21°08.2'		58°30.3'	88°57.6'	99°25.2'
16	209°37.5'	N 22°06.4'	11.5'	6.0'	54.5'	113°03.2'	39°06.7'		20°50.2'		59°00.8'	89°15.3'	99°54.1'
17	224°08.0'	N 22°12.4'	11.4'	5.9'	54.6'	112°36.0'	38°36.7'		20°32.7'	7°21.7'	59°31.3'	89°33.0'	100°23.1'
18	238°38.4'	N 22°18.3'	11.4'	5.8'	54.6'	112°08.9'	38°06.6'		20°15.7'	7°45.9'	60°01.8'	89°50.7'	100°52.1'
19	253°08.7'	N 22°24.1'	11.3'	5.7'	54.6'	111°41.8'	37°36.5'		19°59.2'	8°10.7'	60°32.3'	90°08.3'	101°21.1'
20	267°39.1'	N 22°29.8'	11.3'	5.6'	54.6'	111°14.6'	37°06.5'		19°43.2'	8°36.2'	61°02.9'	90°26.0'	101°50.1'
21	282°09.3'	N 22°35.4'	11.2'	5.5'	54.6'	110°47.5'	36°36.4'			9°02.2'	61°33.4'	90°43.7'	102°19.2'
22	296°39.5'	N 22°40.9'	11.1'	5.4'	54.6'	110°20.3'	36°06.3'			9°28.6'	62°04.0'	91°01.5'	102°48.2'
23	311°09.6'	N 22°46.2'	11.1'	5.3'	54.6'	109°53.1'	35°36.2'			9°55.3'	62°34.6'	91°19.2'	103°17.2'
Mer. pass.		1 h 34 m SD 14.8'		phase 95%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.6'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.5'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.7'	N 89°21.0'
Rigil Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.4'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.1'	S 16°44.5'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.6'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	43°41.8'	184°06.7'	S 15°26.5'	215°18.2'	S 1°48.5'	110°24.8'	S 22°10.0'	105°13.8'	S 21°12.5'	28°26.9'	N 4°50.1'	
1	58°44.3'	199°06.7'	S 15°27.3'	230°17.9'	S 1°49.7'	125°26.9'	S 22°10.0'	120°16.2'	S 21°12.5'	43°29.7'	N 4°50.2'	
2	73°46.7'	214°06.7'	S 15°28.1'	245°17.5'	S 1°50.8'	140°29.0'	S 22°09.9'	135°18.5'	S 21°12.4'	58°32.5'	N 4°50.2'	
3	88°49.2'	229°06.7'	S 15°28.8'	260°17.1'	S 1°52.0'	155°31.1'	S 22°09.9'	150°20.8'	S 21°12.4'	73°35.4'	N 4°50.2'	
4	103°51.6'	244°06.7'	S 15°29.6'	275°16.8'	S 1°53.2'	170°33.1'	S 22°09.8'	165°23.1'	S 21°12.4'	88°38.2'	N 4°50.3'	
5	118°54.1'	259°06.6'	S 15°30.4'	290°16.4'	S 1°54.3'	185°35.2'	S 22°09.8'	180°25.4'	S 21°12.4'	103°41.0'	N 4°50.3'	
6	133°56.6'	274°06.6'	S 15°31.1'	305°16.1'	S 1°55.5'	200°37.3'	S 22°09.7'	195°27.7'	S 21°12.3'	118°43.9'	N 4°50.3'	
7	148°59.0'	289°06.6'	S 15°31.9'	320°15.7'	S 1°56.6'	215°39.3'	S 22°09.6'	210°30.0'	S 21°12.3'	133°46.7'	N 4°50.3'	
8	164°01.5'	304°06.6'	S 15°32.7'	335°15.3'	S 1°57.8'	230°41.4'	S 22°09.6'	225°32.3'	S 21°12.3'	148°49.5'	N 4°50.4'	
9	179°04.0'	319°06.6'	S 15°33.4'	350°15.0'	S 1°59.0'	245°43.5'	S 22°09.5'	240°34.7'	S 21°12.3'	163°52.4'	N 4°50.4'	
10	194°06.4'	334°06.6'	S 15°34.2'	5°14.6'	S 2°00.1'	260°45.5'	S 22°09.5'	255°37.0'	S 21°12.2'	178°55.2'	N 4°50.4'	
11	209°08.9'	349°06.6'	S 15°35.0'	20°14.3'	S 2°01.3'	275°47.6'	S 22°09.4'	270°39.3'	S 21°12.2'	193°58.0'	N 4°50.5'	
12	224°11.4'	4°06.6'	S 15°35.7'	35°13.9'	S 2°02.4'	290°49.7'	S 22°09.4'	285°41.6'	S 21°12.2'	209°00.8'	N 4°50.5'	
13	239°13.8'	19°06.5'	S 15°36.5'	50°13.6'	S 2°03.6'	305°51.8'	S 22°09.3'	300°43.9'	S 21°12.2'	224°03.7'	N 4°50.5'	
14	254°16.3'	34°06.5'	S 15°37.2'	65°13.2'	S 2°04.7'	320°53.8'	S 22°09.2'	315°46.2'	S 21°12.1'	239°06.5'	N 4°50.6'	
15	269°18.7'	49°06.5'	S 15°38.0'	80°12.8'	S 2°05.9'	335°55.9'	S 22°09.2'	330°48.5'	S 21°12.1'	254°09.3'	N 4°50.6'	
16	284°21.2'	64°06.5'	S 15°38.8'	95°12.5'	S 2°07.1'	350°58.0'	S 22°09.1'	345°50.8'	S 21°12.1'	269°12.1'	N 4°50.6'	
17	299°23.7'	79°06.5'	S 15°39.5'	110°12.1'	S 2°08.2'	6°00.0'	S 22°09.1'	0°53.1'	S 21°12.1'	284°14.9'	N 4°50.7'	
18	314°26.1'	94°06.5'	S 15°40.3'	125°11.8'	S 2°09.4'	21°02.1'	S 22°09.0'	15°55.5'	S 21°12.0'	299°17.7'	N 4°50.7'	
19	329°28.6'	109°06.5'	S 15°41.0'	140°11.4'	S 2°10.5'	36°04.2'	S 22°09.0'	30°57.8'	S 21°12.0'	314°20.6'	N 4°50.8'	
20	344°31.1'	124°06.4'	S 15°41.8'	155°11.0'	S 2°11.7'	51°06.2'	S 22°08.9'	46°00.1'	S 21°12.0'	329°23.4'	N 4°50.8'	
21	359°33.5'	139°06.4'	S 15°42.6'	170°10.7'	S 2°12.9'	66°08.3'	S 22°08.8'	61°02.4'	S 21°12.0'	344°26.2'	N 4°50.8'	
22	14°36.0'	154°06.4'	S 15°43.3'	185°10.3'	S 2°14.0'	81°10.4'	S 22°08.8'	76°04.7'	S 21°11.9'	359°29.0'	N 4°50.9'	
23	29°38.5'	169°06.4'	S 15°44.1'	200°10.0'	S 2°15.2'	96°12.4'	S 22°08.7'	91°07.0'	S 21°11.9'	14°31.8'	N 4°50.9'	
		SD 16.1'	d -0.8'		v -0.4' d -1.2'		v 2.1' d 0.1'		v 2.3' d 0.0'		v 2.8' d 0.0'	
Mer. pass.		11 h 43 m 34 s		9 h 39 m		16 h 36 m		16 h 56 m		22 h 2 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Venus	-Regulus	-Procyon	-Pollux	+Aldebaran	+Mars	+Achernar	+Fomalhaut
0	325°39.7'	N 22°51.5'	11.0'	5.2'	54.7'	109°25.9'	71°07.6'	39°53.0'	35°06.1'	10°22.4'	63°05.2'	91°36.9'	103°46.3'
1	340°09.7'	N 22°56.7'	11.0'	5.1'	54.7'	108°58.6'	70°37.4'	39°26.9'	34°35.9'	10°49.9'	63°35.8'	91°54.6'	104°15.3'
2	354°39.7'	N 23°01.8'	10.9'	5.0'	54.7'	108°31.4'	70°07.2'	39°00.9'	34°05.8'	11°17.5'	64°06.4'	92°12.3'	104°44.4'
3	9°09.6'	N 23°06.7'	10.9'	4.8'	54.7'	108°04.1'	69°36.9'	38°34.9'	33°35.7'	11°45.4'	64°37.0'	92°30.1'	105°13.5'
4	23°39.5'	N 23°11.6'	10.8'	4.7'	54.7'	107°36.9'	69°06.6'	38°09.1'	33°05.5'	12°13.5'	65°07.7'	92°47.8'	105°42.6'
5	38°09.3'	N 23°16.3'	10.7'	4.6'	54.7'	107°09.6'	68°36.4'	37°43.3'	32°35.4'	12°41.8'	65°38.3'	93°05.5'	106°11.6'
6	52°39.0'	N 23°20.9'	10.7'	4.5'	54.8'	106°42.3'	68°06.1'	37°17.6'	32°05.2'	13°10.3'	66°09.0'	93°23.2'	106°40.7'
7	67°08.7'	N 23°25.4'	10.6'	4.4'	54.8'	106°15.0'	67°35.7'	36°52.0'	31°35.0'	13°38.9'	66°39.7'	93°41.0'	107°09.9'
8	81°38.3'	N 23°29.8'	10.6'	4.3'	54.8'	105°47.6'	67°05.4'	36°26.5'	31°04.8'	14°07.6'	67°10.4'	93°58.7'	107°39.0'
9	96°07.9'	N 23°34.1'	10.5'	4.2'	54.8'	105°20.3'	66°35.1'	36°01.1'	30°34.6'	14°36.5'	67°41.1'	94°16.4'	108°08.1'
10	110°37.4'	N 23°38.3'	10.5'	4.1'	54.8'	104°52.9'	66°04.7'	35°35.8'	30°04.4'	15°05.5'	68°11.8'	94°34.1'	108°37.2'
11	125°06.9'	N 23°42.4'	10.4'	4.0'	54.8'	104°25.5'	65°34.3'	35°10.6'	29°34.2'	15°34.6'	68°42.6'	94°51.9'	109°06.4'
12	139°36.3'	N 23°46.3'	10.4'	3.8'	54.9'	103°58.1'	65°03.9'	34°45.5'	29°04.0'	16°03.8'	69°13.4'	95°09.6'	109°35.5'
13	154°05.7'	N 23°50.2'	10.3'	3.7'	54.9'	103°30.7'	64°33.5'	34°20.5'	28°33.8'	16°33.1'	69°44.1'	95°27.3'	110°04.7'
14	168°35.0'	N 23°53.9'	10.3'	3.6'	54.9'	103°03.3'	64°03.1'	33°55.6'	28°03.6'	17°02.5'	70°14.9'	95°45.0'	110°33.8'
15	183°04.3'	N 23°57.5'	10.2'	3.5'	54.9'	102°35.8'	63°32.6'	33°30.9'	27°33.3'	17°31.9'	70°45.7'	96°02.7'	111°03.0'
16	197°33.5'	N 24°01.0'	10.2'	3.4'	54.9'	102°08.3'	63°02.2'	33°06.3'	27°03.1'	18°01.4'	71°16.6'	96°20.3'	111°32.2'
17	212°02.7'	N 24°04.3'	10.1'	3.3'	55.0'	101°40.8'	62°31.7'	32°41.8'	26°32.8'	18°31.1'	71°47.4'	96°38.0'	112°01.4'
18	226°31.8'	N 24°07.6'	10.1'	3.1'	55.0'	101°13.3'	62°01.2'	32°17.5'	26°02.6'	19°00.7'	72°18.3'	96°55.7'	112°30.6'
19	241°00.9'	N 24°10.7'	10.0'	3.0'	55.0'	100°45.8'	61°30.7'	31°53.3'	25°32.3'	19°30.5'	72°49.2'	97°13.3'	112°59.8'
20	255°29.9'	N 24°13.7'	10.0'	2.9'	55.0'	100°18.3'	61°00.2'	31°29.2'	25°02.0'	20°00.3'	73°20.1'	97°30.9'	113°29.0'
21	269°58.9'	N 24°16.6'	9.9'	2.8'	55.0'	99°50.7'	60°29.6'	31°05.4'	24°31.8'	20°30.1'	73°51.0'	97°48.6'	113°58.2'
22	284°27.8'	N 24°19.4'	9.9'	2.7'	55.0'	99°23.1'	59°59.1'	30°41.6'	24°01.5'	21°00.0'	74°21.9'	98°06.2'	114°27.4'
23	298°56.7'	N 24°22.0'	9.8'	2.5'	55.1'	98°55.5'	59°28.5'	30°18.1'	23°31.2'	21°30.0'	74°52.8'	98°23.8'	114°56.6'
Mer. pass.		2 h 22 m SD 14.9'		phase 90%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.5'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.5'	N 89°21.0'
Rigil Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.1'	S 16°44.5'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.6'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	44°40.9'	184°06.4'	S 15°44.8'	215°09.6'	S 2°16.3'	111°14.5'	S 22°08.7'	106°09.3'	S 21°11.9'	29°34.6'	N 4°50.9'	
1	59°43.4'	199°06.4'	S 15°45.6'	230°09.2'	S 2°17.5'	126°16.6'	S 22°08.6'	121°11.6'	S 21°11.8'	44°37.4'	N 4°51.0'	
2	74°45.9'	214°06.3'	S 15°46.3'	245°08.9'	S 2°18.7'	141°18.6'	S 22°08.6'	136°13.9'	S 21°11.8'	59°40.2'	N 4°51.0'	
3	89°48.3'	229°06.3'	S 15°47.1'	260°08.5'	S 2°19.8'	156°20.7'	S 22°08.5'	151°16.2'	S 21°11.8'	74°43.0'	N 4°51.1'	
4	104°50.8'	244°06.3'	S 15°47.9'	275°08.1'	S 2°21.0'	171°22.8'	S 22°08.4'	166°18.6'	S 21°11.8'	89°45.8'	N 4°51.1'	
5	119°53.2'	259°06.3'	S 15°48.6'	290°07.8'	S 2°22.1'	186°24.8'	S 22°08.4'	181°20.9'	S 21°11.7'	104°48.6'	N 4°51.1'	
6	134°55.7'	274°06.3'	S 15°49.4'	305°07.4'	S 2°23.3'	201°26.9'	S 22°08.3'	196°23.2'	S 21°11.7'	119°51.4'	N 4°51.2'	
7	149°58.2'	289°06.2'	S 15°50.1'	320°07.1'	S 2°24.5'	216°29.0'	S 22°08.3'	211°25.5'	S 21°11.7'	134°54.2'	N 4°51.2'	
8	165°00.6'	304°06.2'	S 15°50.9'	335°06.7'	S 2°25.6'	231°31.0'	S 22°08.2'	226°27.8'	S 21°11.7'	149°57.0'	N 4°51.3'	
9	180°03.1'	319°06.2'	S 15°51.6'	350°06.3'	S 2°26.8'	246°33.1'	S 22°08.1'	241°30.1'	S 21°11.6'	164°59.8'	N 4°51.3'	
10	195°05.6'	334°06.2'	S 15°52.4'	5°06.0'	S 2°27.9'	261°35.2'	S 22°08.1'	256°32.4'	S 21°11.6'	180°02.6'	N 4°51.4'	
11	210°08.0'	349°06.2'	S 15°53.1'	20°05.6'	S 2°29.1'	276°37.2'	S 22°08.0'	271°34.7'	S 21°11.6'	195°05.4'	N 4°51.4'	
12	225°10.5'	4°06.1'	S 15°53.9'	35°05.3'	S 2°30.3'	291°39.3'	S 22°08.0'	286°37.0'	S 21°11.6'	210°08.2'	N 4°51.4'	
13	240°13.0'	19°06.1'	S 15°54.6'	50°04.9'	S 2°31.4'	306°41.4'	S 22°07.9'	301°39.3'	S 21°11.5'	225°11.0'	N 4°51.5'	
14	255°15.4'	34°06.1'	S 15°55.4'	65°04.5'	S 2°32.6'	321°43.4'	S 22°07.9'	316°41.6'	S 21°11.5'	240°13.8'	N 4°51.5'	
15	270°17.9'	49°06.1'	S 15°56.1'	80°04.2'	S 2°33.7'	336°45.5'	S 22°07.8'	331°43.9'	S 21°11.5'	255°16.6'	N 4°51.6'	
16	285°20.4'	64°06.0'	S 15°56.9'	95°03.8'	S 2°34.9'	351°47.5'	S 22°07.7'	346°46.3'	S 21°11.5'	270°19.4'	N 4°51.6'	
17	300°22.8'	79°06.0'	S 15°57.6'	110°03.4'	S 2°36.0'	6°49.6'	S 22°07.7'	1°48.6'	S 21°11.4'	285°22.2'	N 4°51.7'	
18	315°25.3'	94°06.0'	S 15°58.4'	125°03.1'	S 2°37.2'	21°51.7'	S 22°07.6'	16°50.9'	S 21°11.4'	300°25.0'	N 4°51.7'	
19	330°27.7'	109°06.0'	S 15°59.1'	140°02.7'	S 2°38.4'	36°53.7'	S 22°07.6'	31°53.2'	S 21°11.4'	315°27.7'	N 4°51.8'	
20	345°30.2'	124°06.0'	S 15°59.9'	155°02.3'	S 2°39.5'	51°55.8'	S 22°07.5'	46°55.5'	S 21°11.3'	330°30.5'	N 4°51.8'	
21	0°32.7'	139°05.9'	S 16°00.6'	170°02.0'	S 2°40.7'	66°57.9'	S 22°07.4'	61°57.8'	S 21°11.3'	345°33.3'	N 4°51.9'	
22	15°35.1'	154°05.9'	S 16°01.4'	185°01.6'	S 2°41.8'	81°59.9'	S 22°07.4'	77°00.1'	S 21°11.3'	0°36.1'	N 4°51.9'	
23	30°37.6'	169°05.9'	S 16°02.1'	200°01.2'	S 2°43.0'	97°02.0'	S 22°07.3'	92°02.4'	S 21°11.3'	15°38.9'	N 4°52.0'	
		SD 16.1'	d -0.8'		v -0.4'	d -1.2'		v 2.1'	d 0.1'		v 2.3'	d 0.0'
Mer. pass.		11 h 43 m 36 s		9 h 40 m		16 h 33 m		16 h 53 m		21 h 58 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Venus	-Regulus	-Procyon	-Pollux	+Betelgeuse	+Aldebaran	+Capella	+Rigel
0	313°25.6'	N 24°24.6'	9.8'	2.4'	55.1'	98°27.9'	58°57.9'	29°54.7'	23°00.9'		22°00.0'		
1	327°54.4'	N 24°27.0'	9.8'	2.3'	55.1'	98°00.3'	58°27.3'	29°31.6'	22°30.6'		22°30.1'		
2	342°23.1'	N 24°29.3'	9.7'	2.2'	55.1'	97°32.6'	57°56.7'	29°08.6'	22°00.4'		23°00.2'		
3	356°51.9'	N 24°31.4'	9.7'	2.0'	55.1'	97°04.9'	57°26.0'	28°45.8'	21°30.1'		23°30.4'		
4	11°20.5'	N 24°33.5'	9.6'	1.9'	55.2'	96°37.2'	56°55.3'	28°23.3'	20°59.8'		24°00.6'		35°42.3'
5	25°49.2'	N 24°35.4'	9.6'	1.8'	55.2'	96°09.5'	56°24.7'	28°01.0'	20°29.5'		24°30.8'		35°57.4'
6	40°17.8'	N 24°37.2'	9.6'	1.7'	55.2'	95°41.8'	55°54.0'	27°38.9'	19°59.3'		25°01.1'		36°12.8'
7	54°46.3'	N 24°38.8'	9.5'	1.5'	55.2'	95°14.0'	55°23.2'	27°17.0'	19°29.0'		25°31.4'		36°28.5'
8	69°14.9'	N 24°40.4'	9.5'	1.4'	55.3'	94°46.2'	54°52.5'	26°55.4'	18°58.8'		26°01.8'		36°44.4'
9	83°43.4'	N 24°41.8'	9.5'	1.3'	55.3'	94°18.4'	54°21.7'	26°34.1'	18°28.6'		26°32.2'		37°00.7'
10	98°11.8'	N 24°43.1'	9.4'	1.2'	55.3'	93°50.6'	53°50.9'	26°13.1'	17°58.4'		27°02.7'		37°17.2'
11	112°40.2'	N 24°44.2'	9.4'	1.0'	55.3'	93°22.7'	53°20.1'	25°52.3'	17°28.2'		27°33.1'		37°34.0'
12	127°08.6'	N 24°45.3'	9.4'	0.9'	55.3'	92°54.9'	52°49.3'	25°31.9'	16°58.0'	19°20.6'	28°03.7'		37°51.1'
13	141°37.0'	N 24°46.2'	9.3'	0.8'	55.4'	92°27.0'	52°18.5'	25°11.8'	16°27.8'	19°36.2'	28°34.2'	26°09.9'	38°08.4'
14	156°05.3'	N 24°46.9'	9.3'	0.6'	55.4'	91°59.1'	51°47.6'	24°52.0'	15°57.7'	19°52.4'	29°04.8'	26°25.3'	38°26.0'
15	170°33.6'	N 24°47.6'	9.3'	0.5'	55.4'	91°31.1'	51°16.7'	24°32.5'	15°27.7'	20°09.1'	29°35.4'	26°41.2'	38°43.9'
16	185°01.8'	N 24°48.1'	9.2'	0.4'	55.4'	91°03.2'	50°45.8'	24°13.5'	14°57.6'	20°26.4'	30°06.1'	26°57.5'	39°01.9'
17	199°30.1'	N 24°48.5'	9.2'	0.3'	55.5'	90°35.2'	50°14.9'	23°54.8'	14°27.6'	20°44.2'	30°36.8'	27°14.1'	39°20.3'
18	213°58.3'	N 24°48.8'	9.2'	0.1'	55.5'	90°07.2'	49°44.0'	23°36.5'	13°57.7'	21°02.6'	31°07.5'	27°31.2'	39°38.8'
19	228°26.4'	N 24°48.9'	9.1'	0.0'	55.5'	89°39.2'	49°13.0'	23°18.6'	13°27.8'	21°21.4'	31°38.3'	27°48.7'	39°57.6'
20	242°54.6'	N 24°48.9'	9.1'	-0.1'	55.5'	89°11.1'	48°42.0'	23°01.1'	12°58.0'	21°40.6'	32°09.1'	28°06.5'	40°16.7'
21	257°22.7'	N 24°48.8'	9.1'	-0.3'	55.5'	88°43.0'	48°11.0'	22°44.1'	12°28.3'	22°00.4'	32°40.0'	28°24.7'	40°35.9'
22	271°50.8'	N 24°48.5'	9.1'	-0.4'	55.6'	88°14.9'	47°40.0'	22°27.6'	11°58.7'	22°20.5'	33°10.8'	28°43.3'	40°55.4'
23	286°18.9'	N 24°48.1'	9.0'	-0.5'	55.6'	87°46.8'	47°08.9'	22°11.5'	11°29.2'	22°41.1'	33°41.7'	29°02.2'	41°15.0'
Mer. pass.		3 h 13 m SD 15.0'	phase 83%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.4'	N 89°21.0'
Rigel Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	45°40.1'	S 16°02.9'	184°05.8'	S 16°03.6'	215°00.9'	S 2°44.2'	112°04.0'	S 22°07.3'	107°04.7'	S 21°11.2'	30°41.6'	N 4°52.0'
1	60°42.5'	S 16°03.6'	199°05.8'	S 16°04.4'	230°00.5'	S 2°45.3'	127°06.1'	S 22°07.2'	122°07.0'	S 21°11.2'	45°44.4'	N 4°52.1'
2	75°45.0'	S 16°04.4'	214°05.8'	S 16°04.4'	245°00.2'	S 2°46.5'	142°08.2'	S 22°07.2'	137°09.3'	S 21°11.2'	60°47.2'	N 4°52.1'
3	90°47.5'	S 16°05.1'	229°05.8'	S 16°05.1'	259°59.8'	S 2°47.6'	157°10.2'	S 22°07.1'	152°11.6'	S 21°11.2'	75°50.0'	N 4°52.2'
4	105°49.9'	S 16°05.8'	244°05.7'	S 16°05.8'	274°59.4'	S 2°48.8'	172°12.3'	S 22°07.0'	167°13.9'	S 21°11.1'	90°52.7'	N 4°52.2'
5	120°52.4'	S 16°06.6'	259°05.7'	S 16°06.6'	289°59.1'	S 2°50.0'	187°14.3'	S 22°07.0'	182°16.2'	S 21°11.1'	105°55.5'	N 4°52.3'
6	135°54.9'	S 16°07.3'	274°05.7'	S 16°07.3'	304°58.7'	S 2°51.1'	202°16.4'	S 22°06.9'	197°18.5'	S 21°11.1'	120°58.3'	N 4°52.3'
7	150°57.3'	S 16°08.1'	289°05.7'	S 16°08.1'	319°58.3'	S 2°52.3'	217°18.5'	S 22°06.9'	212°20.8'	S 21°11.1'	136°01.0'	N 4°52.4'
8	165°59.8'	S 16°08.8'	304°05.6'	S 16°08.8'	334°58.0'	S 2°53.4'	232°20.5'	S 22°06.8'	227°23.1'	S 21°11.0'	151°03.8'	N 4°52.4'
9	181°02.2'	S 16°09.6'	319°05.6'	S 16°09.6'	349°57.6'	S 2°54.6'	247°22.6'	S 22°06.7'	242°25.5'	S 21°11.0'	166°06.6'	N 4°52.5'
10	196°04.7'	S 16°10.3'	334°05.6'	S 16°10.3'	4°57.2'	S 2°55.8'	262°24.6'	S 22°06.7'	257°27.8'	S 21°11.0'	181°09.3'	N 4°52.5'
11	211°07.2'	S 16°11.0'	349°05.5'	S 16°11.0'	19°56.9'	S 2°56.9'	277°26.7'	S 22°06.6'	272°30.1'	S 21°10.9'	196°12.1'	N 4°52.6'
12	226°09.6'	S 16°11.8'	4°05.5'	S 16°11.8'	34°56.5'	S 2°58.1'	292°28.8'	S 22°06.6'	287°32.4'	S 21°10.9'	211°14.9'	N 4°52.6'
13	241°12.1'	S 16°12.5'	19°05.5'	S 16°12.5'	49°56.1'	S 2°59.2'	307°30.8'	S 22°06.5'	302°34.7'	S 21°10.9'	226°17.6'	N 4°52.7'
14	256°14.6'	S 16°13.3'	34°05.4'	S 16°13.3'	64°55.8'	S 3°00.4'	322°32.9'	S 22°06.4'	317°37.0'	S 21°10.9'	241°20.4'	N 4°52.7'
15	271°17.0'	S 16°14.0'	49°05.4'	S 16°14.0'	79°55.4'	S 3°01.6'	337°34.9'	S 22°06.4'	332°39.3'	S 21°10.8'	256°23.1'	N 4°52.8'
16	286°19.5'	S 16°14.7'	64°05.4'	S 16°14.7'	94°55.0'	S 3°02.7'	352°37.0'	S 22°06.3'	347°41.6'	S 21°10.8'	271°25.9'	N 4°52.9'
17	301°22.0'	S 16°15.5'	79°05.3'	S 16°15.5'	109°54.7'	S 3°03.9'	7°39.0'	S 22°06.3'	2°43.9'	S 21°10.8'	286°28.7'	N 4°52.9'
18	316°24.4'	S 16°16.2'	94°05.3'	S 16°16.2'	124°54.3'	S 3°05.0'	22°41.1'	S 22°06.2'	17°46.2'	S 21°10.8'	301°31.4'	N 4°53.0'
19	331°26.9'	S 16°17.0'	109°05.3'	S 16°17.0'	139°53.9'	S 3°06.2'	37°43.2'	S 22°06.1'	32°48.5'	S 21°10.7'	316°34.2'	N 4°53.0'
20	346°29.4'	S 16°17.7'	124°05.2'	S 16°17.7'	154°53.5'	S 3°07.4'	52°45.2'	S 22°06.1'	47°50.8'	S 21°10.7'	331°36.9'	N 4°53.1'
21	1°31.8'	S 16°18.4'	139°05.2'	S 16°18.4'	169°53.2'	S 3°08.5'	67°47.3'	S 22°06.0'	62°53.1'	S 21°10.7'	346°39.7'	N 4°53.1'
22	16°34.3'	S 16°19.2'	154°05.1'	S 16°19.2'	184°52.8'	S 3°09.7'	82°49.3'	S 22°06.0'	77°55.4'	S 21°10.6'	1°42.4'	N 4°53.2'
23	31°36.7'	S 16°19.9'	169°05.1'	S 16°19.9'	199°52.4'	S 3°10.8'	97°51.4'	S 22°05.9'	92°57.7'	S 21°10.6'	16°45.2'	N 4°53.3'
			SD 16.1' d -0.7'		v -0.4' d -1.2'		v 2.1' d 0.1'		v 2.3' d 0.0'		v 2.8' d 0.1'	
Mer. pass.			11 h 43 m 39 s		9 h 40 m		16 h 29 m		16 h 49 m		21 h 53 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Regulus	-Procyon	-Pollux	+Betelgeuse	+Capella	+Aldebaran	+Rigel
0	300°46.9'	N 24°47.6'	9.0'	-0.7'	55.6'		46°37.8'	21°56.0'	10°59.8'	23°02.1'	29°21.4'	34°12.7'	41°34.9'
1	315°14.9'	N 24°46.9'	9.0'	-0.8'	55.6'		46°06.7'		10°30.6'	23°23.4'	29°41.0'	34°43.6'	41°55.0'
2	329°42.9'	N 24°46.1'	9.0'	-0.9'	55.7'	119°33.3'	45°35.6'		10°01.6'	23°45.1'	30°00.9'	35°14.6'	42°15.3'
3	344°10.9'	N 24°45.2'	9.0'	-1.1'	55.7'	119°04.5'	45°04.5'		9°32.8'	24°07.2'	30°21.1'	35°45.7'	42°35.8'
4	358°38.9'	N 24°44.2'	8.9'	-1.2'	55.7'	118°35.7'	44°33.3'		9°04.2'	24°29.6'	30°41.6'	36°16.7'	42°56.5'
5	13°06.8'	N 24°43.0'	8.9'	-1.3'	55.7'	118°06.9'	44°02.1'		8°36.0'	24°52.3'	31°02.4'	36°47.8'	43°17.3'
6	27°34.8'	N 24°41.7'	8.9'	-1.4'	55.8'	117°38.1'	43°30.9'		8°08.1'	25°15.3'	31°23.4'	37°19.0'	43°38.4'
7	42°02.7'	N 24°40.2'	8.9'	-1.6'	55.8'	117°09.2'	42°59.7'		7°40.6'	25°38.6'	31°44.8'	37°50.1'	43°59.6'
8	56°30.6'	N 24°38.6'	8.9'	-1.7'	55.8'	116°40.3'	42°28.5'		7°13.6'	26°02.2'	32°06.4'	38°21.3'	44°21.1'
9	70°58.5'	N 24°36.9'	8.9'	-1.8'	55.8'	116°11.4'	41°57.2'		6°47.2'	26°26.1'	32°28.2'	38°52.6'	44°42.7'
10	85°26.3'	N 24°35.1'	8.9'	-2.0'	55.9'	115°42.5'	41°25.9'			26°50.3'	32°50.4'	39°23.8'	45°04.4'
11	99°54.2'	N 24°33.1'	8.8'	-2.1'	55.9'	115°13.5'	40°54.6'			27°14.7'	33°12.7'	39°55.1'	45°26.4'
12	114°22.0'	N 24°31.0'	8.8'	-2.2'	55.9'	114°44.5'	40°23.2'			27°39.3'	33°35.3'	40°26.4'	45°48.5'
13	128°49.9'	N 24°28.7'	8.8'	-2.4'	55.9'	114°15.4'	39°51.9'			28°04.2'	33°58.1'	40°57.8'	46°10.7'
14	143°17.7'	N 24°26.4'	8.8'	-2.5'	56.0'	113°46.4'	39°20.5'			28°29.3'	34°21.2'	41°29.2'	46°33.2'
15	157°45.5'	N 24°23.8'	8.8'	-2.6'	56.0'	113°17.3'	38°49.1'			28°54.6'	34°44.5'	42°00.6'	46°55.7'
16	172°13.3'	N 24°21.2'	8.8'	-2.8'	56.0'	112°48.2'	38°17.6'			29°20.1'	35°08.0'	42°32.1'	47°18.5'
17	186°41.1'	N 24°18.4'	8.8'	-2.9'	56.1'	112°19.0'	37°46.2'			29°45.9'	35°31.6'	43°03.6'	47°41.4'
18	201°08.9'	N 24°15.5'	8.8'	-3.0'	56.1'	111°49.8'	37°14.7'			30°11.8'	35°55.5'	43°35.1'	48°04.4'
19	215°36.7'	N 24°12.4'	8.8'	-3.2'	56.1'	111°20.6'	36°43.2'			30°37.9'	36°19.6'	44°06.7'	48°27.6'
20	230°04.5'	N 24°09.3'	8.8'	-3.3'	56.1'	110°51.4'	36°11.7'			31°04.2'	36°43.9'	44°38.3'	48°50.9'
21	244°32.3'	N 24°05.9'	8.8'	-3.5'	56.2'	110°22.1'	35°40.1'			31°30.7'	37°08.4'	45°09.9'	49°14.4'
22	259°00.0'	N 24°02.5'	8.8'	-3.6'	56.2'	109°52.8'	35°08.5'			31°57.4'	37°33.0'	45°41.5'	49°38.0'
23	273°27.8'	N 23°58.9'	8.8'	-3.7'	56.2'	109°23.5'	34°36.9'			32°24.2'	37°57.8'	46°13.2'	50°01.7'
Mer. pass.			4 h 6 m SD 15.2'		phase 75%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.6'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.2'	N 89°21.0'
Rigel Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars					
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec				
0	46°39.2'	184°05.1'	S	16°20.6'	214°52.1'	S	3°12.0'	112°53.4'	S	22°05.8'	108°00.0'	S	21°10.6'	31°47.9'	N	4°53.3'
1	61°41.7'	199°05.1'	S	16°21.4'	229°51.7'	S	3°13.2'	127°55.5'	S	22°05.8'	123°02.3'	S	21°10.6'	46°50.7'	N	4°53.4'
2	76°44.1'	214°05.0'	S	16°22.1'	244°51.3'	S	3°14.3'	142°57.5'	S	22°05.7'	138°04.6'	S	21°10.5'	61°53.4'	N	4°53.4'
3	91°46.6'	229°05.0'	S	16°22.8'	259°51.0'	S	3°15.5'	157°59.6'	S	22°05.7'	153°06.9'	S	21°10.5'	76°56.1'	N	4°53.5'
4	106°49.1'	244°05.0'	S	16°23.6'	274°50.6'	S	3°16.6'	173°01.7'	S	22°05.6'	168°09.2'	S	21°10.5'	91°58.9'	N	4°53.6'
5	121°51.5'	259°04.9'	S	16°24.3'	289°50.2'	S	3°17.8'	188°03.7'	S	22°05.5'	183°11.5'	S	21°10.5'	107°01.6'	N	4°53.6'
6	136°54.0'	274°04.9'	S	16°25.0'	304°49.9'	S	3°18.9'	203°05.8'	S	22°05.5'	198°13.8'	S	21°10.4'	122°04.4'	N	4°53.7'
7	151°56.5'	289°04.9'	S	16°25.8'	319°49.5'	S	3°20.1'	218°07.8'	S	22°05.4'	213°16.1'	S	21°10.4'	137°07.1'	N	4°53.8'
8	166°58.9'	304°04.8'	S	16°26.5'	334°49.1'	S	3°21.3'	233°09.9'	S	22°05.4'	228°18.4'	S	21°10.4'	152°09.8'	N	4°53.8'
9	182°01.4'	319°04.8'	S	16°27.2'	349°48.7'	S	3°22.4'	248°11.9'	S	22°05.3'	243°20.7'	S	21°10.3'	167°12.6'	N	4°53.9'
10	197°03.8'	334°04.7'	S	16°28.0'	4°48.4'	S	3°23.6'	263°14.0'	S	22°05.2'	258°23.0'	S	21°10.3'	182°15.3'	N	4°53.9'
11	212°06.3'	349°04.7'	S	16°28.7'	19°48.0'	S	3°24.7'	278°16.0'	S	22°05.2'	273°25.3'	S	21°10.3'	197°18.0'	N	4°54.0'
12	227°08.8'	4°04.7'	S	16°29.4'	34°47.6'	S	3°25.9'	293°18.1'	S	22°05.1'	288°27.6'	S	21°10.3'	212°20.8'	N	4°54.1'
13	242°11.2'	19°04.6'	S	16°30.1'	49°47.3'	S	3°27.1'	308°20.1'	S	22°05.1'	303°29.9'	S	21°10.2'	227°23.5'	N	4°54.1'
14	257°13.7'	34°04.6'	S	16°30.9'	64°46.9'	S	3°28.2'	323°22.2'	S	22°05.0'	318°32.2'	S	21°10.2'	242°26.2'	N	4°54.2'
15	272°16.2'	49°04.5'	S	16°31.6'	79°46.5'	S	3°29.4'	338°24.2'	S	22°04.9'	333°34.5'	S	21°10.2'	257°28.9'	N	4°54.3'
16	287°18.6'	64°04.5'	S	16°32.3'	94°46.1'	S	3°30.5'	353°26.3'	S	22°04.9'	348°36.8'	S	21°10.1'	272°31.7'	N	4°54.3'
17	302°21.1'	79°04.5'	S	16°33.1'	109°45.8'	S	3°31.7'	8°28.3'	S	22°04.8'	3°39.1'	S	21°10.1'	287°34.4'	N	4°54.4'
18	317°23.6'	94°04.4'	S	16°33.8'	124°45.4'	S	3°32.9'	23°30.4'	S	22°04.7'	18°41.4'	S	21°10.1'	302°37.1'	N	4°54.5'
19	332°26.0'	109°04.4'	S	16°34.5'	139°45.0'	S	3°34.0'	38°32.5'	S	22°04.7'	33°43.7'	S	21°10.1'	317°39.8'	N	4°54.6'
20	347°28.5'	124°04.3'	S	16°35.2'	154°44.7'	S	3°35.2'	53°34.5'	S	22°04.6'	48°46.0'	S	21°10.0'	332°42.6'	N	4°54.6'
21	2°31.0'	139°04.3'	S	16°36.0'	169°44.3'	S	3°36.3'	68°36.6'	S	22°04.6'	63°48.3'	S	21°10.0'	347°45.3'	N	4°54.7'
22	17°33.4'	154°04.2'	S	16°36.7'	184°43.9'	S	3°37.5'	83°38.6'	S	22°04.5'	78°50.6'	S	21°10.0'	2°48.0'	N	4°54.8'
23	32°35.9'	169°04.2'	S	16°37.4'	199°43.5'	S	3°38.7'	98°40.7'	S	22°04.4'	93°52.9'	S	21°10.0'	17°50.7'	N	4°54.8'
		SD 16.1'	d -0.7'		v -0.4'	d -1.2'		v 2.1'	d 0.1'		v 2.3'	d 0.0'		v 2.7'	d 0.1'	
Mer. pass.		11 h 43 m 42 s			9 h 41 m			16 h 26 m			16 h 45 m			21 h 49 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Arcturus	-Venus	-Regulus	+Pollux	+Procyon	+Betelgeuse	+Capella
0	287°55.6'	N 23°55.2'	8.8'	-3.9'	56.3'	108°54.1'	87°04.7'	75°55.1'	34°05.3'			32°51.2'	38°22.8'
1	302°23.4'	N 23°51.3'	8.8'	-4.0'	56.3'	108°24.7'	86°36.1'	75°26.2'	33°33.7'			33°18.3'	38°48.0'
2	316°51.2'	N 23°47.4'	8.8'	-4.1'	56.3'	107°55.3'	86°07.4'	74°57.3'	33°02.0'			33°45.6'	39°13.3'
3	331°18.9'	N 23°43.2'	8.8'	-4.3'	56.3'	107°25.8'	85°38.8'	74°28.4'	32°30.3'			34°13.0'	39°38.8'
4	345°46.7'	N 23°39.0'	8.8'	-4.4'	56.4'	106°56.4'	85°10.1'	73°59.5'	31°58.6'			34°40.6'	40°04.4'
5	0°14.5'	N 23°34.6'	8.8'	-4.5'	56.4'	106°26.8'	84°41.4'	73°30.5'	31°26.9'			35°08.3'	40°30.2'
6	14°42.3'	N 23°30.1'	8.8'	-4.6'	56.4'	105°57.3'	84°12.7'	73°01.5'	30°55.2'			35°36.2'	40°56.2'
7	29°10.1'	N 23°25.4'	8.8'	-4.8'	56.5'	105°27.7'	83°43.9'	72°32.5'	30°23.4'	7°09.2'		36°04.2'	41°22.3'
8	43°37.9'	N 23°20.7'	8.8'	-4.9'	56.5'	104°58.1'	83°15.1'	72°03.4'	29°51.6'	7°36.7'		36°32.3'	41°48.5'
9	58°05.7'	N 23°15.8'	8.8'	-5.0'	56.5'	104°28.4'	82°46.3'	71°34.3'	29°19.8'	8°04.8'		37°00.5'	42°14.9'
10	72°33.5'	N 23°10.7'	8.8'	-5.2'	56.6'	103°58.7'	82°17.5'	71°05.2'	28°48.0'	8°33.4'		37°28.8'	42°41.4'
11	87°01.3'	N 23°05.5'	8.8'	-5.3'	56.6'	103°29.0'	81°48.6'	70°36.0'	28°16.1'	9°02.5'		37°57.3'	43°08.0'
12	101°29.2'	N 23°00.2'	8.8'	-5.4'	56.6'	102°59.2'	81°19.8'	70°06.8'	27°44.3'	9°31.9'		38°25.9'	43°34.8'
13	115°57.0'	N 22°54.8'	8.9'	-5.6'	56.6'	102°29.5'	80°50.9'	69°37.6'	27°12.4'	10°01.6'		38°54.6'	44°01.7'
14	130°24.9'	N 22°49.2'	8.9'	-5.7'	56.7'	101°59.6'	80°22.0'	69°08.3'	26°40.5'	10°31.6'		39°23.4'	44°28.7'
15	144°52.7'	N 22°43.5'	8.9'	-5.8'	56.7'	101°29.8'	79°53.0'	68°39.0'	26°08.6'	11°01.9'		39°52.3'	44°55.8'
16	159°20.6'	N 22°37.7'	8.9'	-6.0'	56.7'	100°59.9'	79°24.1'	68°09.7'	25°36.6'	11°32.4'	21°25.9'	40°21.4'	45°23.1'
17	173°48.5'	N 22°31.7'	8.9'	-6.1'	56.8'	100°29.9'	78°55.1'	67°40.3'	25°04.7'	12°03.1'	21°41.0'	40°50.5'	45°50.5'
18	188°16.4'	N 22°25.6'	8.9'	-6.2'	56.8'	99°60.0'	78°26.1'	67°10.9'	24°32.7'	12°34.0'	21°56.6'	41°19.7'	46°18.0'
19	202°44.3'	N 22°19.4'	8.9'	-6.3'	56.8'	99°30.0'	77°57.1'	66°41.5'	24°00.7'	13°05.1'	22°12.8'	41°49.0'	46°45.6'
20	217°12.2'	N 22°13.1'	8.9'	-6.5'	56.9'	98°59.9'	77°28.1'	66°12.0'	23°28.8'	13°36.3'	22°29.6'	42°18.4'	47°13.3'
21	231°40.2'	N 22°06.6'	9.0'	-6.6'	56.9'	98°29.9'	76°59.1'	65°42.5'	22°56.8'	14°07.6'	22°47.0'	42°48.0'	47°41.1'
22	246°08.1'	N 21°60.0'	9.0'	-6.7'	56.9'	97°59.8'	76°30.0'	65°12.9'	22°24.8'	14°39.1'	23°04.9'	43°17.6'	48°09.1'
23	260°36.1'	N 21°53.3'	9.0'	-6.9'	57.0'	97°29.6'	76°00.9'	64°43.3'	21°52.8'	15°10.6'	23°23.3'	43°47.3'	48°37.1'
Mer. pass.		4 h 59 m SD 15.3'	phase 66%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.4'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.1'	N 89°21.0'
Rigil Kent	-0.0	139°45.6'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	47°38.3'	184°04.2'	S 16°38.1'	214°43.2'	S 3°39.8'	113°42.7'	S 22°04.4'	108°55.2'	S 21°09.9'	32°53.4'	N 4°54.9'	
1	62°40.8'	199°04.1'	S 16°38.9'	229°42.8'	S 3°41.0'	128°44.8'	S 22°04.3'	123°57.5'	S 21°09.9'	47°56.1'	N 4°55.0'	
2	77°43.3'	214°04.1'	S 16°39.6'	244°42.4'	S 3°42.1'	143°46.8'	S 22°04.3'	138°59.8'	S 21°09.9'	62°58.9'	N 4°55.0'	
3	92°45.7'	229°04.0'	S 16°40.3'	259°42.0'	S 3°43.3'	158°48.9'	S 22°04.2'	154°02.1'	S 21°09.8'	78°01.6'	N 4°55.1'	
4	107°48.2'	244°04.0'	S 16°41.0'	274°41.7'	S 3°44.4'	173°50.9'	S 22°04.1'	169°04.4'	S 21°09.8'	93°04.3'	N 4°55.2'	
5	122°50.7'	259°03.9'	S 16°41.7'	289°41.3'	S 3°45.6'	188°53.0'	S 22°04.1'	184°06.7'	S 21°09.8'	108°07.0'	N 4°55.3'	
6	137°53.1'	274°03.9'	S 16°42.5'	304°40.9'	S 3°46.8'	203°55.0'	S 22°04.0'	199°09.0'	S 21°09.8'	123°09.7'	N 4°55.3'	
7	152°55.6'	289°03.8'	S 16°43.2'	319°40.5'	S 3°47.9'	218°57.1'	S 22°04.0'	214°11.3'	S 21°09.7'	138°12.4'	N 4°55.4'	
8	167°58.1'	304°03.8'	S 16°43.9'	334°40.2'	S 3°49.1'	233°59.1'	S 22°03.9'	229°13.6'	S 21°09.7'	153°15.1'	N 4°55.5'	
9	183°00.5'	319°03.7'	S 16°44.6'	349°39.8'	S 3°50.2'	249°01.1'	S 22°03.8'	244°15.9'	S 21°09.7'	168°17.8'	N 4°55.6'	
10	198°03.0'	334°03.7'	S 16°45.3'	4°39.4'	S 3°51.4'	264°03.2'	S 22°03.8'	259°18.2'	S 21°09.6'	183°20.5'	N 4°55.6'	
11	213°05.5'	349°03.6'	S 16°46.1'	19°39.0'	S 3°52.6'	279°05.2'	S 22°03.7'	274°20.5'	S 21°09.6'	198°23.2'	N 4°55.7'	
12	228°07.9'	4°03.6'	S 16°46.8'	34°38.7'	S 3°53.7'	294°07.3'	S 22°03.6'	289°22.8'	S 21°09.6'	213°25.9'	N 4°55.8'	
13	243°10.4'	19°03.5'	S 16°47.5'	49°38.3'	S 3°54.9'	309°09.3'	S 22°03.6'	304°25.1'	S 21°09.6'	228°28.6'	N 4°55.9'	
14	258°12.8'	34°03.5'	S 16°48.2'	64°37.9'	S 3°56.0'	324°11.4'	S 22°03.5'	319°27.4'	S 21°09.5'	243°31.3'	N 4°55.9'	
15	273°15.3'	49°03.4'	S 16°48.9'	79°37.5'	S 3°57.2'	339°13.4'	S 22°03.5'	334°29.7'	S 21°09.5'	258°34.0'	N 4°56.0'	
16	288°17.8'	64°03.4'	S 16°49.6'	94°37.1'	S 3°58.3'	354°15.5'	S 22°03.4'	349°32.0'	S 21°09.5'	273°36.7'	N 4°56.1'	
17	303°20.2'	79°03.3'	S 16°50.4'	109°36.8'	S 3°59.5'	9°17.5'	S 22°03.3'	4°34.3'	S 21°09.4'	288°39.4'	N 4°56.2'	
18	318°22.7'	94°03.3'	S 16°51.1'	124°36.4'	S 4°00.7'	24°19.6'	S 22°03.3'	19°36.6'	S 21°09.4'	303°42.1'	N 4°56.3'	
19	333°25.2'	109°03.2'	S 16°51.8'	139°36.0'	S 4°01.8'	39°21.6'	S 22°03.2'	34°38.9'	S 21°09.4'	318°44.8'	N 4°56.3'	
20	348°27.6'	124°03.2'	S 16°52.5'	154°35.6'	S 4°03.0'	54°23.7'	S 22°03.1'	49°41.2'	S 21°09.4'	333°47.4'	N 4°56.4'	
21	3°30.1'	139°03.1'	S 16°53.2'	169°35.3'	S 4°04.1'	69°25.7'	S 22°03.1'	64°43.5'	S 21°09.3'	348°50.1'	N 4°56.5'	
22	18°32.6'	154°03.1'	S 16°53.9'	184°34.9'	S 4°05.3'	84°27.8'	S 22°03.0'	79°45.7'	S 21°09.3'	3°52.8'	N 4°56.6'	
23	33°35.0'	169°03.0'	S 16°54.6'	199°34.5'	S 4°06.4'	99°29.8'	S 22°03.0'	94°48.0'	S 21°09.3'	18°55.5'	N 4°56.7'	
		SD 16.1'	d -0.7'	v -0.4'	d -1.2'	v 2.0'	d 0.1'	v 2.3'	d 0.0'	v 2.7'	d 0.1'	
Mer. pass.		11 h 43 m 46 s		9 h 41 m		16 h 23 m		16 h 42 m		21 h 45 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Spica	-Venus	-Regulus	+Pollux	+Procyon	+Betelgeuse	+Sirius
0	275°04.1'	N 21°46.4'	9.0'	-7.0'	57.0'	96°59.4'	75°17.0'	64°13.7'	21°20.8'	15°42.3'	23°42.3'	44°17.1'	49°04.9'
1	289°32.1'	N 21°39.4'	9.0'	-7.1'	57.0'	96°29.2'	74°44.5'	63°44.1'	20°48.8'	16°14.1'	24°01.7'	44°46.9'	49°20.7'
2	304°00.1'	N 21°32.3'	9.0'	-7.2'	57.1'	95°59.0'	74°11.9'	63°14.4'	20°16.8'	16°46.0'	24°21.6'	45°16.9'	49°36.8'
3	318°28.2'	N 21°25.1'	9.1'	-7.4'	57.1'	95°28.7'	73°39.3'	62°44.6'	19°44.8'	17°18.0'	24°42.0'	45°47.0'	49°53.0'
4	332°56.2'	N 21°17.7'	9.1'	-7.5'	57.1'	94°58.3'	73°06.6'	62°14.9'	19°12.8'	17°50.1'	25°02.8'	46°17.1'	50°09.5'
5	347°24.3'	N 21°10.2'	9.1'	-7.6'	57.2'	94°28.0'	72°33.9'	61°45.1'	18°40.8'	18°22.2'	25°24.0'	46°47.3'	50°26.1'
6	1°52.4'	N 21°02.6'	9.1'	-7.7'	57.2'	93°57.5'	72°01.2'	61°15.2'	18°08.8'	18°54.4'	25°45.6'	47°17.6'	50°43.0'
7	16°20.5'	N 20°54.9'	9.1'	-7.9'	57.2'	93°27.1'	71°28.4'	60°45.3'	17°36.9'	19°26.7'	26°07.6'	47°48.0'	51°00.1'
8	30°48.6'	N 20°47.0'	9.2'	-8.0'	57.3'	92°56.6'	70°55.6'	60°15.4'	17°05.0'	19°59.1'	26°30.0'	48°18.4'	51°17.4'
9	45°16.8'	N 20°39.0'	9.2'	-8.1'	57.3'	92°26.1'	70°22.8'	59°45.5'	16°33.1'	20°31.6'	26°52.8'	48°49.0'	51°34.9'
10	59°44.9'	N 20°30.9'	9.2'	-8.2'	57.3'	91°55.5'	69°49.9'	59°15.5'	16°01.3'	21°04.1'	27°15.9'	49°19.6'	51°52.7'
11	74°13.1'	N 20°22.7'	9.2'	-8.3'	57.4'	91°24.9'	69°17.0'	58°45.4'	15°29.5'	21°36.7'	27°39.4'	49°50.3'	52°10.6'
12	88°41.3'	N 20°14.4'	9.2'	-8.5'	57.4'	90°54.3'	68°44.0'	58°15.4'	14°57.8'	22°09.3'	28°03.1'	50°21.0'	52°28.7'
13	103°09.6'	N 20°05.9'	9.3'	-8.6'	57.4'	90°23.6'	68°11.1'	57°45.2'	14°26.1'	22°42.1'	28°27.2'	50°51.9'	52°47.0'
14	117°37.8'	N 19°57.3'	9.3'	-8.7'	57.5'	89°52.9'	67°38.0'	57°15.1'	13°54.6'	23°14.8'	28°51.7'	51°22.8'	53°05.5'
15	132°06.1'	N 19°48.6'	9.3'	-8.8'	57.5'	89°22.1'	67°05.0'	56°44.9'	13°23.1'	23°47.7'	29°16.4'	51°53.7'	53°24.2'
16	146°34.4'	N 19°39.8'	9.3'	-8.9'	57.5'	88°51.3'	66°31.9'	56°14.7'	12°51.7'	24°20.6'	29°41.4'	52°24.8'	53°43.0'
17	161°02.7'	N 19°30.8'	9.3'	-9.1'	57.6'	88°20.5'	65°58.7'	55°44.4'	12°20.5'	24°53.5'	30°06.6'	52°55.9'	54°02.1'
18	175°31.1'	N 19°21.7'	9.4'	-9.2'	57.6'	87°49.6'	65°25.5'	55°14.1'	11°49.4'	25°26.6'	30°32.2'	53°27.1'	54°21.3'
19	189°59.4'	N 19°12.6'	9.4'	-9.3'	57.6'	87°18.6'	64°52.3'	54°43.7'	11°18.5'	25°59.6'	30°58.0'	53°58.4'	54°40.7'
20	204°27.8'	N 19°03.3'	9.4'	-9.4'	57.7'	86°47.7'	64°19.1'	54°13.4'	10°47.8'	26°32.8'	31°24.0'	54°29.7'	55°00.3'
21	218°56.2'	N 18°53.9'	9.4'	-9.5'	57.7'	86°16.7'	63°45.8'	53°42.9'	10°17.4'	27°05.9'	31°50.3'	55°01.1'	55°20.1'
22	233°24.7'	N 18°44.3'	9.5'	-9.6'	57.7'	85°45.6'	63°12.4'	53°12.5'	9°47.3'	27°39.2'	32°16.8'	55°32.6'	55°40.0'
23	247°53.1'	N 18°34.7'	9.5'	-9.8'	57.8'	85°14.5'	62°39.1'	52°41.9'	9°17.5'	28°12.5'	32°43.6'	56°04.1'	56°00.1'
Mer. pass.		5 h 52 m SD 15.5'	phase 56%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.1'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.9'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.0'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.0'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				



h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	48°37.5'	184°03.0'	S 16°55.3'	214°34.1'	S 4°07.6'	114°31.8'	S 22°02.9'	109°50.3'	S 21°09.2'	33°58.2'	N 4°56.7'	
1	63°40.0'	199°02.9'	S 16°56.1'	229°33.7'	S 4°08.8'	129°33.9'	S 22°02.8'	124°52.6'	S 21°09.2'	49°00.9'	N 4°56.8'	
2	78°42.4'	214°02.9'	S 16°56.8'	244°33.4'	S 4°09.9'	144°35.9'	S 22°02.8'	139°54.9'	S 21°09.2'	64°03.5'	N 4°56.9'	
3	93°44.9'	229°02.8'	S 16°57.5'	259°33.0'	S 4°11.1'	159°38.0'	S 22°02.7'	154°57.2'	S 21°09.2'	79°06.2'	N 4°57.0'	
4	108°47.3'	244°02.8'	S 16°58.2'	274°32.6'	S 4°12.2'	174°40.0'	S 22°02.6'	169°59.5'	S 21°09.1'	94°08.9'	N 4°57.1'	
5	123°49.8'	259°02.7'	S 16°58.9'	289°32.2'	S 4°13.4'	189°42.1'	S 22°02.6'	185°01.8'	S 21°09.1'	109°11.6'	N 4°57.2'	
6	138°52.3'	274°02.7'	S 16°59.6'	304°31.8'	S 4°14.5'	204°44.1'	S 22°02.5'	200°04.1'	S 21°09.1'	124°14.3'	N 4°57.2'	
7	153°54.7'	289°02.6'	S 17°00.3'	319°31.5'	S 4°15.7'	219°46.2'	S 22°02.5'	215°06.4'	S 21°09.0'	139°16.9'	N 4°57.3'	
8	168°57.2'	304°02.5'	S 17°01.0'	334°31.1'	S 4°16.9'	234°48.2'	S 22°02.4'	230°08.7'	S 21°09.0'	154°19.6'	N 4°57.4'	
9	183°59.7'	319°02.5'	S 17°01.7'	349°30.7'	S 4°18.0'	249°50.2'	S 22°02.3'	245°11.0'	S 21°09.0'	169°22.3'	N 4°57.5'	
10	199°02.1'	334°02.4'	S 17°02.4'	4°30.3'	S 4°19.2'	264°52.3'	S 22°02.3'	260°13.3'	S 21°08.9'	184°24.9'	N 4°57.6'	
11	214°04.6'	349°02.4'	S 17°03.1'	19°29.9'	S 4°20.3'	279°54.3'	S 22°02.2'	275°15.6'	S 21°08.9'	199°27.6'	N 4°57.7'	
12	229°07.1'	4°02.3'	S 17°03.8'	34°29.6'	S 4°21.5'	294°56.4'	S 22°02.1'	290°17.9'	S 21°08.9'	214°30.3'	N 4°57.8'	
13	244°09.5'	19°02.3'	S 17°04.6'	49°29.2'	S 4°22.6'	309°58.4'	S 22°02.1'	305°20.2'	S 21°08.9'	229°32.9'	N 4°57.8'	
14	259°12.0'	34°02.2'	S 17°05.3'	64°28.8'	S 4°23.8'	325°00.4'	S 22°02.0'	320°22.5'	S 21°08.8'	244°35.6'	N 4°57.9'	
15	274°14.4'	49°02.1'	S 17°06.0'	79°28.4'	S 4°25.0'	340°02.5'	S 22°01.9'	335°24.7'	S 21°08.8'	259°38.3'	N 4°58.0'	
16	289°16.9'	64°02.1'	S 17°06.7'	94°28.0'	S 4°26.1'	355°04.5'	S 22°01.9'	350°27.0'	S 21°08.8'	274°40.9'	N 4°58.1'	
17	304°19.4'	79°02.0'	S 17°07.4'	109°27.6'	S 4°27.3'	10°06.6'	S 22°01.8'	5°29.3'	S 21°08.7'	289°43.6'	N 4°58.2'	
18	319°21.8'	94°02.0'	S 17°08.1'	124°27.3'	S 4°28.4'	25°08.6'	S 22°01.8'	20°31.6'	S 21°08.7'	304°46.2'	N 4°58.3'	
19	334°24.3'	109°01.9'	S 17°08.8'	139°26.9'	S 4°29.6'	40°10.7'	S 22°01.7'	35°33.9'	S 21°08.7'	319°48.9'	N 4°58.4'	
20	349°26.8'	124°01.8'	S 17°09.5'	154°26.5'	S 4°30.7'	55°12.7'	S 22°01.6'	50°36.2'	S 21°08.7'	334°51.6'	N 4°58.5'	
21	4°29.2'	139°01.8'	S 17°10.2'	169°26.1'	S 4°31.9'	70°14.7'	S 22°01.6'	65°38.5'	S 21°08.6'	349°54.2'	N 4°58.6'	
22	19°31.7'	154°01.7'	S 17°10.9'	184°25.7'	S 4°33.0'	85°16.8'	S 22°01.5'	80°40.8'	S 21°08.6'	4°56.9'	N 4°58.7'	
23	34°34.2'	169°01.7'	S 17°11.6'	199°25.3'	S 4°34.2'	100°18.8'	S 22°01.4'	95°43.1'	S 21°08.6'	19°59.5'	N 4°58.7'	
		SD 16.1'	d -0.7'	v -0.4'	d -1.2'	v 2.0'	d 0.1'	v 2.3'	d 0.0'	v 2.7'	d 0.1'	
Mer. pass.		11 h 43 m 51 s		9 h 42 m		16 h 20 m		16 h 38 m		21 h 40 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Spica	-Venus	-Regulus	+Pollux	+Procyon	+Sirius	+Betelgeuse
0	262°21.6'	N 18°24.9'	9.5'	-9.9'	57.8'	84°43.4'	62°05.6'	52°11.4'	8°48.2'	28°45.8'	33°10.5'	56°20.4'	56°35.7'
1	276°50.1'	N 18°15.1'	9.5'	-10.0'	57.9'	84°12.2'	61°32.2'	51°40.8'	8°19.4'	29°19.2'	33°37.7'	56°40.8'	57°07.4'
2	291°18.6'	N 18°05.1'	9.5'	-10.1'	57.9'	83°41.0'	60°58.7'	51°10.2'	7°51.1'	29°52.7'	34°05.1'	57°01.4'	57°39.1'
3	305°47.1'	N 17°55.0'	9.6'	-10.2'	57.9'	83°09.8'	60°25.2'	50°39.5'		30°26.2'	34°32.7'	57°22.2'	58°10.9'
4	320°15.7'	N 17°44.8'	9.6'	-10.3'	58.0'	82°38.5'	59°51.6'	50°08.8'		30°59.7'	35°00.5'	57°43.1'	58°42.7'
5	334°44.3'	N 17°34.5'	9.6'	-10.4'	58.0'	82°07.1'	59°18.0'	49°38.0'		31°33.3'	35°28.4'	58°04.2'	59°14.6'
6	349°12.9'	N 17°24.1'	9.6'	-10.5'	58.0'	81°35.7'	58°44.4'	49°07.2'		32°07.0'	35°56.6'	58°25.4'	59°46.6'
7	3°41.5'	N 17°13.5'	9.7'	-10.6'	58.1'	81°04.3'	58°10.7'	48°36.4'		32°40.7'	36°24.9'	58°46.8'	60°18.7'
8	18°10.2'	N 17°02.9'	9.7'	-10.7'	58.1'	80°32.8'	57°37.0'	48°05.5'		33°14.5'	36°53.4'	59°08.3'	60°50.8'
9	32°38.8'	N 16°52.1'	9.7'	-10.9'	58.1'	80°01.3'	57°03.2'	47°34.6'		33°48.3'	37°22.1'	59°30.0'	61°22.9'
10	47°07.5'	N 16°41.3'	9.7'	-11.0'	58.2'	79°29.8'	56°29.4'	47°03.6'		34°22.2'	37°50.9'	59°51.8'	61°55.2'
11	61°36.3'	N 16°30.3'	9.7'	-11.1'	58.2'	78°58.1'	55°55.6'	46°32.6'		34°56.1'	38°19.9'	60°13.8'	62°27.5'
12	76°05.0'	N 16°19.3'	9.8'	-11.2'	58.2'	78°26.5'	55°21.7'	46°01.5'		35°30.0'	38°49.1'	60°35.9'	62°59.8'
13	90°33.8'	N 16°08.1'	9.8'	-11.3'	58.3'	77°54.8'	54°47.8'	45°30.4'		36°04.0'	39°18.4'	60°58.2'	63°32.2'
14	105°02.5'	N 15°56.8'	9.8'	-11.4'	58.3'	77°23.1'	54°13.8'	44°59.3'		36°38.1'	39°47.8'	61°20.6'	64°04.7'
15	119°31.3'	N 15°45.5'	9.8'	-11.5'	58.4'	76°51.3'	53°39.8'	44°28.1'		37°12.2'	40°17.4'	61°43.1'	64°37.2'
16	134°00.2'	N 15°34.0'	9.8'	-11.6'	58.4'	76°19.5'	53°05.8'	43°56.9'		37°46.4'	40°47.2'	62°05.7'	65°09.8'
17	148°29.0'	N 15°22.4'	9.9'	-11.7'	58.4'	75°47.6'	52°31.7'	43°25.6'		38°20.6'	41°17.0'	62°28.5'	65°42.4'
18	162°57.9'	N 15°10.8'	9.9'	-11.8'	58.5'	75°15.7'	51°57.6'	42°54.3'		38°54.8'	41°47.0'	62°51.4'	66°15.1'
19	177°26.7'	N 14°59.0'	9.9'	-11.9'	58.5'	74°43.8'	51°23.4'	42°23.0'		39°29.1'	42°17.2'	63°14.5'	66°47.9'
20	191°55.6'	N 14°47.1'	9.9'	-12.0'	58.5'	74°11.8'	50°49.3'	41°51.6'		40°03.5'	42°47.4'	63°37.7'	67°20.7'
21	206°24.5'	N 14°35.2'	9.9'	-12.1'	58.6'	73°39.7'	50°15.0'	41°20.2'		40°37.9'	43°17.8'	64°00.9'	67°53.5'
22	220°53.5'	N 14°23.1'	10.0'	-12.1'	58.6'	73°07.7'	49°40.8'	40°48.7'		41°12.3'	43°48.4'	64°24.4'	68°26.4'
23	235°22.4'	N 14°11.0'	10.0'	-12.2'	58.6'	72°35.5'	49°06.5'	40°17.2'		41°46.8'	44°19.0'	64°47.9'	68°59.4'
Mer. pass.		6 h 45 m SD 15.8'	phase 45%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°15.9'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.2'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.3'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.0'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

Tuesday 10 November 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars				
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec			
0	49°36.6'	184°01.6'	S 17°12.3'	214°25.0'	S 4°35.4'	115°20.9'	S 22°01.4'	110°45.4'	S 21°08.5'	35°02.2'	N 4°58.8'				
1	64°39.1'	199°01.5'	S 17°13.0'	229°24.6'	S 4°36.5'	130°22.9'	S 22°01.3'	125°47.7'	S 21°08.5'	50°04.8'	N 4°58.9'				
2	79°41.6'	214°01.5'	S 17°13.7'	244°24.2'	S 4°37.7'	145°24.9'	S 22°01.2'	140°50.0'	S 21°08.5'	65°07.5'	N 4°59.0'				
3	94°44.0'	229°01.4'	S 17°14.4'	259°23.8'	S 4°38.8'	160°27.0'	S 22°01.2'	155°52.2'	S 21°08.4'	80°10.1'	N 4°59.1'				
4	109°46.5'	244°01.3'	S 17°15.1'	274°23.4'	S 4°40.0'	175°29.0'	S 22°01.1'	170°54.5'	S 21°08.4'	95°12.8'	N 4°59.2'				
5	124°48.9'	259°01.3'	S 17°15.8'	289°23.0'	S 4°41.1'	190°31.1'	S 22°01.1'	185°56.8'	S 21°08.4'	110°15.4'	N 4°59.3'				
6	139°51.4'	274°01.2'	S 17°16.5'	304°22.7'	S 4°42.3'	205°33.1'	S 22°01.0'	200°59.1'	S 21°08.4'	125°18.1'	N 4°59.4'				
7	154°53.9'	289°01.1'	S 17°17.2'	319°22.3'	S 4°43.4'	220°35.1'	S 22°00.9'	216°01.4'	S 21°08.3'	140°20.7'	N 4°59.5'				
8	169°56.3'	304°01.1'	S 17°17.9'	334°21.9'	S 4°44.6'	235°37.2'	S 22°00.9'	231°03.7'	S 21°08.3'	155°23.3'	N 4°59.6'				
9	184°58.8'	319°01.0'	S 17°18.6'	349°21.5'	S 4°45.7'	250°39.2'	S 22°00.8'	246°06.0'	S 21°08.3'	170°26.0'	N 4°59.7'				
10	200°01.3'	334°01.0'	S 17°19.2'	4°21.1'	S 4°46.9'	265°41.2'	S 22°00.7'	261°08.3'	S 21°08.2'	185°28.6'	N 4°59.8'				
11	215°03.7'	349°00.9'	S 17°19.9'	19°20.7'	S 4°48.1'	280°43.3'	S 22°00.7'	276°10.6'	S 21°08.2'	200°31.2'	N 4°59.9'				
12	230°06.2'	4°00.8'	S 17°20.6'	34°20.3'	S 4°49.2'	295°45.3'	S 22°00.6'	291°12.9'	S 21°08.2'	215°33.9'	N 4°60.0'				
13	245°08.7'	19°00.8'	S 17°21.3'	49°19.9'	S 4°50.4'	310°47.4'	S 22°00.5'	306°15.1'	S 21°08.1'	230°36.5'	N 4°60.1'				
14	260°11.1'	34°00.7'	S 17°22.0'	64°19.6'	S 4°51.5'	325°49.4'	S 22°00.5'	321°17.4'	S 21°08.1'	245°39.1'	N 5°00.2'				
15	275°13.6'	49°00.6'	S 17°22.7'	79°19.2'	S 4°52.7'	340°51.4'	S 22°00.4'	336°19.7'	S 21°08.1'	260°41.8'	N 5°00.3'				
16	290°16.1'	64°00.5'	S 17°23.4'	94°18.8'	S 4°53.8'	355°53.5'	S 22°00.3'	351°22.0'	S 21°08.1'	275°44.4'	N 5°00.4'				
17	305°18.5'	79°00.5'	S 17°24.1'	109°18.4'	S 4°55.0'	10°55.5'	S 22°00.3'	6°24.3'	S 21°08.0'	290°47.0'	N 5°00.5'				
18	320°21.0'	94°00.4'	S 17°24.8'	124°18.0'	S 4°56.1'	25°57.5'	S 22°00.2'	21°26.6'	S 21°08.0'	305°49.7'	N 5°00.6'				
19	335°23.4'	109°00.3'	S 17°25.5'	139°17.6'	S 4°57.3'	40°59.6'	S 22°00.2'	36°28.9'	S 21°08.0'	320°52.3'	N 5°00.7'				
20	350°25.9'	124°00.3'	S 17°26.2'	154°17.2'	S 4°58.4'	56°01.6'	S 22°00.1'	51°31.2'	S 21°07.9'	335°54.9'	N 5°00.8'				
21	5°28.4'	139°00.2'	S 17°26.9'	169°16.8'	S 4°59.6'	71°03.6'	S 22°00.0'	66°33.5'	S 21°07.9'	350°57.5'	N 5°00.9'				
22	20°30.8'	154°00.1'	S 17°27.5'	184°16.4'	S 5°00.8'	86°05.7'	S 21°60.0'	81°35.7'	S 21°07.9'	6°00.2'	N 5°01.0'				
23	35°33.3'	169°00.1'	S 17°28.2'	199°16.1'	S 5°01.9'	101°07.7'	S 21°59.9'	96°38.0'	S 21°07.8'	21°02.8'	N 5°01.1'				
		SD 16.1'	d -0.7'		v -0.4'	d -1.2'		v 2.0'	d 0.1'		v 2.3'	d 0.0'		v 2.6'	d 0.1'
Mer. pass.		11 h 43 m 57 s		9 h 43 m		16 h 16 m		16 h 34 m		21 h 36 m					

h	Moon				Lunar distance										
	GHA	dec	v	d	HP	-Sun	-Arcturus	-Spica	-Venus	+Regulus	+Pollux	+Procyon	+Sirius		
0	249°51.4'	N 13°58.7'	10.0'	-12.3'	58.7'	72°03.4'	52°11.8'	48°32.1'	39°45.6'		42°21.4'	44°49.7'	65°11.6'		
1	264°20.4'	N 13°46.4'	10.0'	-12.4'	58.7'	71°31.1'	51°43.1'	47°57.8'	39°14.0'		42°56.0'	45°20.6'	65°35.3'		
2	278°49.4'	N 13°34.0'	10.0'	-12.5'	58.8'	70°58.9'	51°14.5'	47°23.3'	38°42.4'	8°28.1'	43°30.6'	45°51.6'	65°59.2'		
3	293°18.4'	N 13°21.5'	10.0'	-12.6'	58.8'	70°26.6'	50°45.9'	46°48.9'	38°10.7'	8°58.1'	44°05.3'	46°22.7'	66°23.2'		
4	307°47.4'	N 13°08.9'	10.0'	-12.7'	58.8'	69°54.2'	50°17.3'	46°14.4'	37°39.0'	9°28.7'	44°40.0'	46°53.9'	66°47.3'		
5	322°16.5'	N 12°56.2'	10.1'	-12.8'	58.9'	69°21.8'	49°48.8'	45°39.9'	37°07.2'	9°59.8'	45°14.8'	47°25.2'	67°11.6'		
6	336°45.5'	N 12°43.4'	10.1'	-12.9'	58.9'	68°49.4'	49°20.4'	45°05.3'	36°35.4'	10°31.3'	45°49.7'	47°56.6'	67°35.9'		
7	351°14.6'	N 12°30.5'	10.1'	-13.0'	58.9'	68°16.9'	48°52.1'	44°30.7'	36°03.5'	11°03.2'	46°24.5'	48°28.1'	68°00.3'		
8	5°43.7'	N 12°17.6'	10.1'	-13.0'	59.0'	67°44.4'	48°23.8'	43°56.1'	35°31.6'	11°35.5'	46°59.5'	48°59.7'	68°24.9'		
9	20°12.8'	N 12°04.6'	10.1'	-13.1'	59.0'	67°11.8'	47°55.6'	43°21.5'	34°59.7'	12°08.0'	47°34.4'	49°31.4'	68°49.5'		
10	34°41.9'	N 11°51.4'	10.1'	-13.2'	59.0'	66°39.2'	47°27.5'	42°46.8'	34°27.7'	12°40.8'	48°09.5'	50°03.2'	69°14.3'		
11	49°11.0'	N 11°38.2'	10.1'	-13.3'	59.1'	66°06.5'	46°59.4'	42°12.0'	33°55.7'	13°13.9'	48°44.5'	50°35.1'	69°39.1'		
12	63°40.2'	N 11°25.0'	10.1'	-13.4'	59.1'	65°33.8'	46°31.5'	41°37.3'	33°23.6'	13°47.2'	49°19.7'	51°07.1'	70°04.1'		
13	78°09.3'	N 11°11.6'	10.2'	-13.4'	59.1'	65°01.1'	46°03.6'	41°02.5'	32°51.5'	14°20.6'	49°54.8'	51°39.2'	70°29.1'		
14	92°38.5'	N 10°58.2'	10.2'	-13.5'	59.2'	64°28.3'	45°35.9'	40°27.7'	32°19.4'	14°54.3'	50°30.0'	52°11.3'	70°54.2'		
15	107°07.6'	N 10°44.6'	10.2'	-13.6'	59.2'	63°55.5'	45°08.2'	39°52.8'	31°47.2'	15°28.1'	51°05.3'	52°43.6'	71°19.5'		
16	121°36.8'	N 10°31.1'	10.2'	-13.7'	59.3'	63°22.6'	44°40.7'	39°17.9'	31°15.0'	16°02.1'	51°40.6'	53°15.9'	71°44.8'		
17	136°06.0'	N 10°17.4'	10.2'	-13.7'	59.3'	62°49.7'	44°13.3'	38°43.0'	30°42.7'	16°36.2'	52°15.9'	53°48.4'	72°10.2'		
18	150°35.2'	N 10°03.6'	10.2'	-13.8'	59.3'	62°16.7'	43°46.0'	38°08.1'	30°10.4'	17°10.4'	52°51.3'	54°20.9'	72°35.7'		
19	165°04.4'	N 9°49.8'	10.2'	-13.9'	59.4'	61°43.7'	43°18.8'	37°33.1'	29°38.1'	17°44.8'	53°26.8'	54°53.5'	73°01.3'		
20	179°33.6'	N 9°36.0'	10.2'	-14.0'	59.4'	61°10.6'	42°51.7'	36°58.1'	29°05.7'	18°19.3'	54°02.3'	55°26.2'	73°27.0'		
21	194°02.8'	N 9°22.0'	10.2'	-14.0'	59.4'	60°37.5'	42°24.8'	36°23.1'	28°33.3'	18°53.9'	54°37.8'	55°58.9'	73°52.8'		
22	208°32.0'	N 9°08.0'	10.2'	-14.1'	59.5'	60°04.4'	41°58.0'	35°48.0'	28°00.9'	19°28.5'	55°13.4'	56°31.8'	74°18.6'		
23	223°01.2'	N 8°53.9'	10.2'	-14.2'	59.5'	59°31.2'	41°31.4'	35°12.9'	27°28.4'	20°03.3'	55°49.0'	57°04.7'	74°44.5'		
Mer. pass.		7 h 36 m SD 16.0'	phase 35%												

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.1'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	N 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.4'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				



h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	51°34.9'	183°58.2' S	17°45.3'	214°06.2' S	5°30.7'	116°58.5' S	21°58.2'	112°35.2' S	21°07.1'	37°07.8' N	5°03.8'	
1	66°37.4'	198°58.1' S	17°45.9'	229°05.8' S	5°31.8'	132°00.5' S	21°58.2'	127°37.5' S	21°07.1'	52°10.4' N	5°03.9'	
2	81°39.8'	213°58.0' S	17°46.6'	244°05.4' S	5°33.0'	147°02.6' S	21°58.1'	142°39.8' S	21°07.0'	67°13.0' N	5°04.0'	
3	96°42.3'	228°57.9' S	17°47.3'	259°05.1' S	5°34.1'	162°04.6' S	21°58.0'	157°42.0' S	21°07.0'	82°15.6' N	5°04.2'	
4	111°44.8'	243°57.8' S	17°47.9'	274°04.7' S	5°35.3'	177°06.6' S	21°58.0'	172°44.3' S	21°07.0'	97°18.2' N	5°04.3'	
5	126°47.2'	258°57.8' S	17°48.6'	289°04.3' S	5°36.4'	192°08.6' S	21°57.9'	187°46.6' S	21°06.9'	112°20.8' N	5°04.4'	
6	141°49.7'	273°57.7' S	17°49.3'	304°03.9' S	5°37.6'	207°10.7' S	21°57.8'	202°48.9' S	21°06.9'	127°23.3' N	5°04.5'	
7	156°52.1'	288°57.6' S	17°50.0'	319°03.5' S	5°38.7'	222°12.7' S	21°57.8'	217°51.2' S	21°06.9'	142°25.9' N	5°04.6'	
8	171°54.6'	303°57.5' S	17°50.6'	334°03.1' S	5°39.9'	237°14.7' S	21°57.7'	232°53.5' S	21°06.8'	157°28.5' N	5°04.7'	
9	186°57.1'	318°57.4' S	17°51.3'	349°02.7' S	5°41.0'	252°16.8' S	21°57.6'	247°55.7' S	21°06.8'	172°31.1' N	5°04.9'	
10	201°59.5'	333°57.3' S	17°52.0'	4°02.3' S	5°42.2'	267°18.8' S	21°57.6'	262°58.0' S	21°06.8'	187°33.6' N	5°05.0'	
11	217°02.0'	348°57.3' S	17°52.6'	19°01.9' S	5°43.3'	282°20.8' S	21°57.5'	278°00.3' S	21°06.7'	202°36.2' N	5°05.1'	
12	232°04.5'	3°57.2' S	17°53.3'	34°01.5' S	5°44.5'	297°22.8' S	21°57.4'	293°02.6' S	21°06.7'	217°38.8' N	5°05.2'	
13	247°06.9'	18°57.1' S	17°54.0'	49°01.1' S	5°45.6'	312°24.9' S	21°57.4'	308°04.9' S	21°06.7'	232°41.4' N	5°05.3'	
14	262°09.4'	33°57.0' S	17°54.6'	64°00.7' S	5°46.8'	327°26.9' S	21°57.3'	323°07.2' S	21°06.6'	247°43.9' N	5°05.5'	
15	277°11.9'	48°56.9' S	17°55.3'	79°00.3' S	5°47.9'	342°28.9' S	21°57.2'	338°09.4' S	21°06.6'	262°46.5' N	5°05.6'	
16	292°14.3'	63°56.8' S	17°56.0'	93°59.9' S	5°49.1'	357°30.9' S	21°57.2'	353°11.7' S	21°06.6'	277°49.1' N	5°05.7'	
17	307°16.8'	78°56.7' S	17°56.6'	108°59.5' S	5°50.2'	12°33.0' S	21°57.1'	8°14.0' S	21°06.5'	292°51.6' N	5°05.8'	
18	322°19.3'	93°56.7' S	17°57.3'	123°59.1' S	5°51.4'	27°35.0' S	21°57.0'	23°16.3' S	21°06.5'	307°54.2' N	5°05.9'	
19	337°21.7'	108°56.6' S	17°58.0'	138°58.7' S	5°52.5'	42°37.0' S	21°57.0'	38°18.6' S	21°06.5'	322°56.7' N	5°06.1'	
20	352°24.2'	123°56.5' S	17°58.6'	153°58.3' S	5°53.7'	57°39.0' S	21°56.9'	53°20.8' S	21°06.5'	337°59.3' N	5°06.2'	
21	7°26.6'	138°56.4' S	17°59.3'	168°57.9' S	5°54.8'	72°41.1' S	21°56.8'	68°23.1' S	21°06.4'	353°01.9' N	5°06.3'	
22	22°29.1'	153°56.3' S	17°60.0'	183°57.5' S	5°56.0'	87°43.1' S	21°56.8'	83°25.4' S	21°06.4'	8°04.4' N	5°06.4'	
23	37°31.6'	168°56.2' S	18°00.6'	198°57.1' S	5°57.1'	102°45.1' S	21°56.7'	98°27.7' S	21°06.4'	23°07.0' N	5°06.6'	
		SD 16.2' d -0.7'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.6' d 0.1'		
Mer. pass.		11 h 44 m 12 s		9 h 44 m		16 h 10 m		16 h 27 m		21 h 28 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Sun	-Arcturus	-Spica	-Venus	+Regulus	+Pollux	+Procyon	+Adhara
0	225°10.0'	N 2°43.5'	10.0'	-15.4'	60.3'	45°28.1'	31°39.9'	20°33.7'	13°46.9'	34°56.7'	70°53.5'	71°09.6'	83°57.3'
1	239°39.0'	N 2°28.1'	10.0'	-15.4'	60.3'	44°53.9'	31°20.5'	19°58.9'	13°13.9'	35°33.2'	71°30.2'	71°44.1'	84°18.9'
2	254°08.0'	N 2°12.7'	10.0'	-15.4'	60.3'	44°19.6'	31°01.5'	19°24.1'	12°41.0'	36°09.7'	72°07.0'	72°18.7'	84°40.4'
3	268°37.0'	N 1°57.3'	9.9'	-15.5'	60.4'	43°45.3'	30°43.1'	18°49.4'	12°08.1'	36°46.2'	72°43.8'	72°53.4'	85°02.1'
4	283°05.9'	N 1°41.8'	9.9'	-15.5'	60.4'	43°11.0'	30°25.1'	18°14.9'	11°35.2'	37°22.9'	73°20.6'	73°28.1'	85°23.7'
5	297°34.8'	N 1°26.3'	9.9'	-15.5'	60.4'	42°36.6'	30°07.6'	17°40.4'	11°02.4'	37°59.5'	73°57.5'	74°02.9'	85°45.4'
6	312°03.7'	N 1°10.8'	9.9'	-15.5'	60.5'	42°02.2'	29°50.7'	17°06.1'	10°29.6'	38°36.2'	74°34.3'	74°37.7'	86°07.2'
7	326°32.5'	N 0°55.3'	9.8'	-15.5'	60.5'	41°27.8'	29°34.3'	16°31.9'	9°57.0'	39°12.9'	75°11.3'	75°12.5'	86°29.0'
8	341°01.4'	N 0°39.7'	9.8'	-15.6'	60.5'	40°53.3'	29°18.4'	15°57.9'	9°24.4'	39°49.7'	75°48.2'	75°47.4'	86°50.8'
9	355°30.2'	N 0°24.2'	9.8'	-15.6'	60.5'	40°18.8'		15°24.1'	8°52.1'	40°26.5'	76°25.2'	76°22.3'	87°12.6'
10	9°58.9'	N 0°08.6'	9.7'	-15.6'	60.6'			14°50.5'	8°19.9'	41°03.4'	77°02.3'	76°57.3'	87°34.5'
11	24°27.7'	S 0°07.0'	9.7'	-15.6'	60.6'			14°17.2'	7°47.9'	41°40.3'	77°39.3'	77°32.3'	87°56.4'
12	38°56.4'	S 0°22.6'	9.7'	-15.6'	60.6'			13°44.2'	7°16.2'	42°17.2'	78°16.4'	78°07.4'	88°18.4'
13	53°25.1'	S 0°38.2'	9.7'	-15.6'	60.6'			13°11.5'	6°44.9'	42°54.2'	78°53.6'	78°42.4'	88°40.3'
14	67°53.8'	S 0°53.9'	9.6'	-15.6'	60.6'			12°39.1'	6°14.0'	43°31.2'	79°30.7'	79°17.6'	89°02.3'
15	82°22.4'	S 1°09.5'	9.6'	-15.6'	60.7'			12°07.3'	5°43.8'	44°08.2'	80°07.9'	79°52.8'	89°24.4'
16	96°51.0'	S 1°25.2'	9.6'	-15.7'	60.7'			11°35.9'		44°45.3'	80°45.1'	80°28.0'	89°46.4'
17	111°19.5'	S 1°40.8'	9.5'	-15.7'	60.7'			11°05.1'		45°22.4'	81°22.4'	81°03.2'	90°08.5'
18	125°48.0'	S 1°56.5'	9.5'	-15.7'	60.7'			10°35.0'		45°59.6'	81°59.7'	81°38.5'	90°30.5'
19	140°16.5'	S 2°12.1'	9.4'	-15.7'	60.8'					46°36.8'	82°37.0'	82°13.8'	90°52.6'
20	154°44.9'	S 2°27.8'	9.4'	-15.7'	60.8'					47°14.0'	83°14.3'	82°49.1'	91°14.7'
21	169°13.3'	S 2°43.4'	9.4'	-15.6'	60.8'					47°51.2'	83°51.7'	83°24.5'	91°36.8'
22	183°41.7'	S 2°59.1'	9.3'	-15.6'	60.8'					48°28.5'	84°29.1'	83°59.9'	91°59.0'
23	198°10.0'	S 3°14.7'	9.3'	-15.6'	60.8'					49°05.8'	85°06.5'	84°35.4'	92°21.1'
Mer. pass.		9 h 19 m SD 16.4'		phase 15%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.3'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

Friday 13 November 2020 UT1

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	52°34.0'	183°56.1'	S 18°01.3'	213°56.7'	S 5°58.3'	117°47.1'	S 21°56.6'	113°30.0'	S 21°06.3'	38°09.5'	N 5°06.7'			
1	67°36.5'	198°56.0'	S 18°02.0'	228°56.3'	S 5°59.4'	132°49.2'	S 21°56.6'	128°32.2'	S 21°06.3'	53°12.1'	N 5°06.8'			
2	82°39.0'	213°56.0'	S 18°02.6'	243°55.9'	S 6°00.6'	147°51.2'	S 21°56.5'	143°34.5'	S 21°06.3'	68°14.6'	N 5°06.9'			
3	97°41.4'	228°55.9'	S 18°03.3'	258°55.5'	S 6°01.7'	162°53.2'	S 21°56.4'	158°36.8'	S 21°06.2'	83°17.2'	N 5°07.1'			
4	112°43.9'	243°55.8'	S 18°03.9'	273°55.1'	S 6°02.9'	177°55.2'	S 21°56.4'	173°39.1'	S 21°06.2'	98°19.7'	N 5°07.2'			
5	127°46.4'	258°55.7'	S 18°04.6'	288°54.6'	S 6°04.0'	192°57.3'	S 21°56.3'	188°41.4'	S 21°06.2'	113°22.3'	N 5°07.3'			
6	142°48.8'	273°55.6'	S 18°05.2'	303°54.2'	S 6°05.1'	207°59.3'	S 21°56.2'	203°43.6'	S 21°06.1'	128°24.8'	N 5°07.5'			
7	157°51.3'	288°55.5'	S 18°05.9'	318°53.8'	S 6°06.3'	223°01.3'	S 21°56.2'	218°45.9'	S 21°06.1'	143°27.4'	N 5°07.6'			
8	172°53.8'	303°55.4'	S 18°06.6'	333°53.4'	S 6°07.4'	238°03.3'	S 21°56.1'	233°48.2'	S 21°06.1'	158°29.9'	N 5°07.7'			
9	187°56.2'	318°55.3'	S 18°07.2'	348°53.0'	S 6°08.6'	253°05.3'	S 21°56.0'	248°50.5'	S 21°06.0'	173°32.5'	N 5°07.8'			
10	202°58.7'	333°55.2'	S 18°07.9'	3°52.6'	S 6°09.7'	268°07.4'	S 21°56.0'	263°52.8'	S 21°06.0'	188°35.0'	N 5°08.0'			
11	218°01.1'	348°55.1'	S 18°08.5'	18°52.2'	S 6°10.9'	283°09.4'	S 21°55.9'	278°55.0'	S 21°06.0'	203°37.5'	N 5°08.1'			
12	233°03.6'	3°55.0'	S 18°09.2'	33°51.8'	S 6°12.0'	298°11.4'	S 21°55.8'	293°57.3'	S 21°05.9'	218°40.1'	N 5°08.2'			
13	248°06.1'	18°54.9'	S 18°09.8'	48°51.4'	S 6°13.2'	313°13.4'	S 21°55.8'	308°59.6'	S 21°05.9'	233°42.6'	N 5°08.4'			
14	263°08.5'	33°54.8'	S 18°10.5'	63°51.0'	S 6°14.3'	328°15.5'	S 21°55.7'	324°01.9'	S 21°05.9'	248°45.2'	N 5°08.5'			
15	278°11.0'	48°54.7'	S 18°11.2'	78°50.6'	S 6°15.4'	343°17.5'	S 21°55.6'	339°04.2'	S 21°05.8'	263°47.7'	N 5°08.6'			
16	293°13.5'	63°54.7'	S 18°11.8'	93°50.2'	S 6°16.6'	358°19.5'	S 21°55.5'	354°06.4'	S 21°05.8'	278°50.2'	N 5°08.8'			
17	308°15.9'	78°54.6'	S 18°12.5'	108°49.8'	S 6°17.7'	13°21.5'	S 21°55.5'	9°08.7'	S 21°05.8'	293°52.8'	N 5°08.9'			
18	323°18.4'	93°54.5'	S 18°13.1'	123°49.4'	S 6°18.9'	28°23.5'	S 21°55.4'	24°11.0'	S 21°05.8'	308°55.3'	N 5°09.0'			
19	338°20.9'	108°54.4'	S 18°13.8'	138°49.0'	S 6°20.0'	43°25.6'	S 21°55.3'	39°13.3'	S 21°05.7'	323°57.8'	N 5°09.1'			
20	353°23.3'	123°54.3'	S 18°14.4'	153°48.6'	S 6°21.2'	58°27.6'	S 21°55.3'	54°15.6'	S 21°05.7'	339°00.3'	N 5°09.3'			
21	8°25.8'	138°54.2'	S 18°15.1'	168°48.2'	S 6°22.3'	73°29.6'	S 21°55.2'	69°17.8'	S 21°05.7'	354°02.9'	N 5°09.4'			
22	23°28.2'	153°54.1'	S 18°15.7'	183°47.7'	S 6°23.5'	88°31.6'	S 21°55.1'	84°20.1'	S 21°05.6'	9°05.4'	N 5°09.6'			
23	38°30.7'	168°54.0'	S 18°16.4'	198°47.3'	S 6°24.6'	103°33.6'	S 21°55.1'	99°22.4'	S 21°05.6'	24°07.9'	N 5°09.7'			
		SD 16.2' d -0.7'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.5' d 0.1'				
Mer. pass.		11 h 44 m 20 s		9 h 45 m		16 h 7 m		16 h 24 m		21 h 24 m				

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Achernar	-Rigel Kent	-Hadar	-Spica	+Venus	+Regulus	+Procyon	+Pollux
0	212°38.3'	S 3°30.4'	9.2'	-15.6'	60.9'		59°26.4'	57°37.3'		49°43.2'	85°10.8'	85°44.0'	
1	227°06.5'	S 3°46.0'	9.2'	-15.6'	60.9'		59°04.4'	57°17.9'		50°20.5'	85°46.3'	86°21.5'	
2	241°34.7'	S 4°01.6'	9.1'	-15.6'	60.9'		58°42.6'	56°58.7'		50°57.9'	86°21.9'	86°59.0'	
3	256°02.9'	S 4°17.2'	9.1'	-15.6'	60.9'		58°21.0'	56°39.7'		51°35.4'	86°57.4'	87°36.5'	
4	270°31.0'	S 4°32.8'	9.1'	-15.6'	60.9'		57°59.5'	56°20.9'		52°12.8'	87°33.0'	88°14.0'	
5	284°59.0'	S 4°48.4'	9.0'	-15.5'	60.9'		57°38.2'	56°02.3'		52°50.3'	88°08.6'	88°51.6'	
6	299°27.1'	S 5°03.9'	9.0'	-15.5'	61.0'	117°47.5'	57°17.0'	55°43.9'		53°27.8'	88°44.2'	89°29.2'	
7	313°55.0'	S 5°19.4'	8.9'	-15.5'	61.0'	117°32.3'	56°56.0'	55°25.7'		54°05.3'	89°19.8'	90°06.8'	
8	328°22.9'	S 5°34.9'	8.9'	-15.5'	61.0'	117°17.0'	56°35.2'	55°07.6'		54°42.9'	89°55.5'	90°44.5'	
9	342°50.8'	S 5°50.4'	8.8'	-15.5'	61.0'		56°14.6'	54°49.9'		55°20.5'	90°31.2'	91°22.1'	
10	357°18.6'	S 6°05.9'	8.8'	-15.4'	61.0'		55°54.1'	54°32.3'		6°00.7'	91°06.9'	91°59.8'	
11	11°46.4'	S 6°21.3'	8.7'	-15.4'	61.0'		55°33.9'	54°14.9'		7°03.4'	56°35.7'	91°42.6'	
12	26°14.1'	S 6°36.7'	8.7'	-15.4'	61.1'		55°13.8'	53°57.8'		7°35.5'	57°13.3'	92°18.3'	
13	40°41.8'	S 6°52.0'	8.6'	-15.3'	61.1'		54°53.9'	53°40.9'		8°08.0'	57°51.0'	92°54.1'	
14	55°09.4'	S 7°07.4'	8.6'	-15.3'	61.1'		54°34.2'	53°24.3'		8°40.8'	58°28.7'	93°29.9'	
15	69°36.9'	S 7°22.7'	8.5'	-15.3'	61.1'		54°14.8'	53°07.9'		9°13.9'	59°06.4'	94°05.6'	
16	84°04.4'	S 7°37.9'	8.4'	-15.2'	61.1'		53°55.5'	52°51.7'		9°47.1'	59°44.1'	94°41.4'	
17	98°31.8'	S 7°53.1'	8.4'	-15.2'	61.1'		53°36.5'	52°35.8'		10°20.6'	60°21.8'	95°17.2'	
18	112°59.2'	S 8°08.3'	8.3'	-15.1'	61.1'		53°17.7'	52°20.1'		10°54.2'	60°59.6'	95°53.0'	
19	127°26.6'	S 8°23.4'	8.3'	-15.1'	61.1'		52°59.1'	52°04.8'		11°27.9'	61°37.4'	96°28.9'	
20	141°53.8'	S 8°38.5'	8.2'	-15.0'	61.1'		52°40.8'			12°01.7'	62°15.2'	97°04.7'	
21	156°21.0'	S 8°53.5'	8.2'	-15.0'	61.1'		52°22.7'			12°35.7'	62°53.0'	97°40.5'	
22	170°48.2'	S 9°08.5'	8.1'	-14.9'	61.2'		52°04.8'		11°07.9'	13°09.7'	63°30.8'	98°16.4'	
23	185°15.3'	S 9°23.4'	8.0'	-14.9'	61.2'		51°47.2'		11°39.3'	13°43.9'	64°08.6'	98°52.2'	
Mer. pass.		10 h 11 m SD 16.6'		phase 7%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.1'
Rigel Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	53°33.2'	183°53.9' S	18°17.0'	213°46.9' S	6°25.7'	118°35.7' S	21°55.0'	114°24.7' S	21°05.6'	39°10.4' N	5°09.8'	
1	68°35.6'	198°53.8' S	18°17.7'	228°46.5' S	6°26.9'	133°37.7' S	21°54.9'	129°26.9' S	21°05.5'	54°13.0' N	5°10.0'	
2	83°38.1'	213°53.7' S	18°18.3'	243°46.1' S	6°28.0'	148°39.7' S	21°54.9'	144°29.2' S	21°05.5'	69°15.5' N	5°10.1'	
3	98°40.6'	228°53.6' S	18°19.0'	258°45.7' S	6°29.2'	163°41.7' S	21°54.8'	159°31.5' S	21°05.5'	84°18.0' N	5°10.2'	
4	113°43.0'	243°53.5' S	18°19.6'	273°45.3' S	6°30.3'	178°43.7' S	21°54.7'	174°33.8' S	21°05.4'	99°20.5' N	5°10.4'	
5	128°45.5'	258°53.4' S	18°20.2'	288°44.9' S	6°31.5'	193°45.8' S	21°54.7'	189°36.0' S	21°05.4'	114°23.0' N	5°10.5'	
6	143°48.0'	273°53.3' S	18°20.9'	303°44.5' S	6°32.6'	208°47.8' S	21°54.6'	204°38.3' S	21°05.4'	129°25.5' N	5°10.6'	
7	158°50.4'	288°53.2' S	18°21.5'	318°44.1' S	6°33.7'	223°49.8' S	21°54.5'	219°40.6' S	21°05.3'	144°28.1' N	5°10.8'	
8	173°52.9'	303°53.1' S	18°22.2'	333°43.7' S	6°34.9'	238°51.8' S	21°54.4'	234°42.9' S	21°05.3'	159°30.6' N	5°10.9'	
9	188°55.4'	318°53.0' S	18°22.8'	348°43.2' S	6°36.0'	253°53.8' S	21°54.4'	249°45.2' S	21°05.3'	174°33.1' N	5°11.1'	
10	203°57.8'	333°52.9' S	18°23.5'	363°42.8' S	6°37.2'	268°55.8' S	21°54.3'	264°47.4' S	21°05.2'	189°35.6' N	5°11.2'	
11	219°00.3'	348°52.8' S	18°24.1'	378°42.4' S	6°38.3'	283°57.9' S	21°54.2'	279°49.7' S	21°05.2'	204°38.1' N	5°11.3'	
12	234°02.7'	363°52.7' S	18°24.8'	393°42.0' S	6°39.4'	298°59.9' S	21°54.2'	294°52.0' S	21°05.2'	219°40.6' N	5°11.5'	
13	249°05.2'	378°52.6' S	18°25.4'	408°41.6' S	6°40.6'	314°01.9' S	21°54.1'	309°54.3' S	21°05.1'	234°43.1' N	5°11.6'	
14	264°07.7'	393°52.5' S	18°26.0'	423°41.2' S	6°41.7'	329°03.9' S	21°54.0'	324°56.5' S	21°05.1'	249°45.6' N	5°11.8'	
15	279°10.1'	408°52.4' S	18°26.7'	438°40.8' S	6°42.9'	344°05.9' S	21°54.0'	339°58.8' S	21°05.1'	264°48.1' N	5°11.9'	
16	294°12.6'	423°52.3' S	18°27.3'	453°40.4' S	6°44.0'	359°07.9' S	21°53.9'	355°01.1' S	21°05.0'	279°50.6' N	5°12.1'	
17	309°15.1'	438°52.2' S	18°28.0'	468°39.9' S	6°45.1'	374°10.0' S	21°53.8'	370°03.4' S	21°05.0'	294°53.1' N	5°12.2'	
18	324°17.5'	453°52.0' S	18°28.6'	483°39.5' S	6°46.3'	389°12.0' S	21°53.8'	385°05.6' S	21°05.0'	309°55.6' N	5°12.3'	
19	339°20.0'	468°51.9' S	18°29.2'	498°39.1' S	6°47.4'	404°14.0' S	21°53.7'	400°07.9' S	21°04.9'	324°58.1' N	5°12.5'	
20	354°22.5'	483°51.8' S	18°29.9'	513°38.7' S	6°48.6'	419°16.0' S	21°53.6'	415°10.2' S	21°04.9'	340°00.6' N	5°12.6'	
21	9°24.9'	138°51.7' S	18°30.5'	168°38.3' S	6°49.7'	74°18.0' S	21°53.5'	70°12.5' S	21°04.9'	355°03.1' N	5°12.8'	
22	24°27.4'	153°51.6' S	18°31.1'	183°37.9' S	6°50.8'	89°20.0' S	21°53.5'	85°14.7' S	21°04.8'	10°05.6' N	5°12.9'	
23	39°29.9'	168°51.5' S	18°31.8'	198°37.5' S	6°52.0'	104°22.0' S	21°53.4'	100°17.0' S	21°04.8'	25°08.1' N	5°13.1'	
		SD 16.2' d -0.6'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.5' d 0.1'		
Mer. pass.		11 h 44 m 30 s		9 h 45 m		16 h 3 m		16 h 20 m		21 h 20 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Rigel Kent	+Spica	+Venus	+Arcturus	+Regulus	+Procyon	+Pollux	+Adhara
0	199°42.3'	S 9°38.3'	8.0'	-14.8'	61.2'	51°29.8'	12°11.3'	14°18.1'		64°46.4'	99°28.0'	100°49.1'	101°30.0'
1	214°09.3'	S 9°53.1'	7.9'	-14.8'	61.2'	51°12.7'	12°43.8'	14°52.3'	28°57.8'	65°24.3'	100°03.9'	101°27.0'	101°51.5'
2	228°36.2'	S 10°07.9'	7.8'	-14.7'	61.2'	50°55.9'	13°16.9'	15°26.6'	29°13.2'	66°02.1'	100°39.7'	102°04.9'	102°13.0'
3	243°03.0'	S 10°22.5'	7.8'	-14.6'	61.2'	50°39.4'	13°50.3'	16°01.0'	29°29.3'	66°40.0'	101°15.6'	102°42.9'	102°34.4'
4	257°29.8'	S 10°37.2'	7.7'	-14.6'	61.2'	50°23.1'	14°24.2'	16°35.4'	29°46.0'	67°17.9'	101°51.4'	103°20.8'	102°55.8'
5	271°56.5'	S 10°51.8'	7.7'	-14.5'	61.2'	50°07.1'	14°58.3'	17°09.9'	30°03.3'	67°55.8'	102°27.3'	103°58.7'	103°17.0'
6	286°23.2'	S 11°06.3'	7.6'	-14.4'	61.2'	49°51.4'	15°32.8'	17°44.4'	30°21.1'	68°33.7'	103°03.1'	104°36.7'	103°38.3'
7	300°49.8'	S 11°20.7'	7.5'	-14.4'	61.2'	49°35.9'	16°07.5'	18°18.9'	30°39.6'	69°11.6'	103°38.9'	105°14.6'	103°59.4'
8	315°16.3'	S 11°35.1'	7.5'	-14.3'	61.2'		16°42.5'	18°53.4'	30°58.5'	69°49.5'	104°14.8'	105°52.5'	104°20.5'
9	329°42.8'	S 11°49.3'	7.4'	-14.2'	61.2'		17°17.7'	19°28.0'	31°18.0'	70°27.4'	104°50.6'	106°30.5'	104°41.5'
10	344°09.2'	S 12°03.6'	7.3'	-14.1'	61.2'		17°53.1'	20°02.6'	31°38.0'	71°05.3'	105°26.4'	107°08.4'	105°02.4'
11	358°35.5'	S 12°17.7'	7.3'	-14.1'	61.2'		18°28.6'	20°37.3'	31°58.5'	71°43.2'	106°02.2'	107°46.4'	105°23.3'
12	13°01.8'	S 12°31.8'	7.2'	-14.0'	61.2'		19°04.3'	21°11.9'	32°19.4'	72°21.1'	106°37.9'	108°24.4'	105°44.1'
13	27°28.0'	S 12°45.7'	7.1'	-13.9'	61.2'		19°40.2'	21°46.6'	32°40.8'	72°59.1'	107°13.7'	109°02.3'	106°04.8'
14	41°54.1'	S 12°59.6'	7.1'	-13.8'	61.2'								
15	56°20.2'	S 13°13.5'	7.0'	-13.7'	61.2'								
16	70°46.2'	S 13°27.2'	6.9'	-13.6'	61.2'								
17	85°12.1'	S 13°40.8'	6.9'	-13.6'	61.2'								
18	99°38.0'	S 13°54.4'	6.8'	-13.5'	61.2'								
19	114°03.7'	S 14°07.8'	6.7'	-13.4'	61.2'								
20	128°29.5'	S 14°21.2'	6.7'	-13.3'	61.2'								
21	142°55.1'	S 14°34.5'	6.6'	-13.2'	61.2'								
22	157°20.7'	S 14°47.6'	6.5'	-13.1'	61.2'								
23	171°46.3'	S 15°00.7'	6.5'	-13.0'	61.2'								
Mer. pass.		11 h 6 m SD 16.7' phase 2%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.2'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.5'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.9'	N 89°21.1'
Rigel Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.8'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

Sunday 15 November 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	54°32.3'	183°51.4'	S 18°32.4'	213°37.0'	S 6°53.1'	119°24.1'	S 21°53.3'	115°19.3'	S 21°04.8'	40°10.6'	N 5°13.2'	
1	69°34.8'	198°51.3'	S 18°33.0'	228°36.6'	S 6°54.3'	134°26.1'	S 21°53.3'	130°21.6'	S 21°04.7'	55°13.1'	N 5°13.4'	
2	84°37.2'	213°51.2'	S 18°33.7'	243°36.2'	S 6°55.4'	149°28.1'	S 21°53.2'	145°23.8'	S 21°04.7'	70°15.6'	N 5°13.5'	
3	99°39.7'	228°51.1'	S 18°34.3'	258°35.8'	S 6°56.5'	164°30.1'	S 21°53.1'	160°26.1'	S 21°04.7'	85°18.0'	N 5°13.7'	
4	114°42.2'	243°51.0'	S 18°34.9'	273°35.4'	S 6°57.7'	179°32.1'	S 21°53.0'	175°28.4'	S 21°04.6'	100°20.5'	N 5°13.8'	
5	129°44.6'	258°50.9'	S 18°35.6'	288°35.0'	S 6°58.8'	194°34.1'	S 21°53.0'	190°30.6'	S 21°04.6'	115°23.0'	N 5°13.9'	
6	144°47.1'	273°50.8'	S 18°36.2'	303°34.5'	S 6°59.9'	209°36.1'	S 21°52.9'	205°32.9'	S 21°04.6'	130°25.5'	N 5°14.1'	
7	159°49.6'	288°50.7'	S 18°36.8'	318°34.1'	S 7°01.1'	224°38.1'	S 21°52.8'	220°35.2'	S 21°04.5'	145°28.0'	N 5°14.2'	
8	174°52.0'	303°50.5'	S 18°37.5'	333°33.7'	S 7°02.2'	239°40.2'	S 21°52.8'	235°37.5'	S 21°04.5'	160°30.5'	N 5°14.4'	
9	189°54.5'	318°50.4'	S 18°38.1'	348°33.3'	S 7°03.4'	254°42.2'	S 21°52.7'	250°39.7'	S 21°04.5'	175°32.9'	N 5°14.5'	
10	204°57.0'	333°50.3'	S 18°38.7'	3°32.9'	S 7°04.5'	269°44.2'	S 21°52.6'	265°42.0'	S 21°04.4'	190°35.4'	N 5°14.7'	
11	219°59.4'	348°50.2'	S 18°39.4'	18°32.5'	S 7°05.6'	284°46.2'	S 21°52.6'	280°44.3'	S 21°04.4'	205°37.9'	N 5°14.8'	
12	235°01.9'	3°50.1'	S 18°40.0'	33°32.0'	S 7°06.8'	299°48.2'	S 21°52.5'	295°46.6'	S 21°04.4'	220°40.4'	N 5°15.0'	
13	250°04.3'	18°50.0'	S 18°40.6'	48°31.6'	S 7°07.9'	314°50.2'	S 21°52.4'	310°48.8'	S 21°04.3'	235°42.8'	N 5°15.2'	
14	265°06.8'	33°49.9'	S 18°41.2'	63°31.2'	S 7°09.0'	329°52.2'	S 21°52.3'	325°51.1'	S 21°04.3'	250°45.3'	N 5°15.3'	
15	280°09.3'	48°49.8'	S 18°41.9'	78°30.8'	S 7°10.2'	344°54.2'	S 21°52.3'	340°53.4'	S 21°04.3'	265°47.8'	N 5°15.5'	
16	295°11.7'	63°49.6'	S 18°42.5'	93°30.4'	S 7°11.3'	359°56.3'	S 21°52.2'	355°55.6'	S 21°04.2'	280°50.3'	N 5°15.6'	
17	310°14.2'	78°49.5'	S 18°43.1'	108°29.9'	S 7°12.4'	14°58.3'	S 21°52.1'	10°57.9'	S 21°04.2'	295°52.7'	N 5°15.8'	
18	325°16.7'	93°49.4'	S 18°43.7'	123°29.5'	S 7°13.6'	30°00.3'	S 21°52.1'	26°00.2'	S 21°04.2'	310°55.2'	N 5°15.9'	
19	340°19.1'	108°49.3'	S 18°44.4'	138°29.1'	S 7°14.7'	45°02.3'	S 21°52.0'	41°02.5'	S 21°04.1'	325°57.7'	N 5°16.1'	
20	355°21.6'	123°49.2'	S 18°45.0'	153°28.7'	S 7°15.8'	60°04.3'	S 21°51.9'	56°04.7'	S 21°04.1'	341°00.1'	N 5°16.2'	
21	10°24.1'	138°49.1'	S 18°45.6'	168°28.2'	S 7°17.0'	75°06.3'	S 21°51.8'	71°07.0'	S 21°04.1'	356°02.6'	N 5°16.4'	
22	25°26.5'	153°49.0'	S 18°46.2'	183°27.8'	S 7°18.1'	90°08.3'	S 21°51.8'	86°09.3'	S 21°04.0'	11°05.0'	N 5°16.5'	
23	40°29.0'	168°48.8'	S 18°46.9'	198°27.4'	S 7°19.2'	105°10.3'	S 21°51.7'	101°11.5'	S 21°04.0'	26°07.5'	N 5°16.7'	
		SD 16.2' d -0.6'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.5' d 0.2'		
Mer. pass.		11 h 44 m 40 s		9 h 46 m		16 h 0 m		16 h 16 m		21 h 16 m		

h	Moon					Lunar distance					
	GHA	dec	v	d	HP	-Achernar	-Fomalhaut	-Deneb	-Altair	-Saturn	-Jupiter
0	186°11.7'	S 15°13.7'	6.4'	-12.9'	61.2'						
1	200°37.1'	S 15°26.5'	6.3'	-12.8'	61.2'						
2	215°02.4'	S 15°39.3'	6.3'	-12.7'	61.1'						
3	229°27.7'	S 15°52.0'	6.2'	-12.5'	61.1'						
4	243°52.9'	S 16°04.5'	6.1'	-12.4'	61.1'						
5	258°18.0'	S 16°16.9'	6.1'	-12.3'	61.1'						
6	272°43.1'	S 16°29.2'	6.0'	-12.2'	61.1'						
7	287°08.0'	S 16°41.5'	5.9'	-12.1'	61.1'						
8	301°33.0'	S 16°53.5'	5.9'	-12.0'	61.1'						
9	315°57.8'	S 17°05.5'	5.8'	-11.8'	61.1'						
10	330°22.6'	S 17°17.3'	5.7'	-11.7'	61.1'						
11	344°47.4'	S 17°29.1'	5.7'	-11.6'	61.1'						
12	359°12.0'	S 17°40.7'	5.6'	-11.5'	61.0'						
13	13°36.6'	S 17°52.2'	5.5'	-11.3'	61.0'						
14	28°01.2'	S 18°03.5'	5.5'	-11.2'	61.0'						
15	42°25.6'	S 18°14.7'	5.4'	-11.1'	61.0'						
16	56°50.1'	S 18°25.8'	5.4'	-11.0'	61.0'						
17	71°14.4'	S 18°36.8'	5.3'	-10.8'	61.0'						
18	85°38.7'	S 18°47.6'	5.2'	-10.7'	60.9'						
19	100°02.9'	S 18°58.3'	5.2'	-10.5'	60.9'						
20	114°27.1'	S 19°08.8'	5.1'	-10.4'	60.9'						
21	128°51.2'	S 19°19.2'	5.1'	-10.3'	60.9'						
22	143°15.3'	S 19°29.5'	5.0'	-10.1'	60.9'	97°11.8'	90°45.8'	89°35.8'	61°49.1'	53°17.4'	49°30.4'
23	157°39.3'	S 19°39.6'	5.0'	-10.0'	60.9'	96°50.1'	90°09.6'	89°19.9'	61°19.4'	52°40.1'	48°53.3'
Mer. pass.		12 h 3 m SD 16.7' phase 0%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.4'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.8'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	55°31.5'	183°48.7'	S 18°47.5'	213°27.0'	S 7°20.4'	120°12.3'	S 21°51.6'	116°13.8'	S 21°04.0'	41°10.0'	N 5°16.9'	
1	70°33.9'	198°48.6'	S 18°48.1'	228°26.6'	S 7°21.5'	135°14.3'	S 21°51.6'	131°16.1'	S 21°03.9'	56°12.4'	N 5°17.0'	
2	85°36.4'	213°48.5'	S 18°48.7'	243°26.1'	S 7°22.6'	150°16.4'	S 21°51.5'	146°18.4'	S 21°03.9'	71°14.9'	N 5°17.2'	
3	100°38.8'	228°48.4'	S 18°49.3'	258°25.7'	S 7°23.8'	165°18.4'	S 21°51.4'	161°20.6'	S 21°03.9'	86°17.3'	N 5°17.3'	
4	115°41.3'	243°48.3'	S 18°50.0'	273°25.3'	S 7°24.9'	180°20.4'	S 21°51.3'	176°22.9'	S 21°03.8'	101°19.8'	N 5°17.5'	
5	130°43.8'	258°48.1'	S 18°50.6'	288°24.9'	S 7°26.0'	195°22.4'	S 21°51.3'	191°25.2'	S 21°03.8'	116°22.2'	N 5°17.6'	
6	145°46.2'	273°48.0'	S 18°51.2'	303°24.4'	S 7°27.2'	210°24.4'	S 21°51.2'	206°27.4'	S 21°03.8'	131°24.7'	N 5°17.8'	
7	160°48.7'	288°47.9'	S 18°51.8'	318°24.0'	S 7°28.3'	225°26.4'	S 21°51.1'	221°29.7'	S 21°03.7'	146°27.1'	N 5°18.0'	
8	175°51.2'	303°47.8'	S 18°52.4'	333°23.6'	S 7°29.4'	240°28.4'	S 21°51.1'	236°32.0'	S 21°03.7'	161°29.6'	N 5°18.1'	
9	190°53.6'	318°47.7'	S 18°53.1'	348°23.2'	S 7°30.6'	255°30.4'	S 21°51.0'	251°34.2'	S 21°03.7'	176°32.0'	N 5°18.3'	
10	205°56.1'	333°47.6'	S 18°53.7'	3°22.7'	S 7°31.7'	270°32.4'	S 21°50.9'	266°36.5'	S 21°03.6'	191°34.5'	N 5°18.4'	
11	220°58.6'	348°47.4'	S 18°54.3'	18°22.3'	S 7°32.8'	285°34.4'	S 21°50.8'	281°38.8'	S 21°03.6'	206°36.9'	N 5°18.6'	
12	236°01.0'	3°47.3'	S 18°54.9'	33°21.9'	S 7°34.0'	300°36.4'	S 21°50.8'	296°41.0'	S 21°03.6'	221°39.4'	N 5°18.8'	
13	251°03.5'	18°47.2'	S 18°55.5'	48°21.5'	S 7°35.1'	315°38.4'	S 21°50.7'	311°43.3'	S 21°03.5'	236°41.8'	N 5°18.9'	
14	266°06.0'	33°47.1'	S 18°56.1'	63°21.0'	S 7°36.2'	330°40.4'	S 21°50.6'	326°45.6'	S 21°03.5'	251°44.2'	N 5°19.1'	
15	281°08.4'	48°47.0'	S 18°56.7'	78°20.6'	S 7°37.4'	345°42.5'	S 21°50.6'	341°47.9'	S 21°03.4'	266°46.7'	N 5°19.3'	
16	296°10.9'	63°46.8'	S 18°57.3'	93°20.2'	S 7°38.5'	0°44.5'	S 21°50.5'	356°50.1'	S 21°03.4'	281°49.1'	N 5°19.4'	
17	311°13.3'	78°46.7'	S 18°58.0'	108°19.8'	S 7°39.6'	15°46.5'	S 21°50.4'	11°52.4'	S 21°03.4'	296°51.6'	N 5°19.6'	
18	326°15.8'	93°46.6'	S 18°58.6'	123°19.3'	S 7°40.7'	30°48.5'	S 21°50.3'	26°54.7'	S 21°03.3'	311°54.0'	N 5°19.7'	
19	341°18.3'	108°46.5'	S 18°59.2'	138°18.9'	S 7°41.9'	45°50.5'	S 21°50.3'	41°56.9'	S 21°03.3'	326°56.4'	N 5°19.9'	
20	356°20.7'	123°46.3'	S 18°59.8'	153°18.5'	S 7°43.0'	60°52.5'	S 21°50.2'	56°59.2'	S 21°03.3'	341°58.9'	N 5°20.1'	
21	11°23.2'	138°46.2'	S 19°00.4'	168°18.0'	S 7°44.1'	75°54.5'	S 21°50.1'	72°01.5'	S 21°03.2'	357°01.3'	N 5°20.2'	
22	26°25.7'	153°46.1'	S 19°01.6'	183°17.6'	S 7°45.3'	90°56.5'	S 21°50.0'	87°03.7'	S 21°03.2'	12°03.7'	N 5°20.4'	
23	41°28.1'	168°46.0'	S 19°01.6'	198°17.2'	S 7°46.4'	105°58.5'	S 21°50.0'	102°06.0'	S 21°03.2'	27°06.1'	N 5°20.6'	
		SD 16.2' d -0.6'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.4' d 0.2'		
Mer. pass.		11 h 44 m 51 s		9 h 46 m		15 h 57 m		16 h 13 m		21 h 12 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Mars	-Achernar	-Fomalhaut	-Deneb	-Altair	-Saturn	-Jupiter	-Antares
0	172°03.3'	S 19°49.6'	4.9'	-9.8'	60.8'		96°28.3'	89°33.5'	89°04.0'	60°49.8'	52°02.7'	48°16.2'	
1	186°27.2'	S 19°59.5'	4.8'	-9.7'	60.8'		96°06.6'	88°57.4'	88°48.1'	60°20.4'	51°25.4'	47°39.1'	
2	200°51.0'	S 20°09.2'	4.8'	-9.5'	60.8'		95°44.8'	88°21.3'	88°32.2'	59°51.0'	50°48.1'	47°02.0'	
3	215°14.8'	S 20°18.7'	4.7'	-9.4'	60.8'		95°23.1'	87°45.3'	88°16.3'	59°21.8'	50°10.9'	46°25.0'	
4	229°38.6'	S 20°28.1'	4.7'	-9.3'	60.7'		95°01.3'	87°09.3'	88°00.5'	58°52.7'	49°33.6'	45°48.0'	
5	244°02.2'	S 20°37.4'	4.6'	-9.1'	60.7'		94°39.5'	86°33.3'	87°44.7'	58°23.7'	48°56.4'	45°11.0'	
6	258°25.9'	S 20°46.5'	4.6'	-8.9'	60.7'		94°17.7'	85°57.3'	87°28.9'	57°54.8'	48°19.3'	44°34.1'	
7	272°49.5'	S 20°55.4'	4.6'	-8.8'	60.7'		93°55.9'	85°21.4'	87°13.1'	57°26.1'	47°42.1'	43°57.2'	
8	287°13.1'	S 21°04.2'	4.5'	-8.6'	60.7'		93°34.1'	84°45.5'	86°57.4'	56°57.5'	47°05.0'	43°20.3'	
9	301°36.6'	S 21°12.8'	4.5'	-8.5'	60.6'		93°12.3'	84°09.6'	86°41.7'	56°29.0'	46°28.0'	42°43.5'	
10	316°00.0'	S 21°21.3'	4.4'	-8.3'	60.6'		92°50.5'	83°33.8'	86°26.1'	56°00.6'	45°50.9'	42°06.7'	
11	330°23.5'	S 21°29.6'	4.4'	-8.2'	60.6'		92°28.8'	82°58.0'	86°10.4'	55°32.4'	45°13.9'	41°29.9'	
12	344°46.9'	S 21°37.8'	4.4'	-8.0'	60.6'		92°07.0'	82°22.2'	85°54.8'	55°04.4'	44°37.0'	40°53.2'	
13	359°10.2'	S 21°45.8'	4.3'	-7.8'	60.5'		91°45.2'	81°46.5'	85°39.3'	54°36.5'	44°00.0'	40°16.5'	
14	13°33.5'	S 21°53.7'	4.3'	-7.7'	60.5'		91°23.5'	81°10.8'	85°23.8'	54°08.7'	43°23.1'	39°39.8'	
15	27°56.8'	S 22°01.4'	4.2'	-7.5'	60.5'		91°01.7'	80°35.2'	85°08.3'	53°41.1'	42°46.3'	39°03.2'	
16	42°20.1'	S 22°08.9'	4.2'	-7.4'	60.4'		90°40.0'	79°59.6'	84°52.8'	53°13.7'	42°09.4'	38°26.6'	
17	56°43.3'	S 22°16.2'	4.2'	-7.2'	60.4'	119°36.1'	90°18.3'	79°24.0'	84°37.5'	52°46.4'	41°32.6'	37°50.0'	
18	71°06.5'	S 22°23.4'	4.2'	-7.0'	60.4'	118°59.2'	89°56.6'	78°48.5'	84°22.1'	52°19.3'	40°55.9'	37°13.5'	
19	85°29.6'	S 22°30.5'	4.1'	-6.9'	60.4'	118°22.5'	89°34.9'	78°13.0'	84°06.8'	51°52.3'	40°19.2'	36°37.0'	
20	99°52.8'	S 22°37.3'	4.1'	-6.7'	60.3'	117°45.7'	89°13.3'	77°37.5'	83°51.6'	51°25.5'	39°42.5'	36°00.6'	
21	114°15.9'	S 22°44.0'	4.1'	-6.5'	60.3'	117°09.0'	88°51.7'	77°02.1'	83°36.4'	50°59.0'	39°05.9'	35°24.2'	9°22.6'
22	128°38.9'	S 22°50.6'	4.1'	-6.4'	60.3'	116°32.3'	88°30.1'	76°26.8'	83°21.2'	50°32.5'	38°29.3'	34°47.8'	9°52.9'
23	143°02.0'	S 22°56.9'	4.0'	-6.2'	60.2'	115°55.7'	88°08.5'	75°51.4'	83°06.2'	50°06.3'	37°52.8'	34°11.5'	10°23.9'
Mer. pass.		13 h 3 m SD 16.6' phase 1%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.6'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.7'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				



h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	56°30.6'	183°45.8'	S 19°02.2'	213°16.7'	S 7°47.5'	121°00.5'	S 21°49.9'	117°08.3'	S 21°03.1'	42°08.6'	N 5°20.7'			
1	71°33.1'	198°45.7'	S 19°02.8'	228°16.3'	S 7°48.6'	136°02.5'	S 21°49.8'	132°10.5'	S 21°03.1'	57°11.0'	N 5°20.9'			
2	86°35.5'	213°45.6'	S 19°03.4'	243°15.9'	S 7°49.8'	151°04.5'	S 21°49.8'	147°12.8'	S 21°03.1'	72°13.4'	N 5°21.1'			
3	101°38.0'	228°45.5'	S 19°04.0'	258°15.5'	S 7°50.9'	166°06.5'	S 21°49.7'	162°15.1'	S 21°03.0'	87°15.8'	N 5°21.2'			
4	116°40.5'	243°45.3'	S 19°04.6'	273°15.0'	S 7°52.0'	181°08.5'	S 21°49.6'	177°17.3'	S 21°03.0'	102°18.3'	N 5°21.4'			
5	131°42.9'	258°45.2'	S 19°05.3'	288°14.6'	S 7°53.1'	196°10.5'	S 21°49.5'	192°19.6'	S 21°03.0'	117°20.7'	N 5°21.6'			
6	146°45.4'	273°45.1'	S 19°05.9'	303°14.2'	S 7°54.3'	211°12.5'	S 21°49.5'	207°21.9'	S 21°02.9'	132°23.1'	N 5°21.8'			
7	161°47.8'	288°45.0'	S 19°06.5'	318°13.7'	S 7°55.4'	226°14.5'	S 21°49.4'	222°24.1'	S 21°02.9'	147°25.5'	N 5°21.9'			
8	176°50.3'	303°44.8'	S 19°07.1'	333°13.3'	S 7°56.5'	241°16.5'	S 21°49.3'	237°26.4'	S 21°02.9'	162°27.9'	N 5°22.1'			
9	191°52.8'	318°44.7'	S 19°07.7'	348°12.9'	S 7°57.7'	256°18.5'	S 21°49.2'	252°28.7'	S 21°02.8'	177°30.4'	N 5°22.3'			
10	206°55.2'	333°44.6'	S 19°08.3'	3°12.4'	S 7°58.8'	271°20.5'	S 21°49.2'	267°30.9'	S 21°02.8'	192°32.8'	N 5°22.4'			
11	221°57.7'	348°44.5'	S 19°08.9'	18°12.0'	S 7°59.9'	286°22.5'	S 21°49.1'	282°33.2'	S 21°02.8'	207°35.2'	N 5°22.6'			
12	237°00.2'	3°44.3'	S 19°09.5'	33°11.6'	S 8°01.0'	301°24.5'	S 21°49.0'	297°35.5'	S 21°02.7'	222°37.6'	N 5°22.8'			
13	252°02.6'	18°44.2'	S 19°10.1'	48°11.1'	S 8°02.2'	316°26.5'	S 21°48.9'	312°37.7'	S 21°02.7'	237°40.0'	N 5°23.0'			
14	267°05.1'	33°44.1'	S 19°10.7'	63°10.7'	S 8°03.3'	331°28.5'	S 21°48.9'	327°40.0'	S 21°02.6'	252°42.4'	N 5°23.1'			
15	282°07.6'	48°43.9'	S 19°11.3'	78°10.3'	S 8°04.4'	346°30.5'	S 21°48.8'	342°42.3'	S 21°02.6'	267°44.8'	N 5°23.3'			
16	297°10.0'	63°43.8'	S 19°11.9'	93°09.8'	S 8°05.5'	1°32.6'	S 21°48.7'	357°44.5'	S 21°02.6'	282°47.2'	N 5°23.5'			
17	312°12.5'	78°43.7'	S 19°12.5'	108°09.4'	S 8°06.6'	16°34.6'	S 21°48.7'	12°46.8'	S 21°02.5'	297°49.6'	N 5°23.7'			
18	327°15.0'	93°43.5'	S 19°13.1'	123°09.0'	S 8°07.8'	31°36.6'	S 21°48.6'	27°49.1'	S 21°02.5'	312°52.0'	N 5°23.8'			
19	342°17.4'	108°43.4'	S 19°13.7'	138°08.5'	S 8°08.9'	46°38.6'	S 21°48.5'	42°51.3'	S 21°02.5'	327°54.4'	N 5°24.0'			
20	357°19.9'	123°43.3'	S 19°14.3'	153°08.1'	S 8°10.0'	61°40.6'	S 21°48.4'	57°53.6'	S 21°02.4'	342°56.8'	N 5°24.2'			
21	12°22.3'	138°43.2'	S 19°14.8'	168°07.6'	S 8°11.1'	76°42.6'	S 21°48.4'	72°55.8'	S 21°02.4'	357°59.2'	N 5°24.4'			
22	27°24.8'	153°43.0'	S 19°15.4'	183°07.2'	S 8°12.3'	91°44.6'	S 21°48.3'	87°58.1'	S 21°02.4'	13°01.6'	N 5°24.5'			
23	42°27.3'	168°42.9'	S 19°16.0'	198°06.8'	S 8°13.4'	106°46.6'	S 21°48.2'	103°00.4'	S 21°02.3'	28°04.0'	N 5°24.7'			
		SD 16.2' d -0.6'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.4' d 0.2'				
Mer. pass.		11 h 45 m 3 s		9 h 47 m		15 h 54 m		16 h 9 m		21 h 8 m				

h	Moon					Lunar distance						
	GHA	dec	v	d	HP	-Mars	-Achernar	-Fomalhaut	-Altair	-Saturn	-Jupiter	+Antares
0	157°25.1'	S 23°03.1'	4.0'	-6.0'	60.2'	115°19.1'	87°47.0'	75°16.2'	49°40.3'	37°16.3'	33°35.3'	10°55.5'
1	171°48.1'	S 23°09.1'	4.0'	-5.9'	60.2'	114°42.5'	87°25.5'	74°41.0'	49°14.5'	36°39.8'	32°59.0'	11°27.5'
2	186°11.1'	S 23°15.0'	4.0'	-5.7'	60.2'	114°06.0'	87°04.0'	74°05.8'	48°48.8'	36°03.4'	32°22.9'	11°60.0'
3	200°34.1'	S 23°20.7'	4.0'	-5.5'	60.1'	113°29.5'	86°42.6'	73°30.6'	48°23.4'	35°27.0'	31°46.7'	12°32.8'
4	214°57.1'	S 23°26.2'	4.0'	-5.3'	60.1'	112°53.1'	86°21.2'	72°55.6'	47°58.2'	34°50.7'	31°10.6'	13°05.9'
5	229°20.1'	S 23°31.5'	4.0'	-5.2'	60.1'	112°16.7'	85°59.9'	72°20.5'	47°33.2'	34°14.4'	30°34.6'	13°39.3'
6	243°43.0'	S 23°36.7'	4.0'	-5.0'	60.0'	111°40.3'	85°38.6'	71°45.6'	47°08.4'	33°38.2'	29°58.6'	14°12.8'
7	258°06.0'	S 23°41.7'	4.0'	-4.8'	60.0'	111°04.0'	85°17.3'	71°10.6'	46°43.8'	33°02.0'	29°22.6'	14°46.6'
8	272°29.0'	S 23°46.5'	4.0'	-4.7'	60.0'	110°27.7'	84°56.1'	70°35.7'	46°19.5'	32°25.8'	28°46.7'	15°20.6'
9	286°51.9'	S 23°51.2'	4.0'	-4.5'	59.9'	109°51.5'	84°34.9'	70°00.9'	45°55.4'	31°49.7'	28°10.8'	15°54.6'
10	301°14.9'	S 23°55.7'	4.0'	-4.3'	59.9'	109°15.3'	84°13.8'	69°26.2'	45°31.6'	31°13.7'	27°35.0'	16°28.9'
11	315°37.8'	S 23°60.0'	4.0'	-4.1'	59.9'	108°39.2'	83°52.7'	68°51.4'	45°08.0'	30°37.7'	26°59.3'	17°03.2'
12	330°00.8'	S 24°04.1'	4.0'	-4.0'	59.8'	108°03.1'	83°31.7'	68°16.8'	44°44.6'	30°01.7'	26°23.6'	17°37.6'
13	344°23.8'	S 24°08.1'	4.0'	-3.8'	59.8'	107°27.1'	83°10.8'	67°42.2'	44°21.5'	29°25.8'	25°47.9'	18°12.1'
14	358°46.8'	S 24°11.8'	4.0'	-3.6'	59.8'	106°51.1'	82°49.9'	67°07.6'	43°58.7'	28°50.0'	25°12.3'	18°46.6'
15	13°09.8'	S 24°15.5'	4.0'	-3.4'	59.7'	106°15.1'	82°29.0'	66°33.1'	43°36.1'	28°14.2'	24°36.8'	19°21.2'
16	27°32.8'	S 24°18.9'	4.0'	-3.3'	59.7'	105°39.2'	82°08.2'	65°58.7'	43°13.8'	27°38.5'	24°01.3'	19°55.8'
17	41°55.8'	S 24°22.2'	4.0'	-3.1'	59.6'	105°03.3'	81°47.5'	65°24.3'	42°51.8'	27°02.8'	23°25.8'	20°30.5'
18	56°18.8'	S 24°25.3'	4.1'	-2.9'	59.6'	104°27.5'	81°26.8'	64°50.0'	42°30.1'	26°27.2'	22°50.4'	21°05.3'
19	70°41.9'	S 24°28.2'	4.1'	-2.7'	59.6'	103°51.8'	81°06.2'	64°15.7'	42°08.6'	25°51.6'	22°15.1'	21°40.0'
20	85°05.0'	S 24°30.9'	4.1'	-2.6'	59.5'	103°16.0'	80°45.7'	63°41.6'	41°47.5'	25°16.1'	21°39.8'	22°14.7'
21	99°28.1'	S 24°33.5'	4.1'	-2.4'	59.5'	102°40.4'	80°25.2'	63°07.4'	41°26.6'	24°40.6'	21°04.6'	22°49.5'
22	113°51.2'	S 24°35.9'	4.2'	-2.2'	59.5'	102°04.7'	80°04.9'	62°33.4'	41°06.1'	24°05.2'	20°29.5'	23°24.3'
23	128°14.4'	S 24°38.1'	4.2'	-2.0'	59.4'	101°29.2'	79°44.5'	61°59.4'	40°45.9'	23°29.8'	19°54.4'	23°59.1'
Mer. pass.												

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.5'	Aldebaran	+0.9	290°43.2'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.6'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.3'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.5'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	57°29.7'	183°42.8'	S 19°16.6'	213°06.3'	S 8°14.5'	121°48.6'	S 21°48.1'	118°02.6'	S 21°02.3'	43°06.4'	N 5°24.9'	
1	72°32.2'	198°42.6'	S 19°17.2'	228°05.9'	S 8°15.6'	136°50.6'	S 21°48.1'	133°04.9'	S 21°02.3'	58°08.8'	N 5°25.1'	
2	87°34.7'	213°42.5'	S 19°17.8'	243°05.5'	S 8°16.7'	151°52.6'	S 21°48.0'	148°07.2'	S 21°02.2'	73°11.2'	N 5°25.2'	
3	102°37.1'	228°42.4'	S 19°18.4'	258°05.0'	S 8°17.9'	166°54.6'	S 21°47.9'	163°09.4'	S 21°02.2'	88°13.6'	N 5°25.4'	
4	117°39.6'	243°42.2'	S 19°19.0'	273°04.6'	S 8°19.0'	181°56.6'	S 21°47.8'	178°11.7'	S 21°02.2'	103°16.0'	N 5°25.6'	
5	132°42.1'	258°42.1'	S 19°19.6'	288°04.1'	S 8°20.1'	196°58.6'	S 21°47.8'	193°14.0'	S 21°02.1'	118°18.4'	N 5°25.8'	
6	147°44.5'	273°41.9'	S 19°20.2'	303°03.7'	S 8°21.2'	212°00.6'	S 21°47.7'	208°16.2'	S 21°02.1'	133°20.8'	N 5°26.0'	
7	162°47.0'	288°41.8'	S 19°20.8'	318°03.3'	S 8°22.4'	227°02.6'	S 21°47.6'	223°18.5'	S 21°02.0'	148°23.2'	N 5°26.1'	
8	177°49.5'	303°41.7'	S 19°21.3'	333°02.8'	S 8°23.5'	242°04.5'	S 21°47.5'	238°20.7'	S 21°02.0'	163°25.5'	N 5°26.3'	
9	192°51.9'	318°41.5'	S 19°21.9'	348°02.4'	S 8°24.6'	257°06.5'	S 21°47.5'	253°23.0'	S 21°02.0'	178°27.9'	N 5°26.5'	
10	207°54.4'	333°41.4'	S 19°22.5'	3°01.9'	S 8°25.7'	272°08.5'	S 21°47.4'	268°25.3'	S 21°01.9'	193°30.3'	N 5°26.7'	
11	222°56.8'	348°41.3'	S 19°23.1'	18°01.5'	S 8°26.8'	287°10.5'	S 21°47.3'	283°27.5'	S 21°01.9'	208°32.7'	N 5°26.9'	
12	237°59.3'	3°41.1'	S 19°23.7'	33°01.1'	S 8°27.9'	302°12.5'	S 21°47.2'	298°29.8'	S 21°01.9'	223°35.1'	N 5°27.0'	
13	253°01.8'	18°41.0'	S 19°24.3'	48°00.6'	S 8°29.1'	317°14.5'	S 21°47.2'	313°32.1'	S 21°01.8'	238°37.5'	N 5°27.2'	
14	268°04.2'	33°40.9'	S 19°24.9'	63°00.2'	S 8°30.2'	332°16.5'	S 21°47.1'	328°34.3'	S 21°01.8'	253°39.8'	N 5°27.4'	
15	283°06.7'	48°40.7'	S 19°25.5'	77°59.7'	S 8°31.3'	347°18.5'	S 21°47.0'	343°36.6'	S 21°01.8'	268°42.2'	N 5°27.6'	
16	298°09.2'	63°40.6'	S 19°26.0'	92°59.3'	S 8°32.4'	2°20.5'	S 21°46.9'	358°38.8'	S 21°01.7'	283°44.6'	N 5°27.8'	
17	313°11.6'	78°40.4'	S 19°26.6'	107°58.8'	S 8°33.5'	17°22.5'	S 21°46.9'	13°41.1'	S 21°01.7'	298°47.0'	N 5°28.0'	
18	328°14.1'	93°40.3'	S 19°27.2'	122°58.4'	S 8°34.7'	32°24.5'	S 21°46.8'	28°43.4'	S 21°01.7'	313°49.3'	N 5°28.2'	
19	343°16.6'	108°40.2'	S 19°27.8'	137°58.0'	S 8°35.8'	47°26.5'	S 21°46.7'	43°45.6'	S 21°01.6'	328°51.7'	N 5°28.3'	
20	358°19.0'	123°40.0'	S 19°28.4'	152°57.5'	S 8°36.9'	62°28.5'	S 21°46.6'	58°47.9'	S 21°01.6'	343°54.1'	N 5°28.5'	
21	13°21.5'	138°39.9'	S 19°28.9'	167°57.1'	S 8°38.0'	77°30.5'	S 21°46.6'	73°50.2'	S 21°01.5'	358°56.4'	N 5°28.7'	
22	28°23.9'	153°39.7'	S 19°29.5'	182°56.6'	S 8°39.1'	92°32.5'	S 21°46.5'	88°52.4'	S 21°01.5'	13°58.8'	N 5°28.9'	
23	43°26.4'	168°39.6'	S 19°30.1'	197°56.2'	S 8°40.2'	107°34.5'	S 21°46.4'	103°54.7'	S 21°01.5'	29°01.2'	N 5°29.1'	
		SD 16.2'	d -0.6'		v -0.4' d -1.1'		v 2.0' d 0.1'		v 2.3' d 0.0'		v 2.4' d 0.2'	
Mer. pass.		11 h 45 m 16 s		9 h 48 m		15 h 51 m		16 h 5 m		21 h 4 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Mars	-Achernar	-Fomalhaut	-Altair	-Saturn	-Jupiter	+Antares	+Sun
0	142°37.6'	S 24°40.1'	4.2'	-1.9'	59.4'	100°53.6'	79°24.3'	61°25.4'	40°26.0'	22°54.6'	19°19.3'	24°33.9'	
1	157°00.8'	S 24°42.0'	4.3'	-1.7'	59.4'	100°18.2'	79°04.1'	60°51.5'	40°06.5'	22°19.3'	18°44.4'	25°08.6'	
2	171°24.0'	S 24°43.7'	4.3'	-1.5'	59.3'	99°42.7'	78°44.0'	60°17.7'	39°47.2'	21°44.2'	18°09.5'	25°43.4'	
3	185°47.3'	S 24°45.3'	4.3'	-1.4'	59.3'	99°07.4'	78°24.0'	59°44.0'	39°28.4'	21°09.1'	17°34.7'	26°18.2'	
4	200°10.6'	S 24°46.6'	4.4'	-1.2'	59.2'	98°32.0'	78°04.0'	59°10.3'	39°09.8'	20°34.1'	16°59.9'	26°52.9'	40°32.8'
5	214°34.0'	S 24°47.8'	4.4'	-1.0'	59.2'	97°56.7'	77°44.2'	58°36.7'	38°51.7'	19°59.1'	16°25.2'	27°27.7'	41°05.7'
6	228°57.4'	S 24°48.8'	4.5'	-0.9'	59.2'	97°21.5'	77°24.4'	58°03.2'	38°33.9'	19°24.2'	15°50.6'	28°02.4'	41°38.6'
7	243°20.9'	S 24°49.7'	4.5'	-0.7'	59.1'	96°46.3'	77°04.7'	57°29.7'	38°16.4'	18°49.4'	15°16.1'	28°37.1'	42°11.4'
8	257°44.4'	S 24°50.4'	4.5'	-0.5'	59.1'	96°11.2'	76°45.1'	56°56.3'	37°59.3'	18°14.6'	14°41.7'	29°11.7'	42°44.2'
9	272°07.9'	S 24°50.9'	4.6'	-0.3'	59.0'	95°36.1'	76°25.5'	56°23.0'	37°42.7'	17°40.0'	14°07.3'	29°46.4'	43°17.0'
10	286°31.5'	S 24°51.2'	4.7'	-0.2'	59.0'	95°01.1'	76°06.1'	55°49.8'	37°26.4'	17°05.4'	13°33.1'	30°21.0'	43°49.7'
11	300°55.2'	S 24°51.4'	4.7'	-0.0'	59.0'	94°26.1'	75°46.7'	55°16.6'	37°10.5'	16°30.9'	12°58.9'	30°55.6'	44°22.3'
12	315°18.9'	S 24°51.4'	4.8'	0.2'	58.9'	93°51.2'	75°27.5'	54°43.5'	36°55.0'	15°56.4'	12°24.8'	31°30.2'	44°54.9'
13	329°42.6'	S 24°51.3'	4.8'	0.3'	58.9'	93°16.3'	75°08.3'	54°10.5'		15°22.1'	11°50.9'	32°04.7'	45°27.5'
14	344°06.5'	S 24°50.9'	4.9'	0.5'	58.8'	92°41.5'	74°49.2'	53°37.5'		14°47.8'	11°17.1'	32°39.2'	45°60.0'
15	358°30.3'	S 24°50.4'	4.9'	0.7'	58.8'	92°06.7'	74°30.3'	53°04.7'		14°13.7'	10°43.4'	33°13.7'	46°32.4'
16	12°54.3'	S 24°49.8'	5.0'	0.8'	58.8'	91°32.0'	74°11.4'	52°31.9'		13°39.7'	10°09.8'	33°48.2'	47°04.8'
17	27°18.3'	S 24°49.0'	5.1'	1.0'	58.7'	90°57.3'	73°52.6'	51°59.2'		13°05.7'	9°36.5'	34°22.6'	47°37.2'
18	41°42.3'	S 24°48.0'	5.1'	1.1'	58.7'	90°22.7'	73°33.9'	51°26.5'		12°31.9'	9°03.3'	34°56.9'	48°09.5'
19	56°06.5'	S 24°46.9'	5.2'	1.3'	58.6'	89°48.1'	73°15.3'	50°54.0'		11°58.3'	8°30.3'	35°31.3'	48°41.8'
20	70°30.7'	S 24°45.6'	5.3'	1.5'	58.6'	89°13.6'	72°56.9'	50°21.5'		11°24.7'	7°57.6'	36°05.6'	49°14.0'
21	84°54.9'	S 24°44.1'	5.3'	1.6'	58.6'	88°39.2'	72°38.5'	49°49.2'		10°51.4'	7°25.1'	36°39.9'	49°46.1'
22	99°19.3'	S 24°42.5'	5.4'	1.8'	58.5'	88°04.7'	72°20.2'	49°16.9'		10°18.2'	6°53.0'	37°14.1'	50°18.3'
23	113°43.7'	S 24°40.7'	5.5'	1.9'	58.5'	87°30.4'	72°02.0'	48°44.7'		9°45.2'	6°21.3'	37°48.3'	50°50.3'
Mer. pass.		15 h 6 m SD 16.2'	phase 11%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.5'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.5'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°29.0'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	58°28.9'	183°39.5'	S 19°30.7'	212°55.7'	S 8°41.3'	122°36.5'	S 21°46.3'	118°56.9'	S 21°01.4'	44°03.5'	N 5°29.3'	
1	73°31.3'	198°39.3'	S 19°31.3'	227°55.3'	S 8°42.5'	137°38.5'	S 21°46.3'	133°59.2'	S 21°01.4'	59°05.9'	N 5°29.5'	
2	88°33.8'	213°39.2'	S 19°31.8'	242°54.8'	S 8°43.6'	152°40.5'	S 21°46.2'	149°01.5'	S 21°01.4'	74°08.3'	N 5°29.6'	
3	103°36.3'	228°39.0'	S 19°32.4'	257°54.4'	S 8°44.7'	167°42.5'	S 21°46.1'	164°03.7'	S 21°01.3'	89°10.6'	N 5°29.8'	
4	118°38.7'	243°38.9'	S 19°33.0'	272°53.9'	S 8°45.8'	182°44.5'	S 21°46.0'	179°06.0'	S 21°01.3'	104°13.0'	N 5°30.0'	
5	133°41.2'	258°38.7'	S 19°33.6'	287°53.5'	S 8°46.9'	197°46.5'	S 21°46.0'	194°08.2'	S 21°01.3'	119°15.3'	N 5°30.2'	
6	148°43.7'	273°38.6'	S 19°34.1'	302°53.0'	S 8°48.0'	212°48.5'	S 21°45.9'	209°10.5'	S 21°01.2'	134°17.7'	N 5°30.4'	
7	163°46.1'	288°38.5'	S 19°34.7'	317°52.6'	S 8°49.1'	227°50.5'	S 21°45.8'	224°12.8'	S 21°01.2'	149°20.1'	N 5°30.6'	
8	178°48.6'	303°38.3'	S 19°35.3'	332°52.1'	S 8°50.3'	242°52.5'	S 21°45.7'	239°15.0'	S 21°01.2'	164°22.4'	N 5°30.8'	
9	193°51.1'	318°38.2'	S 19°35.9'	347°51.7'	S 8°51.4'	257°54.4'	S 21°45.7'	254°17.3'	S 21°01.1'	179°24.8'	N 5°31.0'	
10	208°53.5'	333°38.0'	S 19°36.4'	2°51.2'	S 8°52.5'	272°56.4'	S 21°45.6'	269°19.5'	S 21°01.1'	194°27.1'	N 5°31.2'	
11	223°56.0'	348°37.9'	S 19°37.0'	17°50.8'	S 8°53.6'	287°58.4'	S 21°45.5'	284°21.8'	S 21°01.0'	209°29.5'	N 5°31.4'	
12	238°58.4'	3°37.7'	S 19°37.6'	32°50.3'	S 8°54.7'	303°00.4'	S 21°45.4'	299°24.1'	S 21°01.0'	224°31.8'	N 5°31.6'	
13	254°00.9'	18°37.6'	S 19°38.1'	47°49.9'	S 8°55.8'	318°02.4'	S 21°45.4'	314°26.3'	S 21°01.0'	239°34.2'	N 5°31.7'	
14	269°03.4'	33°37.4'	S 19°38.7'	62°49.4'	S 8°56.9'	333°04.4'	S 21°45.3'	329°28.6'	S 21°00.9'	254°36.5'	N 5°31.9'	
15	284°05.8'	48°37.3'	S 19°39.3'	77°49.0'	S 8°58.0'	348°06.4'	S 21°45.2'	344°30.8'	S 21°00.9'	269°38.9'	N 5°32.1'	
16	299°08.3'	63°37.1'	S 19°39.9'	92°48.5'	S 8°59.1'	3°08.4'	S 21°45.1'	359°33.1'	S 21°00.9'	284°41.2'	N 5°32.3'	
17	314°10.8'	78°37.0'	S 19°40.4'	107°48.1'	S 9°00.3'	18°10.4'	S 21°45.1'	14°35.3'	S 21°00.8'	299°43.5'	N 5°32.5'	
18	329°13.2'	93°36.9'	S 19°41.0'	122°47.6'	S 9°01.4'	33°12.4'	S 21°45.0'	29°37.6'	S 21°00.8'	314°45.9'	N 5°32.7'	
19	344°15.7'	108°36.7'	S 19°41.6'	137°47.2'	S 9°02.5'	48°14.4'	S 21°44.9'	44°39.9'	S 21°00.8'	329°48.2'	N 5°32.9'	
20	359°18.2'	123°36.6'	S 19°42.1'	152°46.7'	S 9°03.6'	63°16.4'	S 21°44.8'	59°42.1'	S 21°00.7'	344°50.6'	N 5°33.1'	
21	14°20.6'	138°36.4'	S 19°42.7'	167°46.3'	S 9°04.7'	78°18.4'	S 21°44.8'	74°44.4'	S 21°00.7'	359°52.9'	N 5°33.3'	
22	29°23.1'	153°36.3'	S 19°43.3'	182°45.8'	S 9°05.8'	93°20.4'	S 21°44.7'	89°46.6'	S 21°00.6'	14°55.2'	N 5°33.5'	
23	44°25.6'	168°36.1'	S 19°43.8'	197°45.4'	S 9°06.9'	108°22.3'	S 21°44.6'	104°48.9'	S 21°00.6'	29°57.6'	N 5°33.7'	
		SD 16.2'	d -0.6'	v -0.5'	d -1.1'	v 2.0'	d 0.1'	v 2.3'	d 0.0'	v 2.3'	d 0.2'	
Mer. pass.		11 h 45 m 30 s		9 h 49 m		15 h 47 m		16 h 2 m		21 h 0 m		

h	Moon				Lunar distance							
	GHA	dec	v	d	HP	-Mars	-Achernar	-Fomalhaut	-Saturn	-Jupiter	+Antares	+Sun
0	128°08.2'	S 24°38.8'	5.6'	2.1'	58.4'	86°56.1'	71°44.0'	48°12.5'	9°12.4'	5°50.2'	38°22.4'	51°22.3'
1	142°32.7'	S 24°36.7'	5.6'	2.2'	58.4'	86°21.8'	71°26.0'	47°40.5'	8°39.8'		38°56.6'	51°54.3'
2	156°57.4'	S 24°34.5'	5.7'	2.4'	58.4'	85°47.6'	71°08.2'	47°08.6'	8°07.6'		39°30.6'	52°26.2'
3	171°22.1'	S 24°32.1'	5.8'	2.5'	58.3'	85°13.5'	70°50.5'	46°36.7'	7°35.7'		40°04.7'	52°58.1'
4	185°46.9'	S 24°29.5'	5.9'	2.7'	58.3'	84°39.4'	70°32.9'	46°05.0'	7°04.2'		40°38.6'	53°29.9'
5	200°11.8'	S 24°26.8'	6.0'	2.8'	58.2'	84°05.3'	70°15.4'	45°33.3'	6°33.2'		41°12.6'	54°01.6'
6	214°36.7'	S 24°24.0'	6.0'	3.0'	58.2'	83°31.3'	69°58.0'	45°01.8'	6°02.8'		41°46.5'	54°33.4'
7	229°01.8'	S 24°21.0'	6.1'	3.1'	58.2'	82°57.4'	69°40.8'	44°30.3'			42°20.4'	55°05.0'
8	243°26.9'	S 24°17.8'	6.2'	3.3'	58.1'	82°23.5'	69°23.6'	43°59.0'			42°54.2'	55°36.6'
9	257°52.1'	S 24°14.5'	6.3'	3.4'	58.1'	81°49.6'	69°06.6'	43°27.7'			43°28.0'	56°08.2'
10	272°17.4'	S 24°11.1'	6.4'	3.6'	58.0'	81°15.8'	68°49.7'	42°56.6'			44°01.7'	56°39.7'
11	286°42.8'	S 24°07.5'	6.5'	3.7'	58.0'	80°42.1'	68°32.9'	42°25.5'			44°35.4'	57°11.2'
12	301°08.3'	S 24°03.8'	6.6'	3.9'	58.0'	80°08.4'	68°16.3'	41°54.6'			45°09.1'	57°42.6'
13	315°33.9'	S 23°59.9'	6.7'	4.0'	57.9'	79°34.8'	67°59.7'	41°23.7'			45°42.7'	58°14.0'
14	329°59.5'	S 23°55.9'	6.8'	4.1'	57.9'	79°01.2'	67°43.4'	40°53.0'			46°16.3'	58°45.3'
15	344°25.3'	S 23°51.8'	6.9'	4.3'	57.8'	78°27.7'	67°27.1'	40°22.4'			46°49.8'	59°16.6'
16	358°51.1'	S 23°47.5'	6.9'	4.4'	57.8'	77°54.2'	67°10.9'	39°51.9'			47°23.3'	59°47.8'
17	13°17.1'	S 23°43.0'	7.0'	4.6'	57.8'	77°20.7'	66°54.9'	39°21.6'			47°56.7'	60°18.9'
18	27°43.1'	S 23°38.5'	7.1'	4.7'	57.7'	76°47.4'	66°39.1'	38°51.3'		5°24.2'	48°30.1'	60°50.1'
19	42°09.3'	S 23°33.8'	7.2'	4.8'	57.7'	76°14.0'	66°23.3'	38°21.2'		5°54.1'	49°03.4'	61°21.1'
20	56°35.5'	S 23°29.0'	7.3'	5.0'	57.6'	75°40.8'	66°07.7'	37°51.2'		6°24.4'	49°36.7'	61°52.2'
21	71°01.8'	S 23°24.0'	7.4'	5.1'	57.6'	75°07.5'	65°52.2'	37°21.3'		6°55.1'	50°10.0'	62°23.1'
22	85°28.2'	S 23°18.9'	7.5'	5.2'	57.6'	74°34.4'	65°36.9'	36°51.6'		7°26.1'	50°43.2'	62°54.1'
23	99°54.8'	S 23°13.7'	7.6'	5.3'	57.5'	74°01.2'	65°21.7'	36°22.0'		7°57.3'	51°16.4'	63°25.0'
Mer. pass.		16 h 5 m SD 15.9'	phase 19%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.2'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.3'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.5'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.4'	N 19°04.6'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	59°28.0'	183°36.0'	S 19°44.4'	212°44.9'	S 9°08.0'	123°24.3'	S 21°44.5'	119°51.2'	S 21°00.6'	44°59.9'	N 5°33.9'	
1	74°30.5'	198°35.8'	S 19°44.9'	227°44.5'	S 9°09.1'	138°26.3'	S 21°44.4'	134°53.4'	S 21°00.5'	60°02.2'	N 5°34.1'	
2	89°32.9'	213°35.7'	S 19°45.5'	242°44.0'	S 9°10.2'	153°28.3'	S 21°44.4'	149°55.7'	S 21°00.5'	75°04.6'	N 5°34.3'	
3	104°35.4'	228°35.5'	S 19°46.1'	257°43.6'	S 9°11.3'	168°30.3'	S 21°44.3'	164°57.9'	S 21°00.5'	90°06.9'	N 5°34.5'	
4	119°37.9'	243°35.4'	S 19°46.6'	272°43.1'	S 9°12.4'	183°32.3'	S 21°44.2'	180°00.2'	S 21°00.4'	105°09.2'	N 5°34.7'	
5	134°40.3'	258°35.2'	S 19°47.2'	287°42.6'	S 9°13.6'	198°34.3'	S 21°44.1'	195°02.4'	S 21°00.4'	120°11.6'	N 5°34.9'	
6	149°42.8'	273°35.1'	S 19°47.8'	302°42.2'	S 9°14.7'	213°36.3'	S 21°44.1'	210°04.7'	S 21°00.3'	135°13.9'	N 5°35.1'	
7	164°45.3'	288°34.9'	S 19°48.3'	317°41.7'	S 9°15.8'	228°38.3'	S 21°44.0'	225°07.0'	S 21°00.3'	150°16.2'	N 5°35.3'	
8	179°47.7'	303°34.7'	S 19°48.9'	332°41.3'	S 9°16.9'	243°40.3'	S 21°43.9'	240°09.2'	S 21°00.3'	165°18.5'	N 5°35.5'	
9	194°50.2'	318°34.6'	S 19°49.4'	347°40.8'	S 9°18.0'	258°42.2'	S 21°43.8'	255°11.5'	S 21°00.2'	180°20.9'	N 5°35.7'	
10	209°52.7'	333°34.4'	S 19°50.0'	2°40.4'	S 9°19.1'	273°44.2'	S 21°43.8'	270°13.7'	S 21°00.2'	195°23.2'	N 5°35.9'	
11	224°55.1'	348°34.3'	S 19°50.5'	17°39.9'	S 9°20.2'	288°46.2'	S 21°43.7'	285°16.0'	S 21°00.2'	210°25.5'	N 5°36.1'	
12	239°57.6'	3°34.1'	S 19°51.1'	32°39.4'	S 9°21.3'	303°48.2'	S 21°43.6'	300°18.2'	S 21°00.1'	225°27.8'	N 5°36.3'	
13	255°00.1'	18°34.0'	S 19°51.7'	47°39.0'	S 9°22.4'	318°50.2'	S 21°43.5'	315°20.5'	S 21°00.1'	240°30.1'	N 5°36.5'	
14	270°02.5'	33°33.8'	S 19°52.2'	62°38.5'	S 9°23.5'	333°52.2'	S 21°43.4'	330°22.7'	S 21°00.1'	255°32.4'	N 5°36.7'	
15	285°05.0'	48°33.7'	S 19°52.8'	77°38.1'	S 9°24.6'	348°54.2'	S 21°43.4'	345°25.0'	S 21°00.0'	270°34.8'	N 5°36.9'	
16	300°07.4'	63°33.5'	S 19°53.3'	92°37.6'	S 9°25.7'	3°56.2'	S 21°43.3'	0°27.3'	S 20°60.0'	285°37.1'	N 5°37.1'	
17	315°09.9'	78°33.4'	S 19°53.9'	107°37.1'	S 9°26.8'	18°58.2'	S 21°43.2'	15°29.5'	S 20°59.9'	300°39.4'	N 5°37.3'	
18	330°12.4'	93°33.2'	S 19°54.4'	122°36.7'	S 9°27.9'	34°00.1'	S 21°43.1'	30°31.8'	S 20°59.9'	315°41.7'	N 5°37.5'	
19	345°14.8'	108°33.0'	S 19°55.0'	137°36.2'	S 9°29.0'	49°02.1'	S 21°43.1'	45°34.0'	S 20°59.9'	330°44.0'	N 5°37.7'	
20	0°17.3'	123°32.9'	S 19°55.5'	152°35.8'	S 9°30.1'	64°04.1'	S 21°43.0'	60°36.3'	S 20°59.8'	345°46.3'	N 5°37.9'	
21	15°19.8'	138°32.7'	S 19°56.1'	167°35.3'	S 9°31.2'	79°06.1'	S 21°42.9'	75°38.5'	S 20°59.8'	0°48.6'	N 5°38.1'	
22	30°22.2'	153°32.6'	S 19°56.6'	182°34.8'	S 9°32.3'	94°08.1'	S 21°42.8'	90°40.8'	S 20°59.8'	15°50.9'	N 5°38.3'	
23	45°24.7'	168°32.4'	S 19°57.2'	197°34.4'	S 9°33.4'	109°10.1'	S 21°42.7'	105°43.0'	S 20°59.7'	30°53.2'	N 5°38.6'	
		SD 16.2'	d -0.6'	v -0.5'	d -1.1'	v 2.0'	d 0.1'	v 2.3'	d 0.0'	v 2.3'	d 0.2'	
Mer. pass.		11 h 45 m 44 s		9 h 49 m		15 h 44 m		15 h 58 m		20 h 57 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Aldebaran	-Rigel	-Mars	-Fomalhaut	+Saturn	+Jupiter	+Antares	+Sun
0	114°21.4'	S 23°08.3'	7.7'	5.5'	57.5'			73°28.2'	35°52.5'		8°28.7'	51°49.5'	63°55.8'
1	128°48.1'	S 23°02.9'	7.8'	5.6'	57.4'			72°55.1'	35°23.2'	5°60.0'	9°00.2'	52°22.6'	64°26.6'
2	143°15.0'	S 22°57.3'	7.9'	5.7'	57.4'			72°22.2'	34°54.0'	6°29.5'	9°31.8'	52°55.6'	64°57.3'
3	157°41.9'	S 22°51.5'	8.0'	5.8'	57.4'			71°49.2'	34°25.0'	6°59.4'	10°03.6'	53°28.6'	65°28.0'
4	172°08.9'	S 22°45.7'	8.1'	6.0'	57.3'			71°16.4'	33°56.1'	7°29.7'	10°35.3'	54°01.6'	65°58.6'
5	186°36.0'	S 22°39.7'	8.2'	6.1'	57.3'			70°43.5'	33°27.4'	8°00.4'	11°07.1'	54°34.5'	66°29.2'
6	201°03.3'	S 22°33.6'	8.3'	6.2'	57.2'			70°10.8'	32°58.9'	8°31.3'	11°39.0'	55°07.3'	66°59.8'
7	215°30.6'	S 22°27.4'	8.4'	6.3'	57.2'			69°38.0'	32°30.5'	9°02.3'	12°10.9'	55°40.2'	67°30.3'
8	229°58.0'	S 22°21.1'	8.5'	6.4'	57.2'			69°05.3'	32°02.3'	9°33.5'	12°42.8'	56°12.9'	68°00.7'
9	244°25.6'	S 22°14.7'	8.6'	6.6'	57.1'			68°32.7'	31°34.2'	10°04.9'	13°14.7'	56°45.7'	68°31.1'
10	258°53.2'	S 22°08.1'	8.7'	6.7'	57.1'			68°00.1'	31°06.4'	10°36.3'	13°46.6'	57°18.4'	69°01.5'
11	273°21.0'	S 22°01.4'	8.8'	6.8'	57.0'			67°27.6'	30°38.7'	11°07.8'	14°18.4'	57°51.0'	69°31.8'
12	287°48.8'	S 21°54.7'	9.0'	6.9'	57.0'		119°45.2'	66°55.1'	30°11.3'	11°39.4'	14°50.3'	58°23.6'	70°02.1'
13	302°16.8'	S 21°47.8'	9.1'	7.0'	57.0'		119°18.6'	66°22.7'	29°44.0'	12°11.0'	15°22.2'	58°56.2'	70°32.3'
14	316°44.8'	S 21°40.8'	9.2'	7.1'	56.9'	119°42.3'	118°52.1'	65°50.3'	29°16.9'	12°42.7'	15°54.1'	59°28.7'	71°02.5'
15	331°13.0'	S 21°33.7'	9.3'	7.2'	56.9'	119°09.7'	118°25.5'	65°17.9'	28°50.1'	13°14.4'	16°25.9'	60°01.2'	71°32.6'
16	345°41.3'	S 21°26.5'	9.4'	7.3'	56.9'	118°37.2'	117°58.9'	64°45.6'	28°23.5'	13°46.0'	16°57.7'	60°33.6'	72°02.7'
17	0°09.6'	S 21°19.1'	9.5'	7.4'	56.8'	118°04.8'	117°32.3'	64°13.4'	27°57.1'	14°17.8'	17°29.5'	61°06.0'	72°32.8'
18	14°38.1'	S 21°11.7'	9.6'	7.5'	56.8'	117°32.4'	117°05.7'	63°41.2'	27°30.9'	14°49.5'	18°01.3'	61°38.3'	73°02.8'
19	29°06.7'	S 21°04.2'	9.7'	7.6'	56.7'	117°00.0'	116°39.0'	63°09.0'	27°05.0'	15°21.2'	18°33.0'	62°10.6'	73°32.7'
20	43°35.3'	S 20°56.5'	9.8'	7.7'	56.7'	116°27.7'	116°12.4'	62°36.9'	26°39.4'	15°52.9'	19°04.7'	62°42.9'	74°02.6'
21	58°04.1'	S 20°48.8'	9.9'	7.8'	56.7'	115°55.4'	115°45.7'	62°04.9'	26°14.0'	16°24.6'	19°36.4'	63°15.1'	74°32.5'
22	72°33.0'	S 20°41.0'	10.0'	7.9'	56.6'	115°23.2'	115°19.0'	61°32.9'	25°48.9'	16°56.2'	20°08.1'	63°47.3'	75°02.3'
23	87°02.0'	S 20°33.1'	10.1'	8.0'	56.6'	114°51.0'	114°52.3'	61°00.9'	25°24.1'	17°27.9'	20°39.7'	64°19.4'	75°32.1'
Mer. pass.		16 h 59 m SD 15.7'		phase 28%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.5'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.6'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	60°27.2'	183°32.3'	S 19°57.7'	212°33.9'	S 9°34.5'	124°12.1'	S 21°42.7'	120°45.3'	S 20°59.7'	45°55.5'	N 5°38.8'	
1	75°29.6'	198°32.1'	S 19°58.3'	227°33.5'	S 9°35.6'	139°14.1'	S 21°42.6'	135°47.6'	S 20°59.6'	60°57.8'	N 5°39.0'	
2	90°32.1'	213°31.9'	S 19°58.8'	242°33.0'	S 9°36.7'	154°16.0'	S 21°42.5'	150°49.8'	S 20°59.6'	76°00.1'	N 5°39.2'	
3	105°34.6'	228°31.8'	S 19°59.4'	257°32.5'	S 9°37.8'	169°18.0'	S 21°42.4'	165°52.1'	S 20°59.6'	91°02.4'	N 5°39.4'	
4	120°37.0'	243°31.6'	S 19°59.9'	272°32.1'	S 9°38.9'	184°20.0'	S 21°42.4'	180°54.3'	S 20°59.5'	106°04.7'	N 5°39.6'	
5	135°39.5'	258°31.5'	S 20°00.5'	287°31.6'	S 9°40.0'	199°22.0'	S 21°42.3'	195°56.6'	S 20°59.5'	121°07.0'	N 5°39.8'	
6	150°41.9'	273°31.3'	S 20°01.0'	302°31.1'	S 9°41.1'	214°24.0'	S 21°42.2'	210°58.8'	S 20°59.5'	136°09.3'	N 5°40.0'	
7	165°44.4'	288°31.1'	S 20°01.5'	317°30.7'	S 9°42.2'	229°26.0'	S 21°42.1'	226°01.1'	S 20°59.4'	151°11.6'	N 5°40.2'	
8	180°46.9'	303°31.0'	S 20°02.1'	332°30.2'	S 9°43.3'	244°28.0'	S 21°42.0'	241°03.3'	S 20°59.4'	166°13.9'	N 5°40.4'	
9	195°49.3'	318°30.8'	S 20°02.6'	347°29.7'	S 9°44.4'	259°29.9'	S 21°42.0'	256°05.6'	S 20°59.3'	181°16.2'	N 5°40.6'	
10	210°51.8'	333°30.7'	S 20°03.2'	2°29.3'	S 9°45.5'	274°31.9'	S 21°41.9'	271°07.8'	S 20°59.3'	196°18.5'	N 5°40.9'	
11	225°54.3'	348°30.5'	S 20°03.7'	17°28.8'	S 9°46.6'	289°33.9'	S 21°41.8'	286°10.1'	S 20°59.3'	211°20.8'	N 5°41.1'	
12	240°56.7'	3°30.3'	S 20°04.3'	32°28.3'	S 9°47.7'	304°35.9'	S 21°41.7'	301°12.3'	S 20°59.2'	226°23.1'	N 5°41.3'	
13	255°59.2'	18°30.2'	S 20°04.8'	47°27.9'	S 9°48.8'	319°37.9'	S 21°41.7'	316°14.6'	S 20°59.2'	241°25.4'	N 5°41.5'	
14	271°01.7'	33°30.0'	S 20°05.3'	62°27.4'	S 9°49.9'	334°39.9'	S 21°41.6'	331°16.8'	S 20°59.2'	256°27.7'	N 5°41.7'	
15	286°04.1'	48°29.9'	S 20°05.9'	77°26.9'	S 9°51.0'	349°41.8'	S 21°41.5'	346°19.1'	S 20°59.1'	271°30.0'	N 5°41.9'	
16	301°06.6'	63°29.7'	S 20°06.4'	92°26.5'	S 9°52.1'	4°43.8'	S 21°41.4'	1°21.4'	S 20°59.1'	286°32.2'	N 5°42.1'	
17	316°09.0'	78°29.5'	S 20°07.0'	107°26.0'	S 9°53.2'	19°45.8'	S 21°41.3'	16°23.6'	S 20°59.0'	301°34.5'	N 5°42.3'	
18	331°11.5'	93°29.4'	S 20°07.5'	122°25.5'	S 9°54.3'	34°47.8'	S 21°41.3'	31°25.9'	S 20°59.0'	316°36.8'	N 5°42.6'	
19	346°14.0'	108°29.2'	S 20°08.0'	137°25.1'	S 9°55.3'	49°49.8'	S 21°41.2'	46°28.1'	S 20°59.0'	331°39.1'	N 5°42.8'	
20	1°16.4'	123°29.0'	S 20°08.6'	152°24.6'	S 9°56.4'	64°51.8'	S 21°41.1'	61°30.4'	S 20°58.9'	346°41.4'	N 5°43.0'	
21	16°18.9'	138°28.9'	S 20°09.1'	167°24.1'	S 9°57.5'	79°53.7'	S 21°41.0'	76°32.6'	S 20°58.9'	1°43.6'	N 5°43.2'	
22	31°21.4'	153°28.7'	S 20°09.6'	182°23.6'	S 9°58.6'	94°55.7'	S 21°40.9'	91°34.9'	S 20°58.9'	16°45.9'	N 5°43.4'	
23	46°23.8'	168°28.5'	S 20°10.2'	197°23.2'	S 9°59.7'	109°57.7'	S 21°40.9'	106°37.1'	S 20°58.8'	31°48.2'	N 5°43.6'	
		SD 16.2'	d -0.5'	v -0.5'	d -1.1'	v 2.0'	d 0.1'	v 2.3'	d 0.0'	v 2.3'	d 0.2'	
Mer. pass.		11 h 45 m 59 s		9 h 50 m		15 h 41 m		15 h 55 m		20 h 53 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Rigel	-Aldebaran	-Mars	-Fomalhaut	+Saturn	+Jupiter	+Altair	+Sun
0	101°31.1'	S 20°25.0'	10.2'	8.1'	56.6'	114°25.6'	114°18.8'	60°29.0'	24°59.6'	17°59.6'	21°11.3'		76°01.9'
1	116°00.3'	S 20°16.9'	10.3'	8.2'	56.5'	113°58.9'	113°46.7'	59°57.1'	24°35.4'	18°31.2'	21°42.8'		76°31.6'
2	130°29.6'	S 20°08.7'	10.4'	8.3'	56.5'	113°32.2'	113°14.6'	59°25.2'	24°11.5'	19°02.8'	22°14.4'		77°01.2'
3	144°59.0'	S 20°00.4'	10.5'	8.4'	56.5'	113°05.5'	112°42.6'	58°53.5'	23°48.0'	19°34.4'	22°45.9'		77°30.8'
4	159°28.5'	S 19°52.0'	10.6'	8.5'	56.4'	112°38.7'	112°10.6'	58°21.7'	23°24.8'	20°06.0'	23°17.3'		78°00.4'
5	173°58.1'	S 19°43.5'	10.7'	8.6'	56.4'	112°12.0'	111°38.6'	57°50.0'	23°01.9'	20°37.5'	23°48.8'		78°29.9'
6	188°27.8'	S 19°35.0'	10.8'	8.7'	56.3'	111°45.3'	111°06.7'	57°18.4'	22°39.5'	21°09.0'	24°20.2'		78°59.4'
7	202°57.6'	S 19°26.3'	10.9'	8.7'	56.3'	111°18.5'	110°34.9'	56°46.7'	22°17.4'	21°40.5'	24°51.5'		79°28.9'
8	217°27.5'	S 19°17.6'	11.0'	8.8'	56.3'	110°51.8'	110°03.0'	56°15.2'	21°55.8'	22°12.0'	25°22.9'	37°42.4'	79°58.3'
9	231°57.4'	S 19°08.7'	11.1'	8.9'	56.2'	110°25.1'	109°31.2'	55°43.6'	21°34.6'	22°43.4'	25°54.2'	37°57.4'	80°27.7'
10	246°27.5'	S 18°59.8'	11.2'	9.0'	56.2'	109°58.3'	108°59.5'	55°12.2'	21°13.9'	23°14.8'	26°25.4'	38°12.7'	80°57.0'
11	260°57.7'	S 18°50.8'	11.3'	9.1'	56.2'	109°31.6'	108°27.8'	54°40.7'	20°53.6'	23°46.2'	26°56.6'	38°28.3'	81°26.3'
12	275°28.0'	S 18°41.7'	11.4'	9.2'	56.1'	109°04.8'	107°56.1'	54°09.3'	20°33.8'	24°17.6'	27°27.8'	38°44.2'	81°55.5'
13	289°58.4'	S 18°32.6'	11.5'	9.2'	56.1'	108°38.1'	107°24.5'	53°38.0'	20°14.5'	24°48.9'	27°59.0'	39°00.3'	82°24.8'
14	304°28.9'	S 18°23.4'	11.6'	9.3'	56.1'	108°11.4'	106°52.9'	53°06.6'	19°55.8'	25°20.2'	28°30.1'	39°16.6'	82°53.9'
15	318°59.5'	S 18°14.0'	11.7'	9.4'	56.0'	107°44.7'	106°21.3'	52°35.4'	19°37.6'	25°51.4'	29°01.2'	39°33.2'	83°23.1'
16	333°30.2'	S 18°04.6'	11.8'	9.5'	56.0'	107°18.0'	105°49.8'	52°04.1'	19°19.9'	26°22.7'	29°32.3'	39°50.0'	83°52.2'
17	348°00.9'	S 17°55.2'	11.9'	9.5'	56.0'	106°51.2'	105°18.3'	51°32.9'	19°02.9'	26°53.9'	30°03.3'	40°07.1'	84°21.2'
18	2°31.8'	S 17°45.6'	12.0'	9.6'	55.9'	106°24.5'	104°46.8'	51°01.8'	18°46.5'	27°25.0'	30°34.3'	40°24.4'	84°50.3'
19	17°02.7'	S 17°36.0'	12.1'	9.7'	55.9'	105°57.8'	104°15.4'	50°30.7'	18°30.8'	27°56.2'	31°05.2'	40°41.9'	85°19.2'
20	31°33.8'	S 17°26.3'	12.1'	9.8'	55.9'	105°31.2'	103°44.0'	49°59.6'		28°27.3'	31°36.2'	40°59.6'	85°48.2'
21	46°04.9'	S 17°16.6'	12.2'	9.8'	55.8'	105°04.5'	103°12.7'	49°28.6'		28°58.4'	32°07.1'	41°17.5'	86°17.1'
22	60°36.2'	S 17°06.8'	12.3'	9.9'	55.8'	104°37.8'	102°41.4'	48°57.6'		29°29.4'	32°37.9'	41°35.6'	86°46.0'
23	75°07.5'	S 16°56.9'	12.4'	10.0'	55.8'	104°11.1'	102°10.1'	48°26.6'		30°00.4'	33°08.7'	41°53.9'	87°14.8'
Mer. pass.		17 h 50 m SD 15.4'		phase 38%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.1'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.6'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.6'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	61°26.3'	183°28.4'	S 20°10.7'	212°22.7'	S 10°00.8'	124°59.7'	S 21°40.8'	121°39.4'	S 20°58.8'	46°50.5'	N 5°43.9'	
1	76°28.8'	198°28.2'	S 20°11.2'	227°22.2'	S 10°01.9'	140°01.7'	S 21°40.7'	136°41.6'	S 20°58.7'	61°52.7'	N 5°44.1'	
2	91°31.2'	213°28.0'	S 20°11.8'	242°21.8'	S 10°03.0'	155°03.7'	S 21°40.6'	151°43.9'	S 20°58.7'	76°55.0'	N 5°44.3'	
3	106°33.7'	228°27.9'	S 20°12.3'	257°21.3'	S 10°04.1'	170°05.6'	S 21°40.6'	166°46.1'	S 20°58.7'	91°57.3'	N 5°44.5'	
4	121°36.2'	243°27.7'	S 20°12.8'	272°20.8'	S 10°05.2'	185°07.6'	S 21°40.5'	181°48.4'	S 20°58.6'	106°59.5'	N 5°44.7'	
5	136°38.6'	258°27.5'	S 20°13.4'	287°20.3'	S 10°06.3'	200°09.6'	S 21°40.4'	196°50.6'	S 20°58.6'	122°01.8'	N 5°44.9'	
6	151°41.1'	273°27.4'	S 20°13.9'	302°19.9'	S 10°07.3'	215°11.6'	S 21°40.3'	211°52.9'	S 20°58.5'	137°04.1'	N 5°45.2'	
7	166°43.5'	288°27.2'	S 20°14.4'	317°19.4'	S 10°08.4'	230°13.6'	S 21°40.2'	226°55.1'	S 20°58.5'	152°06.3'	N 5°45.4'	
8	181°46.0'	303°27.0'	S 20°14.9'	332°18.9'	S 10°09.5'	245°15.5'	S 21°40.2'	241°57.4'	S 20°58.5'	167°08.6'	N 5°45.6'	
9	196°48.5'	318°26.9'	S 20°15.5'	347°18.4'	S 10°10.6'	260°17.5'	S 21°40.1'	256°59.6'	S 20°58.4'	182°10.9'	N 5°45.8'	
10	211°50.9'	333°26.7'	S 20°16.0'	2°18.0'	S 10°11.7'	275°19.5'	S 21°40.0'	272°01.9'	S 20°58.4'	197°13.1'	N 5°46.0'	
11	226°53.4'	348°26.5'	S 20°16.5'	17°17.5'	S 10°12.8'	290°21.5'	S 21°39.9'	287°04.1'	S 20°58.4'	212°15.4'	N 5°46.3'	
12	241°55.9'	3°26.4'	S 20°17.0'	32°17.0'	S 10°13.9'	305°23.5'	S 21°39.8'	302°06.4'	S 20°58.3'	227°17.7'	N 5°46.5'	
13	256°58.3'	18°26.2'	S 20°17.6'	47°16.5'	S 10°15.0'	320°25.4'	S 21°39.8'	317°08.6'	S 20°58.3'	242°19.9'	N 5°46.7'	
14	272°00.8'	33°26.0'	S 20°18.1'	62°16.1'	S 10°16.1'	335°27.4'	S 21°39.7'	332°10.9'	S 20°58.2'	257°22.2'	N 5°46.9'	
15	287°03.3'	48°25.8'	S 20°18.6'	77°15.6'	S 10°17.1'	350°29.4'	S 21°39.6'	347°13.1'	S 20°58.2'	272°24.4'	N 5°47.2'	
16	302°05.7'	63°25.7'	S 20°19.1'	92°15.1'	S 10°18.2'	5°31.4'	S 21°39.5'	2°15.4'	S 20°58.2'	287°26.7'	N 5°47.4'	
17	317°08.2'	78°25.5'	S 20°19.7'	107°14.6'	S 10°19.3'	20°33.4'	S 21°39.4'	17°17.6'	S 20°58.1'	302°28.9'	N 5°47.6'	
18	332°10.7'	93°25.3'	S 20°20.2'	122°14.1'	S 10°20.4'	35°35.3'	S 21°39.4'	32°19.9'	S 20°58.1'	317°31.2'	N 5°47.8'	
19	347°13.1'	108°25.2'	S 20°20.7'	137°13.7'	S 10°21.5'	50°37.3'	S 21°39.3'	47°22.1'	S 20°58.0'	332°33.4'	N 5°48.0'	
20	2°15.6'	123°25.0'	S 20°21.2'	152°13.2'	S 10°22.6'	65°39.3'	S 21°39.2'	62°24.4'	S 20°58.0'	347°35.7'	N 5°48.3'	
21	17°18.0'	138°24.8'	S 20°21.7'	167°12.7'	S 10°23.6'	80°41.3'	S 21°39.1'	77°26.6'	S 20°58.0'	2°37.9'	N 5°48.5'	
22	32°20.5'	153°24.6'	S 20°22.3'	182°12.2'	S 10°24.7'	95°43.3'	S 21°39.0'	92°28.9'	S 20°57.9'	17°40.2'	N 5°48.7'	
23	47°23.0'	168°24.5'	S 20°22.8'	197°11.7'	S 10°25.8'	110°45.2'	S 21°39.0'	107°31.1'	S 20°57.9'	32°42.4'	N 5°48.9'	
		SD 16.2' d -0.5'		v -0.5' d -1.1'		v 2.0' d 0.1'		v 2.2' d 0.0'		v 2.3' d 0.2'		
Mer. pass.		11 h 46 m 15 s		9 h 51 m		15 h 38 m		15 h 51 m		20 h 50 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Capella	-Rigel	-Aldebaran	-Mars	+Saturn	+Jupiter	+Altair	+Sun
0	89°38.9'	S 16°46.9'	12.5'	10.0'	55.8'	114°14.8'	103°44.5'	101°38.9'	47°55.7'	30°31.4'	33°39.5'	42°12.4'	87°43.6'
1	104°10.4'	S 16°36.9'	12.6'	10.1'	55.7'	113°46.4'	103°17.8'	101°07.7'	47°24.9'	31°02.4'	34°10.3'	42°31.0'	88°12.4'
2	118°42.0'	S 16°26.8'	12.7'	10.2'	55.7'	113°18.0'	102°51.2'	100°36.5'	46°54.0'	31°33.3'	34°41.0'	42°49.9'	88°41.1'
3	133°13.7'	S 16°16.6'	12.8'	10.2'	55.7'	112°49.6'	102°24.6'	100°05.4'	46°23.2'	32°04.2'	35°11.7'	43°08.9'	89°09.8'
4	147°45.4'	S 16°06.4'	12.9'	10.3'	55.6'	112°21.3'	101°58.0'	99°34.3'	45°52.5'	32°35.1'	35°42.4'	43°28.1'	89°38.5'
5	162°17.3'	S 15°56.1'	12.9'	10.3'	55.6'	111°52.9'	101°31.4'	99°03.2'	45°21.7'	33°05.9'	36°13.0'	43°47.5'	90°07.2'
6	176°49.2'	S 15°45.8'	13.0'	10.4'	55.6'	111°24.6'	101°04.8'	98°32.2'	44°51.1'	33°36.7'	36°43.6'	44°07.0'	90°35.8'
7	191°21.3'	S 15°35.4'	13.1'	10.5'	55.5'	110°56.2'	100°38.2'	98°01.2'	44°20.4'	34°07.5'	37°14.2'	44°26.6'	91°04.3'
8	205°53.4'	S 15°25.0'	13.2'	10.5'	55.5'	110°27.9'	100°11.7'	97°30.2'	43°49.8'	34°38.2'	37°44.7'	44°46.5'	91°32.9'
9	220°25.5'	S 15°14.4'	13.3'	10.6'	55.5'	109°59.6'	99°45.1'	96°59.3'	43°19.2'	35°09.0'	38°15.2'	45°06.4'	92°01.4'
10	234°57.8'	S 15°03.9'	13.3'	10.6'	55.5'	109°31.2'	99°18.6'	96°28.4'	42°48.7'	35°39.7'	38°45.7'	45°26.5'	92°29.8'
11	249°30.2'	S 14°53.2'	13.4'	10.7'	55.4'	109°02.9'	98°52.1'	95°57.5'	42°18.2'	36°10.3'	39°16.1'	45°46.8'	92°58.3'
12	264°02.6'	S 14°42.6'	13.5'	10.7'	55.4'	108°34.7'	98°25.6'	95°26.6'	41°47.7'	36°40.9'	39°46.5'	46°07.2'	93°26.7'
13	278°35.1'	S 14°31.8'	13.6'	10.8'	55.4'	108°06.4'	97°59.1'	94°55.8'	41°17.3'	37°11.6'	40°16.9'	46°27.7'	93°55.1'
14	293°07.7'	S 14°21.0'	13.7'	10.8'	55.3'	107°38.1'	97°32.7'	94°25.0'	40°46.9'	37°42.1'	40°47.3'	46°48.3'	94°23.4'
15	307°40.3'	S 14°10.2'	13.7'	10.9'	55.3'	107°09.9'	97°06.2'	93°54.3'	40°16.6'	38°12.7'	41°17.6'	47°09.1'	94°51.8'
16	322°13.1'	S 13°59.3'	13.8'	10.9'	55.3'	106°41.7'	96°39.8'	93°23.5'	39°46.3'	38°43.2'	41°47.9'	47°29.9'	95°20.0'
17	336°45.9'	S 13°48.4'	13.9'	11.0'	55.3'	106°13.4'	96°13.3'	92°52.9'	39°16.0'	39°13.7'	42°18.2'	47°50.9'	95°48.3'
18	351°18.8'	S 13°37.4'	14.0'	11.0'	55.2'	105°45.2'	95°46.9'	92°22.2'	38°45.7'	39°44.2'	42°48.4'	48°12.0'	96°16.5'
19	5°51.7'	S 13°26.3'	14.0'	11.1'	55.2'	105°17.1'	95°20.6'	91°51.5'	38°15.5'	40°14.6'	43°18.7'	48°33.3'	96°44.8'
20	20°24.8'	S 13°15.2'	14.1'	11.1'	55.2'	104°48.9'	94°54.2'	91°20.9'	37°45.3'	40°45.0'	43°48.8'	48°54.6'	97°12.9'
21	34°57.9'	S 13°04.1'	14.2'	11.2'	55.2'	104°20.7'	94°27.9'	90°50.4'	37°15.2'	41°15.4'	44°19.0'	49°16.0'	97°41.1'
22	49°31.0'	S 12°52.9'	14.2'	11.2'	55.1'	103°52.6'	94°01.5'	90°19.8'	36°45.1'	41°45.8'	44°49.1'	49°37.5'	98°09.2'
23	64°04.3'	S 12°41.7'	14.3'	11.3'	55.1'	103°24.4'	93°35.2'	89°49.3'	36°15.0'	42°16.1'	45°19.3'	49°59.2'	98°37.3'
Mer. pass.		18 h 36 m SD 15.2'			phase 48%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.2'	N 5°10.3'	Polaris	+2.0	315°04.7'	N 89°21.1'
Rigil Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.6'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.3'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				

Monday 23 November 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	62°25.4'	183°24.3'	S 20°23.3'	212°11.3'	S 10°26.9'	125°47.2'	S 21°38.9'	122°33.4'	S 20°57.9'	47°44.7'	N 5°49.2'	
1	77°27.9'	198°24.1'	S 20°23.8'	227°10.8'	S 10°28.0'	140°49.2'	S 21°38.8'	137°35.6'	S 20°57.8'	62°46.9'	N 5°49.4'	
2	92°30.4'	213°23.9'	S 20°24.3'	242°10.3'	S 10°29.1'	155°51.2'	S 21°38.7'	152°37.9'	S 20°57.8'	77°49.2'	N 5°49.6'	
3	107°32.8'	228°23.8'	S 20°24.8'	257°09.8'	S 10°30.1'	170°53.1'	S 21°38.6'	167°40.1'	S 20°57.7'	92°51.4'	N 5°49.9'	
4	122°35.3'	243°23.6'	S 20°25.4'	272°09.3'	S 10°31.2'	185°55.1'	S 21°38.6'	182°42.4'	S 20°57.7'	107°53.6'	N 5°50.1'	
5	137°37.8'	258°23.4'	S 20°25.9'	287°08.9'	S 10°32.3'	200°57.1'	S 21°38.5'	197°44.6'	S 20°57.7'	122°55.9'	N 5°50.3'	
6	152°40.2'	273°23.2'	S 20°26.4'	302°08.4'	S 10°33.4'	215°59.1'	S 21°38.4'	212°46.9'	S 20°57.6'	137°58.1'	N 5°50.5'	
7	167°42.7'	288°23.1'	S 20°26.9'	317°07.9'	S 10°34.5'	231°01.1'	S 21°38.3'	227°49.1'	S 20°57.6'	153°00.3'	N 5°50.8'	
8	182°45.1'	303°22.9'	S 20°27.4'	332°07.4'	S 10°35.5'	246°03.0'	S 21°38.2'	242°51.4'	S 20°57.5'	168°02.6'	N 5°51.0'	
9	197°47.6'	318°22.7'	S 20°27.9'	347°06.9'	S 10°36.6'	261°05.0'	S 21°38.2'	257°53.6'	S 20°57.5'	183°04.8'	N 5°51.2'	
10	212°50.1'	333°22.5'	S 20°28.4'	2°06.4'	S 10°37.7'	276°07.0'	S 21°38.1'	272°55.8'	S 20°57.5'	198°07.1'	N 5°51.5'	
11	227°52.5'	348°22.4'	S 20°29.0'	17°05.9'	S 10°38.8'	291°09.0'	S 21°38.0'	287°58.1'	S 20°57.4'	213°09.3'	N 5°51.7'	
12	242°55.0'	3°22.2'	S 20°29.5'	32°05.5'	S 10°39.9'	306°10.9'	S 21°37.9'	303°00.3'	S 20°57.4'	228°11.5'	N 5°51.9'	
13	257°57.5'	18°22.0'	S 20°30.0'	47°05.0'	S 10°40.9'	321°12.9'	S 21°37.8'	318°02.6'	S 20°57.3'	243°13.7'	N 5°52.1'	
14	272°59.9'	33°21.8'	S 20°30.5'	62°04.5'	S 10°42.0'	336°14.9'	S 21°37.7'	333°04.8'	S 20°57.3'	258°16.0'	N 5°52.4'	
15	288°02.4'	48°21.6'	S 20°31.0'	77°04.0'	S 10°43.1'	351°16.9'	S 21°37.7'	348°07.1'	S 20°57.3'	273°18.2'	N 5°52.6'	
16	303°04.9'	63°21.5'	S 20°31.5'	92°03.5'	S 10°44.2'	6°18.8'	S 21°37.6'	3°09.3'	S 20°57.2'	288°20.4'	N 5°52.8'	
17	318°07.3'	78°21.3'	S 20°32.0'	107°03.0'	S 10°45.2'	21°20.8'	S 21°37.5'	18°11.6'	S 20°57.2'	303°22.6'	N 5°53.1'	
18	333°09.8'	93°21.1'	S 20°32.5'	122°02.5'	S 10°46.3'	36°22.8'	S 21°37.4'	33°13.8'	S 20°57.2'	318°24.9'	N 5°53.3'	
19	348°12.3'	108°20.9'	S 20°33.0'	137°02.0'	S 10°47.4'	51°24.8'	S 21°37.3'	48°16.1'	S 20°57.1'	333°27.1'	N 5°53.5'	
20	3°14.7'	123°20.7'	S 20°33.5'	152°01.6'	S 10°48.5'	66°26.7'	S 21°37.3'	63°18.3'	S 20°57.1'	348°29.3'	N 5°53.8'	
21	18°17.2'	138°20.6'	S 20°34.0'	167°01.1'	S 10°49.5'	81°28.7'	S 21°37.2'	78°20.6'	S 20°57.0'	3°31.5'	N 5°54.0'	
22	33°19.6'	153°20.4'	S 20°34.5'	182°00.6'	S 10°50.6'	96°30.7'	S 21°37.1'	93°22.8'	S 20°57.0'	18°33.7'	N 5°54.2'	
23	48°22.1'	168°20.2'	S 20°35.0'	197°00.1'	S 10°51.7'	111°32.7'	S 21°37.0'	108°25.0'	S 20°57.0'	33°36.0'	N 5°54.5'	
		SD 16.2' d -0.5'		v -0.5' d -1.1'		v 2.0' d 0.1'		v 2.2' d 0.0'		v 2.2' d 0.2'		
Mer. pass.		11 h 46 m 32 s		9 h 52 m		15 h 35 m		15 h 47 m		20 h 46 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Capella	-Rigel	-Aldebaran	-Mars	+Fomalhaut	+Saturn	+Jupiter	+Sun
0	78°37.6'	S 12°30.4'	14.4'	11.3'	55.1'	102°56.3'	93°08.9'	89°18.8'	35°45.0'		42°46.4'	45°49.3'	99°05.4'
1	93°11.0'	S 12°19.1'	14.4'	11.3'	55.1'	102°28.2'	92°42.6'	88°48.3'	35°15.0'		43°16.7'	46°19.4'	99°33.4'
2	107°44.4'	S 12°07.8'	14.5'	11.4'	55.0'	102°00.1'	92°16.4'	88°17.8'	34°45.0'		43°46.9'	46°49.4'	100°01.4'
3	122°17.9'	S 11°56.4'	14.6'	11.4'	55.0'	101°32.1'	91°50.2'	87°47.4'	34°15.0'		44°17.2'	47°19.4'	100°29.4'
4	136°51.5'	S 11°45.0'	14.6'	11.5'	55.0'	101°04.0'	91°23.9'	87°17.0'	33°45.1'		44°47.4'	47°49.4'	100°57.4'
5	151°25.2'	S 11°33.5'	14.7'	11.5'	55.0'	100°35.9'	90°57.7'	86°46.6'	33°15.3'		45°17.6'	48°19.4'	101°25.3'
6	165°58.9'	S 11°22.0'	14.8'	11.5'	54.9'	100°07.9'	90°31.6'	86°16.3'	32°45.4'		45°47.8'	48°49.3'	101°53.2'
7	180°32.6'	S 11°10.5'	14.8'	11.6'	54.9'	99°39.9'	90°05.4'	85°46.0'	32°15.6'	18°29.1'	46°17.9'	49°19.2'	102°21.1'
8	195°06.5'	S 10°58.9'	14.9'	11.6'	54.9'	99°11.9'	89°39.3'	85°15.7'	31°45.9'	18°44.2'	46°48.0'	49°49.1'	102°49.0'
9	209°40.4'	S 10°47.3'	14.9'	11.6'	54.9'	98°43.9'	89°13.2'	84°45.4'	31°16.1'	18°59.9'	47°18.1'	50°19.0'	103°16.8'
10	224°14.3'	S 10°35.6'	15.0'	11.7'	54.9'	98°16.0'	88°47.1'	84°15.1'	30°46.4'	19°16.1'	47°48.2'	50°48.8'	103°44.6'
11	238°48.3'	S 10°23.9'	15.1'	11.7'	54.8'	97°48.0'	88°21.0'	83°44.9'	30°16.8'	19°32.8'	48°18.2'	51°18.6'	104°12.4'
12	253°22.4'	S 10°12.2'	15.1'	11.7'	54.8'	97°20.1'	87°54.9'	83°14.7'	29°47.1'	19°50.1'	48°48.3'	51°48.4'	104°40.2'
13	267°56.5'	S 10°00.5'	15.2'	11.8'	54.8'	96°52.1'	87°28.9'	82°44.5'	29°17.5'	20°07.8'	49°18.3'	52°18.2'	105°08.0'
14	282°30.6'	S 9°48.7'	15.2'	11.8'	54.8'	96°24.2'	87°02.9'	82°14.4'	28°48.0'	20°26.0'	49°48.3'	52°48.0'	105°35.7'
15	297°04.9'	S 9°36.9'	15.3'	11.8'	54.7'	95°56.3'	86°36.9'	81°44.2'	28°18.4'	20°44.7'	50°18.2'	53°17.7'	106°03.4'
16	311°39.1'	S 9°25.0'	15.3'	11.9'	54.7'	95°28.5'	86°11.0'	81°14.1'	27°48.9'	21°03.7'	50°48.2'	53°47.4'	106°31.1'
17	326°13.5'	S 9°13.2'	15.4'	11.9'	54.7'	95°00.6'	85°45.0'	80°44.0'	27°19.5'	21°23.2'	51°18.1'	54°17.1'	106°58.7'
18	340°47.9'	S 9°01.3'	15.4'	11.9'	54.7'	94°32.8'	85°19.1'	80°13.9'	26°50.1'	21°43.0'	51°48.0'	54°46.8'	107°26.4'
19	355°22.3'	S 8°49.4'	15.5'	12.0'	54.7'	94°04.9'	84°53.2'	79°43.9'	26°20.7'	22°03.2'	52°17.9'	55°16.4'	107°54.0'
20	9°56.8'	S 8°37.4'	15.5'	12.0'	54.6'	93°37.1'	84°27.3'	79°13.8'	25°51.3'	22°23.7'	52°47.8'	55°46.0'	108°21.6'
21	24°31.3'	S 8°25.4'	15.6'	12.0'	54.6'	93°09.3'	84°01.5'	78°43.8'	25°22.0'	22°44.6'	53°17.6'	56°15.7'	108°49.2'
22	39°05.9'	S 8°13.4'	15.6'	12.0'	54.6'	92°41.5'	83°35.7'	78°13.8'	24°52.7'	23°05.7'	53°47.4'	56°45.2'	109°16.8'
23	53°40.5'	S 8°01.4'	15.7'	12.1'	54.6'	92°13.8'	83°09.9'	77°43.8'	24°23.5'	23°27.2'	54°17.3'	57°14.8'	109°44.3'
Mer. pass.		19 h 19 m SD 15.0'		phase 58%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	N 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°04.8'	N 89°21.1'
Rigel Kent	-0.0	139°45.5'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.3'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.6'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.2'				





h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	64°23.7'	183°15.6'	S 20°47.4'	211°47.7'	S 11°18.4'	127°22.0'	S 21°35.0'	124°21.1'	S 20°56.0'	49°31.0'	N 6°00.5'	
1	79°26.2'	198°15.4'	S 20°47.9'	226°47.2'	S 11°19.5'	142°23.9'	S 21°34.9'	139°23.4'	S 20°55.9'	64°33.2'	N 6°00.7'	
2	94°28.6'	213°15.2'	S 20°48.3'	241°46.7'	S 11°20.5'	157°25.9'	S 21°34.8'	154°25.6'	S 20°55.9'	79°35.4'	N 6°01.0'	
3	109°31.1'	228°15.0'	S 20°48.8'	256°46.2'	S 11°21.6'	172°27.9'	S 21°34.7'	169°27.9'	S 20°55.8'	94°37.6'	N 6°01.2'	
4	124°33.6'	243°14.8'	S 20°49.3'	271°45.7'	S 11°22.7'	187°29.8'	S 21°34.6'	184°30.1'	S 20°55.8'	109°39.8'	N 6°01.5'	
5	139°36.0'	258°14.6'	S 20°49.8'	286°45.2'	S 11°23.7'	202°31.8'	S 21°34.5'	199°32.4'	S 20°55.8'	124°41.9'	N 6°01.7'	
6	154°38.5'	273°14.4'	S 20°50.3'	301°44.7'	S 11°24.8'	217°33.8'	S 21°34.5'	214°34.6'	S 20°55.7'	139°44.1'	N 6°01.9'	
7	169°41.0'	288°14.2'	S 20°50.7'	316°44.2'	S 11°25.8'	232°35.8'	S 21°34.4'	229°36.8'	S 20°55.7'	154°46.3'	N 6°02.2'	
8	184°43.4'	303°14.0'	S 20°51.2'	331°43.7'	S 11°26.9'	247°37.7'	S 21°34.3'	244°39.1'	S 20°55.6'	169°48.5'	N 6°02.4'	
9	199°45.9'	318°13.8'	S 20°51.7'	346°43.2'	S 11°28.0'	262°39.7'	S 21°34.2'	259°41.3'	S 20°55.6'	184°50.6'	N 6°02.7'	
10	214°48.4'	333°13.6'	S 20°52.2'	1°42.7'	S 11°29.0'	277°41.7'	S 21°34.1'	274°43.6'	S 20°55.6'	199°52.8'	N 6°02.9'	
11	229°50.8'	348°13.4'	S 20°52.7'	16°42.2'	S 11°30.1'	292°43.6'	S 21°34.0'	289°45.8'	S 20°55.5'	214°55.0'	N 6°03.2'	
12	244°53.3'	3°13.3'	S 20°53.1'	31°41.7'	S 11°31.1'	307°45.6'	S 21°34.0'	304°48.0'	S 20°55.5'	229°57.2'	N 6°03.4'	
13	259°55.7'	18°13.1'	S 20°53.6'	46°41.2'	S 11°32.2'	322°47.6'	S 21°33.9'	319°50.3'	S 20°55.4'	244°59.3'	N 6°03.7'	
14	274°58.2'	33°12.9'	S 20°54.1'	61°40.7'	S 11°33.3'	337°49.5'	S 21°33.8'	334°52.5'	S 20°55.4'	260°01.5'	N 6°03.9'	
15	290°00.7'	48°12.7'	S 20°54.6'	76°40.1'	S 11°34.3'	352°51.5'	S 21°33.7'	349°54.8'	S 20°55.4'	275°03.7'	N 6°04.2'	
16	305°03.1'	63°12.5'	S 20°55.0'	91°39.6'	S 11°35.4'	7°53.5'	S 21°33.6'	4°57.0'	S 20°55.3'	290°05.9'	N 6°04.4'	
17	320°05.6'	78°12.3'	S 20°55.5'	106°39.1'	S 11°36.4'	22°55.4'	S 21°33.5'	19°59.3'	S 20°55.3'	305°08.0'	N 6°04.7'	
18	335°08.1'	93°12.1'	S 20°56.0'	121°38.6'	S 11°37.5'	37°57.4'	S 21°33.5'	35°01.5'	S 20°55.2'	320°10.2'	N 6°04.9'	
19	350°10.5'	108°11.9'	S 20°56.5'	136°38.1'	S 11°38.5'	52°59.4'	S 21°33.4'	50°03.7'	S 20°55.2'	335°12.4'	N 6°05.2'	
20	5°13.0'	123°11.7'	S 20°56.9'	151°37.6'	S 11°39.6'	68°01.3'	S 21°33.3'	65°06.0'	S 20°55.2'	350°14.5'	N 6°05.4'	
21	20°15.5'	138°11.5'	S 20°57.4'	166°37.1'	S 11°40.6'	83°03.3'	S 21°33.2'	80°08.2'	S 20°55.1'	5°16.7'	N 6°05.7'	
22	35°17.9'	153°11.3'	S 20°57.9'	181°36.6'	S 11°41.7'	98°05.3'	S 21°33.1'	95°10.5'	S 20°55.1'	20°18.8'	N 6°05.9'	
23	50°20.4'	168°11.1'	S 20°58.4'	196°36.1'	S 11°42.8'	113°07.2'	S 21°33.0'	110°12.7'	S 20°55.0'	35°21.0'	N 6°06.2'	
		SD 16.2'	d -0.5'		v -0.5'	d -1.1'		v 2.0'	d 0.1'		v 2.2'	d 0.2'
Mer. pass.		11 h 47 m 7 s		9 h 53 m		15 h 29 m		15 h 40 m		20 h 39 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Capella	-Rigel	-Aldebaran	-Mars	+Fomalhaut	+Saturn	+Altair	+Jupiter
0	58°17.7'	S 2°54.8'	16.4'	12.4'	54.2'	80°44.6'	72°33.4'	65°19.6'	12°30.4'	33°28.0'	66°37.7'	68°57.0'	69°29.2'
1	72°53.1'	S 2°42.4'	16.5'	12.4'	54.2'	80°17.2'	72°08.3'	64°50.0'	12°03.1'	33°53.8'	67°07.1'	69°21.2'	69°58.4'
2	87°28.6'	S 2°30.0'	16.5'	12.4'	54.2'	79°49.8'	71°43.2'	64°20.4'	11°36.0'	34°19.6'	67°36.6'	69°45.5'	70°27.6'
3	102°04.1'	S 2°17.5'	16.5'	12.4'	54.2'	79°22.5'	71°18.2'	63°50.8'	11°09.0'	34°45.5'	68°06.0'	70°09.7'	70°56.8'
4	116°39.6'	S 2°05.1'	16.5'	12.4'	54.2'	78°55.2'	70°53.2'	63°21.3'	10°42.2'	35°11.5'	68°35.4'	70°34.0'	71°26.0'
5	131°15.1'	S 1°52.7'	16.5'	12.4'	54.2'	78°27.9'	70°28.3'	62°51.7'	10°15.7'	35°37.6'	69°04.8'	70°58.3'	71°55.1'
6	145°50.6'	S 1°40.2'	16.5'	12.4'	54.2'	78°00.6'	70°03.4'	62°22.2'	9°49.5'	36°03.7'	69°34.2'	71°22.7'	72°24.3'
7	160°26.1'	S 1°27.8'	16.5'	12.4'	54.1'	77°33.3'	69°38.5'	61°52.6'	9°23.6'	36°29.9'	70°03.6'	71°47.0'	72°53.5'
8	175°01.7'	S 1°15.3'	16.6'	12.4'	54.1'	77°06.1'	69°13.6'	61°23.1'	8°58.0'	36°56.2'	70°33.0'	72°11.4'	73°22.6'
9	189°37.3'	S 1°02.9'	16.6'	12.4'	54.1'	76°38.8'	68°48.8'	60°53.6'	8°32.8'	37°22.5'	71°02.4'	72°35.8'	73°51.7'
10	204°12.8'	S 0°50.4'	16.6'	12.4'	54.1'	76°11.6'	68°24.0'	60°24.1'	8°08.1'	37°48.9'	71°31.8'	73°00.3'	74°20.9'
11	218°48.4'	S 0°38.0'	16.6'	12.4'	54.1'	75°44.4'	67°59.3'	59°54.6'	7°43.9'	38°15.4'	72°01.2'	73°24.7'	74°50.0'
12	233°24.0'	S 0°25.5'	16.6'	12.4'	54.1'	75°17.2'	67°34.6'	59°25.1'	7°20.4'	38°41.9'	72°30.5'	73°49.2'	75°19.1'
13	247°59.6'	S 0°13.1'	16.6'	12.4'	54.1'	74°50.0'	67°09.9'	58°55.6'		39°08.5'	72°59.9'	74°13.6'	75°48.2'
14	262°35.2'	S 0°00.6'	16.6'	12.4'	54.1'	74°22.9'	66°45.3'	58°26.1'		39°35.1'	73°29.3'	74°38.1'	76°17.3'
15	277°10.8'	N 0°11.8'	16.6'	12.4'	54.1'	73°55.7'	66°20.7'	57°56.7'		40°01.8'	73°58.6'	75°02.7'	76°46.4'
16	291°46.4'	N 0°24.2'	16.6'	12.4'	54.1'	73°28.6'	65°56.2'	57°27.2'		40°28.5'	74°27.9'	75°27.2'	77°15.5'
17	306°22.0'	N 0°36.7'	16.6'	12.4'	54.1'	73°01.5'	65°31.6'	56°57.7'		40°55.3'	74°57.3'	75°51.7'	77°44.6'
18	320°57.7'	N 0°49.1'	16.6'	12.4'	54.1'	72°34.4'	65°07.2'	56°28.3'		41°22.2'	75°26.6'	76°16.3'	78°13.7'
19	335°33.3'	N 1°01.5'	16.6'	12.4'	54.1'	72°07.3'	64°42.8'	55°58.9'		41°49.1'	75°55.9'	76°40.9'	78°42.8'
20	350°08.9'	N 1°14.0'	16.6'	12.4'	54.0'	71°40.3'	64°18.4'	55°29.4'		42°16.0'	76°25.3'	77°05.5'	79°11.9'
21	4°44.5'	N 1°26.4'	16.6'	12.4'	54.0'	71°13.3'	63°54.0'	54°60.0'		42°43.0'	76°54.6'	77°30.1'	79°40.9'
22	19°20.1'	N 1°38.8'	16.6'	12.4'	54.0'	70°46.2'	63°29.7'	54°30.6'		43°10.0'	77°23.9'	77°54.7'	80°10.0'
23	33°55.8'	N 1°51.2'	16.6'	12.4'	54.0'	70°19.2'	63°05.5'	54°01.1'		43°37.0'	77°53.2'	78°19.3'	80°39.0'
Mer. pass.		20 h 41 m SD 14.8'	phase 76%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.0'	N 89°21.1'
Rigil Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	65°22.8'	183°10.9'	S 20°58.8'	211°35.6'	S 11°43.8'	128°09.2'	S 21°33.0'	125°14.9'	S 20°55.0'	50°23.2'	N 6°06.4'	
1	80°25.3'	198°10.7'	S 20°59.3'	226°35.1'	S 11°44.9'	143°11.2'	S 21°32.9'	140°17.2'	S 20°55.0'	65°25.3'	N 6°06.7'	
2	95°27.8'	213°10.5'	S 20°59.8'	241°34.5'	S 11°45.9'	158°13.1'	S 21°32.8'	155°19.4'	S 20°54.9'	80°27.5'	N 6°06.9'	
3	110°30.2'	228°10.3'	S 21°00.2'	256°34.0'	S 11°47.0'	173°15.1'	S 21°32.7'	170°21.6'	S 20°54.9'	95°29.6'	N 6°07.2'	
4	125°32.7'	243°10.1'	S 21°00.7'	271°33.5'	S 11°48.0'	188°17.1'	S 21°32.6'	185°23.9'	S 20°54.8'	110°31.8'	N 6°07.5'	
5	140°35.2'	258°09.9'	S 21°01.2'	286°33.0'	S 11°49.1'	203°19.0'	S 21°32.5'	200°26.1'	S 20°54.8'	125°34.0'	N 6°07.7'	
6	155°37.6'	273°09.7'	S 21°01.6'	301°32.5'	S 11°50.1'	218°21.0'	S 21°32.4'	215°28.4'	S 20°54.7'	140°36.1'	N 6°08.0'	
7	170°40.1'	288°09.5'	S 21°02.1'	316°32.0'	S 11°51.2'	233°23.0'	S 21°32.4'	230°30.6'	S 20°54.7'	155°38.3'	N 6°08.2'	
8	185°42.6'	303°09.3'	S 21°02.6'	331°31.5'	S 11°52.2'	248°24.9'	S 21°32.3'	245°32.8'	S 20°54.7'	170°40.4'	N 6°08.5'	
9	200°45.0'	318°09.1'	S 21°03.0'	346°30.9'	S 11°53.3'	263°26.9'	S 21°32.2'	260°35.1'	S 20°54.6'	185°42.6'	N 6°08.7'	
10	215°47.5'	333°08.9'	S 21°03.5'	1°30.4'	S 11°54.3'	278°28.9'	S 21°32.1'	275°37.3'	S 20°54.6'	200°44.7'	N 6°09.0'	
11	230°50.0'	348°08.7'	S 21°03.9'	16°29.9'	S 11°55.4'	293°30.8'	S 21°32.0'	290°39.6'	S 20°54.5'	215°46.9'	N 6°09.2'	
12	245°52.4'	3°08.5'	S 21°04.4'	31°29.4'	S 11°56.4'	308°32.8'	S 21°31.9'	305°41.8'	S 20°54.5'	230°49.0'	N 6°09.5'	
13	260°54.9'	18°08.3'	S 21°04.9'	46°28.9'	S 11°57.5'	323°34.7'	S 21°31.9'	320°44.0'	S 20°54.5'	245°51.1'	N 6°09.8'	
14	275°57.3'	33°08.1'	S 21°05.3'	61°28.4'	S 11°58.5'	338°36.7'	S 21°31.8'	335°46.3'	S 20°54.4'	260°53.3'	N 6°10.0'	
15	290°59.8'	48°07.9'	S 21°05.8'	76°27.9'	S 11°59.5'	353°38.7'	S 21°31.7'	350°48.5'	S 20°54.4'	275°55.4'	N 6°10.3'	
16	306°02.3'	63°07.7'	S 21°06.2'	91°27.3'	S 12°00.6'	8°40.6'	S 21°31.6'	5°50.7'	S 20°54.3'	290°57.6'	N 6°10.5'	
17	321°04.7'	78°07.5'	S 21°06.7'	106°26.8'	S 12°01.6'	23°42.6'	S 21°31.5'	20°53.0'	S 20°54.3'	305°59.7'	N 6°10.8'	
18	336°07.2'	93°07.3'	S 21°07.2'	121°26.3'	S 12°02.7'	38°44.6'	S 21°31.4'	35°55.2'	S 20°54.3'	321°01.9'	N 6°11.1'	
19	351°09.7'	108°07.1'	S 21°07.6'	136°25.8'	S 12°03.7'	53°46.5'	S 21°31.3'	50°57.5'	S 20°54.2'	336°04.0'	N 6°11.3'	
20	6°12.1'	123°06.9'	S 21°08.1'	151°25.3'	S 12°04.8'	68°48.5'	S 21°31.3'	65°59.7'	S 20°54.2'	351°06.1'	N 6°11.6'	
21	21°14.6'	138°06.7'	S 21°08.5'	166°24.7'	S 12°05.8'	83°50.4'	S 21°31.2'	81°01.9'	S 20°54.1'	6°08.3'	N 6°11.8'	
22	36°17.1'	153°06.5'	S 21°09.0'	181°24.2'	S 12°06.9'	98°52.4'	S 21°31.1'	96°04.2'	S 20°54.1'	21°10.4'	N 6°12.1'	
23	51°19.5'	168°06.3'	S 21°09.4'	196°23.7'	S 12°07.9'	113°54.4'	S 21°31.0'	111°06.4'	S 20°54.0'	36°12.5'	N 6°12.4'	
		SD 16.2'	d -0.5'	v -0.5'	d -1.0'	v 2.0'	d 0.1'	v 2.2'	d 0.0'	v 2.1'	d 0.3'	
Mer. pass.		11 h 47 m 26 s		9 h 54 m		15 h 25 m		15 h 37 m		20 h 36 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Mars	+Fomalhaut	+Saturn	+Altair
0	48°31.4'	N 2°03.6'	16.6'	12.4'	54.0'	72°06.3'	69°52.3'	62°41.3'	53°31.7'		44°04.1'	78°22.5'	78°44.0'
1	63°07.0'	N 2°16.0'	16.6'	12.4'	54.0'	71°38.1'	69°25.3'	62°17.1'	53°02.3'		44°31.2'	78°51.8'	79°08.6'
2	77°42.6'	N 2°28.3'	16.6'	12.4'	54.0'	71°10.0'	68°58.3'	61°53.0'	52°32.9'		44°58.4'	79°21.1'	79°33.3'
3	92°18.2'	N 2°40.7'	16.6'	12.4'	54.0'	70°41.8'	68°31.4'	61°28.9'	52°03.5'		45°25.6'	79°50.4'	79°58.0'
4	106°53.8'	N 2°53.1'	16.6'	12.3'	54.0'	70°13.7'	68°04.5'	61°04.9'	51°34.1'		45°52.9'	80°19.7'	80°22.7'
5	121°29.4'	N 3°05.4'	16.6'	12.3'	54.0'	69°45.6'	67°37.6'	60°40.9'	51°04.7'		46°20.1'	80°49.0'	80°47.4'
6	136°04.9'	N 3°17.7'	16.6'	12.3'	54.0'	69°17.5'	67°10.7'	60°17.0'	50°35.3'		46°47.5'	81°18.3'	81°12.1'
7	150°40.5'	N 3°30.1'	16.6'	12.3'	54.0'	68°49.4'	66°43.9'	59°53.1'	50°06.0'		47°14.8'	81°47.6'	81°36.8'
8	165°16.1'	N 3°42.4'	16.5'	12.3'	54.0'	68°21.3'	66°17.1'	59°29.3'	49°36.6'		47°42.2'	82°16.8'	82°01.6'
9	179°51.6'	N 3°54.7'	16.5'	12.3'	54.0'	67°53.3'	65°50.3'	59°05.6'	49°07.2'		48°09.6'	82°46.1'	82°26.3'
10	194°27.1'	N 4°06.9'	16.5'	12.3'	54.0'	67°25.2'	65°23.5'	58°41.9'	48°37.8'		48°37.0'	83°15.4'	82°51.1'
11	209°02.7'	N 4°19.2'	16.5'	12.2'	54.0'	66°57.1'	64°56.7'	58°18.2'	48°08.5'		49°04.5'	83°44.7'	83°15.8'
12	223°38.2'	N 4°31.4'	16.5'	12.2'	54.0'	66°29.1'	64°30.0'	57°54.6'	47°39.1'	7°20.0'	49°32.0'	84°14.0'	83°40.6'
13	238°13.7'	N 4°43.7'	16.5'	12.2'	54.0'	66°01.1'	64°03.2'	57°31.1'	47°09.7'	7°43.5'	49°59.5'	84°43.3'	84°05.4'
14	252°49.1'	N 4°55.9'	16.5'	12.2'	54.0'	65°33.1'	63°36.5'	57°07.6'	46°40.4'	8°07.5'	50°27.1'	85°12.5'	84°30.2'
15	267°24.6'	N 5°08.1'	16.4'	12.2'	54.0'	65°05.1'	63°09.9'	56°44.2'	46°11.0'	8°32.1'	50°54.6'	85°41.8'	84°55.0'
16	282°00.0'	N 5°20.2'	16.4'	12.2'	54.0'	64°37.1'	62°43.2'	56°20.8'	45°41.6'	8°57.2'	51°22.2'	86°11.1'	85°19.8'
17	296°35.5'	N 5°32.4'	16.4'	12.1'	54.0'	64°09.1'	62°16.6'	55°57.5'	45°12.3'	9°22.6'	51°49.9'	86°40.4'	85°44.6'
18	311°10.9'	N 5°44.5'	16.4'	12.1'	54.0'	63°41.1'	61°50.0'	55°34.3'	44°42.9'	9°48.4'	52°17.5'	87°09.7'	86°09.4'
19	325°46.3'	N 5°56.6'	16.4'	12.1'	54.0'	63°13.2'	61°23.4'	55°11.1'	44°13.6'	10°14.4'	52°45.2'	87°39.0'	86°34.2'
20	340°21.6'	N 6°08.7'	16.3'	12.1'	54.0'	62°45.2'	60°56.8'	54°48.0'	43°44.2'	10°40.8'	53°12.9'	88°08.3'	86°59.0'
21	354°57.0'	N 6°20.8'	16.3'	12.0'	54.0'	62°17.3'	60°30.3'	54°25.0'	43°14.9'	11°07.3'	53°40.7'	88°37.5'	87°23.9'
22	9°32.3'	N 6°32.9'	16.3'	12.0'	54.0'	61°49.4'	60°03.8'	54°02.1'	42°45.6'	11°34.1'	54°08.4'	89°06.8'	87°48.7'
23	24°07.6'	N 6°44.9'	16.3'	12.0'	54.0'	61°21.4'	59°37.3'	53°39.2'	42°16.2'	12°01.1'	54°36.2'	89°36.1'	88°13.6'
Mer. pass.		21 h 21 m SD 14.7'		phase 83%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.8'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.1'	N 89°21.2'
Rigel Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				

Friday 27 November 2020 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	66°22.0'	183°06.1'	S 21°09.9'	211°23.2'	S 12°08.9'	128°56.3'	S 21°30.9'	126°08.6'	S 20°54.0'	51°14.7'	N 6°12.6'	
1	81°24.5'	198°05.9'	S 21°10.3'	226°22.7'	S 12°10.0'	143°58.3'	S 21°30.8'	141°10.9'	S 20°54.0'	66°16.8'	N 6°12.9'	
2	96°26.9'	213°05.7'	S 21°10.8'	241°22.1'	S 12°11.0'	159°00.3'	S 21°30.7'	156°13.1'	S 20°53.9'	81°18.9'	N 6°13.1'	
3	111°29.4'	228°05.5'	S 21°11.2'	256°21.6'	S 12°12.1'	174°02.2'	S 21°30.7'	171°15.4'	S 20°53.9'	96°21.1'	N 6°13.4'	
4	126°31.8'	243°05.3'	S 21°11.7'	271°21.1'	S 12°13.1'	189°04.2'	S 21°30.6'	186°17.6'	S 20°53.8'	111°23.2'	N 6°13.7'	
5	141°34.3'	258°05.1'	S 21°12.1'	286°20.6'	S 12°14.1'	204°06.1'	S 21°30.5'	201°19.8'	S 20°53.8'	126°25.3'	N 6°13.9'	
6	156°36.8'	273°04.8'	S 21°12.6'	301°20.0'	S 12°15.2'	219°08.1'	S 21°30.4'	216°22.1'	S 20°53.8'	141°27.4'	N 6°14.2'	
7	171°39.2'	288°04.6'	S 21°13.0'	316°19.5'	S 12°16.2'	234°10.1'	S 21°30.3'	231°24.3'	S 20°53.7'	156°29.6'	N 6°14.5'	
8	186°41.7'	303°04.4'	S 21°13.5'	331°19.0'	S 12°17.3'	249°12.0'	S 21°30.2'	246°26.5'	S 20°53.7'	171°31.7'	N 6°14.7'	
9	201°44.2'	318°04.2'	S 21°13.9'	346°18.5'	S 12°18.3'	264°14.0'	S 21°30.1'	261°28.8'	S 20°53.6'	186°33.8'	N 6°15.0'	
10	216°46.6'	333°04.0'	S 21°14.4'	1°17.9'	S 12°19.3'	279°16.0'	S 21°30.1'	276°31.0'	S 20°53.6'	201°35.9'	N 6°15.2'	
11	231°49.1'	348°03.8'	S 21°14.8'	16°17.4'	S 12°20.4'	294°17.9'	S 21°30.0'	291°33.2'	S 20°53.5'	216°38.1'	N 6°15.5'	
12	246°51.6'	3°03.6'	S 21°15.3'	31°16.9'	S 12°21.4'	309°19.9'	S 21°29.9'	306°35.5'	S 20°53.5'	231°40.2'	N 6°15.8'	
13	261°54.0'	18°03.4'	S 21°15.7'	46°16.4'	S 12°22.4'	324°21.8'	S 21°29.8'	321°37.7'	S 20°53.5'	246°42.3'	N 6°16.0'	
14	276°56.5'	33°03.2'	S 21°16.1'	61°15.8'	S 12°23.5'	339°23.8'	S 21°29.7'	336°40.0'	S 20°53.4'	261°44.4'	N 6°16.3'	
15	291°58.9'	48°03.0'	S 21°16.6'	76°15.3'	S 12°24.5'	354°25.8'	S 21°29.6'	351°42.2'	S 20°53.4'	276°46.5'	N 6°16.6'	
16	307°01.4'	63°02.8'	S 21°17.0'	91°14.8'	S 12°25.5'	9°27.7'	S 21°29.5'	6°44.4'	S 20°53.3'	291°48.6'	N 6°16.8'	
17	322°03.9'	78°02.6'	S 21°17.5'	106°14.3'	S 12°26.6'	24°29.7'	S 21°29.5'	21°46.7'	S 20°53.3'	306°50.7'	N 6°17.1'	
18	337°06.3'	93°02.3'	S 21°17.9'	121°13.7'	S 12°27.6'	39°31.6'	S 21°29.4'	36°48.9'	S 20°53.3'	321°52.9'	N 6°17.4'	
19	352°08.8'	108°02.1'	S 21°18.4'	136°13.2'	S 12°28.6'	54°33.6'	S 21°29.3'	51°51.1'	S 20°53.2'	336°55.0'	N 6°17.6'	
20	7°11.3'	123°01.9'	S 21°18.8'	151°12.7'	S 12°29.7'	69°35.5'	S 21°29.2'	66°53.4'	S 20°53.2'	351°57.1'	N 6°17.9'	
21	22°13.7'	138°01.7'	S 21°19.2'	166°12.1'	S 12°30.7'	84°37.5'	S 21°29.1'	81°55.6'	S 20°53.1'	6°59.2'	N 6°18.2'	
22	37°16.2'	153°01.5'	S 21°19.7'	181°11.6'	S 12°31.7'	99°39.5'	S 21°29.0'	96°57.8'	S 20°53.1'	22°01.3'	N 6°18.5'	
23	52°18.7'	168°01.3'	S 21°20.1'	196°11.1'	S 12°32.8'	114°41.4'	S 21°28.9'	112°00.1'	S 20°53.0'	37°03.4'	N 6°18.7'	
		SD 16.2'	d -0.4'		v -0.5'	d -1.0'		v 2.0'	d 0.1'		v 2.2'	d 0.0'
Mer. pass.		11 h 47 m 46 s		9 h 55 m		15 h 22 m		15 h 33 m		20 h 32 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Mars	+Fomalhaut	+Altair	+Saturn
0	38°42.8'	N 6°56.9'	16.2'	12.0'	54.0'	60°53.6'	59°10.9'	53°16.4'	41°46.9'	12°28.2'	55°04.0'	88°38.4'	90°05.4'
1	53°18.1'	N 7°08.9'	16.2'	12.0'	54.0'	60°25.7'	58°44.5'	52°53.6'	41°17.5'	12°55.4'	55°31.8'	89°03.3'	90°34.7'
2	67°53.3'	N 7°20.8'	16.2'	11.9'	54.0'	59°57.8'	58°18.1'	52°31.0'	40°48.2'	13°22.8'	55°59.7'	89°28.1'	91°04.0'
3	82°28.5'	N 7°32.7'	16.2'	11.9'	54.0'	59°29.9'	57°51.7'	52°08.4'	40°18.9'	13°50.3'	56°27.5'	89°53.0'	91°33.3'
4	97°03.6'	N 7°44.6'	16.1'	11.9'	54.0'	59°02.1'	57°25.4'	51°45.9'	39°49.5'	14°17.9'	56°55.4'	90°17.8'	92°02.6'
5	111°38.8'	N 7°56.5'	16.1'	11.8'	54.0'	58°34.3'	56°59.1'	51°23.5'	39°20.2'	14°45.7'	57°23.4'	90°42.7'	92°31.9'
6	126°13.9'	N 8°08.4'	16.1'	11.8'	54.0'	58°06.5'	56°32.8'	51°01.1'	38°50.9'	15°13.5'	57°51.3'	91°07.6'	93°01.3'
7	140°49.0'	N 8°20.2'	16.0'	11.8'	54.0'	57°38.7'	56°06.6'	50°38.9'	38°21.5'	15°41.3'	58°19.2'	91°32.4'	93°30.6'
8	155°24.0'	N 8°31.9'	16.0'	11.8'	54.0'	57°10.9'	55°40.4'	50°16.7'	37°52.2'	16°09.3'	58°47.2'	91°57.3'	93°59.9'
9	169°59.0'	N 8°43.7'	16.0'	11.7'	54.0'	56°43.1'	55°14.2'	49°54.7'	37°22.9'	16°37.3'	59°15.2'	92°22.2'	94°29.2'
10	184°34.0'	N 8°55.4'	15.9'	11.7'	54.0'	56°15.4'	54°48.0'	49°32.7'	36°53.5'	17°05.4'	59°43.2'	92°47.0'	94°58.5'
11	199°08.9'	N 9°07.1'	15.9'	11.7'	54.0'	55°47.6'	54°21.9'	49°10.8'	36°24.2'	17°33.6'	60°11.3'	93°11.9'	95°27.9'
12	213°43.8'	N 9°18.8'	15.9'	11.6'	54.0'	55°19.9'	53°55.9'	48°49.0'	35°54.9'	18°01.8'	60°39.3'	93°36.8'	95°57.2'
13	228°18.7'	N 9°30.4'	15.8'	11.6'	54.0'	54°52.2'	53°29.8'	48°27.3'	35°25.6'	18°30.0'	61°07.4'	94°01.6'	96°26.6'
14	242°53.5'	N 9°42.0'	15.8'	11.6'	54.0'	54°24.5'	53°03.8'	48°05.7'	34°56.2'	18°58.4'	61°35.5'	94°26.5'	96°55.9'
15	257°28.3'	N 9°53.5'	15.8'	11.5'	54.0'	53°56.9'	52°37.9'	47°44.3'	34°26.9'	19°26.7'	62°03.6'	94°51.4'	97°25.2'
16	272°03.1'	N 10°05.1'	15.7'	11.5'	54.0'	53°29.2'	52°12.0'	47°22.9'	33°57.6'	19°55.1'	62°31.7'	95°16.2'	97°54.6'
17	286°37.8'	N 10°16.5'	15.7'	11.4'	54.0'	53°01.6'	51°46.1'	47°01.6'	33°28.3'	20°23.5'	62°59.9'	95°41.1'	98°24.0'
18	301°12.5'	N 10°28.0'	15.6'	11.4'	54.0'	52°34.0'	51°20.3'	46°40.5'	32°59.0'	20°52.0'	63°28.0'	96°06.0'	98°53.3'
19	315°47.2'	N 10°39.4'	15.6'	11.4'	54.0'	52°06.4'	50°54.5'	46°19.4'	32°29.7'	21°20.5'	63°56.2'	96°30.8'	99°22.7'
20	330°21.8'	N 10°50.8'	15.6'	11.3'	54.0'	51°38.8'	50°28.8'	45°58.5'	32°00.3'	21°49.1'	64°24.4'	96°55.7'	99°52.1'
21	344°56.3'	N 11°02.1'	15.5'	11.3'	54.0'	51°11.3'	50°03.1'	45°37.7'	31°31.0'	22°17.6'	64°52.6'	97°20.5'	100°21.5'
22	359°30.9'	N 11°13.4'	15.5'	11.3'	54.0'	50°43.7'	49°37.4'	45°17.0'	31°01.7'	22°46.2'	65°20.9'	97°45.4'	100°50.9'
23	14°05.3'	N 11°24.7'	15.4'	11.2'	54.0'	50°16.2'	49°11.8'	44°56.5'	30°32.4'	23°14.9'	65°49.1'	98°10.2'	101°20.3'
Mer. pass.		22 h 2 m SD 14.7'		phase 90%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.9'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.2'	N 89°21.2'
Rigil Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	67°21.1'	183°01.1'	S 21°20.5'	211°10.5'	S 12°33.8'	129°43.4'	S 21°28.9'	127°02.3'	S 20°53.0'	52°05.5'	N 6°19.0'	
1	82°23.6'	198°00.9'	S 21°21.0'	226°10.0'	S 12°34.8'	144°45.3'	S 21°28.8'	142°04.5'	S 20°53.0'	67°07.6'	N 6°19.3'	
2	97°26.1'	213°00.7'	S 21°21.4'	241°09.5'	S 12°35.9'	159°47.3'	S 21°28.7'	157°06.8'	S 20°52.9'	82°09.7'	N 6°19.5'	
3	112°28.5'	228°00.4'	S 21°21.8'	256°08.9'	S 12°36.9'	174°49.3'	S 21°28.6'	172°09.0'	S 20°52.9'	97°11.8'	N 6°19.8'	
4	127°31.0'	243°00.2'	S 21°22.3'	271°08.4'	S 12°37.9'	189°51.2'	S 21°28.5'	187°11.2'	S 20°52.8'	112°13.9'	N 6°20.1'	
5	142°33.4'	258°00.0'	S 21°22.7'	286°07.9'	S 12°38.9'	204°53.2'	S 21°28.4'	202°13.5'	S 20°52.8'	127°16.0'	N 6°20.3'	
6	157°35.9'	272°59.8'	S 21°23.1'	301°07.3'	S 12°40.0'	219°55.1'	S 21°28.3'	217°15.7'	S 20°52.8'	142°18.1'	N 6°20.6'	
7	172°38.4'	287°59.6'	S 21°23.6'	316°06.8'	S 12°41.0'	234°57.1'	S 21°28.2'	232°17.9'	S 20°52.7'	157°20.2'	N 6°20.9'	
8	187°40.8'	302°59.4'	S 21°24.0'	331°06.3'	S 12°42.0'	249°59.0'	S 21°28.2'	247°20.2'	S 20°52.7'	172°22.3'	N 6°21.2'	
9	202°43.3'	317°59.2'	S 21°24.4'	346°05.7'	S 12°43.1'	265°01.0'	S 21°28.1'	262°22.4'	S 20°52.6'	187°24.4'	N 6°21.4'	
10	217°45.8'	332°58.9'	S 21°24.9'	1°05.2'	S 12°44.1'	280°03.0'	S 21°28.0'	277°24.6'	S 20°52.6'	202°26.5'	N 6°21.7'	
11	232°48.2'	347°58.7'	S 21°25.3'	16°04.7'	S 12°45.1'	295°04.9'	S 21°27.9'	292°26.9'	S 20°52.5'	217°28.6'	N 6°22.0'	
12	247°50.7'	2°58.5'	S 21°25.7'	31°04.1'	S 12°46.1'	310°06.9'	S 21°27.8'	307°29.1'	S 20°52.5'	232°30.7'	N 6°22.2'	
13	262°53.2'	17°58.3'	S 21°26.1'	46°03.6'	S 12°47.2'	325°08.8'	S 21°27.7'	322°31.3'	S 20°52.5'	247°32.8'	N 6°22.5'	
14	277°55.6'	32°58.1'	S 21°26.6'	61°03.1'	S 12°48.2'	340°10.8'	S 21°27.6'	337°33.6'	S 20°52.4'	262°34.9'	N 6°22.8'	
15	292°58.1'	47°57.9'	S 21°27.0'	76°02.5'	S 12°49.2'	355°12.7'	S 21°27.5'	352°35.8'	S 20°52.4'	277°37.0'	N 6°23.1'	
16	308°00.6'	62°57.6'	S 21°27.4'	91°02.0'	S 12°50.2'	10°14.7'	S 21°27.5'	7°38.0'	S 20°52.3'	292°39.1'	N 6°23.3'	
17	323°03.0'	77°57.4'	S 21°27.8'	106°01.4'	S 12°51.2'	25°16.7'	S 21°27.4'	22°40.3'	S 20°52.3'	307°41.1'	N 6°23.6'	
18	338°05.5'	92°57.2'	S 21°28.3'	121°00.9'	S 12°52.3'	40°18.6'	S 21°27.3'	37°42.5'	S 20°52.2'	322°43.2'	N 6°23.9'	
19	353°07.9'	107°57.0'	S 21°28.7'	136°00.4'	S 12°53.3'	55°20.6'	S 21°27.2'	52°44.7'	S 20°52.2'	337°45.3'	N 6°24.2'	
20	8°10.4'	122°56.8'	S 21°29.1'	150°59.8'	S 12°54.3'	70°22.5'	S 21°27.1'	67°47.0'	S 20°52.2'	352°47.4'	N 6°24.5'	
21	23°12.9'	137°56.6'	S 21°29.5'	165°59.3'	S 12°55.3'	85°24.5'	S 21°27.0'	82°49.2'	S 20°52.1'	7°49.5'	N 6°24.7'	
22	38°15.3'	152°56.3'	S 21°30.0'	180°58.7'	S 12°56.3'	100°26.4'	S 21°26.9'	97°51.4'	S 20°52.1'	22°51.6'	N 6°25.0'	
23	53°17.8'	167°56.1'	S 21°30.4'	195°58.2'	S 12°57.4'	115°28.4'	S 21°26.8'	112°53.6'	S 20°52.0'	37°53.7'	N 6°25.3'	
		SD 16.2'	d -0.4'		v -0.5'	d -1.0'		v 2.0'	d 0.1'		v 2.2'	d 0.0'
Mer. pass.		11 h 48 m 6 s		9 h 56 m		15 h 19 m		15 h 30 m		20 h 29 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Mars	+Fomalhaut	+Achernar	+Altair
0	28°39.8'	N 11°35.9'	15.4'	11.2'	54.0'	49°48.8'	48°46.3'	44°36.0'	30°03.1'	23°43.5'	66°17.4'		98°35.0'
1	43°14.2'	N 11°47.0'	15.3'	11.1'	54.0'	49°21.3'	48°20.8'	44°15.8'	29°33.8'	24°12.2'	66°45.7'	69°57.5'	98°59.9'
2	57°48.5'	N 11°58.2'	15.3'	11.1'	54.0'	48°53.9'	47°55.4'	43°55.6'	29°04.6'	24°40.9'	67°14.0'	70°12.6'	99°24.7'
3	72°22.8'	N 12°09.2'	15.3'	11.0'	54.0'	48°26.5'	47°30.0'	43°35.6'	28°35.3'	25°09.7'	67°42.3'	70°27.7'	99°49.5'
4	86°57.1'	N 12°20.3'	15.2'	11.0'	54.0'	47°59.1'	47°04.7'	43°15.7'	28°06.0'	25°38.5'	68°10.7'	70°42.9'	100°14.3'
5	101°31.3'	N 12°31.3'	15.2'	10.9'	54.0'	47°31.8'	46°39.4'	42°56.0'	27°36.7'	26°07.2'	68°39.0'	70°58.2'	100°39.1'
6	116°05.4'	N 12°42.2'	15.1'	10.9'	54.0'	47°04.4'	46°14.2'	42°36.4'	27°07.5'	26°36.1'	69°07.4'	71°13.5'	101°03.9'
7	130°39.6'	N 12°53.1'	15.1'	10.8'	54.0'	46°37.2'	45°49.1'	42°17.0'	26°38.2'	27°04.9'	69°35.8'	71°28.9'	101°28.7'
8	145°13.6'	N 13°03.9'	15.0'	10.8'	54.1'	46°09.9'	45°24.0'	41°57.7'	26°09.0'	27°33.7'	70°04.2'	71°44.4'	101°53.5'
9	159°47.6'	N 13°14.8'	15.0'	10.8'	54.1'	45°42.7'	44°59.0'	41°38.6'	25°39.7'	28°02.6'	70°32.6'	71°59.9'	102°18.2'
10	174°21.6'	N 13°25.5'	14.9'	10.7'	54.1'	45°15.5'	44°34.0'	41°19.7'	25°10.5'	28°31.5'	71°01.0'	72°15.5'	102°43.0'
11	188°55.5'	N 13°36.2'	14.9'	10.7'	54.1'	44°48.3'	44°09.1'	41°00.9'	24°41.3'	29°00.4'	71°29.5'	72°31.2'	103°07.7'
12	203°29.4'	N 13°46.9'	14.8'	10.6'	54.1'	44°21.2'	43°44.4'	40°42.3'	24°12.1'	29°29.3'	71°58.0'	72°46.9'	103°32.5'
13	218°03.2'	N 13°57.5'	14.8'	10.5'	54.1'	43°54.1'	43°19.6'	40°23.9'	23°42.9'	29°58.3'	72°26.4'	73°02.7'	103°57.2'
14	232°36.9'	N 14°08.0'	14.7'	10.5'	54.1'	43°27.1'	42°55.0'	40°05.7'	23°13.7'	30°27.3'	72°54.9'	73°18.6'	104°21.9'
15	247°10.6'	N 14°18.5'	14.7'	10.4'	54.1'	43°00.1'	42°30.4'	39°47.6'	22°44.5'	30°56.3'	73°23.5'	73°34.5'	104°46.6'
16	261°44.3'	N 14°28.9'	14.6'	10.4'	54.1'	42°33.1'	42°05.9'	39°29.8'	22°15.4'	31°25.3'	73°52.0'	73°50.4'	105°11.3'
17	276°17.9'	N 14°39.3'	14.5'	10.3'	54.1'	42°06.2'	41°41.5'	39°12.1'	21°46.2'	31°54.3'	74°20.5'	74°06.5'	105°35.9'
18	290°51.4'	N 14°49.6'	14.5'	10.3'	54.1'	41°39.3'	41°17.2'	38°54.7'	21°17.1'	32°23.3'	74°49.1'	74°22.6'	106°00.6'
19	305°24.9'	N 14°59.9'	14.4'	10.2'	54.1'	41°12.5'	40°53.0'	38°37.4'	20°48.0'	32°52.4'	75°17.7'	74°38.7'	106°25.2'
20	319°58.4'	N 15°10.1'	14.4'	10.2'	54.1'	40°45.7'	40°28.9'	38°20.4'	20°19.0'	33°21.5'	75°46.3'	74°54.9'	106°49.9'
21	334°31.7'	N 15°20.3'	14.3'	10.1'	54.1'	40°18.9'	40°04.9'	38°03.5'	19°49.9'	33°50.5'	76°14.9'	75°11.2'	107°14.5'
22	349°05.0'	N 15°30.4'	14.3'	10.0'	54.2'	39°52.2'	39°40.9'	37°46.9'	19°20.9'	34°19.6'	76°43.5'	75°27.5'	107°39.0'
23	3°38.3'	N 15°40.4'	14.2'	10.0'	54.2'	39°25.6'	39°17.1'	37°30.6'	18°51.9'	34°48.8'	77°12.1'	75°43.8'	108°03.6'
Mer. pass.		22 h 45 m SD 14.7'		phase 95%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.2'	N 45°21.5'	Acrux	+0.8	173°04.1'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.9'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.2'	N 89°21.2'
Rigil Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	68°20.3'	182°55.9'	S 21°30.8'	210°57.6'	S 12°58.4'		130°30.3'	S 21°26.8'		127°55.9'	S 20°52.0'		52°55.7'	N 6°25.6'				
1	83°22.7'	197°55.7'	S 21°31.2'	225°57.1'	S 12°59.4'		145°32.3'	S 21°26.7'		142°58.1'	S 20°51.9'		67°57.8'	N 6°25.8'				
2	98°25.2'	212°55.5'	S 21°31.6'	240°56.6'	S 13°00.4'		160°34.2'	S 21°26.6'		158°00.3'	S 20°51.9'		82°59.9'	N 6°26.1'				
3	113°27.7'	227°55.2'	S 21°32.1'	255°56.0'	S 13°01.4'		175°36.2'	S 21°26.5'		173°02.6'	S 20°51.9'		98°02.0'	N 6°26.4'				
4	128°30.1'	242°55.0'	S 21°32.5'	270°55.5'	S 13°02.5'		190°38.2'	S 21°26.4'		188°04.8'	S 20°51.8'		113°04.0'	N 6°26.7'				
5	143°32.6'	257°54.8'	S 21°32.9'	285°54.9'	S 13°03.5'		205°40.1'	S 21°26.3'		203°07.0'	S 20°51.8'		128°06.1'	N 6°27.0'				
6	158°35.0'	272°54.6'	S 21°33.3'	300°54.4'	S 13°04.5'		220°42.1'	S 21°26.2'		218°09.3'	S 20°51.7'		143°08.2'	N 6°27.2'				
7	173°37.5'	287°54.4'	S 21°33.7'	315°53.8'	S 13°05.5'		235°44.0'	S 21°26.1'		233°11.5'	S 20°51.7'		158°10.3'	N 6°27.5'				
8	188°40.0'	302°54.1'	S 21°34.1'	330°53.3'	S 13°06.5'		250°46.0'	S 21°26.0'		248°13.7'	S 20°51.6'		173°12.3'	N 6°27.8'				
9	203°42.4'	317°53.9'	S 21°34.5'	345°52.7'	S 13°07.5'		265°47.9'	S 21°26.0'		263°16.0'	S 20°51.6'		188°14.4'	N 6°28.1'				
10	218°44.9'	332°53.7'	S 21°35.0'	0°52.2'	S 13°08.5'		280°49.9'	S 21°25.9'		278°18.2'	S 20°51.6'		203°16.5'	N 6°28.4'				
11	233°47.4'	347°53.5'	S 21°35.4'	15°51.7'	S 13°09.6'		295°51.8'	S 21°25.8'		293°20.4'	S 20°51.5'		218°18.5'	N 6°28.6'				
12	248°49.8'	2°53.2'	S 21°35.8'	30°51.1'	S 13°10.6'		310°53.8'	S 21°25.7'		308°22.6'	S 20°51.5'		233°20.6'	N 6°28.9'				
13	263°52.3'	17°53.0'	S 21°36.2'	45°50.6'	S 13°11.6'		325°55.7'	S 21°25.6'		323°24.9'	S 20°51.4'		248°22.7'	N 6°29.2'				
14	278°54.8'	32°52.8'	S 21°36.6'	60°50.0'	S 13°12.6'		340°57.7'	S 21°25.5'		338°27.1'	S 20°51.4'		263°24.7'	N 6°29.5'				
15	293°57.2'	47°52.6'	S 21°37.0'	75°49.5'	S 13°13.6'		355°59.6'	S 21°25.4'		353°29.3'	S 20°51.3'		278°26.8'	N 6°29.8'				
16	308°59.7'	62°52.4'	S 21°37.4'	90°48.9'	S 13°14.6'		11°01.6'	S 21°25.3'		8°31.6'	S 20°51.3'		293°28.9'	N 6°30.0'				
17	324°02.2'	77°52.1'	S 21°37.8'	105°48.4'	S 13°15.6'		26°03.5'	S 21°25.3'		23°33.8'	S 20°51.3'		308°30.9'	N 6°30.3'				
18	339°04.6'	92°51.9'	S 21°38.2'	120°47.8'	S 13°16.6'		41°05.5'	S 21°25.2'		38°36.0'	S 20°51.2'		323°33.0'	N 6°30.6'				
19	354°07.1'	107°51.7'	S 21°38.6'	135°47.3'	S 13°17.6'		56°07.5'	S 21°25.1'		53°38.3'	S 20°51.2'		338°35.0'	N 6°30.9'				
20	9°09.5'	122°51.5'	S 21°39.0'	150°46.7'	S 13°18.6'		71°09.4'	S 21°25.0'		68°40.5'	S 20°51.1'		353°37.1'	N 6°31.2'				
21	24°12.0'	137°51.2'	S 21°39.4'	165°46.1'	S 13°19.7'		86°11.4'	S 21°24.9'		83°42.7'	S 20°51.1'		8°39.2'	N 6°31.5'				
22	39°14.5'	152°51.0'	S 21°39.8'	180°45.6'	S 13°20.7'		101°13.3'	S 21°24.8'		98°44.9'	S 20°51.0'		23°41.2'	N 6°31.7'				
23	54°16.9'	167°50.8'	S 21°40.2'	195°45.0'	S 13°21.7'		116°15.3'	S 21°24.7'		113°47.2'	S 20°51.0'		38°43.3'	N 6°32.0'				
		SD 16.2'	d -0.4'		v -0.5'	d -1.0'		v 2.0'	d 0.1'		v 2.2'	d 0.0'		v 2.1'	d 0.3'			
Mer. pass.		11 h 48 m 27 s		9 h 57 m			15 h 16 m			15 h 26 m			20 h 25 m					

h	Moon					Lunar distance												
	GHA	dec	v	d	HP	-Betelgeuse	-Capella	-Rigel	-Aldebaran	+Mars	+Achernar	+Fomalhaut	+Altair					
0	18°11.5'	N 15°50.4'	14.1'	9.9'	54.2'	38°59.0'	38°53.4'	37°14.4'	18°23.0'	35°17.9'	76°00.2'	77°40.8'	108°28.2'					
1	32°44.7'	N 16°00.3'	14.1'	9.8'	54.2'	38°32.5'	38°29.8'	36°58.5'	17°54.1'	35°47.1'	76°16.7'	78°09.4'	108°52.7'					
2	47°17.7'	N 16°10.1'	14.0'	9.8'	54.2'	38°06.1'	38°06.3'	36°42.9'	17°25.2'	36°16.2'	76°33.2'	78°38.1'	109°17.2'					
3	61°50.8'	N 16°19.9'	14.0'	9.7'	54.2'	37°39.7'	37°43.0'	36°27.5'	16°56.4'	36°45.4'	76°49.8'	79°06.8'	109°41.7'					
4	76°23.7'	N 16°29.6'	13.9'	9.7'	54.2'	37°13.4'	37°19.7'		16°27.7'	37°14.6'	77°06.4'	79°35.5'	110°06.2'					
5	90°56.6'	N 16°39.3'	13.8'	9.6'	54.2'	36°47.1'	36°56.6'		15°58.9'	37°43.8'	77°23.0'	80°04.3'	110°30.6'					
6	105°29.5'	N 16°48.9'	13.8'	9.5'	54.2'	36°20.9'	36°33.6'		15°30.3'	38°13.1'	77°39.8'	80°33.0'	110°55.0'					
7	120°02.3'	N 16°58.4'	13.7'	9.5'	54.2'	35°54.8'	36°10.8'		15°01.7'	38°42.3'	77°56.5'	81°01.7'	111°19.4'					
8	134°35.0'	N 17°07.9'	13.7'	9.4'	54.2'	35°28.8'	35°48.1'		14°33.3'	39°11.6'	78°13.3'	81°30.5'	111°43.8'					
9	149°07.6'	N 17°17.2'	13.6'	9.3'	54.2'	35°02.8'	35°25.5'		14°04.9'	39°40.8'	78°30.1'	81°59.3'	112°08.1'					
10	163°40.2'	N 17°26.6'	13.5'	9.2'	54.3'	34°37.0'	35°03.1'		13°36.6'	40°10.1'	78°47.0'	82°28.1'	112°32.5'					
11	178°12.8'	N 17°35.8'	13.5'	9.2'	54.3'	34°11.2'	34°40.9'		13°08.4'	40°39.4'	79°03.9'	82°56.9'	112°56.8'					
12	192°45.3'	N 17°45.0'	13.4'	9.1'	54.3'	33°45.5'	34°18.8'		12°40.3'	41°08.7'	79°20.9'	83°25.7'	113°21.0'					
13	207°17.7'	N 17°54.1'	13.3'	9.0'	54.3'	33°19.9'	33°56.9'		12°12.4'	41°38.1'	79°37.9'	83°54.6'	113°45.3'					
14	221°50.0'	N 18°03.1'	13.3'	9.0'	54.3'	32°54.4'	33°35.2'		11°44.7'	42°07.4'	79°55.0'	84°23.4'	114°09.5'					
15	236°22.3'	N 18°12.0'	13.2'	8.9'	54.3'	32°29.0'	33°13.6'		11°17.1'	42°36.8'	80°12.0'	84°52.3'	114°33.6'					
16	250°54.5'	N 18°20.9'	13.2'	8.8'	54.3'	32°03.7'	32°52.3'		10°49.7'	43°06.2'	80°29.2'	85°21.2'	114°57.8'					
17	265°26.7'	N 18°29.7'	13.1'	8.7'	54.3'	31°38.6'	32°31.1'		10°22.6'	43°35.6'	80°46.3'	85°50.0'	115°21.9'					
18	279°58.8'	N 18°38.5'	13.0'	8.6'	54.3'	31°13.5'	32°10.1'		9°55.7'	44°05.0'	81°03.5'	86°18.9'	115°45.9'					
19	294°30.8'	N 18°47.1'	13.0'	8.6'	54.3'	30°48.6'	31°49.4'		9°29.1'	44°34.4'	81°20.8'	86°47.9'	116°10.0'					
20	309°02.8'	N 18°55.7'	12.9'	8.5'	54.4'	30°23.8'	31°28.8'		9°02.9'	45°03.8'	81°38.0'	87°16.8'	116°34.0'					
21	323°34.7'	N 19°04.2'	12.8'	8.4'	54.4'	29°59.2'	31°08.5'		8°37.1'	45°33.3'	81°55.3'	87°45.7'	116°57.9'					
22	338°06.5'	N 19°12.6'	12.8'	8.3'	54.4'	29°34.6'	30°48.4'		8°11.8'	46°02.7'	82°12.6'	88°14.7'	117°21.8'					
23	352°38.3'	N 19°20.9'	12.7'	8.2'	54.4'	29°10.3'	30°28.5'		7°47.0'	46°32.2'	82°30.0'	88°43.7'	117°45.7'					
Mer. pass.		23 h 30 m SD 14.8'		phase 98%														

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.3'	N 45°21.5'	Acrux	+0.8	173°04.0'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°52.0'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.9'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.3'	N 89°21.2'
Rigel Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				

Monday 30 November 2020 UT1

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	69°19.4'	182°50.6'	S 21°40.6'	210°44.5'	S 13°22.7'		131°17.2'	S 21°24.6'		128°49.4'	S 20°51.0'		53°45.3'	N 6°32.3'				
1	84°21.9'	197°50.3'	S 21°41.0'	225°43.9'	S 13°23.7'		146°19.2'	S 21°24.5'		143°51.6'	S 20°50.9'		68°47.4'	N 6°32.6'				
2	99°24.3'	212°50.1'	S 21°41.5'	240°43.4'	S 13°24.7'		161°21.1'	S 21°24.4'		158°53.9'	S 20°50.9'		83°49.4'	N 6°32.9'				
3	114°26.8'	227°49.9'	S 21°41.9'	255°42.8'	S 13°25.7'		176°23.1'	S 21°24.4'		173°56.1'	S 20°50.8'		98°51.5'	N 6°33.2'				
4	129°29.3'	242°49.6'	S 21°42.2'	270°42.3'	S 13°26.7'		191°25.0'	S 21°24.3'		188°58.3'	S 20°50.8'		113°53.5'	N 6°33.5'				
5	144°31.7'	257°49.4'	S 21°42.6'	285°41.7'	S 13°27.7'		206°27.0'	S 21°24.2'		204°00.5'	S 20°50.7'		128°55.6'	N 6°33.7'				
6	159°34.2'	272°49.2'	S 21°43.0'	300°41.2'	S 13°28.7'		221°28.9'	S 21°24.1'		219°02.8'	S 20°50.7'		143°57.6'	N 6°34.0'				
7	174°36.7'	287°49.0'	S 21°43.4'	315°40.6'	S 13°29.7'		236°30.9'	S 21°24.0'		234°05.0'	S 20°50.6'		158°59.7'	N 6°34.3'				
8	189°39.1'	302°48.7'	S 21°43.8'	330°40.0'	S 13°30.7'		251°32.8'	S 21°23.9'		249°07.2'	S 20°50.6'		174°01.7'	N 6°34.6'				
9	204°41.6'	317°48.5'	S 21°44.2'	345°39.5'	S 13°31.7'		266°34.8'	S 21°23.8'		264°09.4'	S 20°50.6'		189°03.8'	N 6°34.9'				
10	219°44.0'	332°48.3'	S 21°44.6'	0°38.9'	S 13°32.7'		281°36.7'	S 21°23.7'		279°11.7'	S 20°50.5'		204°05.8'	N 6°35.2'				
11	234°46.5'	347°48.0'	S 21°45.0'	15°38.4'	S 13°33.7'		296°38.7'	S 21°23.6'		294°13.9'	S 20°50.5'		219°07.9'	N 6°35.5'				
12	249°49.0'	2°47.8'	S 21°45.4'	30°37.8'	S 13°34.7'		311°40.6'	S 21°23.6'		309°16.1'	S 20°50.4'		234°09.9'	N 6°35.8'				
13	264°51.4'	17°47.6'	S 21°45.8'	45°37.2'	S 13°35.7'		326°42.6'	S 21°23.5'		324°18.4'	S 20°50.4'		249°11.9'	N 6°36.1'				
14	279°53.9'	32°47.4'	S 21°46.2'	60°36.7'	S 13°36.7'		341°44.5'	S 21°23.4'		339°20.6'	S 20°50.3'		264°14.0'	N 6°36.3'				
15	294°56.4'	47°47.1'	S 21°46.6'	75°36.1'	S 13°37.7'		356°46.5'	S 21°23.3'		354°22.8'	S 20°50.3'		279°16.0'	N 6°36.6'				
16	309°58.8'	62°46.9'	S 21°47.0'	90°35.6'	S 13°38.7'		11°48.4'	S 21°23.2'		9°25.0'	S 20°50.3'		294°18.1'	N 6°36.9'				
17	325°01.3'	77°46.7'	S 21°47.4'	105°35.0'	S 13°39.7'		26°50.4'	S 21°23.1'		24°27.3'	S 20°50.2'		309°20.1'	N 6°37.2'				
18	340°03.8'	92°46.4'	S 21°47.8'	120°34.4'	S 13°40.7'		41°52.3'	S 21°23.0'		39°29.5'	S 20°50.2'		324°22.1'	N 6°37.5'				
19	355°06.2'	107°46.2'	S 21°48.2'	135°33.9'	S 13°41.7'		56°54.3'	S 21°22.9'		54°31.7'	S 20°50.1'		339°24.2'	N 6°37.8'				
20	10°08.7'	122°46.0'	S 21°48.5'	150°33.3'	S 13°42.7'		71°56.2'	S 21°22.8'		69°33.9'	S 20°50.1'		354°26.2'	N 6°38.1'				
21	25°11.2'	137°45.7'	S 21°48.9'	165°32.8'	S 13°43.7'		86°58.1'	S 21°22.7'		84°36.2'	S 20°50.0'		9°28.2'	N 6°38.4'				
22	40°13.6'	152°45.5'	S 21°49.3'	180°32.2'	S 13°44.7'		102°00.1'	S 21°22.7'		99°38.4'	S 20°50.0'		24°30.3'	N 6°38.7'				
23	55°16.1'	167°45.3'	S 21°49.7'	195°31.6'	S 13°45.6'		117°02.0'	S 21°22.6'		114°40.6'	S 20°49.9'		39°32.3'	N 6°39.0'				
		SD 16.2' d -0.4'		v -0.6' d -1.0'			v 1.9' d 0.1'			v 2.2' d 0.0'			v 2.0' d 0.3'					
Mer. pass.		11 h 48 m 49 s		9 h 57 m			15 h 13 m			15 h 22 m			20 h 22 m					

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Pollux	-Capella	-Betelgeuse	-Aldebaran	+Mars	+Achernar	+Fomalhaut	+Altair
0	7°10.0'	N 19°29.1'	12.6'	8.2'	54.4'	50°12.2'	30°08.9'	28°46.1'	7°22.9'	47°01.7'	82°47.4'	89°12.7'	118°09.5'
1	21°41.6'	N 19°37.3'	12.6'	8.1'	54.4'	49°42.1'	29°49.6'	28°22.0'		47°31.2'	83°04.8'	89°41.6'	118°33.3'
2	36°13.2'	N 19°45.4'	12.5'	8.0'	54.4'	49°12.1'	29°30.5'	27°58.2'		48°00.8'	83°22.3'	90°10.7'	118°57.1'
3	50°44.7'	N 19°53.4'	12.4'	7.9'	54.4'	48°42.0'	29°11.7'	27°34.5'		48°30.3'	83°39.8'	90°39.7'	119°20.8'
4	65°16.1'	N 20°01.3'	12.4'	7.8'	54.5'	48°11.9'	28°53.2'	27°11.0'		48°59.8'	83°57.3'	91°08.7'	119°44.4'
5	79°47.5'	N 20°09.1'	12.3'	7.7'	54.5'	47°41.8'	28°35.0'	26°47.7'		49°29.4'	84°14.8'	91°37.8'	
6	94°18.8'	N 20°16.8'	12.2'	7.6'	54.5'	47°11.6'	28°17.1'	26°24.6'		49°59.0'	84°32.4'	92°06.8'	
7	108°50.1'	N 20°24.5'	12.2'	7.6'	54.5'	46°41.5'	27°59.5'	26°01.7'		50°28.6'	84°49.9'	92°35.9'	
8	123°21.2'	N 20°32.0'	12.1'	7.5'	54.5'	46°11.4'	27°42.2'	25°39.0'		50°58.2'	85°07.6'	93°05.0'	
9	137°52.4'	N 20°39.5'	12.0'	7.4'	54.5'	45°41.2'	27°25.3'	25°16.6'		51°27.8'	85°25.2'	93°34.1'	
10	152°23.4'	N 20°46.9'	12.0'	7.3'	54.5'	45°11.0'	27°08.7'	24°54.4'		51°57.5'	85°42.8'	94°03.2'	
11	166°54.4'	N 20°54.2'	11.9'	7.2'	54.5'	44°40.9'	26°52.4'	24°32.5'		52°27.1'	86°00.5'	94°32.3'	
12	181°25.3'	N 21°01.3'	11.9'	7.1'	54.6'	44°10.7'	26°36.6'	24°10.9'		52°56.8'	86°18.2'	95°01.4'	
13	195°56.2'	N 21°08.4'	11.8'	7.0'	54.6'	43°40.5'	26°21.1'	23°49.5'		53°26.5'	86°35.9'	95°30.6'	
14	210°26.9'	N 21°15.4'	11.7'	6.9'	54.6'	43°10.3'		23°28.5'		53°56.2'	86°53.7'	95°59.7'	
15	224°57.7'	N 21°22.3'	11.7'	6.8'	54.6'	42°40.0'		23°07.7'		54°25.9'	87°11.4'	96°28.9'	
16	239°28.3'	N 21°29.2'	11.6'	6.7'	54.6'	42°09.8'		22°47.3'		54°55.6'	87°29.2'	96°58.1'	
17	253°58.9'	N 21°35.9'	11.5'	6.6'	54.6'	41°39.5'		22°27.2'		55°25.4'	87°47.0'	97°27.3'	
18	268°29.4'	N 21°42.5'	11.5'	6.5'	54.6'	41°09.3'		22°07.5'		55°55.1'	88°04.8'	97°56.5'	
19	282°59.9'	N 21°49.0'	11.4'	6.4'	54.6'	40°39.0'		21°48.2'		56°24.9'	88°22.6'	98°25.7'	
20	297°30.3'	N 21°55.4'	11.3'	6.3'	54.7'	40°08.7'		21°29.3'		56°54.7'	88°40.4'	98°54.9'	
21	312°00.7'	N 22°01.7'	11.3'	6.2'	54.7'	39°38.4'		21°10.8'		57°24.5'	88°58.3'	99°24.1'	
22	326°30.9'	N 22°07.9'	11.2'	6.1'	54.7'	39°08.1'		20°52.7'		57°54.3'	89°16.1'	99°53.4'	
23	341°01.1'	N 22°14.0'	11.2'	6.0'	54.7'	38°37.8'		20°35.1'		58°24.1'	89°34.0'	100°22.6'	
Mer. pass.		0 h 19 m SD 14.8'		phase 100%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°18.2'	S 29°30.9'	Spica	+1.0	158°26.1'	S 11°16.0'	Betelgeuse	+0.5	270°55.4'	N 7°24.6'
Deneb	+1.2	49°28.3'	N 45°21.5'	Acrux	+0.8	173°04.0'	S 63°12.5'	Capella	+0.1	280°26.4'	N 46°01.0'
Altair	+0.8	62°03.4'	N 8°55.5'	Regulus	+1.4	207°38.0'	N 11°51.9'	Rigel	+0.2	281°06.8'	S 8°10.7'
Vega	+0.0	80°35.9'	N 38°48.4'	Pollux	+1.2	243°21.2'	N 27°58.4'	Aldebaran	+0.9	290°43.1'	N 16°33.0'
Antares	+1.1	112°20.3'	S 26°28.5'	Procyon	+0.4	244°54.1'	N 5°10.3'	Polaris	+2.0	315°05.3'	N 89°21.2'
Rigil Kent	-0.0	139°45.4'	S 60°55.0'	Adhara	+1.5	255°08.2'	S 28°59.9'	Achernar	+0.5	335°22.4'	S 57°08.1'
Arcturus	-0.1	145°51.3'	N 19°04.5'	Sirius	-1.4	258°28.9'	S 16°44.6'				
Hadar	+0.6	148°41.2'	S 60°28.1'	Canopus	-0.6	263°53.4'	S 52°42.3'				