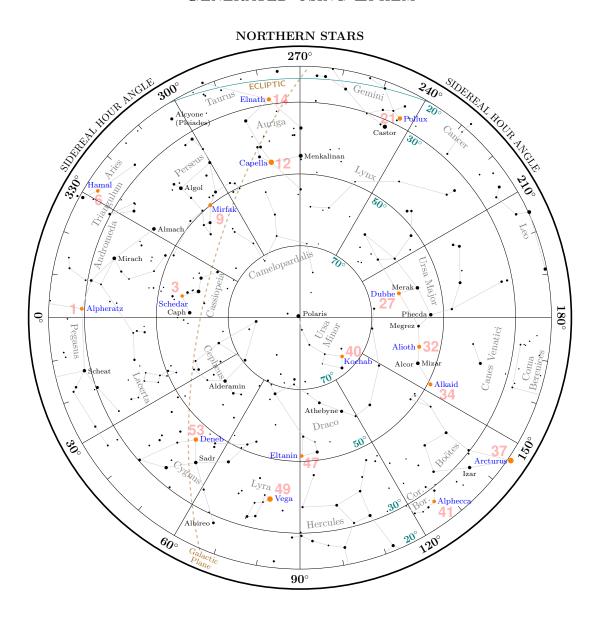
GENERATED USING EPHEM



THE NAUTICAL ALMANAC

10.06.1995

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June 10, 11, 12 (Sat., Sun., Mon.)

	Aries Venus		Mars		Jupiter		Saturn		
Sat	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	257°52.9	200°40.2	N 18°54.1	98°26.3	N09°53.5	9°59.5	S 21°05.3	262°25.6	S 04°09.8
1	272°55.4	215°39.6	54.8	113°27.6	53.0	25°02.3	05.2	277°28.0	09.8
2	287°57.8	230°38.9	55.5	128°28.9	52.5	40°05.1	05.2	292°30.3	09.8
3	303°00.3	245°38.3	• • 56.3	143°30.2	• • 51.9	55°07.9	• • 05.1	307°32.7	• • 09.7
4	318°02.7	260°37.6	57.0	158°31.5	51.4	70°10.7	05.1	322°35.1	09.7
5	333°05.2	275°37.0	57.7	173°32.8	50.9	85°13.5	05.1	337°37.4	09.7
6	348°07.7	290°36.3	N 18°58.5	188°34.1	N09°50.4	100°16.3	S 21°05.0	352°39.8	S 04°09.6
7	3°10.1	305°35.6	59.2	203°35.4	49.9	115°19.1	05.0	7°42.1	09.6
8	18°12.6	320°35.0	18°59.9	218°36.7	49.4	130°21.9	04.9	22°44.5	09.6
9	33°15.1	335°34.3	19°00.6	233°38.0	• • 48.9	145°24.7	• • 04.9	37°46.9	• • 09.5
10	48°17.5	350°33.7	01.4	248°39.3	48.3	160°27.5	04.9	52°49.2	09.5
11	63°20.0	5°33.0	02.1	263°40.6	47.8	175°30.3	04.8	67°51.6	09.5
12	78°22.5	20°32.3	$N19^{\circ}02.8$	278°41.9	N09°47.3	190°33.1	S 21°04.8	82°54.0	S 04°09.4
13	93°24.9	35°31.7	03.5	293°43.2	46.8	205°35.9	04.7	97°56.3	09.4
14	108°27.4	50°31.0	04.3	308°44.5	46.3	220°38.6	04.7	112°58.7	09.4
15	123°29.9	65°30.4	• • 05.0	323°45.8	• • 45.8	235°41.4	• • 04.7	128°01.0	• • 09.3
16	138°32.3	80°29.7	05.7	338°47.1	45.3	250°44.2	04.6	143°03.4	09.3
17	153°34.8	95°29.0	06.4	353°48.4	44.7	265°47.0	04.6	158°05.8	09.3
18	168°37.2	110°28.4	$N19^{\circ}07.2$	8°49.7	N09°44.2	280°49.8	S 21°04.5	173°08.1	S 04°09.3
19	183°39.7	125°27.7	07.9	23°51.0	43.7	295°52.6	04.5	188°10.5	09.2
20	198°42.2	140°27.0	08.6	38°52.3	43.2	310°55.4	04.5	203°12.9	09.2
21	213°44.6	155°26.4	• • 09.3	53°53.6	• • 42.7	325°58.2	• • 04.4	218°15.2	• • 09.2
22	228°47.1	170°25.7	10.0	68°54.9	42.2	341°01.0	04.4	233°17.6	09.1
23	243°49.6	185°25.0	10.7	83°56.2	41.7	356°03.8	04.3	248°20.0	09.1
Mer.p	ass. 06:47	ν -0.7 $^{\prime}$ d C	.7′ m -3.8	ν 1.3 $^{\prime}$ d -0	0.5′ m 1.0	ν 2.8′ d 0	.0′ m -2.4	ν 2.4′ d 0	0.0′ m 1.2

Sun	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	258°52.0	200°24.4	N 19°11.5	98°57.5	N09°41.1	11°06.6	S 21°04.3	263°22.3	S 04°09.1
1	273°54.5	215°23.7	12.2	113°58.8	40.6	26°09.4	04.2	278°24.7	09.0
2	288°57.0	230°23.0	12.9	129°00.1	40.1	41°12.2	04.2	293°27.1	09.0
3	303°59.4	245°22.4	• • 13.6	144°01.4	• • 39.6	56°15.0	• • 04.2	308°29.4	• • 09.0
4	319°01.9	260°21.7	14.3	159°02.7	39.1	71°17.7	04.1	323°31.8	08.9
5	334°04.4	275°21.0	15.0	174°04.0	38.6	86°20.5	04.1	338°34.1	08.9
6	349°06.8	290°20.4	N 19°15.7	189°05.3	N09°38.0	101°23.3	S 21°04.0	353°36.5	S 04°08.9
7	4°09.3	305°19.7	16.4	204°06.6	37.5	116°26.1	04.0	8°38.9	8.80
8	19°11.7	320°19.0	17.1	219°07.9	37.0	131°28.9	04.0	23°41.2	08.8
9	34°14.2	335°18.4	• • 17.9	234°09.2	• • 36.5	146°31.7	• • 03.9	38°43.6	• • 08.8
10	49°16.7	350°17.7	18.6	249°10.5	36.0	161°34.5	03.9	53°46.0	08.7
11	64°19.1	5°17.0	19.3	264°11.8	35.5	176°37.3	03.8	68°48.3	08.7
12	79°21.6	20°16.4	N 19°20.0	279°13.1	N09°34.9	191°40.1	S 21°03.8	83°50.7	S 04°08.7
13	94°24.1	35°15.7	20.7	294°14.4	34.4	206°42.9	03.8	98°53.1	08.7
14	109°26.5	50°15.0	21.4	309°15.7	33.9	221°45.7	03.7	113°55.4	08.6
15	124°29.0	65°14.3	• • 22.1	324°17.0	• • 33.4	236°48.4	• • 03.7	128°57.8	• • 08.6
16	139°31.5	80°13.7	22.8	339°18.3	32.9	251°51.2	03.6	144°00.2	08.6
17	154°33.9	95°13.0	23.5	354°19.6	32.4	266°54.0	03.6	159°02.5	08.5
18	169°36.4	110°12.3	N19°24.2	9°20.9	N09°31.8	281°56.8	S 21°03.6	174°04.9	S 04°08.5
19	184°38.9	125°11.6	24.9	24°22.2	31.3	296°59.6	03.5	189°07.3	08.5
20	199°41.3	140°11.0	25.6	39°23.5	30.8	312°02.4	03.5	204°09.6	08.4
21	214°43.8	155°10.3	• • 26.3	54°24.8	• • 30.3	327°05.2	• • 03.4	219°12.0	• • 08.4
22	229°46.2	170°09.6	27.0	69°26.1	29.8	342°08.0	03.4	234°14.4	08.4
23	244°48.7	185°08.9	27.7	84°27.4	29.2	357°10.8	03.4	249°16.7	08.4
Mer.p	bass. 06:43	ν -0.7 $^{\prime}$ d C).7′ m -3.8	ν 1.3 $^{\prime}$ d -0	0.5' m 1.0	ν 2.8′ d 0	.0′ m -2.4	ν 2.4′ d 0	0.0' m 1.2

Mon	GHA	GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec
0	259°51.2	200°08.3	N19°28.4	99°28.7	N09°28.7	12°13.6	S 21°03.3	264°19.1	S 04°08.3
1	274°53.6	215°07.6	29.1	114°30.0	28.2	27°16.4	03.3	279°21.5	08.3
2	289°56.1	230°06.9	29.8	129°31.2	27.7	42°19.1	03.2	294°23.8	08.3
3	304°58.6	245°06.2	• • 30.4	144°32.5	• • 27.2	57°21.9	• • 03.2	309°26.2	• • 08.2
4	320°01.0	260°05.5	31.1	159°33.8	26.6	72°24.7	03.2	324°28.6	08.2
5	335°03.5	275°04.9	31.8	174°35.1	26.1	87°27.5	03.1	339°31.0	08.2
6	350°06.0	290°04.2	N19°32.5	189°36.4	N 09°25.6	102°30.3	S 21°03.1	354°33.3	S 04°08.1
7	5°08.4	305°03.5	33.2	204°37.7	25.1	117°33.1	03.0	9°35.7	08.1
8	20°10.9	320°02.8	33.9	219°39.0	24.6	132°35.9	03.0	24°38.1	08.1
9	35°13.4	335°02.1	• • 34.6	234°40.3	• • 24.0	147°38.7	• • 03.0	39°40.4	• • 08.1
10	50°15.8	350°01.5	35.3	249°41.6	23.5	162°41.5	02.9	54°42.8	0.80
11	65°18.3	5°00.8	35.9	264°42.9	23.0	177°44.2	02.9	69°45.2	0.80
12	80°20.7	20°00.1	N 19°36.6	279°44.2	N09°22.5	192°47.0	S 21°02.8	84°47.5	S 04°08.0
13	95°23.2	34°59.4	37.3	294°45.5	22.0	207°49.8	02.8	99°49.9	07.9
14	110°25.7	49°58.7	38.0	309°46.8	21.4	222°52.6	02.8	114°52.3	07.9
15	125°28.1	64°58.0	• • 38.7	324°48.1	• • 20.9	237°55.4	• • 02.7	129°54.7	• • 07.9
16	140°30.6	79°57.3	39.4	339°49.4	20.4	252°58.2	02.7	144°57.0	07.9
17	155°33.1	94°56.7	40.0	354°50.6	19.9	268°01.0	02.6	159°59.4	07.8
18	170°35.5	109°56.0	N 19°40.7	9°51.9	N09°19.3	283°03.8	S 21°02.6	175°01.8	S 04°07.8
19	185°38.0	124°55.3	41.4	24°53.2	18.8	298°06.6	02.6	190°04.1	07.8
20	200°40.5	139°54.6	42.1	39°54.5	18.3	313°09.3	02.5	205°06.5	07.7
21	215°42.9	154°53.9	• • 42.7	54°55.8	• • 17.8	328°12.1	• • 02.5	220°08.9	• • 07.7
22	230°45.4	169°53.2	43.4	69°57.1	17.3	343°14.9	02.4	235°11.2	07.7
23	245°47.8	184°52.5	44.1	84°58.4	16.7	358°17.7	02.4	250°13.6	07.7
Mer.p	ass. 06:39	ν -0.7' d 0).7′ m -3.8	ν 1.3′ d -	0.5′ m 1.0	ν 2.8′ d 0	.0′ m -2.4	ν 2.4′ d 0	.0′ m 1.2

	Stars	
	SHA	Dec
Alpheratz	357°57.6	29°03.8
Ankaa Schedar	353°29.2 349°56.2	-42°19.6 56°30.5
Diphda	349°09.6	-18°00.6
Achernar	335°37.3	-57° 15.4
Hamal Polaris	328°16.3 323°25.0	23°26.3 89°14.4
Acamar	315°29.0	-40° 19.3
Menkar	314°29.5	4°04.2
Mirfak Aldebaran	309°00.2 291°05.3	49°50.5 16°29.9
Rigel	291 05.3 281°25.4	-8°12.5
Capella	280°55.0	45°59.5
Bellatrix	278°46.9	6°20.6 28°36.1
Elnath Alnilam	278°30.2 276°00.5	-1°12.4
Betelgeuse	$271^{\circ}16.3$	7°24.2
Canopus	264°02.7	-52°41.8
Sirius Adhara	258°46.0 255°23.5	-16°42.8 -28°58.2
Procyon	245°14.2	5°14.1
Pollux	243°44.6	28°02.2
Avior Suhail	234°24.0 223°02.6	-59°30.1 -43°25.2
Miaplacidus	221°42.9	-43°23.2
Alphard	218°09.6	-8°38.5
Regulus	207°58.0	11°59.3 61°46.7
Dubhe Denebola	194°08.4 182°47.4	14°35.8
Gienah	$176^{\circ}06.2$	-17°31.2
Acrux	173°24.2	-63°04.8
Gacrux Alioth	172°15.8 166°32.4	-57°05.6 55°59.3
Spica	158°45.4	-11°08.3
Alkaid	153°09.3	49°20.4
Hadar Menkent	149°06.7 148°23.3	-60°21.3 -36°21.0
Arcturus	146° 23.3	19°12.4
Rigil Kent.	140°09.6	-60°49.1
Kochab Zuben'ubi	137°18.6 137°20.2	74°10.7 -16°01.4
Alphecca	126°22.2	26°43.9
Åntares	$112^{\circ}42.5$	-26°25.3
Atria Sabik	107°56.0 102°27.7	-69°01.1 -15°43.1
Shaula	96°39.9	-15 45.1 -37°05.9
Rasalhague	96°18.7	12°33.9
Eltanin	90°51.9 84°01.4	51°29.4
Kaus Aust. Vega	84 01.4 80°47.7	-34°23.1 38°46.8
Nunki	$76^{\circ}14.8$	-26°18.0
Altair	62°21.2	8°51.5
Peacock Deneb	53°40.1 49°40.4	-56° 44.7 45° 15.8
Enif	34°00.3	9°51.3
Al Na'ir	28°00.6	-46°58.7
Fomalhaut Scheat	15°38.9 14°06.5	-29°38.5 28°03.4
Markab	13°51.8	15° 10.8
Jun 10 Sat	SHA	Mer.pass
Venus	302°47.3	10:38
Mars	200°33.4 112°06.6	17:25 23:16
Jupiter Saturn	4°32.7	06:29
Jun 11 Sun	SHA	Mer.pass
Venus	301°32.3	10:39
Mars	200°05.5	17:23
Jupiter Saturn	112°14.5 4°30.3	23:11 06:25
Jun 12 Mon	SHA	Mer.pass
Venus	300°17.1	10:40
Mars	199°37.5	17:21
Jupiter Saturn	112°22.4 4°27.9	23:07 06:22
Jatuill	. 21.3	30.22

Horizontal parallax Venus: Mars:

0.1 0.1

					DCC		
0	180°11.5	N22°57.3	45°58.9	7.3'	S 12°58.0	-9.1'	60.0'
1	195°11 4	57.5	60°25.2	7.2'	13°07.1	-9.0'	60.0'
	210°11.3		74°51.4		13°16.1	-9.0'	60.1
2		57.7		7.1'			
3	225°11.1	• • 57.9	89°17.6	7.0'	13°25.1	-8.9'	60.1'
4	240°11.0	58.1	103°43.6	6.9'	13°34.0	-8.8'	60.1'
5	255°10.9	58.3	118°09.5	6.9'	13°42.8	-8.7'	60.2'
	270°10.8						
6		N 22°58.5	132°35.4	6.8'	S 13°51.5	-8.7'	60.2'
7	285°10.7	58.7	147°01.2	6.7'	$14^{\circ}00.2$	-8.6'	60.2'
8	300°10.5	58.9	161°26.9	6.6'	14°08.8	-8.5'	60.3'
9	315°10.4	• • 59.1	175°52.5	6.5'	14° 17.2	-8.4'	60.3
	330°10.3	59.3	190°18.0	6.4'	14°25.6	-8.3'	60.3
10							
11	345°10.2	59.5	204°43.4	6.3'	14°34.0	-8.2'	60.4'
12	0°10.0	N22°59.7	219°08.7	6.2'	S14°42.2	-8.1'	60.4'
13	15°09.9	22°59.9	233°34.0	6.2'	14°50.3	-8.0'	60.4
					14°58.4		
14	30°09.8	23°00.1	247°59.1	6.1'		-8.0'	60.5'
15	45°09.7	• • 00.3	262°24.2	6.0'	15°06.3	-7.9'	60.5'
16	60°09.5	00.5	276°49.2	5.9'	$15^{\circ}14.2$	-7.8'	60.5'
17	75°09.4	00.6	291°14.1	5.8'	$15^{\circ}21.9$	-7.7'	60.6'
			-				
18	90°09.3	N 23°00.8	305°38.9	5.7'	S 15°29.6	-7.6'	60.6'
19	105°09.2	01.0	320°03.7	5.7'	15°37.2	-7.5'	60.6'
20	120°09.1	01.2	334°28.3	5.6'	15°44.6	-7.4'	60.6'
	135°08.9	01.4	348°52.9	5.5'	15°52.0		
21						-7.3'	60.7'
22	150°08.8	01.6	3°17.4	5.4'	15°59.3	-7.2	60.7'
23	165°08.7	01.8	17°41.8	5.3'	$16^{\circ}06.4$	-7.1'	60.7'
	SD = 15.8'	d = 0.2'		•	5D = 16.4'		
		- 0.2			20.1		
Sun	GHA	Dec	GHA	ν	Dec	d	HP
0	180°08.6	N23°02.0	32°06.1	5.2'	S 16°13.5	-6.9'	60.7'
1	195°08.4	02.2	46°30.4	5.2'	16°20.4	-6.8'	60.8
	210°08.3			٠.ـ			
2		02.3	60°54.5	5.1'	16°27.3	-6.7'	60.8'
3	225°08.2	• • 02.5	75°18.6	5.0'	16°34.0	-6.6'	60.8'
4	240°08.1	02.7	89°42.6	4.9'	16°40.6	-6.5'	60.8'
5	255°07.9	02.9	104°06.6	4.9'	16°47.1	-6.4'	60.9'
	270°07.8	N23°03.1					
6			118°30.4	4.8'	S 16°53.5	-6.3'	60.9'
7	285°07.7	03.2	132°54.2	4.7'	$16^{\circ}59.8$	-6.2'	60.9'
8	300°07.6	03.4	147°17.9	4.6'	$17^{\circ}05.9$	-6.0'	60.9'
9	315°07.4	03.6	161°41.6	4.6'	17° 12.0	-5.9'	61.0'
	330°07.3	03.8	176°05.1	4.5'	17°17.9	-5.8'	
10							61.0'
11	345°07.2	04.0	190°28.6	4.4'	$17^{\circ}23.7$	-5.7'	61.0'
12	0°07.1	N23°04.1	204°52.1	4.4'	S 17°29.4	-5.6'	61.0'
13	15°06.9	04.3	219°15.4	4.3'	17°34.9	-5.4'	61.0'
		07.5	219 13.4	т.Э		-3.4	01.0
1/	200060	04 5	222020	4 2'	170 40 4	E 2'	61 1'
14	30°06.8	04.5	233°38.7	4.2'	17°40.4	-5.3'	61.1'
15	45°06.7	• • 04.7	248°01.9	4.2'	17° 45.7	-5.2'	61.1'
15 16	45°06.7 60°06.6	· · 04.7 04.8	248°01.9 262°25.1	4.2' 4.1'	17°45.7 17°50.8	-5.2' -5.1'	61.1' 61.1'
15 16 17	45°06.7 60°06.6 75°06.4	· · · 04.7 04.8 05.0	248°01.9 262°25.1 276°48.2	4.2' 4.1' 4.0'	17° 45.7 17° 50.8 17° 55.9	-5.2' -5.1' -4.9'	61.1' 61.1' 61.1'
15 16 17 18	45°06.7 60°06.6 75°06.4 90°06.3	•• 04.7 04.8 05.0 N 23°05.2	248°01.9 262°25.1 276°48.2 291°11.2	4.2' 4.1' 4.0' 4.0'	17°45.7 17°50.8 17°55.9 S 18°00.8	-5.2' -5.1' -4.9' -4.8'	61.1' 61.1' 61.1' 61.1'
15 16 17	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2	· · · 04.7 04.8 05.0	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2	4.2' 4.1' 4.0'	17° 45.7 17° 50.8 17° 55.9 S 18° 00.8 18° 05.6	-5.2' -5.1' -4.9'	61.1' 61.1' 61.1'
15 16 17 18	45°06.7 60°06.6 75°06.4 90°06.3	•• 04.7 04.8 05.0 N 23°05.2	248°01.9 262°25.1 276°48.2 291°11.2	4.2' 4.1' 4.0' 4.0'	17°45.7 17°50.8 17°55.9 S 18°00.8	-5.2' -5.1' -4.9' -4.8'	61.1' 61.1' 61.1' 61.1'
15 16 17 18 19 20	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1	•• 04.7 04.8 05.0 N 23°05.2 05.4 05.5	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1	4.2' 4.1' 4.0' 4.0' 3.9' 3.9'	17° 45.7 17° 50.8 17° 55.9 \$18° 00.8 18° 05.6 18° 10.3	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2'
15 16 17 18 19 20 21	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9	•• 04.7 04.8 05.0 N 23° 05.2 05.4 05.5 •• 05.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0	4.2' 4.1' 4.0' 4.0' 3.9' 3.9' 3.8'	17° 45.7 17° 50.8 17° 55.9 S 18° 00.8 18° 05.6 18° 10.3 18° 14.8	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8	•• 04.7 04.8 05.0 N 23° 05.2 05.4 05.5 •• 05.7 05.9	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8	4.2' 4.1' 4.0' 4.0' 3.9' 3.9' 3.8' 3.7'	17° 45.7 17° 50.8 17° 55.9 S 18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7	•• 04.7 04.8 05.0 N23° 05.2 05.4 05.5 •• 05.7 05.9 06.1	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0	4.2' 4.1' 4.0' 4.0' 3.9' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S 18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8	•• 04.7 04.8 05.0 N 23° 05.2 05.4 05.5 •• 05.7 05.9	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8	4.2' 4.1' 4.0' 4.0' 3.9' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S 18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7	$ \begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \textbf{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ \end{array} $	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 \$18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22 23	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 5D = 15.8'	. 04.7 04.8 05.0 N23°05.2 05.4 05.5 . 05.7 06.1 d = 0.2'	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' Σ	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6′	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22 23 Mon	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8'	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.1 d = 0.2' Dec N23°06.2	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 GHA 17° 28.2	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' ν	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' HP
15 16 17 18 19 20 21 22 23 Mon 0	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8′ GHA	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \textbf{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' \$\frac{\nu}{\nu}\$	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 Dec S18° 27.6 18° 31.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' HP
15 16 17 18 19 20 21 22 23 Mon 0 1 2	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.1 d = 0.2' Dec N23°06.2	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 \$18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec \$18° 27.6 18° 31.6 18° 35.4	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.7'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' HP
15 16 17 18 19 20 21 22 23 Mon 0	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8′ GHA	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \textbf{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' \$\frac{\nu}{\nu}\$	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 Dec S18° 27.6 18° 31.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ \end{array}$	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 GHA 17° 28.2 31° 50.8 46° 13.4 60° 36.0	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 \$18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 Dec \$18° 27.6 18° 31.6 18° 35.4 18° 39.2	-5.2' -5.1' -4.9' -4.8' -4.7' -4.4' -4.3' -4.1'	61.1' 61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.9 06.1 d = 0.2' Dec N23°06.2 06.4 06.6 06.7 06.9	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 GHA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' 5 0 0 0 0 0 0 1.6' 3.5' 3.5' 3.5' 3.5' 3.5' 3.5'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 6D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 2 3 4 5	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \text{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 06.9 \\ 06.1 \\ \hline \textit{d} = 0.2' \\ \hline \textbf{Dec} \\ \text{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ 06.9 \\ 07.1 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.9 06.1 d = 0.2' Dec N23°06.2 06.4 06.6 06.7 06.9	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 GHA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' 5 0 0 0 0 0 0 1.6' 3.5' 3.5' 3.5' 3.5' 3.5' 3.5'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 6D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \text{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \textbf{Dec} \\ \text{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ 06.9 \\ 07.1 \\ \text{N23}^{\circ} 07.2 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7' .	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ \textbf{N23}^{\circ} 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ 06.9 \\ 07.1 \\ \textbf{N23}^{\circ} 07.2 \\ 07.4 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.4' -4.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 05.9 06.1 $d = 0.2'$ Dec N23°06.2 06.4 06.6 06.7 06.9 07.1 N23°07.2 07.4 07.6	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.3'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6' Dec \$18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 \$18° 49.5 18° 55.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.3' -3.2' -3.0' -2.9'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 2 3 4 5 6 7 8 9	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.9 06.1 d = 0.2' Dec N23°06.2 06.4 06.6 06.7 06.9 07.1 N23°07.2 07.4 07.6 07.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 10.3 18° 14.8 18° 19.2 18° 23.5 DD = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.9' -2.7'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.9 06.1 d = 0.2' Dec N23°06.2 06.4 06.6 06.7 06.9 07.1 N23°07.2 07.4 07.6 07.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6	4.2' 4.1' 4.0' 4.9' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 6D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.7' -2.6'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 2 3 4 5 6 7 8 9	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4	04.7 04.8 05.0 N23°05.2 05.4 05.5 05.7 06.9 06.1 d = 0.2' Dec N23°06.2 06.4 06.6 06.7 06.9 07.1 N23°07.2 07.4 07.6 07.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 10.3 18° 14.8 18° 19.2 18° 23.5 DD = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.9' -2.7'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3	. · · · 04.7 04.8 05.0 N23°05.2 05.4 05.5 · · 05.7 06.9 06.1 d = 0.2′ Dec N23°06.2 06.4 06.6 · · 06.7 06.9 07.1 N23°07.2 07.4 07.6 · · 07.7 07.9 08.0	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 6D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 55.6	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.7' -3.6' -3.3' -2.9' -2.9' -2.6' -2.4'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8′ GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ 04.8 \\ 05.0 \\ 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \\ \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ 06.9 \\ 07.1 \\ \textbf{N23}^{\circ} 07.2 \\ 07.4 \\ 07.6 \\ \cdot \cdot 07.7 \\ 07.9 \\ 08.0 \\ \textbf{N23}^{\circ} 08.2 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.0' -3.9' -3.7' -3.6' -3.3' -3.2' -3.3' -2.9' -2.6' -2.4' -2.3'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9	. · · · 04.7 04.8 05.0 05.2 05.4 05.5 · · 05.7 06.9 06.6 · · 06.7 06.9 07.1 N23°07.2 07.4 07.6 · · 07.7 07.9 08.0 N23°08.2 08.4	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.3' 3.2' 3.2' 3.1'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6' Dec \$18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 \$18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.4' -3.3' -3.2' -3.0' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8	$\begin{array}{c} \cdot \cdot \cdot 04.7 \\ 04.8 \\ 05.0 \\ 04.8 \\ 05.0 \\ 05.2 \\ 05.4 \\ 05.5 \\ \cdot \cdot 05.7 \\ 05.9 \\ 06.1 \\ d = 0.2' \\ \hline \\ \textbf{Dec} \\ \textbf{N23}^{\circ} 06.2 \\ 06.4 \\ 06.6 \\ \cdot \cdot 06.7 \\ 06.9 \\ 07.1 \\ \textbf{N23}^{\circ} 07.2 \\ 07.4 \\ 07.6 \\ \cdot \cdot 07.7 \\ 07.9 \\ 08.0 \\ \textbf{N23}^{\circ} 08.2 \\ \end{array}$	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.6' 3.5' 3.5' 3.4' 3.3' 3.2' 3.2' 3.1' 3.1'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 DD = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 56.6 18° 56.6	-5.2' -5.1' -4.9' -4.7' -4.5' -4.4' -4.0' -3.9' -3.7' -3.6' -3.3' -3.2' -3.3' -2.9' -2.6' -2.4' -2.3'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9	. · · · 04.7 04.8 05.0 05.2 05.4 05.5 · · 05.7 06.9 06.6 · · 06.7 06.9 07.1 N23°07.2 07.4 07.6 · · 07.7 07.9 08.0 N23°08.2 08.4	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.3' 3.2' 3.2' 3.1'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6' Dec \$18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 \$18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.1' d -4.0' -3.9' -3.4' -3.3' -3.2' -3.0' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.7 SD = 15.8′ GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7	. · · · 04.7 04.8 05.0 N23° 05.2 05.4 05.5 · · · 05.7 06.9 06.4 06.6 · · 06.7 06.9 07.1 N23° 07.2 07.4 ○ · · 07.7 07.9 08.0 N23° 08.2 08.4 08.5 · · · · · · · · · · · · · · · · · ·	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 3°05.5 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 56.6 18° 56.6 18° 57.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 08.6 19° 10.7 19° 12.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.7' -3.6' -3.4' -3.3' -2.2' -2.0' -2.4' -2.3' -2.20' -1.9'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 3 4 5 6 7 8 9 10 11 12 13 14 15 16	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5	. · · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	T7° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 49.5 18° 52.6 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 06.3 19° 08.6 19° 10.7 19° 10.7 19° 14.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.7' -3.6' -2.9' -2.6' -2.4' -2.3' -2.2' -2.0' -1.7'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4	. · · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5 261°47.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.2' 3.2' 3.1' 3.1' 3.1' 3.0'	T7° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 10.7 19° 10.7 19° 10.7 19° 10.7 19° 10.7 19° 12.7 19° 14.6 19° 16.3	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.7' -3.6' -3.4' -3.3' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -2.0' -1.7' -1.6'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 3 4 5 6 7 8 9 10 11 12 13 14 15 16	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5	. · · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 GHA 17°28.2 31°50.8 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.7'	T7° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 49.5 18° 52.6 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 06.3 19° 08.6 19° 10.7 19° 10.7 19° 14.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.7' -3.6' -2.9' -2.6' -2.4' -2.3' -2.2' -2.0' -1.7'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 17 18	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4 90°03.3	. · · 04.7	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 3° 05.5 6HA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 180° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.2' 3.2' 3.1' 3.1' 3.1' 3.0' 3.0'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.8 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 45.5 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 12.7 19° 14.6 19° 16.3 S19° 17.9	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -2.9' -2.4' -2.3' -2.2' -2.0' -1.9' -1.6' -1.4'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 7 8 9 10 11 12 13 14 15 16 17 17 18 19 19 10 11 11 11 11 11 11 11 11 11 11 11 11	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.3 105°03.1	. · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 3°05.5 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5 261°47.5 276°09.6 290°31.6	4.2' 4.1' 4.0' 3.9' 3.8' 3.7'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 10.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -2.0' -1.9' -1.6' -1.4' -1.3'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 19 10 11 11 11 11 11 11 11 11 11 11 11 11	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.1 120°03.0	. · · · 04.7 04.8 05.0 05.2 05.4 05.5 · · · 05.7 06.9 06.1 06.6 · · 06.7 06.9 07.1 N23°07.2 07.4 07.6 · · 07.7 07.9 08.0 N23°08.2 08.4 08.5 · · · 08.7 08.8 09.0 N23°09.1 09.3 09.5	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 GHA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6 290° 31.6 304° 53.6	4.2' 4.1' 4.0' 3.9' 3.8' 3.7' 3.6' 3.6' 3.5' 3.5' 3.4' 3.4' 3.3' 3.2' 3.2' 3.1' 3.1' 3.1' 3.0' 3.0' 3.0' 3.0' 3.0'	17° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 10.3 18° 14.8 18° 19.2 18° 23.5 D = 16.6′ Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 51.2 19° 01.2 19° 03.8 S19° 06.3 19° 06.3 19° 10.7 19° 12.7 19° 14.6 19° 16.3 S19° 17.9 19° 19.3 19° 20.5	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -1.9' -1.7' -1.6' -1.4' -1.3' -1.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.3 15°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9	. · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 3°05.5 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5 261°47.5 276°09.6 290°31.6 304°53.6 319°15.6	4.2' 4.1' 4.0' 3.9' 3.8' 3.7' 3.7'	T7° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 DEC S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 19° 10.7 19° 10.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.2' -2.6' -2.4' -2.3' -2.2' -1.6' -1.4' -1.3' -1.1' -1.0'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 19 10 10 11 11 11 11 11 11 11 11 11 11 11	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9 150°02.8	. · · · 04.7 04.8 05.0 05.2 05.4 05.5 · · · 05.7 06.9 06.1 06.6 · · 06.7 06.9 07.1 N23°07.2 07.4 07.6 · · 07.7 07.9 08.0 N23°08.2 08.4 08.5 · · · 08.7 08.8 09.0 N23°09.1 09.3 09.5	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 3° 05.5 3° 05.5 6HA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6 290° 31.6 304° 53.6 319° 15.6 333° 37.5	4.2' 4.1' 4.0' 3.9' 3.8' 3.7' 3.6' 3.6' 3.5' 3.5' 3.4' 3.4' 3.3' 3.2' 3.2' 3.1' 3.1' 3.1' 3.0' 3.0' 3.0' 3.0' 3.0'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 12.7 19° 16.3 S19° 17.9 19° 19.3 19° 20.5 19° 21.7 19° 22.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -1.9' -1.7' -1.6' -1.4' -1.3' -1.1'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 19 20 21 21 22 23 23 23 24 25 25 26 27 27 27 27 27 27 27 27 27 27 27 27 27	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.3 15°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9	. · · 04.7	248°01.9 262°25.1 276°48.2 291°11.2 305°34.2 305°34.2 319°57.1 334°20.0 348°42.8 3°05.5 3°05.5 46°13.4 60°36.0 74°58.5 89°20.9 103°43.3 118°05.7 132°28.0 146°50.3 161°12.6 175°34.8 189°57.0 204°19.1 218°41.3 233°03.4 247°25.5 261°47.5 276°09.6 290°31.6 304°53.6 319°15.6	4.2' 4.1' 4.0' 3.9' 3.8' 3.7' 3.7'	T7° 45.7 17° 50.8 17° 55.9 S18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 DEC S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 52.6 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 19° 10.7 19° 10.7	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -3.0' -2.2' -2.6' -2.4' -2.3' -2.2' -1.6' -1.4' -1.3' -1.1' -1.0'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 17 18 19 19 20 21 22 23	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9 150°02.8 165°02.6	. · · 04.7	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 3° 05.5 3° 05.5 6HA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6 290° 31.6 304° 53.6 319° 15.6 333° 37.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7' 3.6' 3.5' 3.5' 3.5' 3.4' 3.3' 3.2' 3.1' 3.1' 3.1' 3.0' 3.0' 3.0' 3.0' 3.0' 3.0' 3.0' 3.0	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 12.7 19° 14.6 19° 10.7 19° 12.7 19° 14.6 19° 10.3 S19° 17.9 19° 19.3 19° 20.5 19° 21.7 19° 22.6 19° 23.5	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -2.0' -1.17' -1.6' -1.4' -1.3' -1.1' -0.8'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 17 18	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9 150°02.8	04.7	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 3° 05.5 3° 05.5 6HA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6 290° 31.6 304° 53.6 319° 15.6 333° 37.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.8 18° 05.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 12.7 19° 16.3 S19° 17.9 19° 19.3 19° 20.5 19° 21.7 19° 22.6	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -2.0' -1.17' -1.6' -1.4' -1.3' -1.1' -0.8'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4' 61.4'
15 16 17 18 19 20 21 22 23 Mon 0 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 17 18	45°06.7 60°06.6 75°06.4 90°06.3 105°06.2 120°06.1 135°05.9 150°05.8 165°05.7 SD = 15.8' GHA 180°05.6 195°05.4 210°05.3 225°05.2 240°05.1 255°04.9 270°04.8 285°04.7 300°04.5 315°04.4 330°04.3 345°04.2 0°04.0 15°03.9 30°03.8 45°03.7 60°03.5 75°03.4 90°03.3 105°03.1 120°03.0 135°02.9 150°02.8 165°02.6	. · · 04.7	248° 01.9 262° 25.1 276° 48.2 291° 11.2 305° 34.2 319° 57.1 334° 20.0 348° 42.8 3° 05.5 3° 05.5 3° 05.5 3° 05.5 6HA 17° 28.2 31° 50.8 46° 13.4 60° 36.0 74° 58.5 89° 20.9 103° 43.3 118° 05.7 132° 28.0 146° 50.3 161° 12.6 175° 34.8 189° 57.0 204° 19.1 218° 41.3 233° 03.4 247° 25.5 261° 47.5 276° 09.6 290° 31.6 304° 53.6 319° 15.6 333° 37.5	4.2' 4.1' 4.0' 4.0' 3.9' 3.8' 3.7'	17° 45.7 17° 50.8 17° 50.8 18° 00.8 18° 00.6 18° 10.3 18° 14.8 18° 19.2 18° 23.5 5D = 16.6' Dec S18° 27.6 18° 31.6 18° 35.4 18° 39.2 18° 42.7 18° 46.2 S18° 49.5 18° 55.6 18° 55.6 18° 55.6 18° 58.5 19° 01.2 19° 03.8 S19° 06.3 19° 10.7 19° 12.7 19° 14.6 19° 10.7 19° 12.7 19° 14.6 19° 10.3 S19° 17.9 19° 19.3 19° 20.5 19° 21.7 19° 22.6 19° 23.5	-5.2' -5.1' -4.9' -4.8' -4.7' -4.5' -4.4' -4.3' -4.1' d -4.0' -3.9' -3.6' -3.4' -3.3' -3.2' -2.9' -2.7' -2.6' -2.4' -2.3' -2.2' -2.0' -1.17' -1.6' -1.4' -1.3' -1.1' -0.8'	61.1' 61.1' 61.1' 61.2' 61.2' 61.2' 61.2' 61.2' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.3' 61.4'

Sun

Dec

GHA

GHA

Moon

Dec

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Sat

	Twilight				Twilight		
Lat.	Naut.	Civil	Sunrise	Sunset	Civil	Naut.	
N 72°							
N 70° 68°							
66°		Щ.	00:26	23:41			
64°	-:-	-:-	00:26	23:41	-:- -:-	-:-	
62°	-:- -:-	-:- -:-	01:39	21:46	-:- -:-	-:- -:-	
60°	-:-	01:01	02:14	21:21	23:00	-:- -:-	
	i						
N 58°	-:-	01:46	02:58	21:01	22:15	-:-	
56°	-:-	02:14	03:15	20:45	21:46	-:-	
54°	00:56	02:35	03:28	20:31	21:25	23:05	
52°	01:37	02:52	03:40	20:19	21:07	22:23	
50°	02:03	03:07	03:51	20:08	20:53	21:57	
45°	02:47	03:36	04:13	19:46	20:23	21:13	
N 40°	03:17	03:58	04:31	19:28	20:01	20:43	
35°	03:39	04:16	04:46	19:14	19:43	20:20	
30°	03:58	04:31	04:58	19:01	19:28	20:01	
20°	04:26	04:55	05:20	18:39	19:04	19:33	
N 10°	04:49	05:16	05:39	18:20	18:44	19:11	
0°	05:07	05:33	05:56	18:03	18:26	18:52	
S 10°	05:24	05:50	06:13	17:46	18:09	18:35	
20°	05:40	06:07	06:31	17:28	17:52	18:19	
30°	05:56	06:26	06:52	17:07	17:33	18:03	
35°	06:05	06:36	07:04	16:55	17:23	17:54	
40°	06:14	06:48	07:18	16:41	17:11	17:45	
45°	06:24	07:01	07:35	16:24	16:58	17:35	
S 50°	06:35	07:17	07:55	16:04	16:42	17:24	
52°	06:40	07:24	08:05	15:54	16:35	17:18	
54°	06:46	07:32	08:16	15:43	16:27	17:13	
56°	06:52	07:41	08:28	15:31	16:18	17:07	
58°	06:59	07:51	08:42	15:17	16:08	17:00	
S 60°	07:06	08:02	08:59	15:00	15:57	16:53	
		Moonrise	2		Moonset		

Lat.	Sat	Moonrise Sun	Mon	Sat	Moonset Sun	Mon
N 72°	19:46			23:33		
N 70°	19:04	21:08	22:58	00:17	00:16	00:19
68°	18:36	20:22	21:51	00:35	00:45	01:05
66°	18:15	19:52	21:15	00:50	01:07	01:35
64°	17:58	19:30	20:49	01:02	01:25	01:58
62°	17:44	19:12	20:29	01:13	01:39	02:17
60°	17:32	18:57	20:13	01:22	01:51	02:32
N 58°	17:22	18:45	19:59	01:30	02:02	02:45
56°	17:13	18:34	19:47	01:37	02:11	02:56
54°	17:06	18:24	19:36	01:43	02:20	03:06
52°	16:59	18:16	19:27	01:49	02:27	03:14
50°	16:52	18:08	19:19	01:54	02:34	03:22
45°	16:39	17:52	19:01	02:05	02:48	03:39
N 40°	16:28	17:39	18:47	02:14	03:00	03:53
35°	16:18	17:27	18:35	02:22	03:10	04:04
30°	16:10	17:17	18:24	02:29	03:19	04:15
20°	15:56	17:01	18:06	02:42	03:34	04:32
N 10°	15:44	16:46	17:50	02:52	03:48	04:48
0°	15:32	16:32	17:35	03:02	04:00	05:02
S 10°	15:21	16:19	17:20	03:12	04:13	05:16
20°	15:09	16:04	17:05	03:23	04:27	05:32
30°	14:55	15:48	16:47	03:35	04:42	05:49
35°	14:47	15:38	16:36	03:42	04:51	05:59
40°	14:38	15:27	16:24	03:50	05:01	06:11
45°	14:28	15:15	16:10	04:00	05:13	06:25
S 50°	14:15	14:59	15:53	04:11	05:28	06:42
52°	14:09	14:52	15:45	04:17	05:35	06:50
54°	14:03	14:44	15:36	04:23	05:43	06:58
56°	13:56	14:35	15:26	04:29	05:51	07:08
58°	13:48	14:25	15:14	04:37	06:01	07:20
S 60°	13:39	14:14	15:01	04:45	06:12	07:33

			Sun		Moon			
Day	Day	Eqn.of Time		Mer.	Mer.	Pass.		l
	00 ^h	12 ^h	Pass	Upper	Lower	Age	l	
		mm:ss	mm:ss	hh:mm	hh:mm	hh:mm		
	10	00:46	00:40	11:59	21:46	09:17	12(86%)	
	11	00:34	00:28	12:00	22:47	10:16	13(93%)	l
	12	00:22	00:16	12:00	23:50	11:18	14(98%)	l